

2021 | 中鋁國際 社會責任報告

2021 Corporate Social Responsibility Report
China Aluminum International Engineering Corporation Limited

環境、社會和企業管治 (ESG) 報告
Environmental, Social and Corporate Governance (ESG) Report



技術引領 築夢家園



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中鋁國際工程股份有限公司
China Aluminum International Engineering Corporation Limited

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中鋁國際工程股份有限公司
China Aluminum International Engineering Corporation Limited

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報告導讀

INTRODUCTION

本報告旨在響應利益相關方期望，展示環境、社會、企業管治及可持續發展方面的理念、管理、行動和成效。

This Report responds to the expectations of stakeholders by demonstrating the ideas, management, actions, and achievements of the Company in environmental, social, and corporate governance, as well as sustainable development.

報告標準 Reporting Standards

本報告遵循香港聯合交易所（以下簡稱“香港聯交所”）《環境、社會及管治報告指引》，上海證券交易所（以下簡稱“上交所”）《上海證券交易所上市公司自律監管指引第1號—規範運作》的有關規定與要求，並廣泛參考全球報告倡議組織（GRI）《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-CSR 4.0）》等在內的國內外社會責任報告標準。

This Report is formulated in accordance with the relevant regulations and requirements of the *Environmental, Social and Governance Reporting Guide* of the Stock Exchange of Hong Kong Limited (hereinafter referred to as the “SEHK”), and the *Guidelines No. 1 for the Self-Regulation of Listed Companies on the Shanghai Stock Exchange – Standardized Operation* of the Shanghai Stock Exchange (hereinafter referred to as the “SSE”), and with reference to the *Sustainability Reporting Guidelines* of the Global Reporting Initiative (GRI), the *Guidelines on Corporate Social Responsibility Reporting for Chinese Enterprises (CASS-CSR 4.0)* of the Chinese Academy of Social Sciences (CASS), as well as other domestic and international social responsibility reporting standards.

報告覆蓋範圍 Reporting Scope

如無特殊說明，本報告涵蓋中鋁國際工程股份有限公司總部、分支機構及其附屬子公司。

Unless otherwise specified, this Report covers the headquarters, branches, and subsidiaries of China Aluminum International Engineering Corporation Limited.

報告數據來源 Data Sources

除特殊說明，本報告所引用的信息與數據來自公司的正式文件、統計報告與財務報告，以及經由公司統計、匯總與審核的環境、社會及管治信息。

Unless otherwise specified, the information and data herein come from the official documents, statistical reports, and financial reports of the Company, as well as the environmental, social, and corporate governance information collected, aggregated, and audited by the Company.

報告時間範圍

Reporting Period

2021年1月1日至2021年12月31日。部分內容適當追溯歷史數據。

This Report covers the period from January 1, 2021 to December 31, 2021. Some contents herein may appropriately be traced back to historical data.

報告稱謂說明 Terms and Description

為便于表述和方便閱讀，“中鋁國際”“公司”“我們”表示中鋁國際工程股份有限公司總部、分支機構及附屬子公司。如無特殊說明，本報告中的“元”“萬元”“億元”分別代表“人民幣元”“人民幣萬元”“人民幣億元”。

For better indication and reading, “CHALIECO,” “the Company,” and “We” refer to the headquarters, branches, and subsidiaries of China Aluminum International Engineering Corporation Limited. Unless otherwise specified, reference to “yuan” in this Report is denominated in “RMB”.

報告周期

Reporting Cycle

本報告為年度報告。

This Report is an annual report.

報告獲取

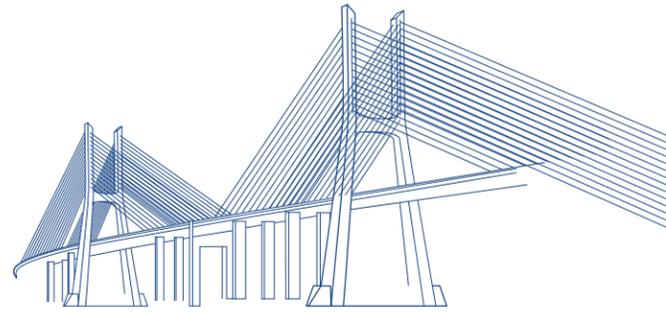
Report Access

可以在中鋁國際官方網站、香港聯交所網站以及上交所網站瀏覽和下載本報告的中文簡體／英文、中文繁體／英文版本。

The publications in Chinese simplified/English, traditional Chinese/English are available for inquiry and download at the official websites of CHALIECO, the SEHK, and the SSE.

董事長致辭

MESSAGE FROM THE CHAIRMAN



- 2021年是“十四五”開局之年，也是中鋁國際改革創新發展的關鍵之年。面對複雜多變的國內外形勢，我們直面困難，踔厲奮發，迎難而上，勇于擔當，謀求高質量發展，各項工作取得新成效。我們在加快建設國內一流、全球有核心競爭力的有色金屬工程技術公司的同時，主動承擔社會責任，努力為各利益相關方創造經濟、社會和環境最優的綜合價值。

2021, the first year of the 14th Five-Year Plan, was crucial to CHALIECO for reform, innovation, and development promotion. Facing the complicated and changing environment at home and abroad, we stood up to forge ahead against difficulties and challenges with a great sense of responsibility in pursuit of high-quality development and further achievements in all aspects. While building a first-class nonferrous metal engineering company with global core competitiveness in China, we took the initiative to fulfill social responsibilities, striving to earn the highest value in economy, society and environment for stakeholders.

- 我們踐行多措並舉，匠心打造品質工程。不斷追求專業精神、工匠精神，全方位發力加強項目建設，管控更加精準到位。全力克服疫情防控常态化對項目建設的影響，保質保量搶趕工程進度。推動科技成果應用，突破項目建設瓶頸，實現更高質量的項目建設。2021年獲得國家住房和城鄉建設部頒發的《工程設計綜合甲級資質》證書，業務涵蓋21個行業的161個專業。公司獲得魯班獎1項，國家優質工程獎3項，省部級及以上優質工程獎13項，有色金屬建設行業成果獎42項，省部級及以上優秀QC成果70項。

We took various measures to build high-quality projects. While constantly enhancing professionalism and craftsmanship, we spared no effort in project construction across the board, and strengthened the management and control in a more accurate manner. While eliminating the impact of the regular epidemic prevention and control on project construction, we did our utmost to accelerate the construction with satisfactory quality. We kept promoting the commercialization of science and technology achievements, and strived to overcome the bottleneck in project building. In 2021, the Company was certified “Engineering Design Integrated Qualification Class-A” by the Ministry of Housing and Urban-Rural Development of the People’s Republic of China, with businesses covering 161 specialties in 21 industries. The Company won one China Construction Engineering Luban Prize, three National Quality Engineering Awards, 13 quality engineering awards at provincial/ministerial level or above, 42 achievement awards for nonferrous metal construction industry, as well as 70 outstanding QC achievement awards at provincial/ministerial level or above.

- 我們堅持技術引領，持續儲蓄核心力量。把握當前有色行業發展大趨勢，加速轉型創新發展，開拓新領域、掌握新技術。2021年，我們搶抓新一輪產業變革和科技革命重大機遇期，圍繞“八大領域、五大方向”，組織重點科研項目立項12項，完成11個項目成果驗收，整體研發投入水平處於行業領先地位。

We persistently established core competitiveness with emphasis on technologies. Following the current development trend of the nonferrous metals industry, we strode forward in transformation and innovation to master new technologies in new fields. In 2021, we seized the opportunities of the new round of industrial transformation and technological revolution and obtained the approval of 12 key scientific research projects and completed acceptance of 11 projects with focus on “eight fields from five directions”. Our investment in R&D maintained a leading position in the industry.

- 我們深耕綠色發展，致力實現“雙碳”目標。重視科技創新，聚焦綠色低碳循環發展核心技術和關鍵業務，搶占行業碳達峰碳中和技術制高點。踐行綠色施工理念，減少對生態環境造成的影響。加強綠色教育宣傳，提高廣大員工低碳意識。2021年，節能降碳領域多項技術取得重大科技成果。

Committed to green development, we strived to achieve the goals of “carbon emission peak and carbon neutrality”. Focusing on innovation in science and technology, as well as the core technologies and key businesses of green, low-carbon, and circular development, we made great effort to seize the high ground of technologies that helps achieve the goals of “carbon emission peak

and carbon neutrality”. We effectively implemented green construction concept, and did our best to reduce the impact of project construction on ecological environment. We strengthened education and publicity of green development to improve the awareness of employees on low-carbon development. In 2021, several major achievements were made in energy conservation and carbon reduction.

- 我們關注員工成長，穩步築牢發展基石。大力實施員工關愛工程，努力構建“陽光、坦誠、簡單、友善”的員工關係。為廣大員工提供公平的職業發展機會，通過講座、培訓、競賽等形式，攜手員工共同成長。建立完善的薪酬福利體系，保障員工各項基本權益，致力於為全體員工打造公平公正的職場和安全健康的工作環境。

We underlined the growth of employees as an attempt to lay a solid foundation for development. We vigorously implemented employee care program, and made great effort to build a “bright, honest, simple, and friendly” relation for and among employees. We provided employees with fair and equal career development opportunities, and achieved common development with employees through seminars, training sessions and contests. We established a sound compensation and benefits system, guaranteed the basic rights and interests of employees, and strived to build a fair and equal workplace and a safe and healthy work environment.

- 我們助力美好社會，合力實現和諧發展。在疫情常态化的今天，我們積極開展疫情防控，保障員工生命健康，實現複工複產；在特大暴雨災情面前，我們聞“汛”而動，逆“洪”而上，保障群眾生命財產安全；在鄉村振興方面，我們積極履行社會責任，全面部署鄉村振興相關工作，激發鄉村發展活力。同時，我們還開展形式豐富的公益活動，促進社區共融與社會和諧。

We contributed to the building of a beautiful society towards harmonious development. Under routine COVID protocols, we took active measures in pandemic prevention and control to safeguard the life and health of employees and resume production. Facing torrential rains and other natural disasters, we rushed to the site unhesitatingly to protect lives and property. In terms of rural revitalization, we took initiative to fulfill social responsibilities, made comprehensive arrangements in rural revitalization to drive rural development. We also increased investment in public welfare programs to promote an integrated community and a harmonious society.

- 我們落實“一帶一路”，履行全球公民責任。堅持實行高水平對外開放，穩步推進國際業務發展，深耕“一帶一路”，積極主動與沿線國家溝通，開展互利合作，實現共贏發展。堅持共商共建共享原則，堅持依法合規納稅，堅持本地化用工、本地化採購，堅持國際安全、健康和環保標準，尊重當地傳統和文化，積極參與社會公益，服務當地社會民生和環境可持續發展，共同創造美好未來。

Guided by the “Belt and Road” Initiative, we earnestly fulfilled our social responsibilities as global corporate citizen. In pursuit of a higher-standard opening up, we steadily promoted the development of international businesses, and established active communication and win-win cooperation with the countries and regions along the Belt and Road. In the principle of achieving shared growth through discussion and collaboration, we paid taxes according to law, persisted in local employment and procurement, abided by international safety, health and environmental standards, respected local traditions and culture, actively participated in public welfare activities, and made great contributions for local people’s livelihood and sustainable environmental development, for the sake of a beautiful future.

- 于高山之巔，方見大河奔湧；于群峰之上，更覺長風浩蕩。2022年是挑戰與機遇並存的一年，我們將繼續堅持黨建引領和創新引領，完整、準確、全面貫徹新發展理念，融入構建新發展格局，勇擔“國之大者”重任，聚焦主責主業，大力實施“十四五”發展戰略，把主業做強、市場做大、管理做優、品牌做響，為全面建設社會主義現代化國家貢獻力量。

On the peak of mountains shall we see the gorgeous rivers; on the top of peaks shall we feel the mighty winds. 2022 will be a year filled with challenges and opportunities on our way forward. Forging ahead with Party building and innovation, we will fully, accurately, and comprehensively implement the new development strategies under the new development pattern, focus on the top priorities and the main business of the Company, and vigorously take measures under the 14th Five-Year Plan. We will enhance our existing businesses on the market, optimize the management mode and strengthen, and we will make contributions to the building of a modern socialist country in an all-round way.

董事會 ESG 管治聲明

ESG GOVERNANCE STATEMENT FROM THE BOARD OF DIRECTORS

- 中鋁國際深知良好的公司治理和風險管理流程的重要性，致力於推動公司經營管理與業務實踐的可持續發展，對公司全面風險管理體系進行測評，努力實現與環境、社會和諧共生，提升公司的穩健發展水平。

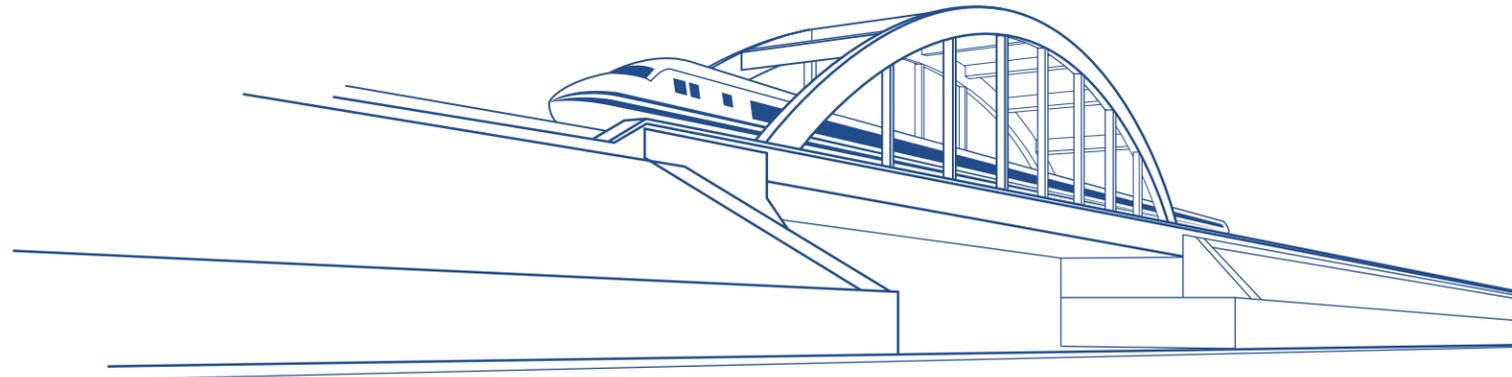
CHALIECO is fully aware of the importance of good corporate governance and risk management process, and is committed to promoting the sustainable development of corporate operations, management and business practices. With evaluation of the total risk management system, CHALIECO strives to achieve a harmonious coexistence with the environment and society, and to improve steady development.

- 中鋁國際遵循擔責、透明、道德的原則，不斷完善法人治理結構，加強董事會建設，規範決策程序，建立科學高效的決策、執行、監督體系，重點做好合規管理、風險防控、廉潔從業等工作。

In the principle of accountability, transparency and business ethics, CHALIECO constantly improves the corporate governance structure, strengthens the building of the Board of Directors, standardizes decision-making procedures, establishes a scientific and efficient decision-making, implementation and supervision system, and stresses the compliance management, risk prevention and control, and integrity practices.

- 公司董事會承諾，本公司嚴格遵守香港聯交所《環境、社會及管治報告指引》的披露要求，在董事會的領導與監督下，各職能部門以及各成員企業各司其職，協同配合。

The Board of Directors of CHALIECO undertakes to strictly comply with the disclosure requirements of the *Environmental, Social and Governance Reporting Guide* of the SEHK. Under the leadership and supervision of the Board of Directors, all functional departments and member enterprises perform their respective duties and cooperate with one another.



- 2021年，公司董事會對ESG重點議題進行了識別和評估，以此明確年度工作重點，制定了公司的可持續發展指標和目標。按照《中鋁國際工程股份有限公司社會責任管理模塊及負面清單》《中鋁國際工程股份有限公司社會責任工作實施細則》和《中鋁國際工程股份有限公司社會責任管理制度目錄》，各部門嚴格履行責任，中鋁國際對2021年各模塊社會責任指標完成情況進行自我評估，形成報告並上報中鋁集團。

In 2021, the Board of Directors identified and evaluated ESG critical issues as a way to clarify the annual work priorities and set the Company's sustainability indicators and goals. All departments strictly fulfilled their responsibilities according to the *Social Responsibility Management Module and Negative List of China Aluminum International Engineering Corporation Limited*, the *Implementation Rules of China Aluminum International Engineering Corporation Limited for Work on Social Responsibilities*, and the *Catalogue of Social Responsibility Management System of China Aluminum International Engineering Corporation Limited*. CHALIECO conducted self-assessment on the completion of social responsibility indicators of each module in 2021, and a report detailing the assessment results was submitted to CHINALCO.

- 2022年，公司董事會將進一步完善ESG治理體系，推動公司ESG治理水平不斷提升。

In 2022, the Board of Directors will further perfect the ESG governance system, and promote the continuous improvement of the Company's ESG governance.

關於我們 ABOUT US

公司簡介 Corporate Profile

中鋁國際工程股份有限公司（簡稱“中鋁國際”）成立於2003年12月16日，隸屬於中國鋁業集團有限公司（以下簡稱“中鋁集團”）的工程技術戰略單元，是中鋁集團控股子公司，是中國有色金屬行業領先的技術、工程服務與設備供應商。中鋁國際於2012年7月6日在香港聯交所主板（H股代碼：2068）上市，於2018年8月31日在上海證券交易所（A股代碼：601068）上市，成為“A+H”股有色工程技術第一股。

Established in December 16, 2003, China Aluminum International Engineering Corporation Limited (hereafter referred to as "CHALIECO") is an engineering technology strategic unit and a holding subsidiary of Aluminum Corporation of China (hereafter referred to as "CHINALCO"), as well as a leading technology, engineering service and equipment provider in nonferrous metal industry in China. CHALIECO was listed on the main board of the SEHK (stock code: 2068) on July 6, 2012, and the SSE (stock code: 601068) on August 31, 2018, the first nonferrous engineering company listed on both the stock exchanges.

中鋁國際現有員工約**12,500**人，是一家集技術研發、測繪勘察、工程設計、工程建設、裝備製造和各類相關投資等業務為一體的高新技術企業。中鋁國際成立近二十年來，創造了百餘項“中國第一”和中國企業新紀錄，取得中國建築工程魯班獎、國家優質工程獎等各級各類工程獎項**500**餘項，在世界享有廣泛聲譽。目前擁有包括“工程設計綜合甲級資質”在內的建設工程企業資質**200**餘項，2021年度，以第105位和第164位蟬聯美國《工程新聞記錄》(ENR)“全球工程設計企業**150**強”和“國際工程設計企業**225**強”雙榜。

CHALIECO, with about **12,500** employees, is a new high-tech enterprise integrating research and development, surveying and mapping, engineering design, engineering construction, equipment manufacturing, and relevant investment businesses. Since its establishment, CHALIECO has ranked "China's No. 1" for over 100 areas and created some new records among Chinese enterprises, and won over **500** engineering awards at various levels, including China Construction Engineering Luban Prize and National Quality Engineering Award, enjoying a wide reputation in the world. Boasting more than **200** construction engineering enterprise qualifications including Engineering Design Integrated Qualification Class-A, CHALIECO ranked 105th and 164th among the Top **150** Global Design Firms and the Top **225** International Design Firms in 2021, respectively, released by *Engineering News-Record* (ENR).

近年來，中鋁國際積極參與地方基礎設施建設、棚戶區改造、生態建設、環境工程、道路橋梁、城市公用事業等領域的投資、建設與開發，為構建資源節約型和環境友好型社會做出了積極貢獻。

In recent years, CHALIECO has taken initiative to participate in the investment, construction and development of local infrastructure, shantytown renovation, ecological construction, and environmental engineering, as well as roads, bridges, urban public utilities, making better contributions to the building of a resource-conserving and environmentally-friendly society.

企業文化

Corporate Culture



發展願景

Development Vision

建設國內一流、全球有核心競爭力的有色金屬工程技術公司

To build a first-class nonferrous metal engineering technology company in China with global core competitiveness



戰略定位

Strategic Positioning

有色行業技術的引領者，有色工程建設的主力軍，基礎設施及民用工程建設的生力軍

To be the technology leader of the nonferrous metal industry, the main force for nonferrous engineering construction, and the new force for infrastructure and civil engineering construction



發展戰略

Development Strategy

聚焦主責主業，實施“233”發展戰略。“2”就是“科技+國際”發展方向，強化“科技+國際”，發揮技術、品牌、產業一體化及海外影響力的優勢。抓住“碳達峰”、“碳中和”歷史機遇，提前布局綠色產業，搶占市場先機。“33”就是“3+3”業務結構：做強做優勘察設計諮詢、有色及工業工程總承包、基礎設施建設及民用工程總承包三個核心業務；做亮做實工程用鋁、科技產業化、新興產業三個拓展業務。各成員企業要圍繞“一主一特一拓”加快發展。

To focus on main responsibilities and businesses, and implementation of the "233" development strategy. Of the "233" strategy, "2" represents the development direction of "S&T + Internationalization", namely exerting the strengths in technology, brand and industry integration as well as the overseas influence, and seizing the historical opportunities of carbon emission peak and carbon neutrality to take the priority in green industry development; "33" represents the "3+3" business structure: namely enhancing and optimizing the three core businesses - survey and design consulting, general contracting for nonferrous metal engineering and industrial engineering projects, and general contracting business for infrastructure and civil engineering construction, and boosting the three scalable businesses of aluminum for engineering construction, science and technology commercialization, and emerging industries. Member enterprises are urged to step up development by focusing on the "main business, featured business, and scalable business."

組織架構

Organizational Structure



注：此架構圖只披露部分重要二級公司，但不包括全部。

Note: This chart only lists some major second tier companies.

全資子公司 Wholly-owned Subsidiaries

沈陽鋁鎂設計研究院有限公司
Shenyang Aluminum & Magnesium Engineering and Research Institute Company Limited (SAMI)

貴陽鋁鎂設計研究院有限公司
Guiyang Aluminum & Magnesium Design and Research Institute Co., Ltd. (GAMI)

長沙有色冶金設計研究院有限公司
CINF Engineering Co., Ltd.

中國有色金屬長沙勘察設計研究院有限公司
China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd.

中國有色金屬工業第六冶金建設有限公司
China Sixth Metallurgical Construction Co., Ltd.

中色十二冶金建設有限公司
China Nonferrous Metals Industry's 12th Metallurgical Construction Co., Ltd.

中國有色金屬工業昆明勘察設計研究院有限公司
Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd.

中鋁西南建設投資有限公司
CHINALCO Southwest Construction Investment Co., Ltd.

中鋁國際(天津)建設有限公司
CHALIECO (Tianjin) Construction Company Limited

中鋁國際工程設備有限公司
CHALIECO Trading Co., Ltd.

中鋁國際技術發展有限公司
China Aluminum International Technology Development Co., Ltd.

中鋁國際鋁應用工程有限公司
CHALIECO aluminum application Co., Ltd.

中鋁國際雲南鋁應用工程有限公司
CHINALCO International Yunnan Aluminum Application Engineering Co., Ltd.

控股子公司 Holding subsidiaries

中色科技股份有限公司
China Nonferrous Metals Processing Technology Co., Ltd.

九冶建設有限公司
Jiuye Construction Co., Ltd.

中鋁山東工程技術有限公司
CHINALCO Shandong Engineering Technology Co., Ltd.

分公司 Branch Companies

中鋁國際工程股份有限公司沈陽分公司
CHALIECO Shenyang Branch

中鋁國際工程股份有限公司貴陽分公司
CHALIECO Guiyang Branch

中鋁國際工程股份有限公司長沙分公司
CHALIECO Changsha Branch

中鋁國際工程股份有限公司洛陽分公司
CHALIECO Luoyang Branch

中鋁國際工程股份有限公司長勘分公司
CHALIECO Changkan Branch

中鋁國際工程股份有限公司昆明分公司
CHALIECO Kunming Branch

中鋁國際工程股份有限公司鋁應用設計分公司
Aluminum Application Design Branch of China Aluminum International Engineering Corporation Limited

海外機構 Overseas Entities

中鋁國際香港有限公司
CHALIECO Hong Kong Corporation Limited

中鋁國際工程(印度)私人有限責任公司
China Aluminum International Engineering (India) Pty Ltd.

中鋁國際工程股份有限公司委內瑞拉分公司
CHALIECO Venezuela Branch

代管(托管) Escrow (nominee) companies

中鋁招標有限公司
Chinalco Tendering Co., Ltd.

昆明有色冶金設計研究院股份分公司
Kunming Engineering & Research Institute of Nonferrous Metallurgy Co., Ltd. (KERI)

企業治理

Corporate Governance

中鋁國際嚴格遵守《中華人民共和國公司法》《中華人民共和國證券法》《上市公司治理准則》等相關法律法規，明確職責，建立合規章程，制定議事規則和程序，確保公司守法合規。

In strict compliance with the *Company Law of the People's Republic of China*, the *Securities Law of the People's Republic of China*, the *Code of Corporate Governance for Listed Companies* and other laws and regulations, CHALIECO clarifies its responsibilities and sets compliance charter and rules of procedure to ensure legal compliance of the Company in conducting business.

管理績效

Management Performance

指標/Indicators	2019	2020	2021
企業規章制度法律審核率 (%) Legal review rate of corporate rules and regulations (%)	100	100	100
企業經濟合同法律審核率 (%) Legal review rate of corporate business contracts (%)	100	100	100
企業重要經濟決策法律審核率 (%) Legal review rate of important corporate business decisions (%)	100	100	100
守法合規培訓次數 (次) Number of legal compliance training sessions (time)	6	6	8
守法合規培訓時長 (小時) Number of hours for legal compliance training (hour)	26	26	30

指標/Indicators	2019	2020	2021
總資產 (萬元) Total assets (RMB'0,000)	5,599,946.31	5,451,402.43	5,882,803.53
淨資產 (萬元) Net assets (RMB'0,000)	1,539,538.00	1,563,691.27	1,651,518.20
營業收入 (萬元) Operating revenue (RMB'0,000)	3,105,979.16	2,302,595.10	2,334,819.63
納稅總額 (萬元) Total tax (RMB'0,000)	74,687.64	79,671.84	73,689.22
召開董事會 (次) Number of board meetings held (time)	12	7	6
召開股東大會 (次) Number of general shareholders' meetings held (time)	5	3	3
員工群眾來訪接訪率 (%) Reception rate of visits of employees and other stakeholders (%)	100	100	100
來信來函受理率 (%) Handing rate of letters and mails (%)	100	100	100

● 對標先進 深化改革 Benchmark for Deepening Reform

中鋁國際按照國務院國資委的工作部署及中鋁集團的工作要求，確定了本戰略單元深化改革三年行動任務台賬，主要有完善現代企業制度、推進產業布局優化和結構調整、深化混合所有制改革、健全市場化經營機制、抓好國企改革專項工作、加強黨的建設等七個方面、45項改革任務，明確了每項任務的改革舉措、完成時點和責任部門。截至2021年12月底，中鋁國際“三年改革”工作完成比例超過70%，滿足中鋁集團的考核要求。

According to the arrangement of the State-owned Assets Supervision and Administration Commission (SASAC) of the State Council and the requirements of CHINALCO, CHALIECO has established its standing books system for the three-year action, which mainly includes 45 tasks from seven aspects - modern enterprise system perfection, industrial layout optimization and structural adjustment, mixed-ownership reform acceleration, market-oriented mechanism improvement, state-owned enterprise (SOE) reform promotion and Party building enhancement, with specific measures, completion time and responsible department. By the end of December 2021, CHALIECO has completed over 70 percent of its “three-year reform”, catering to the assessment requirements of CHINALCO.

中鋁國際深化改革主要開展工作

Main Tasks of CHALIECO in Deepening Reform

制定“三重一大”決策制度及清單、黨委會前置研究討論重大經營管理事項清單等，理清了各治理主體權責邊界

CHALIECO established a decision-making system and worklist for the major issues, major personnel appointments and dismissals, investments in major projects and use of large sums of money and the ex-ante approach for the Party committee for deliberating major issues relating to business operation and management, aiming at clarifying the powers and responsibilities of each governing body.

所屬企業通過應建必建董事會，實現了外部董事占多數，完善了各企業的法人治理結構

Board of Directors was established as necessary for all affiliated enterprises with outside directors in a majority, with an aim to improve corporate governance.

中鋁國際及所屬6家重要子企業制定了落實董事會職權實施方案，全面依法落實了董事會各項權利

CHALIECO and its six major subsidiaries formulated the implementation plans for exercising the functions of the Board of Directors, in a bid to fully perform rights of the Board in accordance with law.

進行組織機構改革，梳理公司本部、成員企業及其他業務實體的各自職責，明確邊界，構建精簡高效的本部機關

CHALIECO started reforms on organizational structure, streamlined and clarified the responsibilities of the headquarters, member enterprises, and other business entities, and built a lean and efficient structure.

完善勞動、人事、薪酬各方面改革的推進要點，真正實現管理人員能上能下、員工能進能出、收入能增能減

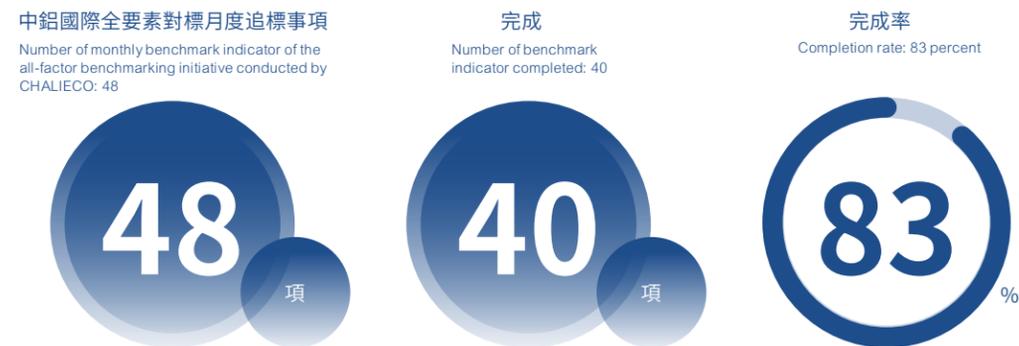
CHALIECO addressed the key points relating to the reforms in the aspects of, among others, labor relations, personnel, and compensation, which effectively established a mechanism for the promotion and demotion of management personnel, employment and dismissal of employees, and adjustment of salaries and remunerations.

案例
CASE

中鋁國際全要素對標成績顯著
CHALIECO achieved outstanding performance in benchmarking in all aspects.

2021年，中鋁國際全要素對標工作全面開展，構建5C價值管理指標體系，開展全要素對標自評價，制訂了《中鋁國際工程股份有限公司對標世界一流管理提升行動實施方案》。2021年末，中鋁國際全要素對標月度追標事項48項，完成40項，完成率83%。

In 2021, CHALIECO started benchmarking in an all-around way, built a 5C value-based management indicator system, carried out self-assessment on all factors on benchmarking, and formulated the Implementation Plan of China Aluminum International Engineering Corporation Limited for Benchmarking World-class Management System. By the end of 2021, CHALIECO completed 40 of 48 monthly indicators of the all-factor benchmark initiative, with a completion rate of 83 percent.



企業品牌文化專項對標工作方面取得了較好的成效，確立了“幹一個項目、樹一座豐碑、交一方朋友、培養一批幹部、留一段美好記憶”的理念，形成了工程項目黨建特色品牌，擬訂了企業文化和品牌建設制廢改立計劃，出台了對外宣傳管理辦法等制度，獲得了一批企業文化和品牌建設榮譽，提升了公司軟實力。

CHALIECO achieves satisfactory results in benchmarking on corporate brand culture, established the philosophy of “embarking a project, building a monument, making some friends, training management personnel and keeping good memories,” formed a featured brand of Party building from project construction, drafted the establishment, modification and abolition and plan for corporate culture and brand construction, and developed management measures for external publicity and other systems. Those efforts earned awards and honors for the Company in terms of corporate culture and brand construction, and improved the soft power of the Company.

依法治企 合規經營 Law-Based Corporate Governance and Operation in Compliance

中鋁國際按照全面依法治國及法治央企的戰略部署，圍繞公司改革發展總體目標，適應市場化、現代化、國際化發展需要，切實加強對公司法治建設的組織領導，形成高效的法律合規工作管控體系，有效發揮法律合規工作的服務、保障、支撐、風控和監督作用，嚴控法律合規風險。

According to the strategic requirements for comprehensively promoting law-based governance and governing central SOEs by the rule of law, CHALIECO, centering on the overall goal for corporate reform and development, adapted to market-oriented development, modernization and internationalization, effectively enhanced the organization and leadership of the Company by the rule of law, established efficient management and control system for legal compliance, gave full play to the role of legal compliance in service provision, guarantee, support, risk control and supervision, and strictly controlled legal compliance risks.

制度建設 System Construction

中鋁國際制定發布了《主要負責人履行推進法治建設第一責任人職責實施辦法》《中鋁國際“十四五”法治專項工作規劃》等一系列制度文件，建立健全並持續優化法律管控制度體系，統一了法律工作標準與要求，明確了法律業務管理邊界與權責，建立了上下協同運行的法律工作體系。

CHALIECO formulated and issued a series of requirements, such as the *Regulations on the Duties and Responsibilities of Top Leaders as the Principal Persons Liable for Implementing the Rule of Law*, and the *Special Work Plan for the Rule of Law of CHALIECO in the 14th Five-Year Plan Period*, so as to establish and constantly optimize law-based management and control systems, unified the legal work procedures and requirements, clarified the management boundaries and the powers and responsibilities of law-related businesses, and developed legal work system characterized by coordinated operations from top to bottom.

機構設置 Institutional Setting

中鋁國際本部設立獨立的法律合規部。12個主要二級成員企業中，6個設置獨立的法律事務職能部門，6個設置非獨立法律事務職能部門，採用與其他職能部門合署辦公的形式。

The headquarters of CHALIECO has an independent legal compliance department. Among the 12 major second-tier member enterprises, six have an independent functional department for legal affairs, and six have a non-independent functional department in joint operations with other functional departments.

普法培訓 Legal Training

2021年，根據“八五”普法工作部署，中鋁國際法律合規部採取多種形式，在公司本部組織成員企業開展普法培訓工作7次，包括《全民國家安全》《民法典》《安全生產法》《從合規角度剖析公司管理》等主題培訓。

In 2021, the Legal Compliance Department of CHALIECO, in accordance with the requirements of legal training during the 8th Five-Year Plan period, held seven law training sessions by various means at the headquarters and the member enterprises under the themes like “National Security,” “Civil Code,” “Work Safety Law,” “Corporate Management Analysis from the Perspective of Compliance”.



中鋁國際進行國家安全日法律培訓
“National Security Education Day” legal training by CHALIECO

風險防控 Risk Prevention and Control

中鋁國際持續推進內部控制體系建設，一方面，成立公司內控工作組，進行公司內控流程及內控矩陣的更新，完成公司內控手冊的修訂工作。另一方面，狠抓相關內控管理制度的“廢改立”，修訂責任不清、流程不明的有關事項。

CHALIECO constantly promoted the internal control system construction. An internal control work group was established in charge of updating internal control process and internal control matrix and completing the revision of internal control handbooks. The establishment, modification and abolition mechanism of internal control systems was further improved, particularly in issues with obscure responsibilities and procedures.

建立日常風險監控機制，每月編制並逐級上報風險管理監控報告和報表，將風險監控予以量化，達到風險預警和監控。堅持“管業務必須管風險”的經營理念，充分發揮“大監督”工作機制作用。通過主題培訓和學習交流等方式，進一步加大風險管控人員培訓和指導，提高風險管控人員的業務素質和風險意識。

CHALIECO established a routine risk monitoring mechanism, by which the risk management and monitoring reports and statements were prepared and submitted level by level, and the risk monitoring results were quantified to enhance risk warning and control. Under the concept of “equal stress on business development and risk management”, CHALIECO gave full play to the working mechanism of “extensive supervision”, and organized special topic training and exchanges to further strengthen the training and guidance for risk management personnel, and improve their professionalism and risk awareness.

財務風險管理 Financial Risk Management

中鋁國際通過進一步完善內控體系建設、管理信息化系統建設，加強資金管理、改善融資結構，夯實財務和業務基礎管理，提高管理效率，降低企業財務風險，防範公司運營中存在的風險和問題。

CHALIECO further improved internal control system and IT management system construction, strengthened capital management, refined financing structure, enhanced financial and business foundation management, boosted management efficiency to reduce financial risks, and mitigate potential risks and problems amid operations.

資本風險防控 Capital Risk Prevention and Control

為做好重大資產重組及資本運作過程風險防範，中鋁國際加強事前籌劃，制訂預案，提前化解。2021年完成投資業務管理制度的調整和完善，進一步明確投資前的盡調、策劃和方案設計，科學決策投資項目，並提前防範並購風險。

To effectively prevent risks in the process of major asset restructuring and asset operations, CHALIECO strengthened the pre-planning work and formulated emergency plans to address potential risks and problems. In 2021, CHALIECO completed the adjustment and improvement of management systems for investment business, and further clarified the responsibilities in due diligence, planning and program design for investment projects. Investment decisions were made in a scientific manner and the merger and acquisition risks were effectively prevented and solved in advance.



加強黨建 Party Building

2021年，中鋁國際黨委堅持以習近平新時代中國特色社會主義思想為指導，落實中央企業“黨建創新拓展年”的要求，抓好黨史學習教育、黨建與生產經營“雙融合”、黨的建設“回頭看”等重點專項工作任務，助力公司打贏“兩戰一仗”。

In 2021, CHALIECO, guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, fulfilled the requirements of the “Year of Party Building: Innovation and Development” for the central state-owned enterprises, and underlined the Party history learning and education, the integration of the Party building and the production and operation, the follow-up checks for Party building, and other major tasks, all of which supported the Company to win the “two-battle-and-one-campaign” for performance improvement.

強化政治建設 Political Building Reinforced

把學習習近平新時代中國特色社會主義思想、習近平總書記最新重要講話和指示批示精神列為黨組織會議“第一議題”，第一時間學習傳達、研究部署、推動落實。2021年，成立黨史學習教育領導小組，制定黨史學習教育實施方案；組織副經理以上幹部635人次進行百年黨史培訓；開展黨史學習教育網絡答題，黨員參與率實現100%；印發黨史學習教育簡報32期，微信公眾號推送專題宣傳報道170余期、黨史知識100余條。公司和各單位共成立31個學習教育指導組，分批分類督學40余次。召開“回頭看”工作專題部署會，對“回頭看”工作23項內容進行分解，紮實推進問題整改，整改率在90%以上。

CHALIECO gave priority to the study of the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and the spirit of the latest important speeches and instructions made by General Secretary Xi Jinping for the Party organization meetings, the spirit of which were studied, conveyed, and implemented timely and effectively. In 2021, CHALIECO set up a leading group for Party history education, formulated the implementation plan for Party history learning and education; organized 635 employees at and above the deputy managerial position to participate in the training sessions with a theme of Centenary History of the Communist Party of China; carried out online tests focusing on Party history education, with the participation rate of Party members to 100 percent; issued 32 volumes of Party history bulletins, posted more than 170 featured stories on Party history and over 100 Party-related tips on official WeChat account. CHALIECO and its units set up 31 steering groups for Party history education that organized over 40 inspections. CHALIECO also held several meetings on following up Party history education, during which a total of 23 work items were detailed to promote problem rectification, with rectification rate exceeding 90 percent.

加強思想建設 Ideological Building Strengthened

持續開展“思想、紀律、作風”三大整頓，印發《關於緊盯“四風”問題的通知》，加大明察暗訪力度，嚴格公務用車管理和使用。組織13家企業開展專項調研，落實中央八項規定精神、治“四風”、樹新風，糾正形式主義、官僚主義。

CHALIECO constantly conducted the rectifications of “ideology, discipline and style of work,” issued the Notice of Keeping a Close Watch on the “Four Forms of Decadence,” carried out thorough investigations, and strengthened the management and use of official vehicles. CHALIECO organized a total of 13 member enterprises to conduct special topic investigations, implement the spirit of the Eight-point Rules of the CPC Central Committee, tirelessly address the “four forms of decadence,” foster new practices, and rectify formalism and bureaucratism.

推動基礎管理 Fundamental Management Boosted

強化“線上+線下”指導管理，通過視頻會議、電話、現場查閱資料等形式指導基層黨組織工作20余次；組織開展黨建工作製度“廢改立”，抓實黨員發展、黨內統計、黨員教育等基础性工作。修訂完善了黨委會前置清單，做到了黨建基礎資料和專項工作等分門別類歸檔保存。

CHALIECO strengthened the “online + offline” guidance and management, and guided the work of primary-level Party organizations for more than 20 times by means of videoconferencing, telephone notification, and on-site review of materials; organized and carried out the establishment, modification and abolition work on the Party building work system, and enhanced the groundwork on new Party member admission, statistical operation within the Party, and education for Party members; revised and improved the ex-ante checklist of the Party committee, and classified and filed the basic and special work information of Party building.

開展文化建設 Cultural Construction Promoted

管好用好公司及成員企業“報、網、號、端”，《中國鋁業報》《今日中鋁》等媒體刊發265篇，《中國有色金屬報》刊發177篇，《中鋁強國號》刊發8期，發表的文章在《中國證券報》、新華社等多家媒體刊發。舉辦建黨100周年慶祝活動、“七一”升國旗活動、“紅色觀影”活動、“七個一”主題活動、“黨旗飄揚團旗紅，我為中鋁做貢獻”實踐活動等。

CHALIECO and its member enterprises gave full play to the newspapers, official websites, apps, and clients to enhance corporate culture construction. CHINALCO News, official WeChat account CHINALCO-NEWS, and other news outlets published 256 articles in total; China Nonferrous Metals News released 177 articles; the official CHINALCO account at the “Xuexi Qiangguo” platform posted eight articles that were reprinted by China Securities Journal, Xinhua News Agency, and other news media. A series of activities were held, such as the celebration for the 100th anniversary of the founding of the Communist Party of China, “July 1st” National Flag Raising Ceremony, revolution-themed film appreciations, Party history-themed activities, and other Party building and Party history education sessions.



中鋁國際舉辦“七一”系列活動
“July 1st” serial activities organized by CHALIECO



六冶黨員幹部參加信陽新縣大別山培訓
Party members and cadres of China Sixth Metallurgical Construction Co., Ltd. at Party building-themed training in Dabie Mountain area of Xinxian County, Xinyang City, Henan Province

提升黨務工作能力 Capacity on Party Affairs Enhanced

組織開展“黨建大學習、大比武、大落實”競賽，促進黨建工作規範化，提高黨建工作能力。組織開展各級黨組織黨建工作檢查考核，促進黨建責任落實。

CHALIECO organized Party building-themed contests to improve the standardization of Party building and enhance the ability of employees to handle Party-related affairs. Party organizations at all level of CHALIECO were organized to conduct Party building inspection and assessment, so as to further fulfill the responsibilities regarding Party building.

反腐倡廉 Anti-corruption and Integrity

中鋁國際堅持全面從嚴治黨，強化監督執紀問責，加強黨內監督，不斷取得黨風廉政建設和反腐敗工作新成效。

With full and strict governance over the Party, CHALIECO enhanced the accountability for overseeing discipline compliance, achieving new results in upholding integrity and fighting against corruption.

暢通信訪舉報渠道，製定處理程序，在嚴格保護舉報人隱私的前提下，組織開展舉報線索核查。2021年實現存量問題線索清零。

CHALIECO made great efforts to facilitate the petition of complaints with simplified acceptance procedures, and organized relevant personnel to investigate and examine the clues while strictly protecting the privacy of whistle-blowers. In 2021, all existing clues relating to violations of Party disciplines and regulations were settled properly.

持續加強黨員幹部的廉潔教育，通過多種形式築牢思想防線。在全戰略單元開展反腐倡廉宣傳教育月活動，在微信公眾號設立“清風中鋁國際”專欄，發布廉潔文章、廉潔視頻等，組織“開講了”廉潔專題黨課，開展黨風廉政建設警示教育大會，實現董事會及員工層面全覆蓋。

CHALIECO continued to strengthen integrity education among Party members and cadres, and enhanced the building of strong ideological defense lines through various approaches. “Publicity and Education Month for Combating Corruption and Upholding Integrity” was completed among all strategic units under CHALIECO. The official WeChat account of CHALIECO set up a special column titled “Upholding Integrity at CHALIECO” to post articles and videos on integrity and clean corporate management. Integrity-themed Party lectures, and the Warning Education Conference for Improving Party Conduct and Upholding Integrity were organized for the Board of Directors and employees at all levels.



中鋁國際召開2021年黨風廉政建設警示教育大會
2021 Warning Education Conference for Improving Party Conduct and Upholding Integrity at CHALIECO

可持續發展管理

SUSTAINABLE DEVELOPMENT MANAGEMENT

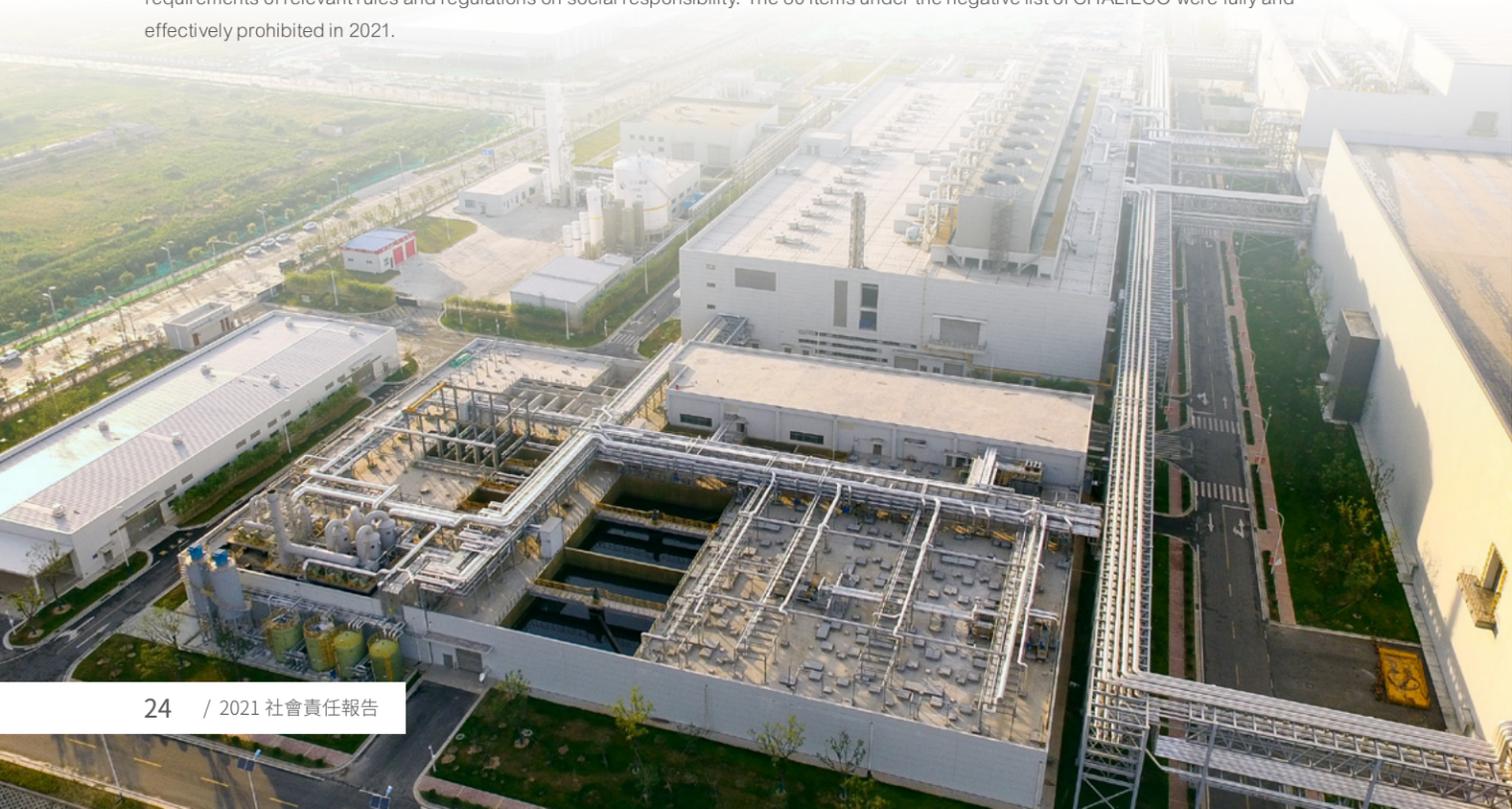
可持續發展管理體系

Sustainable Development Management System



公司將社會責任管理有效融入公司業務管理系統，成立由黨委書記、董事長擔任組長，總裁擔任常務副組長，領導班子其他成員以及有關人員擔任副組長的社會責任工作領導小組，負責向上匯報社會責任工作進展，向下傳達中鋁集團關於社會責任工作的指導及管理意見，統籌規劃公司社會責任工作的實施。領導小組下設辦公室，負責社會責任的日常工作。公司各單位、各部門嚴格按照《中鋁國際工程股份有限公司社會責任管理模塊及負面清單》《中鋁國際工程股份有限公司社會責任工作實施細則》以及社會責任相關規章製度的要求，做好公司治理、員工權益、環境保護、公平運營和社區支持5大領域的各項管理和實踐。2021年，中鋁國際負面清單80項禁止事項得到認真貫徹執行。

CHALIECO, with effective integration of social responsibility management into corporate business management system, established a Social Responsibility Leading Group with the Secretary of Party Committee and Chairman of the Board as the leader, the President of the Company as the executive deputy leader, and other members of the Management and competent personnel as deputy leaders. The Leading Group is responsible for reporting the progress of social responsibility to the superior, and conveying the guiding and management advice and suggestions of CHINALCO on social responsibility, as well as conducting overall planning for the fulfillment of social responsibilities. The office of the Leading Group is responsible for the daily operation of social responsibility. All units and departments of the Company achieved satisfactory results in the management and practice in five major fields - corporate governance, rights and interests of employees, environmental protection, fair operations, and community support in strict compliance with the *Social Responsibility Management Module and Negative List of China Aluminum International Engineering Corporation Limited*, the *Implementation Rules of China Aluminum International Engineering Corporation Limited for Social Responsibility Work*, and the requirements of relevant rules and regulations on social responsibility. The 80 items under the negative list of CHALIECO were fully and effectively prohibited in 2021.



董事會參與

Engagement with the Board of Directors

截至本報告報出日，公司董事會共有6人，其中2名執行董事，1名非執行董事，3名獨立非執行董事。

As of the release of this report, the board of directors of CHALIECO consisted of six members, including two executive directors, one non-executive director, and three independent non-executive directors.

公司董事會負責制定社會責任方針、策略及目標，審核社會責任治理風險評估結果，並對可能影響公司業務運作及利益相關方重點關注的社會責任相關事宜進行監察。在社會責任報告編製過程中，董事會負責對利益相關方溝通結果及重大議題判定結果進行審批，並審核報告信息披露內容。2021年，公司組織召開6次董事會，審議ESG相關議題10個。

The Board of Directors is responsible for formulating social responsibility guidelines, strategies, and objectives, reviewing the risk assessment results of social responsibility governance, and supervising the relevant matters influencing corporate business operations and the issues on social responsibility concerned by stakeholders. In the formulation of social responsibility report, the Board of Directors duly and earnestly examined the results of communication with stakeholders and the results of determination on major issues, and reviewed the information disclosed in the report. In 2021, the Company held six board meetings, deliberating and reviewing 10 ESG-related issues.

利益相關方溝通

Communication with Stakeholders

中鋁國際高度重視與利益相關方的溝通交流，建立起有效便捷的溝通機制和溝通渠道，積極聽取不同利益相關方的聲音，並就相關問題進行回應，不斷提高公司透明度，提升管理運營能力。

With great attention on the communication and exchanges with stakeholders, CHALIECO established efficient and convenient communication approaches and channels to actively listen to and reply the opinions and suggestions of stakeholders, in a bid to further improve the transparency of corporate operations and enhance the corporate governance.

公司積極做好投資者關係維護，不斷創新拓展投資者溝通渠道，及時回應投資者訴求，加深投資者對公司的了解和認同。2021年公司在上交所網站發布公告105項，在香港聯交所網站發布中文公告120項、英文公告49項。

Proactive in maintaining investor relations, CHALIECO kept innovation in communication channels with investors, and remained active in response to investors in a timely manner so as to help them better understand the Company. In 2021, CHALIECO released 105 announcements at the official website of the SSE, as well as 120 Chinese announcements and 49 English announcements at the official website of the HKSE.

利益相關方 Stakeholders	政府與監管機構 Governments and regulators	股東 Shareholders	客戶及合作夥伴 Customers and partners	環境 Environment	員工 Employees	社區及公眾 Community and the public
	期望與訴求 Expectations and Demands	<ul style="list-style-type: none"> 貫徹落實國家政策及法律法規 促進地方經濟發展 推動行業發展 Implementation of national policies, laws and regulations Promotion of local economic development Industrial development boosting 	<ul style="list-style-type: none"> 收益回報 合規運營 安全生產 Returns and benefits Compliance operations Work safety 	<ul style="list-style-type: none"> 依法履約 誠信經營 優質產品與服務 Contract fulfillment according to law Integrity operations High-quality products and services 	<ul style="list-style-type: none"> 合規排放 節能減排 保護生態 Compliance with pollutants discharge standards Energy-saving and emission reduction Ecological protection 	<ul style="list-style-type: none"> 權益維護 職業健康 薪酬福利 職業發展 Rights and interests protection Occupational health Compensation and benefits Career development
溝通與回應方式 Communication and Feedback	<ul style="list-style-type: none"> 上報文件 建言獻策 專題匯報 合作洽談 Paper reporting Advice and suggestions Special topic reporting Discussion on cooperation 	<ul style="list-style-type: none"> 公司公告 專題匯報 實地考察 Corporate bulletins Special topic reporting Field investigation 	<ul style="list-style-type: none"> 商務溝通 客戶反饋 交流研討 Business communication Customer feedback Exchanges and discussion 	<ul style="list-style-type: none"> 工作匯報 報表報送 調研檢查 Work reporting Statements reporting Investigation and inspection 	<ul style="list-style-type: none"> 職工代表大會 集體協商 民主溝通平臺 Employees' congress Collective negotiation Democratic communication platform 	<ul style="list-style-type: none"> 公司網站 公司公告 採訪交流 Official website Corporate bulletins Interviews and exchanges

重大議題識別

Major Issue Identification

為進一步提高針對性和報告披露信息的回應性，中鋁國際通過分析比較不同可持續發展議題對利益相關方的影響和對本公司自身發展的重要性，識別篩選出需要在報告中重點披露的議題。

To further improve the pertinence and responsiveness of the information disclosed from the report, CHALIECO, after analyzing and comparing the influences of different sustainable development issues on stakeholders and their importance to corporate development, successfully defined and identified the issues that need to be highlighted in this report.

- 1.社區發展貢獻 Contribution to community development
- 2.公益事業投入 Investment in public welfare
- 3.水資源使用管理 Water resource management
- 4.綠色辦公 Green workspace
- 5.供應鏈管理 Supply chain management
- 6.員工溝通 Communication with employees
- 7.廢棄物管理 Waste management
- 8.能源使用管理 Energy use management
- 9.員工關愛政策 Employee care policies
- 10.員工培訓發展 Employee training and development
- 11.項目質量管理 Project quality management
- 12.綠色施工 Green construction
- 13.員工權益保護 Employee right and interest protection
- 14.自主創新 Independent innovation
- 15.風險管理 Risk management
- 16.內部廉政管理 Internal integrity management
- 17.安全生產 Work safety
- 18.合規合法經營 Law-based and compliance operation
- 19.鄉村振興 Rural revitalization

CHALIECO



科技賦能

彰顯“有色鐵軍”力量

A GREAT “NONFERROUS METAL POWER” WITH
S&T SUPPORT

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打造優質工程 / High-Quality Projects

35

持續技術創新 / Unstoppable Technology Innovation

42

攜手共築未來 / Together for a Shared Future

1



經濟績效

Economic Performance

指標/Indicators	2019	2020	2021
研發資金投入(萬元) Investment in R&D (RMB'0,000)	52,431.00	60,416.00	76,012.72
研發人員數量(人) Number of R&D personnel (person)	2,482	2,286	2,584
累計有效專利數(件) Cumulative number of valid patents (items)	2,256	2,240	2,406
其中:發明專利(件) Including: Patents for invention (items)	993	1,029	1,061
完成專利受理(件) Number of patent applications accepted (items)	313	317	313
其中:發明專利(件) Including: Patents for invention (items)	141	154	133
新增專利授權(件) Number of newly added authorized patents (items)	178	240	303
其中:發明專利(件) Including: Patents for invention (items)	44	42	65

打造優質工程

High-Quality Projects

項目質量管理

Project Quality Management

中鋁國際遵守《中華人民共和國產品質量法》《建設工程質量管理條例》《建設工程施工項目管理規範》等相關國家法律法規，不斷加大工程總承包業務市場開發力度。2021年，中鋁國際獲得魯班獎1項，國家優質工程獎3項，省部級及以上優質工程獎13項，有色金屬建設行業成果獎42項，省部級及以上優秀QC成果70項。

In compliance with the *Law of the People's Republic of China on Product Quality*, the *Regulations on Construction Project Quality Management*, the *Construction Project Management Code*, and relevant state laws and regulations, CHALIECO enhanced its efforts to develop the market of general contracting business. In 2021, CHALIECO won one China Construction Engineering Luban Prize, three National Quality Engineering Awards, 13 quality engineering awards at provincial/ministerial level or above, 42 achievement awards for nonferrous metal construction industry, as well as 70 outstanding QC achievement awards at provincial/ministerial level or above.

中鋁國際獲得魯班獎
Number of China Construction Engineering Luban Prize won by CHALIECO: 1

1 項

獲得國家優質工程獎
Number of National Quality Engineering Award: 3

3 項

有色金屬建設行業成果獎
Number of achievement award for nonferrous metal construction: 42

42 項

獲得省部級及以上優質工程獎
Number of quality engineering award at provincial/ministerial level or above: 13

13 項

省部級及以上優秀QC成果
Number of outstanding QC achievement award at provincial/ministerial level or above: 70

70 項

案例
CASE

雲南高速公路項目取得突破性進展
Breakthrough progress achieved in Yunnan Expressway Project

2021年是雲南高速公路項目開工建設的第三年，中鋁國際克服疫情影響，召開定期早調會、複工動員大會，針對現場問題採取清單化管理，圍繞年度目標層層分解、責任到人，確保工作穩步推進。通過多方面努力，寧永項目哨房隧道、石卡拉隧道、彌玉項目朱山鋪隧道等多條隧道逐一貫通。9月30日，雲臨項目螞蟻堆立交至新塘房立交段正式建成通車並聯網收費，成為中鋁國際雲南高速公路項目首段通車路段。

In 2021, the third year for the Yunnan Expressway Project, CHALIECO overcame the impact of the COVID-19, held regular morning assemblies and mobilization meetings for work resumption, applied list-based management for on-site issues, and detailed the annual goals with specific duties on each level to ensure steady progress. Through various efforts, several tunnels were opened in succession, including Shaofang Tunnel and Shikala Tunnel in the Ninglang-Yongsheng Project and Zhushanpu Tunnel in the Mile-Yuxi Project. On September 30th, the section from Mayidui overpass to Xintangfang overpass in the Yunlin Project was officially completed and opened to traffic and incorporated into the network of toll collection, being the first section put into operation under CHALIECO's Yunnan Expressway Project.



雲南高速公路項目現場
Construction site of the Yunnan Expressway Project



螞蟻堆至新塘房段通車儀式
Opening ceremony for the section from Mayidui to Xintangfang

優化客戶服務
Customer Service Optimization

中鋁國際高度重視項目管理及質量管控工作，以優質的服務和領先的技術贏得客戶的認可。通過貫徹落實項目管理標準化，積極創建標桿項目，爭創品牌優質工程，為客戶創造價值。組織開展顧客滿意度調查，2021年度顧客滿意度為85%，根據客戶提出的意見建議，不斷改善和提高質量管理體系執行標準，逐步提高質量管理體系運行水平。

CHALIECO attaches great importance to project management and quality control. CHALIECO has been highly spoken of by customers for quality services and leading technologies, and perfectly catered to the project management standardization with active efforts to set up benchmark projects and to build brand quality projects, thus creating value for customers. CHALIECO carried out several customer satisfaction surveys in 2021, which recorded a satisfaction ratio of 85%. Base on the customers' suggestions, CHALIECO will continuously improve and enhance the implementation standard of quality management system, and gradually improve the operation of quality management system.

2021年度顧客滿意度為
Customer satisfaction rate in 2021: 85 percent



持續技術創新

Unstoppable Technology Innovation

為切實推動中鋁國際科技創新工作在“十四五”期間健康快速發展，中鋁國際完成了《中鋁國際工程股份有限公司“十四五”科技發展專項規劃》的編製，進一步明確了創新方向、目標、任務，並以此為基礎組織開展技術研發指南的編製工作。中鋁國際以國家戰略和市場需求為導向，致力於關鍵核心技術的重大突破，助力實現碳達峰碳中和承諾，聚焦生產實踐中的難點、痛點、關鍵點問題，對能夠引領行業技術發展方向的系統性科研課題進行梳理，完成公司年度重點科研項目立項工作。2021年，中鋁國際研發資金投入共計7.6億元。

In order to effectively promote the healthy and rapid development of science and technology innovation during the 14th Five-Year Plan period, CHALIECO has completed the compilation of the 14th Five-Year Science and Technology Development Plan of China Aluminum International Engineering Corporation Limited to further specify the direction, goals, and tasks of innovation, and prepared the technology R&D guide on such basis. Orientated toward national strategy and market demand, CHALIECO is committed to making major breakthroughs in core technologies to support the goals of carbon dioxide emission peak and carbon neutrality. With focus on the difficult problems, pain spots and critical issues in production practice, CHALIECO sorted out systematic research topics that lead industrial technology development, and acquired the approval of the annual key research project of the company. In 2021, CHALIECO's investment in R&D totaled RMB760 million.

2021年中鋁國際研發資金投入共計
Investment in R&D of CHALIECO in 2021:
RMB760 million

7.6 億元

科技創新能力
S&T Innovation Capability

中鋁國際對《中鋁國際科研管理規定》《中鋁國際科技創新獎勵暫行辦法》《中鋁國際技術轉讓與許可管理辦法》等管理製度進行修訂，進一步提高科技創新管理能力。健全科技創新和研發業務的科學評價體系，穩步增加科研資金投入，推進科技創新平臺建設，完善科技人才培養和激勵機制，加強核心技術攻關，不斷提升創新能力。2021年，長沙院組建“有色金屬資源循環高效利用公共技術服務平臺”，六冶籌建的“第八批河南省博士後創新實踐基地”獲批。截至2021年末，中鋁國際擁有6個國家級工程技術研究中心和國家級技術中心，2個國家級企業博士後科研工作站，17個省級技術中心，2個省級博士後創新實踐基地，1個省級工程實驗室。

CHALIECO revised the management systems such as the Regulations of CHALIECO on Research Management, the Tentative Measures of CHALIECO for Rewarding Science and Technology Innovation, and the Measures of CHALIECO for Technology Transfer and Licensing Management to further improve the management capability for science and technology innovation. CHALIECO improved the scientific evaluation system of technology innovation and R&D, steadily increased the investment in scientific research, promoted the building of the S&T innovation platform, improved the training and incentive mechanism of S&T workforce, and strengthened the R&D of core technologies



中鋁國際擁有國家級工程技術研究中心和國家級技術中心

Number of national engineering technology research center and national technology center owned by CHALIECO: 6

6 個

國家級企業博士後科研工作站

Number of national enterprise postdoctoral research station: 2

2 個

省級技術中心

Number of provincial technology center: 17

17 個

省級博士後創新實踐基地

Number of provincial postdoctoral innovation practice base: 2

2 個

省級工程實驗室

Number of Provincial engineering laboratory: 1

1 個

科技創新成果

Achievements in S&T Innovation

to constantly improve the innovation capability. In 2021, CINF Engineering Co., Ltd. set up the “Public Technology Service Platform for Recycle and Efficient Utilization of Nonferrous Metal Resources,” while China Sixth Metallurgical Construction Co., Ltd. was approved to establish the “Postdoctoral Innovation Base of Henan Province (the 8th batch).” By the end of 2021, CHALIECO has owned six national engineering technology research centers and national technology centers, two national enterprise postdoctoral research stations, 17 provincial technology centers, two provincial postdoctoral innovation bases, and one provincial engineering laboratory.



昆明院與昆明理工大學共建產教融合研究生聯合培養基地
Joint Training Base for Post-graduate Students by Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd. and Kunming University of Science and Technology

中鋁國際搶抓新一輪產業變革和科技革命重大機遇期，圍繞“八大領域、五大方向”，持續推動自主創新技術成果轉移轉化，在勘察設計、工程建設、裝備製造等業務領域取得重大突破。中鋁國際全年共組織開展了技術創新活動160余項，積極開發新工藝、新技術，組織科技人員完成企業級工法70余項，部級工法28項。

CHALIECO seized the great opportunity of the new round of industrial reform and S&T revolution to constantly promote the transfer and transformation of independent innovation technology achievements with focus on “eight major fields and five major directions,” and made significant breakthroughs in the fields of survey and design, engineering construction and equipment manufacturing. Throughout 2021, CHALIECO organized and completed more than 160 technology innovation activities, submitted 313 new patent applications, had 300 odd patent applications under review and 311 patents granted. CHALIECO actively developed new processes and technologies, and organized scientific and technical personnel to complete more than 70 corporate techniques and 28 ministerial techniques.

中鋁國際獲得省部級科學技術獎

Number of science and technology award at provincial/ministerial level won by CHALIECO: 32

32 項

其中“中國專利優秀獎”

Number of “China Patent Award”: 1

1 項

2021年，中鋁國際獲得省部級科學技術獎32項，其中“中國專利優秀獎”1項。“超大型綠色節能鋁電解成套技術傑出成就項目團隊”獲得中鋁集團第四屆科技創新傑出成就獎。

In 2021, CHALIECO won 32 science and technology awards at provincial and ministerial level, including one “China Patent Award.” The “Project Team of Outstanding Achievement in Ultra-Large Green Energy-Saving Aluminum Electrolysis Complete Set Technology” was awarded the 4th Outstanding Achievement Award for Science and Technology Innovation by CHINALCO.

數量 Nos.	獲獎等級 Award
15	省部級一等獎 First prize at provincial/ministerial level
6	省部級二等獎 Second prize at provincial/ministerial level
6	省部級三等獎 Third prize at provincial/ministerial level
5	省部級優秀獎 Excellence prize at provincial/ministerial level

2021年，公司多項科研項目取得重大成果

Major achievements in research projects in 2021

<p>貴陽院 GAMI</p>	<ul style="list-style-type: none"> “基於管控一體化的高效陽極組裝技術及裝備”整體技術達到國際領先水平 The overall technology of “high-efficiency anode assembly technology and equipment based on control integration” leads the world now.
<p>長沙院 CINF Engineering Co., Ltd.</p>	<ul style="list-style-type: none"> 國家重點研發計劃項目“超大型礦山重大災害預控與充填技術”順利驗收 “基於工業視覺的水體表面汙染檢測系統”成功入圍“首屆全國智能製造創新大賽”全國總決賽 “大型地下鋁土礦床綜合機械化連續開采技術及裝備”革新了地下鋁土礦床開采工藝

	<ul style="list-style-type: none"> National Key R&D Program “pre-control and filling technology for major disasters in super-scale mines” was accepted after examination. “Industrial-vision-based water surface contamination detection system” entered the national finals of the “1st National Intelligent Manufacturing and Innovation Competition”. “Mechanized continuous mining technology and equipment for large underground bauxite deposits” became a revolution of the the underground bauxite deposit mining process.
<p>中色科技 China Nonferrous Metals Processing Technology Co., Ltd.</p>	<ul style="list-style-type: none"> “2800mm寬幅六輥鋁帶冷軋機組”突破多項關鍵技術成功實現國產應用 The “2800mm wide six-roller aluminum strip cold rolling mill” represented several breakthroughs in key technologies and was successfully applied at home.
<p>長勘院 China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd.</p>	<ul style="list-style-type: none"> “空天地”壹體化礦山安全監測預警技術研發與應用，被列入2021年湖南省第壹批重點研發項目 “Online-SAR工程災害智能監測雷達系統”，被中國測繪學會認定為測繪地理信息自主創新產品 “礦山地下采空區智能化精準探測裝備”對礦山企業環境保護、災害治理、安全開采等具有重大意義 The R&D and application of “Space-Air-Land” integrated mine safety monitoring and early warning technology was listed in the first batch of key R&D projects of Hunan Province in 2021. The “Online-SAR Engineering Disaster Intelligent Monitoring Radar System” was recognized as an independent innovation product of surveying and mapping geographic information by the Chinese Society for Geodesy Photogrammetry and Cartography. The “intelligent and precise detection equipment for underground mined-out areas” is of great significance for environmental protection, disaster management and safe mining of mining enterprises.
<p>雲南鋁應用 CHINALCO International Yunnan Aluminum Application Engineering Co., Ltd.</p>	<ul style="list-style-type: none"> “鋁合金護欄在防震減災技術中的應用”獲中鋁集團“金點子”合理化建議表彰 “The application of aluminum alloy guardrail in earthquake mitigation technology” was commended by CHINALCO as a “Golden Idea”.

案例
CASE



中色科技成功研制國產首台2800mm寬幅六輥鋁板帶冷軋機
The first homemade 2800mm wide six-roller aluminum strip cold rolling mill successfully developed

2021年，中色科技成功研制出具有完全自主知識產權的國產首台2800mm寬幅六輥鋁板帶冷軋機。該項技術的研制成功，突破了制約國內鋁板帶領域的技術與裝備瓶頸，掌握了十八項關鍵技術，打破了外國公司在該領域的技術壁壘，也標志著中色科技向攻占有色金屬行業高端裝備高端市場，實現企業高質量發展邁出了重要壹步。

In 2021, China Nonferrous Metals Processing Technology Co., Ltd. successfully developed the first homemade 2800mm wide six-roller aluminum strip cold rolling mill with independent intellectual property, which broke the technological bottlenecks in the field of aluminum sheet and strip in China. Thanks to the eighteen key technologies contained, we successfully leap over the technical barriers of foreign companies in this field, marking an important step towards the capture of the high-end market of high-end equipment in the nonferrous metal industry and the high-quality development of the enterprise.



2800mm寬幅鋁板帶冷軋機主機
2800mm wide six-roller aluminum strip cold rolling mill (main body)



長勘院Online SAR圓弧地基雷達智能監測系統
Online SAR ground-based radar intelligent monitoring system developed by China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd.

案例
CASE

九冶可快速移動安裝的軟防護阻車器施工技術

Soft-protection car arrestor featuring quick moving and installation.

九冶可快速移動安裝的軟防護阻車器施工技術與傳統阻車器相比，提高了井下工作面的掘進工效，推動國家煤炭、金屬礦及非金屬礦節能環保施工，對環境沒有任何汙染，還能快速移動安裝，填補了軟防護阻車器快速移動安裝技術的空白。成果已應用於多項工程，創造經濟效益430.37萬元。該技術成果獲實用新型專利授權1項，發明專利受理1項，有色行業部級工法1項，通過中國有色金屬建設協會關鍵技術鑒定達到國內先進水平。

Compared with traditional car arrestor, the soft protection car arrestor of Jiuye Construction Co., Ltd. is superior in quick moving and installation as well as higher digging efficiency of underground working face, features great energy-saving and environmental protection performance in coal, metal and non-metal mining. It filled the gap of the rapid moving and installation technology of soft-protection car arrestor for China. The technology has been applied in several projects, which contributed to economic benefits totaling RMB4.3037 million. It was recognized and accepted as one utility model patent, one invention patent, and one technique at the ministerial level in the nonferrous industry, and rated as a leading technology at home by China National Association for Nonferrous Metals Industries Construction.

技術成果創造經濟效益

Amount of economic benefits created by technological achievements: RMB4.3037 million

430.37 萬元

打造信息化企業

IT-Based Enterprise Building

中鋁國際結合業務特性和發展戰略，通過加強與標杆企業的溝通，認真總結和分析了近年來公司信息化管理方面存在的問題，並提出信息化、數字化發展規劃。完成了中鋁國際“十四五”信息化專項規劃、信息系統總體建設規劃方案等指導性文件，利用“互聯網+”工程技術、數字經濟、共享服務的優勢，通過建設“兩中心、壹平台”、施工BIM雲平台，深化內外合作，推廣信息技術在公司各類生產經營活動中的應用，加強數據隱私保護，探索管理新模式、新路徑，推動中鋁國際整體邁向高質量發展。

With reference to the business characteristics and development strategies, after in-depth communication with benchmark enterprises, CHALIECO carefully summarized and analyzed the problems in information management in recent years, and put forward corresponding informatization and digital development plans. CHALIECO compiled the 14th Five-Year informatization planning, information system overall construction scheme and other guiding documents, and, by taking advantage of “Internet+” engineering technology, digital economy and shared services, built “two centers and one platform” and BIM cloud platform to deepen internal and external cooperation, promote the application of information technology in production and operation of the Company. Meanwhile, CHALIECO strove to strengthen data privacy protection, and explore new modes and paths of management to promote the high-quality development of the Company.

知識產權保護

Intellectual Property Rights Protection

中鋁國際注重知識產權管理，根據《中華人民共和國民法典》《中華人民共和國專利法》《企業知識產權管理規範》等相關法律法規，制定《中鋁國際專利管理辦法》，開展知識產權創造、管理、保護與運用系統工作，提升公司核心競爭力。中鋁國際堅持自主創新，在保障自有知識產權不被侵犯的同時，避免侵犯其他企業知識產權。

CHALIECO lays great emphasis on the management of intellectual property rights. In accordance with the *Civil Code of the People's Republic of China*, the *Patent Law of the People's Republic of China*, the *Standards on Enterprises' Intellectual Property Rights Management* and other relevant laws and regulations, CHALIECO formulated the *CHALIECO Patent Management Measures* and commenced the creation, management, protection and application of intellectual property rights to enhance the core competitiveness. Adhering to the principle of independent innovation, CHALIECO invested a lot in safeguarding its intellectual property rights, while avoiding infringement upon others.

公司技術部（技術中心）負責知識產權事務，對知識產權申請、維護等進行統壹管理，法律合規部負責知識產權許可轉讓風險審核、知識產權糾紛處置等相關工作，市場開發部及下屬企業負責專利推廣與普及應用。同時，中鋁國際通過激勵機制改革，推進集團及所屬企業制定知識產權獎勵、報酬和懲罰辦法，促進知識產權工作。2021年，中鋁國際專利申請313件，授權專利311件，其中，海外專利授權8件。

The Technology Department (Technology Center) of the Company is responsible for the affairs on intellectual property and the unified management of intellectual property applications and maintenance; the Legal Compliance Department is in charge of the risk review on intellectual property licensing and transfer, intellectual property dispute resolution and other related work; and the Market Development Department and subordinate enterprises take charge of patent promotion, popularization and application. CHALIECO pushed ahead the work concerning intellectual property rights through incentive mechanism reform and promoted the Group and its affiliated enterprises to formulate measures for reward, remuneration and punishment related to intellectual property rights. In 2021, CHALIECO applied for 313 patents and were granted 311 patents, among which eight for overseas.

中鋁國際專利申請

Number of patents applied by CHALIECO: 313

313 件

授權專利

Number of granted patents: 311

311 件

海外專利授權

Number of granted patents overseas: 8

8 件

攜手共築未來 | Together for a Shared Future

建設責任產業鏈 Building of A Responsible Industry Chain

作為生產性服務企業，中鋁國際不斷提高自身技術、研發、承包建設服務能力，積極推動有色金屬產業鏈安全、綠色、高質量發展。同時重視與公司業務相關聯供應商、分包商的責任管理，推動負責任、可持續產業鏈建設。

As a productive service provider, we keep improving our technology, R&D and contracting service capabilities, and actively drive the development of the nonferrous metal industry chain towards safe, green and high-quality orientation. We also attach importance to the responsibility management of suppliers and subcontractors associated with the company's business, and promote the building of a responsible and sustainable industry chain.

實施陽光採購 Sunshine Procurement Promotion

中鋁國際遵守《中華人民共和國民法典》《中華人民共和國招標投標法》《中華人民共和國審計法》《中華人民共和國反不正當競爭法》等國家法律法規，制定了工程招投標實施細則及相關管理監督辦法，規範公司及下屬企業採購管理，明確採購原則及流程。實施陽光採購的同時，保障供應商、分包商公平參與競爭的權利。

In accordance with the *Civil Code of the People's Republic of China*, the *Law of the People's Republic of China on Bidding and Tendering*, the *Audit Law of the People's Republic of China*, the *Anti-Unfair Competition Law of the People's Republic of China*, and relevant state laws and regulations, CHALIECO formulated the implementation rules for bidding and tendering of projects and relevant management and supervision measures, standardized procurement management of the Company and subordinate enterprises, and clarified procurement principles and processes. While implementing sunshine procurement, we endeavored to safeguard the rights of suppliers and subcontractors to participate in fair competition.

供應商、分包商管理 Supplier and Subcontractor Management

中鋁國際持續完善供應商管理體系，制定《中鋁國際供應商管理辦法》《合格供應商管理規定》《中鋁國際貿易類客戶和供應商信用風險管理辦法（暫行）》《中鋁國際客戶及供應商信用管理暫行辦法》等，規範供應商准入、評價、退出等管理環節，降低供應鏈風險。

CHALIECO has been continuously improving the supplier management system by formulating the *CHALIECO Supplier Management Measures*, the *Regulations on Management of Qualified Suppliers*, and the *Credit Risk Management Measures for Trade Customers and Suppliers of CHALIECO (Provisional)*, the *Interim Measures for Credit Management of Customers and Suppliers of CHALIECO*, in a bid to regulate the links of supplier access, evaluation and withdrawal and reduce risks at the supply chain.

在准入環節，公司要求承包商提供QHSE管理體系與認證文件，並優先考慮使用環保節能產品的供應商。

For supplier access, the Company requires contractors to provide QHSE management system and certification documents, and gives priority to those with environmentally-friendly and energy-saving products.

在生產施工期間，為保障工程進度、質量及目標，中鋁國際通過分包商過程管控及獎懲考核機制，對分包商隊伍資質、能力、信譽、素質等進行綜合考評，動態調整合格分包商名錄。對分包商用工管理、安全環保工作落實情況進行監管，對有違反法律規定的用工行為、發生突發性環境事件的分包商等，將對其清退並列入黑名單。公司將分包商納入項目安全環保教育培訓及監督管理中，嚴格檢查分包商文明施工情況，定期組織考評，敦促分包商落實好現場安全環保責任。

During the production and construction, in order to guarantee project progress, quality and target, CHALIECO conducted comprehensive assessment on the qualification, capability, reputation and quality of subcontractors via the Subcontractor Process Control and Reward and Punishment Assessment Mechanism, and flexibly adjusted the list of qualified subcontractors. CHALIECO will continue to diligently supervise the labor management and the safety and environmental protection of subcontractors, and withdraw and blacklist subcontractors that violate the laws and regulations on labor use and involve in environmental incidents. CHALIECO will include subcontractors in the project safety and environmental protection trainings and supervision, strictly inspect the construction of subcontractors, organize regular evaluations, and urge subcontractors to fulfill responsibilities for on-site safety and environmental protection.

2021年度供應商數目(個)

Number of suppliers in 2021 (Nos.)

合計 Total	華北 North China	東北 Northeast China	華南 South China
	461	172	236
4,272	華西 West China	華中 Central China	華東 East China
	1,381	1,242	780

推動行業發展 Industrial Development Promotion

作為中國有色金屬工程技術領域的龍頭企業，中鋁國際以行業領先的技術優勢、資質優勢、人才優勢、全產業鏈優勢，為整個有色金屬產業鏈上的各類業務提供全方位綜合技術及工程設計服務，牽頭編制了《中國有色金屬行業中長期發展規劃》，主持參與編寫了國家及行業標準或法規140余項，成為中國鋁工業的締造者、行業標準的制定者、有色工程技術的引領者。

As a leading enterprise in the field of nonferrous metal engineering technology in China, CHALIECO aims to provide comprehensive technical and engineering design services for all kinds of businesses on the entire industry chain with its leading advantages in technology, qualification, talent and industry chain operation. CHALIECO took the lead in compiling the *Medium- and Long-Term Development Plan of China's Nonferrous Metal Industry*, and presided over the compilation of 140 national and industrial standards or regulations, making it the founder of China's aluminum industry, the maker of industry standards and the leader of nonferrous engineering technology.

● 深化戰略合作 Strategic Cooperation Deepening

中鋁國際與各地方政府、企業及學術機構建立了長期、緊密的戰略合作夥伴關係，謀劃、促進多領域展開合作，推動產業技術融合和高新技術成果轉化，共享合作成果。

CHALIECO has established long-term close strategic partnerships with local governments, enterprises, and academic institutions to seek for cooperation in multiple fields, promote the integration of industry and technology and the transformation and application of high-tech achievements, and promote the extensive sharing of the fruits from cooperation.

案例 CASE



中鋁國際成爲“中國壹帶壹路網理事會”理事單位 CHALIECO became the director of the Belt and Road Portal.

中國壹帶壹路網理事會是由國家信息中心發起和管理，新華社和國家開發銀行等16家中央企業加入的非實體合作平台。2021年，中鋁國際代表中鋁集團加入該組織，成爲“中國壹帶壹路網理事會”理事單位。作爲中國有色金屬行業工程技術服務的引領者，中鋁國際憑借“技術爲先導”的集約發展模式，積極推進“科技+國際”的發展戰略，向全球數十個國家和地區輸出技術、設備和勞務，爲“壹帶壹路”沿線國家提供了大量的優質工程服務。

The Council of the Belt and Road Portal is a nonphysical cooperation platform initiated and managed by the State Information Center and composed of 16 central SOEs including Xinhua News Agency and China Development Bank. In 2021, CHALIECO joined the organization on behalf of CHINALCO and became a member of the Council. As a leader in engineering and technology services in the nonferrous metals industry of China, CHALIECO has been actively promoting the development strategy of “S&T + Internationalization” by virtue of its “technology first” intensive development mode, exporting technology, equipment and labor services to dozens of countries and regions, and providing a large quantity of high-quality engineering services to countries along the Belt and Road.



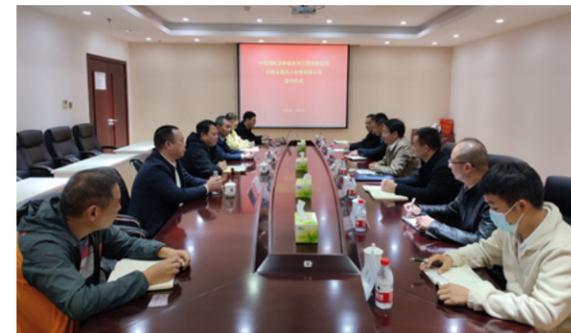
理事單位授牌
Plaque-awarding Ceremony for CHALIECO



中鋁國際與西安建築科技大學簽署戰略合作協議
Signing Ceremony for the Strategic Cooperation Agreement between CHALIECO and Xi'an University of Architecture and Technology



昆明有色院與雲南磷化集團合作設立國家磷資源開發利用工程技術研究中心昆明有色冶金設計研究院分中心
Kunming Branch Center of the National Engineering and Technology Research Center for Development and Utilization of Phosphorus Resources jointly built by Kunming Engineering & Research Institute of Nonferrous Metallurgy Co., Ltd. (KERI) and Yunnan Phosphate Chemical Group



雲南鋁應用與國家能源集團雲南龍源風力發電有限公司簽署新產品推廣應用戰略合作協議
CHALIECO International Yunnan Aluminum Application Engineering Co., Ltd. signed Strategic Cooperation Agreement for New Product Promotion and Application with CHN Energy Yunnan Longyuan Wind Power Co.



昆勘院到中國瑞林工程技術股份有限公司開展對標交流、進行項目合作溝通
Exchange regarding benchmark analysis and project cooperation between Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd. and China Nerin Engineering Co.

● 加強行業交流 In-depth Industrial Exchanges

中鋁國際構建多邊合作共享戰略平台，與國內外企業、跨國公司密切合作，積極參加國際多邊、雙邊高端論壇，推廣行業技術與理念，推動中國有色金屬行業發展進步，推進夥伴間“命運共同體”更加緊密。

Devoted to building a strategic platform for multilateral cooperation and sharing, CHALIECO, keeps close cooperation with domestic and foreign enterprises and multinational companies, actively participates in international multilateral and bilateral high-end forums, popularizes industry technologies and concepts, pushes forward the development and progress of China's nonferrous metal industry, and tighten the ties among the partners in the community of a shared future.

綠色環保

助力永續發展進程

SUSTAINABLE DEVELOPMENT WITH GREEN AND ENVIRONMENTAL PROTECTION

50

應對氣候變化 / Response to Climate Change

51

環保技術應用 / Application of Environmentally-Friendly Technologies

61

完善環境管理 / Environmental Management Improvement

2

環境績效 Environmental Performance

指標/Indicators	2019	2020	2021
環保總投入 (萬元) Total investment in environmental protection (RMB'0,000)	2,457.86	3,015.29	12,807.37
無害廢棄物排放量 (噸) (廚余垃圾、建築垃圾等) Discharge of non-hazardous waste (ton) (Kitchen waste, construction waste, etc.)	4,670.94	4,399.73	4,639.57
萬元營收無害廢棄物排放強度 (噸/萬元) Non-hazardous waste discharge intensity per RMB10,000 of operating revenue (ton/RMB'0,000)	0.0015	0.0019	0.0020
有害廢棄物排放量 (噸) (硒鼓、廢棄燈管等) Discharge of hazardous waste (ton) (Toner cartridges, damaged light tubes, etc.)	2.74	1.15	2.53
萬元營收有害廢棄物排放強度 (噸/萬元) Hazardous waste discharge intensity per RMB10,000 of operating revenue (ton/RMB'0,000)	8.82×10^{-7}	4.99×10^{-7}	1.08×10^{-6}
能源消耗總量 (噸標準煤) Total energy consumption (tce)	11,384.40	33,013.92	35,279.40

指標/Indicators	2019	2020	2021
萬元營收能源消耗強度 (噸標準煤/萬元) Energy consumption intensity per RMB10,000 of operating revenue (tce/RMB'0,000)	0.0037	0.0143	0.0151
燃油使用量 (升) Fuel oil consumption (L)	3,581,559.90	18,027,118.00	19,886,004.90
汽油使用量 (升) Gasoline consumption (L)	652,739.00	2,983,202.00	3,292,824.40
柴油使用量 (升) Diesel consumption (L)	2,928,820.90	15,043,916.00	16,593,180.50
天然氣使用量 (立方米) Natural gas consumption (m ³)	1,242,626.70	593,600.00	346,075.00
用電量 (萬千瓦時) Electricity consumption (10,000 kWh)	4,447.7686	8,273.9183	8,534.9021
總用水量 (噸) Total water consumption (ton)	679,394	897,349	725,006
用水強度 (噸/萬元) Water consumption intensity (ton/RMB'0,000)	0.2187	0.3897	0.3105

應對氣候變化

Response to Climate Change

氣候變化已成為有色金屬行業不可忽視的關鍵問題。《聯合國氣候變化框架公約》和《巴黎氣候變化協定》是國際社會應對氣候變化、實現綠色低碳發展的重要承諾。中鋁國際支持國家向國際社會作出的碳減排承諾，努力推進可再生資源轉型、碳市場交易發展及創新技術平台開發。壹方面，中鋁國際積極推進項目施工和生產領域的減排降碳相關工作，包括非化石能源替代、低碳生產等關鍵措施，主動應對氣候變化；另壹方面，中鋁國際努力實現降碳減排關鍵技術研發、新技術新裝備攻關和成果應用。2021年，中鋁國際溫室氣體排放量為35,001.72噸CO₂e，其中直接排放18,904.13噸CO₂e，間接排放16,097.60噸CO₂e，萬元營收溫室氣體排放強度為0.015噸CO₂e/萬元。

Climate change has become a key issue that cannot be ignored in the nonferrous metals industry. The *United Nations Framework Convention on Climate Change* and the *Paris Agreement* are important commitments of the international community to tackle climate change and achieve green and low-carbon development. CHALIECO fully supports the commitment of China on carbon emission reduction to the international community and strives to promote the transformation of renewable resources, the development of carbon trading market and the development of innovative technology platform. On the one hand, CHALIECO actively carries forward the work related to emission reduction and carbon reduction in project construction and production, including the key measures such as non-fossil energy substitution and low-carbon production, to actively cope with climate change; on the other hand, CHALIECO strives to make breakthroughs and applications of core technologies R&D for carbon emission reduction. In 2021, the emission of greenhouse gases of CHALIECO was 35,001.72 tons of CO₂e, among which the direct and indirect emission was 18,904.13 tons of CO₂e and 16,097.60 tons of CO₂e, respectively; the greenhouse gases emission intensity per RMB10,000 of operating revenue (ton CO₂e/RMB'0,000) was 0.015 ton of CO₂e.

貴陽院主導編制了“電解鋁企業生產全流程碳足跡(WPCF)測評技術指南”；制定了“炭素制品生產碳排放量計算統計方法”團標，為電解鋁、石墨及炭素制品製造行業實現碳達峰碳中和目標提供了技術方案，並建立健全了該行業的測算標準。

GAMI led the compilation of the “Technical Guide for the Measurement of the Whole Process Carbon Footprint (WPCF) of Aluminum Electrolysis Enterprises”; formulated the “carbon emission calculation and statistical method for production of carbon products,” a standard document on the association’s level, which provides a technical solution for electrolytic extraction of aluminum, graphite and carbon products manufacturing industry to achieve the goals of carbon emission peak and carbon neutrality, setting a threshold for the industry.

中鋁國際溫室氣體排放量為
Emission of greenhouse gases of CHALIECO:
35,001.72 tons of CO₂e

35,001.72
噸CO₂e

其中直接排放
Direct emission: 18,904.13 tons of CO₂e

18,904.13
噸CO₂e

間接排放
Indirect emission: 16,097.60 tons of CO₂e

16,097.60
噸CO₂e

萬元營收溫室氣體排放強度為
Greenhouse gases emission intensity per
RMB10,000 of operating revenue: 0.015
ton of CO₂e

0.015
噸CO₂e/萬元

環保技術應用

Application of Environmentally-Friendly Technologies

綠色技術研究

Research on Green Technology

隨著我國環境要求和標準日趨嚴格，在礦區高效開采、工廠清潔冶煉、排放物回收利用、生態治理等領域，中鋁國際迎來了新的機遇。中鋁國際積極拓展環保技術研究與推廣，在能源使用效率提升、廢氣有機處理、汙染物排放控制與治理、金屬回收率提升、礦區自動探測、低品位鋁土礦高效利用等領域展開技術研發，擁有國內先進的技術與經驗，為承接項目工程奠定基礎。同時，中鋁國際對環保關鍵裝備做出深入分析和研究，從設計源頭出發，為項目提供更清潔、更高效、更綠色的環境解決方案。

With the increasingly strict environmental requirements and standards in China, CHALIECO met new opportunities of development from efficient mining, clean smelting, recycling of emissions and ecological treatment. With active research and popularization of environmental protection technologies, CHALIECO continues the technology research and development in such fields as efficiency enhancement of energy use, organic treatment of exhaust gas, pollutant emission control and treatment, metal recovery rate enhancement, automatic detection in mining areas, and high-efficiency utilization of low-grade bauxite ore. The advanced technologies and rich experience have laid a solid foundation for undertaking projects. Meanwhile, CHALIECO has made in-depth analysis and research on key environmental protection equipment and provided cleaner, greener and more efficient environmental solutions for the projects from design.



中鋁國際有色領域壹流環保技術 (例舉)

Top-notch environmentally-friendly technologies of CHALIECO in nonferrous industry (examples)

沈陽院 SAMI	蓄熱式焚燒爐 (ROT) 技術 Regenerative thermal oxidizer (RTO) technology	治理炭素生產過程中的有機廢氣 To treat organic waste gas in the carbon production process
長沙院 CINF Engineering Co., Ltd.	濕法冶煉工藝 Wet smelting technology	解決銅冶煉行業二氧化硫排放問題 To solve the problem of sulfur dioxide emission in the copper smelting industry
長沙院 CINF Engineering Co., Ltd.	鉛陽極泥處理新技術 New technology for lead anode slime treatment	提高金屬回收率的同時，減少排放、節約能耗 To increase metal recovery rate, reduce emissions and save energy
長沙院 CINF Engineering Co., Ltd.	RDP全過程壹體化精準協同膏體充填技術 RDP whole process integrated precise collaboration paste filling technology	提高礦山填充實驗室數據準確性，提供工藝設計標準方法與平台，助力全流程智能化管控 To improve the accuracy of mine filling laboratory data, develop a standard method and platform for process design, and provide support for the whole-process intelligent control
長沙院 CINF Engineering Co., Ltd.	富氧粉煤噴吹熔池熔煉技術和裝備研究 Research on oxygen-rich pulverized coal blowing bath smelting technology and equipment	提升鉛系統還原爐生產指標、降低渣含鉛、煤耗、氧耗、勞動強度 To improve the production index of lead reduction furnace, reduce lead slag, coal consumption, oxygen consumption and labor intensity

長沙院 CINF Engineering Co., Ltd.	銅冶煉企業廢水“零排放”關鍵技術及應用 Key technology and application of zero discharge of wastewater from copper smelting enterprises	實現銅冶煉廢水資源化、無害化經濟型“零排放” To turn wastewater into harmless resources and realize economic “zero discharge” of copper smelting wastewater
長沙院 CINF Engineering Co., Ltd.	鋅浸出渣高值化清潔冶煉技術 Zinc leaching slag high-value utilization clean smelting technology	實現危廢渣-鋅浸出渣中有價金屬的富集和綜合回收 To achieve the enrichment and comprehensive recovery of valuable metals from hazardous waste residue-zinc leaching slag
長勘院 China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd.	有色行業礦渣堆場生態修復技術研究和推廣 Research and promotion of ecological restoration technology for slag dumps in the nonferrous industry	基于自然的解決方案，實現生態修復 To achieve ecological restoration based on natural solutions
長勘院 China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd.	礦山地下采空區無人自動探測技術 Unmanned automatic detection technology for underground mined-out areas	整合礦產資源、避免礦山環境惡化和資源浪費 To integrate mineral resources and avoid environmental degradation of mines and waste of resources



案例
CASE

廢物再利用—碳粉高效利用與危廢資源化技術
Waste reuse – efficient utilization of carbon powder and from-hazardous-waste-to-resource technology

沈陽院針對焙燒工藝廢碳粉固體廢棄物和危險廢棄物焦油問題，開發了碳粉高效利用與危廢資源化技術。該工藝可深度淨化焦油和苯並芘，有效降低能耗，降碳效果明顯，整個工藝無固廢、危廢、廢水產生，同時填充料回用可節約購買成本，經濟效益顯著，達到國際領先水平。當前，該工藝已成功投入應用。

SAMI has developed the technology of efficient utilization of carbon powder and turning hazardous waste into resource for the problem of solid waste of waste carbon powder and tar-containing hazardous waste in roasting process. The technology is used to effectively purify tar and benzopyrene and reduce energy consumption with apparent carbon reduction, without generation of any solid waste, hazardous waste or wastewater during the whole process, while the filler reuse helps save purchase cost and bring significant economic benefits, reaching the international leading level. Now, the technology has been successfully put into application.



碳粉高效利用與危廢資源化技術應用全景

Application scenario of efficient utilization of carbon powder and from-hazardous-waste-to-resource technology

案例
CASE

電解技術實現經濟、社會和環境效益三豐收
Electrolysis technology boosts economic, social and environmental development

為實現碳達峰、2035年降碳目標，加快實施電解鋁降碳行動，沈陽院與合作單位聯合研發節能長壽命鋁電解槽陰極制造技術及裝備，實現陰極炭塊生鐵澆鑄組裝成功率大于99.9%。相比傳統紮糊組裝形式，噸鋁節電約200kWh，首批電解槽運行壽命較國際領先技術槽壽命提高超過400天。目前該技術已在國內外10個系列、350萬噸電解鋁產能得到應用，獲得授權專利3項，發表學術論文6篇，被中國有色金屬工業協會評價為國際領先水平。

In order to achieve the goals of carbon emission peak and 2035 carbon reduction and accelerate the implementation of carbon reduction action for the electrolytic extraction of aluminum, SAMI and its cooperation units jointly developed the energy-saving and long-life aluminum electrolysis cathode manufacturing technology and equipment, achieving a success rate exceeding 99.9 percent in cast-iron casting and cathode carbon block assembly. Compared with the traditional paste-material bonding, it saves about 200kWh of electricity per ton of aluminum, and the service life of the first batch of electrolytic cathodes is 400 days longer than that with the international leading technology. The technology has now been applied in 10 series and 3.5 million tons of aluminum electrolysis production capacity at home and abroad; with three authorized patents and six academic papers published, it is evaluated as the international leading technology by China Nonferrous Metals Industry Association.



節能長壽命鋁電解槽陰極制造技術實施現場—燃氣預熱前

Energy-saving and long-life aluminum electrolysis cathode manufacturing technology (gas preheating)

案例
CASE

長沙院推動科技創新 落實綠色發展

CINF Engineering Co., Ltd. promotes S&T innovation and green development.

長沙院積極踐行“綠水青山就是金山銀山”科學發展理念，持續完善科研體系，形成有利于科技人才發展的良好機制；加大科研投入，建立研發準備金制度，建立企業、高校和科研院所協同創新機制；依托科技研發平台引進培養高層次人才，建立深井開采、清潔冶煉、固廢處置、有色冶金智能制造4個專職研發團隊，解決行業技術瓶頸和技術難題，在壹系列關鍵技術領域取得重大突破。

CINF Engineering Co., Ltd. adhering to the concept of “lucid waters and lush mountains are invaluable assets”, constantly improved the scientific research system, and formed a benign mechanism conducive to the development of science and technology workforce. It increased investment in scientific research, set up an R&T reserve system, and established a collaborative innovation mechanism among enterprises, universities, and research institutes. With the support of the scientific research and development platforms, it introduced and trained high-level talents, and formed four full-time R&D teams for deep well mining, clean smelting, solid waste disposal and intelligent manufacturing of nonferrous metallurgy to solve technical bottlenecks and problems of the industry, achieving significant breakthroughs in a series of key technology areas.

自主研發“高、深、難”礦山采選技術，建成世界海拔最高的特大型露天礦山、中國第壹深井、中國首座綠色智能化礦山等壹批具有重大影響力的代表性礦山

It has independently developed mining technology for mines featuring “height, depth and difficulty” and built several influential representative mines, such as mega open pit mine at the highest altitude around the world, the first deep shaft in China and the first green and intelligent mine in China.

創新研發氧壓浸出、CSCC熔池熔煉和閃速熔煉等新型綠色冶煉技術，建造壹系列綠色示範工程

It has conducted innovative research and development of new green smelting technologies such as oxygen pressure leaching, CSCC bath smelting and flash smelting, and built a series of green demonstration projects.

依托國家重點研發計劃“超大規模礦山重大災害預控與充填技術”形成具有自主知識產權的高濃度大流量充填料漿精確制備與連續輸送安全管控技術

With the support of the National Key Research and Development Program project “pre-control and filling technology for major disasters in super-scale mines,” it has developed a safety control technology with independent intellectual property rights for precise preparation and continuous transportation of high-concentration and high-flow filling slurry.

尾礦零排放綠色低碳梯級利用技術攻克尾礦幹排技術瓶頸，形成了尾礦處置系統性綜合解決方案與推廣模式

Zero-discharge low-carbon green gradient utilization technology of tailings overcomes the technical bottleneck of dry tailings discharge and forms a systematic and comprehensive solution and promotion model for tailings disposal.

具有自主知識產權的“複雜多金屬物料協同冶煉及綜合回收關鍵技術”入選國家綠色技術推廣名錄（中鋁集團唯壹入選技術）

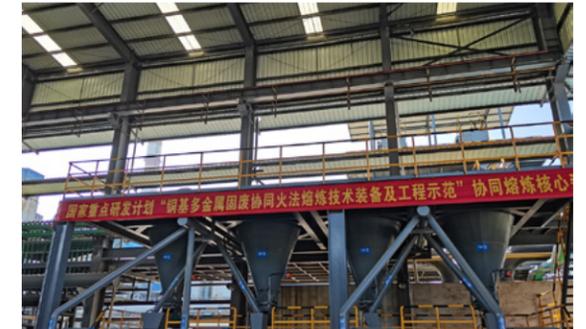
“Key technology of complex multi-metal material co-smelting and comprehensive recovery” with independent intellectual property rights was (as the only technology of CHINALCO that was) included in the Catalogue of Recommended Green Technologies in China.

“銅冶煉企業廢水零排放關鍵技術及應用”“鋅浸出渣高值化清潔冶煉技術”成功列入湖南省環境保護實用技術目錄

“Key technology and application of zero discharge of wastewater from copper smelting enterprises” and “zinc leaching slag high-value utilization clean smelting technology” were included in the Environmental Protection Practical Technology Catalogue of Hunan Province.



打造“壹站五中心四工作室多基地”創新平台
Innovation platform consisting of one station, five centers, four studios, and multi-bases



落實落地“複雜多金屬物料協同冶煉及綜合回收關鍵技術”
Effective implementation of the “key technology of complex multi-metal material co-smelting and comprehensive recovery”



新疆眾和股份有限公司鋁箔軋機油霧自動回收處理系統
Automatic oil mist recovery and treatment system for aluminum foil mill of Xinjiang Joinworld Co. Ltd.

鋁應用推廣

Aluminum Application Promotion

鋁製品的可回收性、保值性和金屬屬性，在節約能耗、降低溫室氣體排放方面具有獨特的重要性。從長遠來看，鋁應用將在建築業、交通運輸業等領域具有更為廣泛的前景，也將具有更為顯著的社會效益。中鋁國際推進鋁精深加工價值鏈高端轉型，加大創新力度，開展工程用鋁，探索新的市場領域，打造核心競爭力。以市場和用戶需求為導向，在建築用鋁、交通用鋁，電信產品、工業設備、基礎設施等領域開發鋁合金產品，推廣實施鋁應用。2021年，昆明有色院“輕質鋁材裝配式房屋創新應用探索”項目，榮獲第三屆中央企業熠星創新創意大賽優秀獎，位列優秀獎項目組第26名。

The recyclability, value retention and metal properties of aluminum products are of unique importance in saving energy and reducing greenhouse gas emissions. In the long run, the application of aluminum will show a broader prospect in the sectors of construction and transportation, and bring more significant social benefits. CHALIECO makes unremitting efforts to promote the high-end transformation of the value chain of aluminum intensive processing, increase innovation, enhance aluminum utilization in engineering and explore new market areas to build core competitiveness. Guided by market and user demand, we develop aluminum alloy products in the fields of aluminum for construction and for transportation, telecommunication products, industrial equipment and infrastructure to promote the application of aluminum. In 2021, the project of "Exploration of Innovative Application of Lightweight Aluminum Assembly House" of Kunming Engineering & Research Institute of Nonferrous Metallurgy Co., Ltd. (KERI) won the 26th place of the Award of Excellence in the 3rd Central SOEs Glittering Star Innovation and Creativity Competition.



六冶建川博物館雙層鋁合金網殼專案主體工程完工
Principal project of Jianchuan Museum's double-layer aluminum alloy reticulated shell structures undertaken by China Sixth Metallurgical Construction Co., Ltd.



沈陽院總承包管理建設某公司高精鋁板帶產品項目壹期工程
Management and construction of a company's high-precision aluminum strip products project (Phase I) undertaken by SAMI under general contracting

案例 CASE



六冶中標河南鋁合金人行天橋項目

China Sixth Metallurgical Construction Co., Ltd. successfully won the bidding on the aluminum pedestrian bridge project of Henan

鋁合金是壹種全新的環保材料，作為人行天橋具有外形美觀、耐腐蝕性強、重量輕、養護費用低等優點。2021年，六冶成功中標河南鋁合金人行天橋項目。該天橋為中承式鋁合金結構，主橋橋面寬為4.65米，淨寬4.15米，主橋跨度為90米。

Aluminum alloy is a new environmentally-friendly material used for pedestrian bridge and featuring artistic appearance, strong corrosion resistance, light weight and low maintenance cost, etc. In 2021, China Sixth Metallurgical Construction Co., Ltd. successfully won the bidding on the aluminum pedestrian bridge project of Henan. The pedestrian bridge is designed in a half-through aluminum-alloy structure, with a 4.65-meter-wide main bridge deck, a net width of 4.15 meters, and a main span of 90 meters.

中承式鋁合金結構天橋

主橋橋面寬為**4.65**米，淨寬**4.15**米，主橋跨度為**90**米

A half-through aluminum alloy structure
Main bridge deck: 4.65 meters wide, net width: 4.15 meters, main span: 90 meters long

河南鋁合金人行天橋效果圖

Henan aluminum alloy pedestrian bridge renderings



案例
CASE

雲南鋁應用將鋁推廣應用到怒江美麗公路綠道建設項目

CHALIECO International Yunnan Aluminum Application Engineering Co., Ltd. applied aluminum in greenway project of Nujiang River beautiful highway.

3月30日，雲南鋁應用成功簽下怒江美麗公路綠道工程鋁合金護欄供貨合同，將鋁推廣應用到怒江美麗公路綠道建設項目中。截至2021年12月20日，雲南鋁應用公司圓滿完成項目總計175公里合同供貨任務。怒江美麗公路綠道建設項目為雲南鋁應用充分發掘鋁應用產品特性，深耕市政交通領域，加強鋁合金產品推廣和市場開拓力度，打好曲靖“綠色能源”“綠色食品”“健康生活目的地”三張牌貢獻“中鋁方案”。

On March 30, CHALIECO International Yunnan Aluminum Application Engineering Co., Ltd. successfully signed the aluminum alloy guardrail supply contract for the Greenway Project of Nujiang River Highway, where aluminum was applied. As of December 20, 2021, CHINALCO International Yunnan Aluminum Application Engineering Co., Ltd. successfully completed the 175-kilometer-long contract supply tasks for the project. In the greenway construction, the company fully explored the characteristics of aluminum products, and enhanced efforts for promotion of aluminum products and market development in the field of municipal transportation, aiming to provide a "CHALIECO solution" for Qujing, that is "green energy" "green food" and "healthy life destination".



完善環境管理 | Environmental Management Improvement

中鋁國際嚴格遵循《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》《中華人民共和國清潔生產促進法》及項目所在運營地的環保法律、法規及標準。嚴格內部管理，制定《OHS程序文件》《OHSE 管理體系手冊》，堅持HSE體系及中鋁集團CAHSE體系並軌運行，對環境管理進行持續監督。2021年，中鋁國際未發生較大及以上突發性環境事件。

In strict adherence to the *Environmental Protection Law of the People's Republic of China*, the *Law of the People's Republic of China on Air Pollution Prevention and Control*, the *Law of the People's Republic of China on Promotion of Cleaner Production*, and the environmental protection laws, regulations and standards of the places of project operation, CHALIECO further strengthened internal management, formulated the *OHS Procedure Document* and the *OHSE Management System Manual*, laid equal emphasis on the HSE system and CHINALCO's CAHSE system, and applied constant monitoring on environmental management. In 2021, no environmental incidents of large scale or above occurred in CHALIECO.

各設計單位加強對承攬業務的合規性評價，堅持以規劃環評是項目環評先導的原則，做好項目與規劃相符性分析；及時獲取並組織學習最新的環保相關的法律法規，不斷強化環評業務人員的業務素質及能力培養；進壹步規範環評業務全過程質量管控，確保環評報告內容合法合規、科學準確。

All design units strengthened the compliance evaluation in business, and did a good job in analyzing the conformity of the project with the plan adhering to the principle that EIA planning is the precursor of project EIA; timely organized the study of latest laws and regulations on environmental protection in a timely manner, and continuously strengthened the quality and capacity training of EIA professionals; further standardized the whole-process quality control of EIA to ensure that the contents of EIA reports are legally compliant and scientifically accurate.

中鋁國際持續推進中央環保督察反饋問題整改。根據集團中央環保督察問題整改工作要求，成立公司中央生態環境保護督察問題整改領導小組，統籌推進問題整改工作；組織企業參加集團三期整改推進培訓會；在第二輪第三批中央環保督察期間，組織各企業開展環保專項檢查工作，累計排查整改環保問題隱患263項。截至2021年底，集團中央生態環境保護督察反饋問題中涉及公司共計19項問題33條具體整改措施，已經完成17項問題29條具體措施整改，並按要求向集團反饋整改報告，其餘問題正在整改中，未發生逾期未整改情況。

CHALIECO continuously promoted the rectification of problems from the feedback of central environmental inspections. According to the Group's requirements for the rectification of problems from central environmental inspections, CHALIECO set up a leaders' group to coordinate the rectification work, and organized enterprises to participate in the Group's three training sessions for the advancement of the problem rectification. During the second central environmental inspection in the third tour, CHALIECO organized all subordinate enterprises to carry out special inspection for environmental protection, through which a total of 263 environmental problems and hidden dangers were located and rectified. By the end of 2021, among all the 33 specific rectification measures for 19 problems from the feedback of central environmental inspections, CHALIECO successfully applied 29 rectification measures for 17 problems and submitted rectification reports to the Group as required, with the remaining issues under rectification without any delay.



環保業務 Environmental Protection

中鋁國際深耕類壤土基質複綠、邊坡複綠等環境治理項目領域，積極開拓綠色技術研發、綠色勘查施工、綠色運行管理、綠色項目開發的生態環保新業務領域，為業主提供綠色方案。

CHALIECO has been deeply engaged in the field of environmental management projects such as simulate loam substrate re-greening and slope re-greening, and actively developing new business fields of ecological and environmental protection including green technology R&D, green survey and construction, green operation and management, and green project development to provide green solutions for property owners.



昆勘院打造綠色環保EPC標杆項目
Green and environmentally-friendly EPC benchmark project by Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd.

案例 CASE

天津建設積極參與陝西國家儲備林建設項目 CHALIECO (Tianjin) Construction Company Limited participated in Shaanxi National Reserve Forest Project.

天津建設正在實施的陝西國家儲備林項目，設計面積6萬畝，項目實施完成後，種植苗木量將達600萬株，包含人工集約栽培林和林地經濟的種植、養殖。陝西國家儲備林項目的實施，增加了城市綠地，美化了城市環境，進壹步提升鄉村景觀，形成山、水、田、林與城市、鄉村壹體的區域景觀，改善旅遊環境，吸引遊客休閒度假，產生壹系列綜合發展效應。

Shaanxi National Reserve Forest Project, the undergoing project of CHALIECO (Tianjin) Construction Company Limited with a design area of more than 60,000 mu and six million seedlings after completion, includes planting and breeding of the intensive artificially-cultivated forest and under-forest economy. The implementation of the Shaanxi National Reserve Forest Project will increase urban green space, further beautify the urban environment, enhance the rural landscape, and form a regional landscape that integrates mountains, water, fields, forests and cities and villages. It will also improve the tourism environment, attract tourists for leisure and vacation, and bring about comprehensive development effects.



天津建設陝西國家儲備林(志丹)基地建設項目營造林工程
Afforestation/reforestation at the Shaanxi National Reserve Forest Project (Zhidan) Base by CHALIECO (Tianjin) Construction Company Limited

節能減排 Energy Conservation and Emission Reduction

2021年能源消耗總量
Total energy consumption: 352,794 million tons of standard coal equivalent in 2021

35,279.40
萬噸標準煤

電力消耗量
Electricity consumption: 85,349,021 million kWh

8,534.90
萬千瓦時

汽油消耗量
Gasoline consumption: 3,292,824.40 liters

3,292,824.40
升

天然氣消耗量
Natural gas consumption: 346,075 m³

346,075.00
立方米

● 節約降耗 Energy-Saving and Consumption Reduction

節約能源是中鋁國際落實可持續發展觀、踐行綠色發展的根本要求。中鋁國際重視科技創新，實施源頭節能，各個設計企業在設計諮詢項目中嚴格遵守國家有關法律法規，嚴格執行國家產業政策和國家、行業技術規定，精心設計，為企業生產創造良好的節能條件。2021年，中鋁國際未發生節能違法違規事件。2021年，能源消耗總量35,279.40萬噸標準煤；電力消耗量8,534.90萬千瓦時，汽油消耗量3,292,824.40升，天然氣消耗量346,075.00立方米。

Energy conservation is the fundamental requirement for CHALIECO to implement the concept of sustainable development and green development. CHALIECO attaches great importance to science and technology innovation, and makes great efforts in emission reduction from the source. Each engineering company strictly complies with related state laws and regulations in design consulting projects, strictly implements national industrial policies, national technical regulations, and industrial technical regulations to accomplish meticulous designs and create good energy conservation conditions for production. In 2021, CHALIECO fully complied with energy conservation laws and regulations. In 2021, the Company recorded a total energy consumption of 352,794,000 tons of standard coal equivalent, electricity consumption of 85,349,031 kWh, gasoline consumption of 3,292,824.4 liters, and natural gas consumption of 346,075 m³.

● 綠色施工 Green Construction

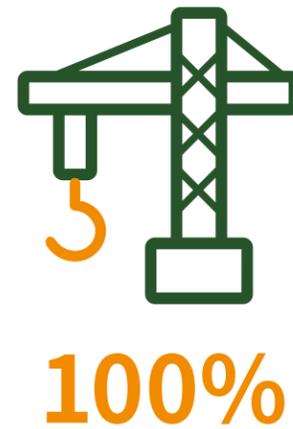
中鋁國際踐行綠色施工理念，聚焦施工現場揚塵、噪音、汙水排放、建築垃圾等主要環保問題，按照“六個百分百”目標進行管控，減少和減輕對周邊的影響；鼓勵項目現場推廣應用新材料、新工藝、新設備，提高綠色施工能力，減少材料浪費，紮實做好施工現場“四節壹環保”工作；加強對焊接、切割、噴塗作業生產車間的環保管控，保證收塵、除煙裝置配備到位並有效運行。

Adhering to the idea of green construction and focusing on the main environmental issues including dust, noise, sewage discharge, and building rubbish at construction site, CHALIECO conducted management and control towards the target of "six 100-percent" to reduce and weaken the influence on surrounding areas, and encouraged the application of new materials, new processes and new equipment on site to improve green construction capacity, reduce material waste, and completed the task of "four-conservation-and-one-protection" at construction site. CHALIECO constantly enhances environmental protection management and control on production workshops for welding, cutting, and spraying process to ensure dust collection equipment and smoke removal installations are in place and effective.

中鋁國際項目施工“六個百分百”目標

CHALIECO's "six 100-percent" goals at the construction site

封閉管理百分百	100 percent closed-off management
道路硬化百分百	100 percent road hardening
物料覆蓋百分百	100 percent material coverage
車輛清洗百分百	100 percent vehicle cleaning
清潔保潔百分百	100 percent cleanness and water-spraying
密閉運輸百分百	100 percent enclosed transportation



● 污染防治 Pollution Prevention and Control

中鋁國際嚴格遵照國家最新《固體廢物汙染環境防治法》的相關要求，修訂完善固廢（危廢）管理制度，持續加強對施工現場、生產車間固廢（危廢）的管控力度，施工現場、生產車間貯存固廢（危廢）的場所符合安全環保要求，收集、貯存、運輸、利用、處置固體廢物採取防揚散、防流失、防滲漏等防汙染措施，規範建立管理記錄及台賬，嚴禁擅自傾倒、堆放建築垃圾等固體廢物，危險固廢委託具有資質的單位進行轉移和處理。

In compliance with relevant requirements under the *Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste*, CHALIECO revised and improved the management system on solid waste (hazardous waste), and constantly strengthened the management and control on solid waste (hazardous waste) at construction site and in production workshops. The requirements provide that all places storing solid waste (hazardous waste) at construction site and in production workshops shall meet safety and environmental protection standards; collection, storage, transport, utilization, and disposal of solid waste shall take anti-pollution measures to prevent scattering, loss, and leakage; management records and standing books must be properly kept and standardized. It is strictly forbidden to dump or stack building rubbish and other solid waste. Hazardous waste has been transferred and disposed by qualified units.

科技的開發與應用推動中鋁國際三廢綜合利用能力提高。

Development and application of science and technology boosted the improvement of CHALIECO's comprehensive utilization capacity on "three wastes".

“節能長壽命鋁電解槽陰極製造技術及裝備”能夠達到節能、減排、環保的綜合效果，經濟效益與社會效益並重。

"Energy-saving and long-life aluminum electrolysis cathode manufacturing technology and equipment" can help achieve the effect of energy conservation, emission reduction, and environmental protection as it underlines economic and social benefit.

“電解鋁煙氣無組織排放深度治理技術”從電解槽生命周期的三個階段入手全面系統地降低鋁電解過程中的無組織排放，應用後電解槽集氣效率達到99.5%，處於國際領先水平。

"In-depth treatment technology for fugitive emission of electrolytic aluminum exhaust gas" stresses the three phases of electrolytic cell lifecycle to reduce fugitive emission comprehensively and systematically during aluminum electrolysis. Gas collection efficiency of electrolytic cell can reach 99.5 percent upon application, which is now leading the industry over the world.

“二氧化碳協同生物法處理鉛鋅選礦廢水成套技術”可實現廢水100%回用，有效解決重金屬選礦廢水汙染的重大行業難題。

"Packaged technology of CO2 synergized biological method on treating lead and zinc beneficiation wastewater" features 100 percent reuse of wastewater and effectively solve the major industrial problem of heavy metal beneficiation wastewater pollution.



生態保護

Ecological Protection

中鋁國際在項目建設中注重保護環境，做好項目周邊環境維護與治理，盡量減少對植被和動物棲息地的影響，維持企業所在地和項目建設區的生態平衡和生物多樣性。

With emphasis on environmental protection in project construction, CHALIECO made great efforts on surrounding environment maintenance and management to reduce impact on vegetation and animal habitats as much as possible, and maintain ecological equilibrium and biological diversity of corporate locations and project construction areas.

環保意識

Environmental Protection Awareness

中鋁國際通過學習培訓、宣傳推廣等方式，讓綠色低碳理念深入人心。中鋁國際組織各企業安全環保人員學習習近平生態文明思想和有關安全生產重要論述，培養了壹批合格的生態環境精準體系審核人員，提高了全體環保專業人才隊伍業務水平。精心策劃員工喜愛、方便參與的宣傳活動，通過懸掛宣傳標語、微信平台推廣環保小視頻等方式，大力弘揚生態文化和生態道德，普及生態環保知識，進壹步增強全員生態環境意識。

Through training and learning, publicity and popularization, CHALIECO has efficiently popularized green and low-carbon concept in the Company. We arranged security and environmental protection personnel of each member enterprise to study Xi Jinping's Thought on Ecological Civilization, as well as the important speeches and instructions on work safety. We cultivated a group of qualified assessors for accurate ecological environment system audit, and greatly improved the professional skill of the entire environmental protection workforce. We also effectively planned publicity activities for employees by hanging slogans and posting short videos on WeChat account to promote environmental protection, with an aim to publicize ecological culture and ecological ethics for eco-environment protection and further enhance employee's awareness of ecological environment.

案例 CASE

宣傳環保理念 綠色深入人心

Green and environmental protection enjoyed popular support.

全國第31個節能宣傳周期間，十二冶利用黑板畫、宣傳畫等形式進行環保低碳活動宣傳，聯合黨群、共青團，以向行人分發定制環保布袋的形式宣傳節能降碳。通過宣傳教育，增強了大家的節能意識、能源憂患意識、環保意識和責任意識，從而養成良好的節約習慣。

At the 31st National Energy Conservation Week, China Nonferrous Metals Industry's 12th Metallurgical Construction Co., Ltd. publicized environmental protection and low-carbon activities by means like blackboard paintings and picture posters. The company cooperated with the Party organizations and the Communist Youth League to publicize energy conservation and low-carbon activities by giving away customized environmentally-friendly cloth bags to pedestrians. Through publicity and education, it has enhanced people's awareness of energy conservation and unexpected risk to energy, and their sense of environmental protection and responsibility to develop good habit of energy conservation.



志願者向路人分發環保布袋
Environmentally-friendly cloth bags distributed to pedestrians

綠色辦公

Green Workspace

中鋁國際持續推廣綠色辦公。夏季倡導使用自然通風降溫，減少空調使用；鼓勵員工交通出行減少私家車使用，推薦乘坐大巴車、電動車等綠色出行工具；對辦公產生的廢紙等資源進行回收；倡導員工節約用水、用電、減少廢棄物產生等。

CHALIECO continuously promotes the idea of "green workspace" by advocating the use of natural ventilation instead of air conditioner for cooling in summer, and encouraging employees to commute by bus, scooter or other low-carbon traffic tools instead of private car. CHALIECO continued to recycle waste paper and other resources generated in the office, and called for saving water and electricity for waste reduction.

攜手共進

守護萬家燈火璀璨

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3



社會績效

Society Performance

指標/Indicators	2019	2020	2021
員工人數 (人) Number of employees (person)	14,685	14,633	12,489
其中: 男性員工 (人) Including: Male employees (person)	10,980	11,239	10,061
女性員工 (人) Female employees (person)	3,705	3,394	2,428
正式員工 (人) Number of regular employees (person)	14,685	14,633	12,489
非正式員工 (人) Number of non-regular employees (person)	0	0	0
30歲以下員工數 (人) Number of employees aged under 30 (person)	4,050	3,517	2,571
30歲-50歲員工數 (人) Number of employees aged between 30 and 50 (person)	7,883	8,074	7,055
50歲以上員工數 (人) Number of employees aged above 50 (person)	2,752	3,042	2,863

生產安全事故數 (次) Number of work safety accidents (time)	0	1	0

員工死亡人數 (人) Number of work-related fatalities (person)	0	1	0

因工傷損失工作日數 (天) Lost days due to work injury (day)	0	0	0

指標/Indicators	2019	2020	2021
員工體檢覆蓋率 (%) Coverage of physical examination for employees (%)	100	100	100

員工流失率 (%) Employee turnover rate (%)	4.09	4.09	6.34
其中: 女性員工流失率 (%) Including: Turnover rate of female employees (%)	0.63	0.82	3.48
男性員工流失率 (%) Turnover rate of male employees (%)	2.18	3.27	2.86
30歲以下員工流失率 (%) Turnover rate of employees aged under 30 (%)	1.89	2.14	3.63
30歲-50歲員工流失率 (%) Turnover rate of employees aged between 30 and 50 (%)	0.88	1.05	1.60
50歲以上員工流失率 (%) Turnover rate of employees aged above 50 (%)	0.04	0.90	1.11

報告期內吸納就業人數 (人) Number of newly recruited employees in the reporting period (person)	1,304	905	30

健康檔案覆蓋率 (%) Coverage of health record (%)	100	100	100

社會績效

Society Performance

指標/Indicators	2019	2020	2021
勞動合同簽訂率 (%) Signing rate of employment contracts (%)	100	100	100
集體合同覆蓋率 (%) Coverage of collective contracts (%)	100	100	100
社會保險覆蓋率 (%) Coverage of social insurance (%)	100	100	100
通過申訴機制申請、處理和解決的員工申訴數量 (個) Number of employee complaints filed, handled and solved through complaint mechanism (issue)	0	0	0
女性管理者人數 (人) Number of female managers (person)	1,244	1,367	1,410
中層管理者中女性管理者占比 (%) Proportion of female managers in middle management (%)	27	29	31
少數民族員工占比 (%) Proportion of ethnic minority employees (%)	4.93	4.42	4.59
本地化僱傭比例 (%) Local employment rate (%)	85	81	86
人均帶薪休假天數 (天) Days of paid leaves per capita (day)	9.78	10.25	10.00

指標/Indicators	2019	2020	2021
員工培訓投入 (萬元) Investment in employee training (RMB'0,000)	1,012.08	921.38	880.62
員工培訓次數 (人次) Number of participants of employee training (person-time)	15,086	12,546	29,971
員工培訓時長 (小時) Number of hours for employee training (hour)	167,680.00	108,838.60	123,629.80
女性員工平均培訓時長 (小時) Average training duration of female employees (hour)	20.70	22.05	21.49
男性員工平均培訓時長 (小時) Average training duration of male employees (hour)	30.64	33.35	33.64
女性員工培訓比例 (%) Proportion of female employees participated in the training (%)	76.73	78.49	79.32
男性員工培訓比例 (%) Proportion of male employees participated in the training (%)	87.51	88.42	90.56
職工薪酬同比增長 (%) YOY growth of employee compensation (%)	1.33	2.90	1.77

履行員工責任 | Employee Responsibilities Fulfillment

保護員工權益 Employee Rights and Interests Protection

中鋁國際致力於建立“陽光、坦誠、簡單、友善”的員工關係，大力實施工員關愛工程，關注並深入了解基層員工的生產生活條件，為廣大員工提供公平的職業發展機會、有競爭力的報酬體系以及融洽的人際環境。

CHALIECO, committed to establishing a “bright, honest, simple, and friendly” relation with and for employees, has vigorously carried out employee care program to care about and further understand the living and production conditions of employees at the ground level. CHALIECO has made great efforts to provide fair vocational development opportunities, competitive compensation system, and harmonious interpersonal conditions for employees.

反強迫勞動和騷擾虐待方面，公司嚴格執行《勞動法》《勞動合同法》《社會保險法》《婦女權益保護法》等法律法規，尊重員工人權，反對強迫勞動，禁止僱傭童工和強制勞工，2021年未發生重大勞動爭議和人權問題投訴。

In terms of anti-forced labor, anti-harassment, and anti-abuse, CHALIECO, in strict accordance with the *Labor Law of the People's Republic of China*, the *Labor 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 Rights and Interests of Women*, and other related laws and regulations, highly values and respects employees' human rights, forbids slave labor and employment of child labor, and opposes forced labor. In 2021, CHALIECO recorded no major labor dispute and complaint about human rights.

薪酬待遇方面，中鋁國際為員工提供公平的薪酬和福利，依法為員工繳納社會保險和公積金。建立企業年金制度，為職工退休生活提供進壹步養老保障。大力保障職工生命健康權益，積極開展疫情防控，落實職工健康體檢、女職工和特殊崗位專項體檢。

In terms of compensation and benefits, CHALIECO provides fair compensation and benefits for employees, pays social insurance and accumulation fund for employees according to law, and has established enterprise annuity system to further provide employees with old age security for their retired life. CHALIECO actively safeguards employees' rights and interests on life and health, enhances pandemic prevention and control, and conducts physical examination for employees, especially the female employees and employees at special positions.

采用職工合理化建議
Number of rational proposals adopted: Over 200

200 余條

民主管理方面，中鋁國際充分發揮以職代會為基本形式的企業民主管理、民主監督、民主決策的作用。積極開展合理化建議活動，2021年，采用職工合理化建議322條，採納200余條。

In terms of democratic management, CHALIECO gives full play to the role of enterprise democratic management, democratic supervision, and democratic decision-making with employees' congress as the basic form, and actively organizes rational proposal activities. In 2021, a total of 322 rational proposals from employees were accepted, of which more than 200 proposals were adopted.



中鋁國際召開三屆壹次會員代表大會
The 1st Session of the 3rd Member Representative Conference at CHALIECO



2021年員工學歷結構

Distribution of employees by education background in 2021

指標/Indicator	2019	2020	2021
博士 (人) Employees with a doctor's degree (person)	36	37	38
碩士 (人) Employees with a master's degree (person)	1,329	1,428	1,317
本科 (人) Employees with a bachelor's degree (person)	7,080	7,278	6,906
其他 (人) Others (person)	5,346	5,194	4,845

2021年員工技術結構

Distribution of employees by technical skill in 2021

指標/Indicator	2019	2020	2021
普通工 (人) Regular workers (person)	1,280	699	325
初級工 (人) Workers with junior title (person)	139	94	66
中級工 (人) Workers with intermediate title (person)	260	199	287
高級工 (人) Workers with senior title (person)	353	309	339
技師 (人) Technicians (person)	418	283	461
高級技師 (人) Senior technicians (person)	235	174	280

關注員工發展

Focus on Employee Development

中鋁國際為員工提供成長平台，滿足員工自我發展、不斷提升的要求。2021年，中鋁國際召開職稱評審會，共有56人通過初審，其中高級職稱20人、中級職稱25人、初級職稱11人。各單位組織形式多樣的勞動競賽58次，投入150余萬元，參賽員工人數達2,167人次。堅持用先進的理念引導職工，用優良的作風培育職工，選樹命名各級各類勞模、工匠、先進典型262人。開展“金點子”“銀點子”合理化建議征集活動，新建勞模工匠、技術能手等工作室12個，獲省級以上榮譽的工作室7個。

CHALIECO provides a development platform to employees for continuous self-development. In 2021, CHALIECO held a professional title evaluation. A total of 56 participants passed the first review, among which 20 were given senior professional title, 25 given medium-grade professional title, and 11 given junior professional title. A total of 58 labor competitions of various types were organized by different units with total investment of more than RMB1.5 million and total participants of 2,167 employees. Guided by the advanced idea to guide employees and cultivates employees by fine conduct, CHALIECO evaluated and named 262 employees as model workers, craftsmen, and advanced models at all levels and types. CHALIECO also collected proposals to compete for "Golden Idea" and "Silver Idea". A total of 12 studios of model worker, model craftsman, technical expert and other types were newly built among which seven studios granted awards of provincial level and above.

● 隊伍建設 Team Building

中鋁國際堅持構建老中青梯次搭配的幹部隊伍，用好各年齡段的幹部。統籌謀劃優秀年輕幹部隊伍建設，注重選用有基層壹線、重點關鍵崗位、改革發展壹線、複雜環境、艱苦地區工作經歷，取得廣大幹部員工公認業績的幹部，注重加強優秀年輕幹部的培養。

CHALIECO never stops building management teams with seniors, middle-aged and young leaders in a proper proportion. Based on an overall plan for the establishment of management team with excellent young leaders, CHALIECO selected those with working experience at ground level, on key position, on the frontline of reform and development, in complex environment, or in poverty-stricken areas and those who also have achieved performance well acknowledged by the majority of managers and employees. CHALIECO has been laying emphasis on cultivation of outstanding young management staff.

● 員工培訓 Employee Training

中鋁國際為員工提供廣闊的發展平台和空間，制定壹系列員工培訓方案和績效考核辦法，明確了培養方式。採用線上線下相結合的形式，針對痛點難點，實施“靶向培訓”；優化培訓工作的組織體系、課程體系、支持體系和評估體系，使整個培訓工作更具系統性和結構性；針對不同主題的培訓內容採用不同的授課模式，提升培訓效果；加強課前審核，根據培訓目標，科學規範參加培訓人員的條件和範圍。

CHALIECO provides broad development space for employees, and has formulated specific employee training schemes and performance assessment. CHALIECO organized online and offline targeted training sessions according to different pain points and difficulties. CHALIECO optimized the organizational system, curriculum system, support system and evaluation system of the training to make it more systematic and structuralized. CHALIECO applied different teaching modes for different themes to improve training effect, and strengthened pre-training inspection to scientifically standardize the conditions and scope of trainees according to training objective.

案例
CASE

中鋁國際持續開辦“中鋁國際講堂”
CHALIECO continued to hold “CHALIECO Lecture Hall”.

為進一步加強學習型組織建設，為“科技+國際”發展戰略提供有力的幹部人才支撐，中鋁國際持續開辦“中鋁國際講堂”，圍繞改革發展、生產經營相關問題，組織業務交流研討和培訓。2021年度，中鋁國際面向廣大幹部員工通過“中鋁國際大講堂”開辦了市場開發、BIM應用、國企改革、廉潔從業、內控風控等方面的培訓。

To further step up the establishment of a learning organization and provide strong cadre support for the development strategy of “S&T + Internationalization,” CHALIECO held several sessions of “CHALIECO Lecture Hall” with an aim to boost business exchange and training about issues relating to reform & development, production and operation. In 2021, CHALIECO held trainings on market development, BIM application, reform on SOEs, integrity practices, and internal risk control for the majority of managers and employees through the “CHALIECO Lecture Hall”.



中鋁國際舉辦第三屆綜合辦公技能競賽
The 3rd Integrated Office Skills Contest held by CHALIECO



九冶舉辦“華山計劃”人選培訓班
“Huashan Program” Training Workshop held by Jiuye Construction Co., Ltd.



山東工程舉辦黨務技能大比武
Party Affairs Skills Contest held by CHINALCO Shandong Engineering Technology Co., Ltd.

關愛員工生活
Care about Employees' Lives

● 關懷送溫暖 Care for Employees

中鋁國際在元旦、春節等節日期間組織慰問壹線員工，為員工及其家屬發放禮品、表達問候，讓員工感受到溫暖與關懷。

During the Chinese New Year, Spring Festival and other festivities, CHALIECO organized several activities to care about front-line employees, and distributed gifts and expressed greetings to employees and their families.



中鋁國際“七壹”前夕慰問海外員工家屬
Visit to family members of employees working abroad on the eve of “July 1st”



長勘院為壹線員工送清涼
China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd. visiting front-line workers



天津建設協助呂梁市總工會為呂梁新區各參建單位職工發放防暑降溫慰問品
CHALIECO (Tianjin) Construction Company Limited assisted Lyuliang Federation of Trade Unions to distribute free heat prevention products for employees of all participating units in Lyuliang New Area

● 多彩文化活動 Colorful Cultural Activities

中鋁國際將文體活動融入企業發展目標，融入企業職工隊伍建設。節日期間舉辦多種多樣的活動，日常積極開展職工籃球賽、健步走接力賽等特色文體活動，平衡員工工作與生活，調動工作的積極性，不斷增強員工凝聚力。

CHALIECO integrates cultural and physical activities into enterprise development target and team building. CHALIECO held a variety of activities during festivals and actively organized employee basketball games, walking relay race and other distinctive cultural or physical activities to balance employees' work and life, aiming at mobilizing employees' initiative for work and continuously enhancing their cohesion.



中鋁國際組織開展慶祝“三八”國際婦女節系列活動
Activities held by CHALIECO to celebrate the International Women's Day



中鋁國際舉辦健步走接力賽活動
Walking relay race held by CHALIECO



昆勘院舉辦第十屆“勘察設計杯”職工籃球賽
The 11th “Prospecting Design Cup” Employee Basketball Match held by Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd.



九冶舉辦首屆青年線上交友聯誼活動
The 1st online fellowship activity for young employees held by Jiuye Construction Co., Ltd.



六冶舉辦“冶煉愛情·緣在當夏”單身青年聯誼活動
Fellowship activity for young employees themed “Love in Summer” held by China Sixth Metallurgical Construction Co., Ltd.



沈陽院舉辦職工趣味運動會
Fun Run for employees held by SAMI

● 困難員工幫扶 Support to Employees in Need

2021年，中鋁國際列支幫扶資金103.19萬元，幫扶困難職工135人，已實現解困脫困的困難職工48人。

In 2021, CHALIECO invested RMB1.0319 million to support 135 employees in need, of whom 48 were lifted out of poverty.



長勘院走訪慰問離退休老同志及困難職工
China Nonferrous Metal Changsha Survey and Design Institute Co., Ltd. visiting retired employees and employees in need



山東工程春節前走訪慰問困難職工（黨員）
CHINALCO Shandong Engineering Technology Co., Ltd. visiting employees (Party members) in need

築牢安全防線 | Safety Defense Line Consolidation

中鋁國際深入踐行“一切風險皆可控制、一切事故皆可預防”的安全管理理念，貫徹落實“安全第一、預防為主、綜合治理”的安全生產方針，本著“強基礎、抓重點、補短板”的工作思路，促進安全生產落細落小落實。

CHALIECO, adhering to the safety management concept of “all risks can be controlled, and all accidents can be prevented” and the principles of “giving first place to safety, laying stress on prevention and taking comprehensive measures”, makes great efforts to enhance safety production in details in the spirit of “enhancing foundation, focusing on key areas, and making up for weak points”.

安全管理體系 Safety Management System

中鋁國際堅持CAHSE及QHSE體系並軌運行，將質量、健康、安全、環境納入風險管控體系，開展企業自評、中鋁集團和中鋁國際分級審核、第三方外部審核，提高企業安全環保管理的制度化、規範化及體系化水平。

CHALIECO, with equal stress on CAHSE and QHSE systems, has incorporated quality, health, safety, and environment into risk control system, and conducted enterprise self-assessment, graded inspection for CHINALCO and CHALIECO, and third-party external audits to improve the institutionalization, standardization, and systemization of safety and environmental protection management.

針對工程技術企業安全風險管控重點在基層、難點在壹線的特點，中鋁國際制定《工程項目安全生產責任》，明確項目現場施工安全管理及各職級的安全生產責任，通過風險分級管控，確定風險控制措施，保障施工人員人身安全，減少職業病發生。編制適用於工業施工、民用建築施工、市政道路施工、非煤礦山施工、勘察測繪和加工制造等不同領域的職業健康考評標準，加強考核管理。

Since the focus on risk control is on grassroots level and the front line, CHALIECO formulated *Safety Production Responsibilities of Engineering Project* to clarify the responsibilities of safety management on construction site and safety production on all levels. By classified management and control of risks, CHALIECO defined risk control measures to guarantee constructors' personal safety and reduce their occupational disease. CHALIECO also formulated occupational health assessment standards for industrial engineering, civil architecture construction, municipal road construction, non-coal mine mountain construction, surveying and mapping, processing and manufacturing, and other different fields to reinforce assessment management.

落實安全生產 Work Safety

中鋁國際持之以恆抓好現場安全管理，對項目安全生產明確提出“十條禁令”“七必須”“八不准”要求。公司不斷強化環節管理，落實項目經理責任，以項目現場檢查為重點，紮實推進安全生產專項整治三年行動。在作業現場推廣使用中鋁國際CARC工具，現場風險評價得到了改善。對重點項目開展

“抓兩頭、帶中間”專項督查，並對各成員企業機關、部分二級單位以及項目進行滲透式的督查，通過督查檢查，有效改善現場的安全管理現狀。

With persistent focus on site safety management, CHALIECO clearly put forward the requirements of “Ten Prohibitions,” “Seven Must,” and “Eight Must Not”. CHALIECO constantly enhances process management, fulfills responsibilities of project managers, and firmly promotes the three-year action of special rectification on safety production with focus on site inspection. CHALIECO promoted the use of CARC tool at construction site to improve risk assessment, conducted special supervision of “addressing the two ends while leading the middle link” for major projects, and completed supervisions and inspections on each member enterprise and some second-tier units and projects, which significantly improved the safety management on site.

2021年，中鋁國際以安全生產月活動為契機，集中開展三年行動專項攻堅及“五查五嚴”再排查。針對礦山安全事故，老舊設施安全風險，易燃易爆、有毒有害及有限空間作業，全覆蓋的電氣作業工作票等進行專項排查整治工作。

In 2021, CHALIECO conducted re-investigation on the efforts for the three-year action and “Five Investigations in Five Strictness” in the “Work Safety Month”, completed special investigation and rectification on mine safety accidents, safety risks of old facilities, flammable and explosive materials, toxic and harmful materials, operations in limited space, and work orders for all-standing electrical operations.

案例 CASE

中鋁國際開展安全督察工作 CHALIECO completed safety supervision.

2021年3月至5月，中鋁國際依據公司2021年安全環保工作要點及關於開展重大安全風險隱患“五查五嚴”專項排查整治工作部署及相關要求，對貴陽院、六冶等進行安全生產專項督查。本次督查本著“邊督邊改邊指導”的原則，聚焦雲南高速路群等重點項目，通過與企業各級管理人員的訪談交流、查閱安全管理基礎資料、進行現場檢查，排查安全管理問題426項、現場隱患及違章135項，出具問題清單9份、隱患整改通知單6份。通過專項督查，切實排查出壹批問題、發現並整改壹批隱患。

From March to May in 2021, CHALIECO conducted special supervisions on the safety production in Guiyang Aluminum & Magnesium Design and Research Institute Co., Ltd., China Sixth Metallurgical Construction Co., Ltd. and other member companies according to the requirements of safety and environmental protection in 2021 and the arrangements for special investigation and rectification under the “Five Investigations in Five Strictness” standards on major safety risks. Based on the principle of “Supervising and Rectifying while Guiding,” CHALIECO, with focus on key projects such as Yunnan Highway, detected 426 safety management problems, 135 on-site hidden dangers and regulation breach, and issued 9 lists and six notices for risk rectification through interviews and discussion with managerial staff at all levels, checks on fundamental materials of safety management and on site investigations. CHALIECO is committed to effectively identifying and rectifying project-related problems in the most efficient manner.



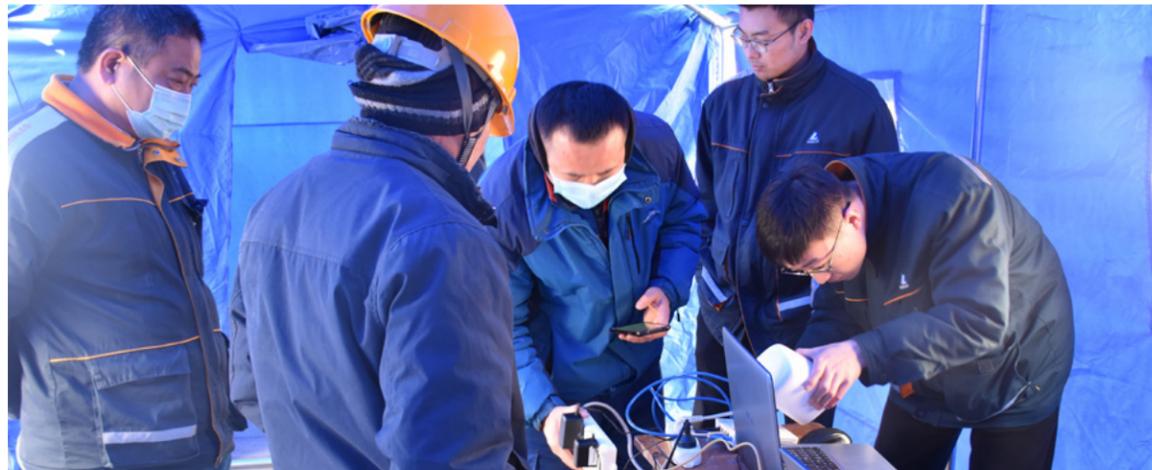
提升安全意識 Safety Awareness Enhancement

中鋁國際通過專題培訓、警示教育、應急演練、文化宣傳等形式，調動員工參與安全管理的積極性和主動性，營造濃厚安全文化氛圍等方式，為高質量發展奠定安全基石。2021年10月至11月，公司組織各企業參加CAHSE體系培訓，極大地提高了專業人才隊伍建設。全年參加安全生產培訓職工人數為11,789人。

Through special training, warning education, emergency exercise, cultural publicity and other activities, CHALIECO effectively mobilized employees to participate in safety management, and built a safety culture, which laid a solid foundation for high-quality development. From October to November of 2021, CHALIECO organized various member enterprises to attend CAHSE system training which has greatly improved talent team building. A total of 11,789 employees attended safety production training throughout 2021.

參加安全生產培訓職工人數為
Number of employees attended safety production
training: 11,789

11,789 人



山東工程開展全員核酸檢測應急演練
CHINALCO Shandong Engineering Technology Co., Ltd. conducted company-wide nucleic acid testing emergency drill



昆勸院首個房建EPC項目——“易門縣人民醫院建設項目設計、施工(EPC)工程總承包”項目，助力疫情防
The first EPC housing project of the “People’s Hospital of Yimen County” undertaken by Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd. for the pandemic prevention and control

助力和諧社會

Contribution to Building a Harmonious Society

公益志願服務 Volunteer Services

中鋁國際秉持愛心向善的初心，弘揚樂善好施的中華傳統美德，擔當扶危濟困的企業公民責任。截至2021年末，中鋁國際注冊青年志願者883人，年度志願者服務總時長2,124小時，企業捐贈總額為154.44萬元。

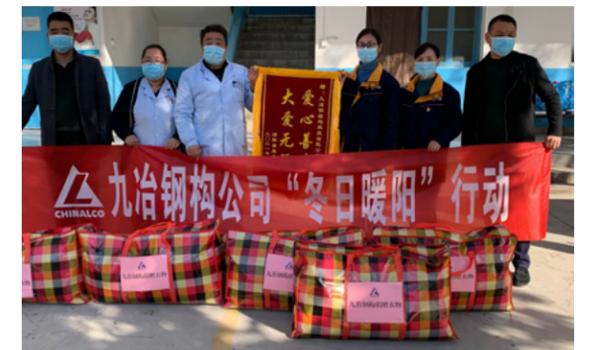
To its original aspiration to uphold goodness and promote the traditional Chinese virtue of philanthropism, CHALIECO has been taking the responsibility of helping those in need as a corporate citizen. By the end of 2021, CHALIECO had registered 883 young volunteers with total 2,124 volunteering service hours; and it had donated RMB1.5444 million in total.

企業捐贈總額為
Total donations of CHALIECO: RMB1.5444 million

154.44 萬元



九冶五公司向寶雞小學生捐贈交通安全愛心包
No. 5 Enginnering Co. of Jiuye Construction Co., Ltd. donated traffic safety care packages to Baoji elementary school students



九冶鋼構公司為涇陽縣康復中心精神病患者捐贈過冬衣物
Jiuye Steel Structure Co. donated winter clothes to patients of Jingyang Rehabilitation Centre



西南公司舉辦“清檢垃圾 共建美麗家園”志願服務活動
Volunteer service activity themed “Garbage Removing to Build A Beautiful Home” held by CHINALCO Southwest Construction Investment Co., Ltd.

助力鄉村振興 Rural Revitalization

中鋁國際積極參與國家鄉村振興工作。2021年，各成員企業工會採取“消費扶貧，訂單式生產”等方式購買扶貧點農產品，支援產業發展等投入資金共計150余萬元。

CHALIECO has actively participated in national rural revitalization. In 2021, the union of each member enterprise purchased agricultural products for poverty alleviation by means of “consumption for poverty alleviation and order-based production,” and invested more than RMB1.5 million to support industrial development.

案例 CASE

鄉村振興 長沙院廣續奮鬥再出發
CINF Engineering Co., Ltd. supported rural revitalization.

2021年，根據國家鄉村振興戰略總要求，長沙院派遣工作隊進駐隆回縣天馬山村，聚力開展幫扶工作。

According to the general requirements of national rural revitalization strategy, CINF Engineering Co., Ltd. sent a work team to Tianmashan Village of Longhui County to assist in poverty alleviation.

產業振興 Industrial revitalization



擴大已有養殖產業規模，發展特色經濟林果產業；利用祠堂文物及自然資源優勢發展旅遊、民宿及康養產業。

Efforts were made to expand the scale of existing breeding industry, develop characteristic economy of forestry and fruit industry, and develop tourism, homestay and health and wellness industry by taking advantage of ancestral halls and natural resources.

人才振興 Talent attraction



吸引本土人才回村助力建設發展，重點培養村中種養大戶、專業合作社領辦人等。

Effective measures were taken to attract talented workforce to return to help rural construction, and invested a lot in cultivating major farming families in the villages and leaders for specialized cooperatives.

文化振興 Cultural enrichment



起草制定並實施村民規約，提出村民殯葬地集中建設、集中管理的初步想法。

The team assisted in the drafting, formulation, and implementation of stipulations for villagers, and proposing the preliminary idea of centralized construction and centralized management of villagers' burial sites.

生態振興 Ecological development



配合開展“三清三化”“旱廁改造”等工作；組織開展衛生整治、道路維修工作；起草制定並實施環境評比、保潔員考核管理相關條例。

The team assisted in “three cleanups and three modernizations,” “renovation of latrine pit,” and other work, organized and conducted sanitation improvement and road maintenance work, and supported to draft, formulate, and implement relevant regulations on environmental assessment and appraisal management for cleaners.

組織振興 Organizational expansion



加強村“兩委”班子建設，培養年輕後備力量，推動村黨支部建設，加強黨員管理與監督。

To enhance the capabilities of the members under “two committees” for the villages, the company helped train young reserve forces, boost the establishment of village-based Party branches, and strengthen Party member management and supervision.

鞏固脫貧攻堅成果 Consolidation of poverty alleviation results



每月組織開展全村民常態化監測，動態跟蹤因病致困的農戶並落實幫扶措施，預防返貧。

A regular monitoring on villagers was held each month to keep dynamic tracking on rural families suffering from poverty due to illness, and assist villagers to be free from re-poverty.

為民辦實事 Substantive support for villagers



組織村民參與新農村建設，在村內多處安裝公園椅，關懷留守少年兒童，為困難村民購置生活物資。

The team organized villagers to participate in new countryside construction like chair installation in many places of the village, cared about left-behind children and purchased living materials for villagers in need.



長沙院工程師攜無人機開展天馬山村詳細測量勘察
Survey at Tianmashan Village with unmanned aerial vehicle of CINF Engineering Co., Ltd.

案例
CASE

天津建設呂梁項目黨支部為鄉村振興助力
Party Branch of Lyuliang Project boosted rural revitalization.

天津建設呂梁項目黨支部積極響應呂梁市新區建管中心號召，走進呂梁市臨縣安家莊鄉消費幫扶活動現場，幫助困難群眾銷售農產品。獲得安家莊鄉政府頒發的“愛心幫扶企業”榮譽稱號，為當地脫貧攻堅貢獻了力量。

Party Branch of Lyuliang Project of CHALIECO (Tianjin) Construction Company Limited made active response to the call of Lyuliang New Area Construction Management Center and helped people in impoverished circumstances sell agricultural products on site in Anjiazhuang Township of Lin County, Lyuliang City. The honorary title of "Caring and Helping Enterprise" was awarded by the government of Anjiazhuang Township to recognize its contribution to local poverty alleviation.



天津建設獲當地鄉政府“愛心幫扶企業”榮譽稱號
"Philanthropic Enterprise" awarded to CHALIECO (Tianjin) Construction Company Limited by the local government

案例
CASE

六冶雲南分公司為鄉村振興“鋪路”
China Sixth Metallurgical Construction Co., Ltd. Yunnan Branch made great contributions to rural revitalization.

六冶雲南分公司積極助推鄉村振興，為玉溪市盤溪鎮、河西鎮，麗江市戰河鄉等地村民修建便道。這壹舉措改善了當地農村面貌，解決了村民出行不便、農產品運輸難的問題，為當地脫貧攻堅貢獻了六冶力量。

Yunnan Branch of China Sixth Metallurgical Construction Co., Ltd. has been actively promoting rural revitalization and built pavement for villagers in Panxi Town and Hexi Town of Yuxi, and Zhanhe Village of Lijiang, which improved local rural landscape, solved the problems of inconvenient travel for villagers and difficult transport of agricultural products, and made great contribution to poverty alleviation.



六冶獲當地村民贈送的錦旗
Silk banners sent by local villagers to China Sixth Metallurgical Construction Co., Ltd.

投身抗洪救災

Devotion to Disaster Relief

中鋁國際切實踐行中央企業社會責任擔當，積極投身抗洪救災壹線。2021年7月20日，河南省受多日持續暴雨襲擊，多地受災嚴重。中鋁國際時時關注受災情況，各戰略單元及時作出汛情響應。

CHALIECO earnestly fulfilled the social responsibilities and duties as a central SOE, and actively participated in flood relief. On July 20, 2021, Henan Province suffered from continuous extraordinary rainstorm for days, and several cities were severely affected. With a great concern on it, CHALIECO made quick responses and took immediate actions to the disaster relief.



九冶積極參加鄭州特大暴雨災後重建工作
Jiuye Construction Co., Ltd. engaged in post-disaster reconstruction in Zhengzhou after the disaster



六冶轉移被困村民
China Sixth Metallurgical Construction Co., Ltd. transferring disaster-affected villagers



雲南鋁應用公司組織開展河南抗洪救災捐款活動
CHINALCO International Yunnan Aluminum Application Engineering Co., Ltd. holding a donation ceremony to support Henan Province



案例
CASE

天津建設奮戰特大暴雨抗洪壹線

CHALIECO (Tianjin) Construction Company Limited participated in the emergency rescue in Henan.

7月20日，河南省多地遭遇罕見的特大暴雨。天津建設駐河南安陽第四分公司積極響應號召，實行24小時值班制度，發現問題第一時間報告處置，確保現場人員及財產安全。在完成自救的同時，安陽項目二部立即組織應急小分隊，積極參與到安陽縣的應急搶險救援工作中，迅速完成漳河水域及護城河等部分橋段河草清理及防汛沙袋填築等搶險救災工作，有效保障人民群眾生命及財產安全。

On July 20, 2021, several cities in Henan Province suffered from extraordinary rainstorm. No. 4 Branch of CHALIECO (Tianjin) Construction Company Limited in Anyang of Henan Province made immediate response to the call and initiated a 24-hour stand-by system to guarantee on-site personnel safety and property security. Amid self-rescue, No. 2 Project Department of Anyang Project immediately organized an emergency team to actively participate in the emergency rescue and disaster relief of Anyang County. Quick in cleaning river grass and filling sandbags for flood prevention, the team made extraordinary performances in rescue and relief on the sections of Zhanghe River and the city moat, effectively safeguarding the citizens' lives and properties.



天津建設抗洪救災現場
The heroes of CHALIECO (Tianjin) Construction Company Limited in disaster relief and rescue operations

參與疫情防控

Participation in Pandemic Prevention and Control

中鋁國際全面落實中鋁集團關於疫情防控的要求，迅速行動、周密部署，統籌做好疫情防控和複工複產各項任務，協助社區進行疫情防控工作，為打贏疫情防控阻擊戰貢獻力量。

In line with the requirements of CHINALCO for pandemic prevention and control, CHALIECO took immediate actions to make thorough plans and detailed arrangements on tasks for work and production resumption, and also coordinated with communities on pandemic prevention and control, contributing to fight against COVID-19.



六冶志願者協助社區疫情防控
China Sixth Metallurgical Construction Co., Ltd. assisting local communities in pandemic prevention and control



九冶志願者積極配合地方政府參與核酸檢測工作
Volunteers of Jiuye Construction Co., Ltd. assisting in the nucleic acid testing



十二冶志願者維護社區核酸檢測現場秩序
Volunteers of China Nonferrous Metals Industry's 12th Metallurgical Construction Co., Ltd. assisting in maintaining order at the site of nucleic acid testing

強化海外履責

Stricter Fulfillment of Responsibilities on Overseas Markets

境外業務拓展

Overseas Business Expansion

2021年，中鋁國際總計新簽海外業務合同33.32億元（5.15億美元）。年內多個重大合同落地，如印度BALCO電解鋁EP項目、印尼電解鋁廠電解系列升級改造總承包項目、印度Vedanta年產13萬噸鋁板帶改擴建項目設計供貨和項目管理等；年內海外市場開拓內部市場協同有成果，如貴陽院和中色科技壹起聯合開發印度市場，兩家單位同步完成兩項重大合同的簽約，同時在哈薩克斯坦、阿塞拜疆等項目開發上多家企業緊密合作，合作進展顯著；海外業務開發機構持續優化完善，為踐行“科技+國際”戰略，公司本部完成海外業務發展中心的設立，各成員企業也在積極行動，逐步完善組織架構，將海外業務開發作為未來發展重點。

中鋁國際總計新簽海外業務合同
Total amount of the newly signed overseas contracts of CHALIECO: RMB3.332 billion

33.32 億元



In 2021, the total amount of the newly signed overseas contracts of CHALIECO reached RMB3.332 billion, or about USD515 million. A number of major contracts were signed during the year, which included the Indian BALCO Electrolytic Aluminum EP Project, a general contracting project for the transformation and upgrading of an Indonesian electrolytic aluminum plant, and a design project for large-scale electrolytic aluminum project (500KA) of Vedanta Group in India. CHALIECO also achieved excellent results in terms of overseas market development and domestic market coordination. For example, Guiyang Aluminum & Magnesium Design and Research Institute Co., Ltd. and China Nonferrous Metals Processing Technology Co., Ltd. worked together to expand Indian market, and each signed a major contract with Indian counterparts respectively; several member enterprises made joint efforts to expand markets in Kazakhstan, Azerbaijan, and other countries, achieving remarkable progress. Overseas business development affiliates have been continuously optimized and perfected. For effective implementation of the "S&T + Internationalization" strategy, CHALIECO established an overseas business development center and the member enterprises also worked hard to gradually refine organizational structure and took overseas business development as the focus of their future development.

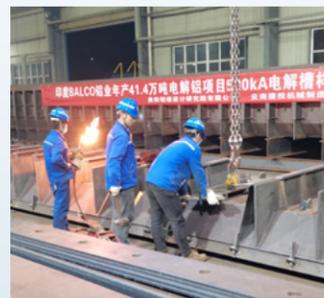
案例 CASE

貴陽院簽署印度BALCO電解鋁供貨和服務合同

GAMI signed aluminum supply & service contracts with Indian BALCO electrolytic.

2021年初，貴陽院中標印度Balco電解鋁項目系列設備供貨和技術服務合同，並通過“雲簽約”的方式簽署該海外大型合同，首次實現中國500KA電解鋁技術的印度市場輸出。該項目再創近年來海外電解鋁項目合同額的新高。

In early 2021, GAMI successfully won the bidding of a supply and service contract for Indian BALCO electrolyte aluminum project. This major contract was concluded online as the first step to output China's 500KA electrolyte aluminum technology into Indian market. The total contract amount of the project set a record of electrolyte aluminum contract value in recent years.



疫情防護

Pandemic Prevention and Control

中鋁國際定期組織召開境外疫情防護專題會議，督促各境外項目、機構做好疫情防護工作，對防疫工作落實情況進行檢查；前往六冶、昆勘院召開境外疫情防護專題會議，檢查疫情防護工作開展情況；定期統計境外人員回國信息，協調解決員工疫苗注射、回國手續等工作。

CHALIECO organized and held special sessions of overseas pandemic prevention and control regularly, and urged all overseas project departments and entities to effectively implement the pandemic prevention and control measures and conduct inspections on their implementation of anti-pandemic work. CHALIECO also convened special sessions of overseas pandemic prevention and control at China Sixth Metallurgical Construction Co., Ltd. and Kunming Prospecting Design Institute of China Nonferrous Metals Industry Co., Ltd. and inspected the implementation of relevant measures. CHALIECO regularly made statistics on employees returning to China from abroad, assisted in vaccination and other procedures.

境外員工關愛

Care for Employees

中鋁國際在生產經營中，遵守所在地法律，尊重當地習俗，保護環境，維護當地員工權益，積極參與社區建設，為當地經濟社會發展作出了積極貢獻。

CHALIECO strictly observed local laws and regulations, respected local traditions and customs, protects environment, safeguards rights and interests of employees, and took initiative to participate in community construction, making great contribution to local economic and social development.



2021年春節，九冶安裝公司海外1號項目與業主舉辦5人足球賽，融洽了業主關係的同時，也豐富了員工的精神文化生活。

During the Spring Festival of 2021, employees of the overseas No. 1 project of Installation Co. under Jiuye Construction Co., Ltd. held a five-a-side football match with the project owner, which not only strengthened the harmonious relationships between the two sides, but also enriching the spiritual and cultural life of overseas employees.

未來 展望

FOR THE FUTURE

“十四五”時期是中鋁國際轉型發展的關鍵時期，作為有色行業技術的引領者，有色工程建設的主力軍，基礎設施及民用工程建設的生力軍，中鋁國際必將堅持新發展理念，讓創新驅動發展轉型，不斷提升國際化水平，立足有色行業、實現業務多元化發展，做強勘察設計諮詢，做優工程總承包，做實科技產業化，做亮工程用鋁，實現企業可持續高質量發展。

The 14th Five-Year Plan period is crucial for the transformation and development of CHALIECO. As the technology leader of nonferrous metal industry, the main force for nonferrous engineering construction, and the new power for infrastructure and civil engineering construction, CHALIECO will firmly uphold the new development concept to promote innovation-driven transformation and development and constantly step up internationalization, establish a foothold in nonferrous metal industry for business enrichment, enhance survey and design consulting, optimize general contracting procedures, strengthen science and technology commercialization, and boost aluminum for engineering construction, thereby achieving sustainable and high-quality development of the Company.

風勁帆滿圖新志，砥礪奮進正當時。中鋁國際將不忘初心、繼續奮鬥，在困境中闖出新路，在拼搏中擁抱未來，努力開創中鋁國際改革發展新局面，朝著建設國內壹流、全球有核心競爭力的有色金屬工程技術公司邁進。

Work hard and forge ahead with great ambitions in mind. CHALIECO will remain true to its original aspiration, continue to strive and overcome adversities to blaze a new trail to success, and embrace a brighter future with hard work. CHALIECO will not stop in reform and development, and spare no effort to build a domestic first-class nonferrous metal engineering technology company with global core competitiveness.

附錄 | Appendix

指標索引 Index

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
主要範疇A—環境 A. Environmental			
A1 排放物 A1: Emissions	壹般披露：有關廢氣及溫室氣體排放、向水及土地的排汙、有害及無害廢棄物的產生等的： (a)政策；及 (b)遵守對發行人有重大影響的相關法律及規例的資料。 General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste.	完善環境管理 Environmental Management Improvement	P61
	A1.1 排放物種類及相關排放數據。 A1.1 The types of emissions and respective emissions data.	環境績效 Environmental Performance	P48-49
	A1.2 直接及能源間接溫室氣體排放量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。 A1.2 Direct and energy indirect greenhouse gas emissions (in tonnes) and, where appropriate, intensity (e.g., per unit of production volume, per facility).	應對氣候變化 Response to Climate Change	P50
	A1.3 所產生有害廢棄物總量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。 A1.3 Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g., per unit of production volume, per facility).	環境績效 Environmental Performance	P48-49
	A1.4 所產生無害廢棄物總量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。 A1.4 Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g., per unit of production volume, per facility).	環境績效 Environmental Performance	P48-49

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
A1 排放物 A1: Emissions	A1.4 所產生無害廢棄物總量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。 A1.4 Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g., per unit of production volume, per facility).	環境績效 Environmental Performance	P48-49
	A1.5 描述所訂立的排放量目標及為達到這些目標所採取的步驟。 A1.5 Description of emissions target(s) set and steps taken to achieve the same.	完善環境管理 Environmental Management Improvement	P63-65
	A1.6 描述處理有害及無害廢棄物的方法，及描述所訂立的減廢目標及為達到這些目標所採取的步驟。 A1.6 Description of how hazardous and non-hazardous wastes are handled, and a description of reduction target(s) set and steps taken to achieve them.	環保技術應用 Application of Environmentally-Friendly Technologies 完善環境管理 Environmental Management Improvement	P51-57 P63-65
A2 資源使用 A2: Use of Resources	壹般披露：有效使用資源（包括能源、水及其他原材料）的政策。 General Disclosure Policies on the efficient use of resources, including energy, water and other raw materials.	完善環境管理 Environmental Management Improvement	P61 P63
	A2.1 按類型劃分的直接及/或間接能源（如電、氣或油）總耗量（以千個千瓦時計算）及密度（如以每產量單位、每項設施計算）。 A2.1 Direct and/or indirect energy consumption by type (e.g., electricity, gas or oil) in total (kWh in '000s) and intensity (e.g., per unit of production volume, per facility).	環境績效 Environmental Performance	P48-49
	A2.2 總耗水量及密度（如以每產量單位、每項設施計算）。 A2.2 Water consumption in total and intensity (e.g., per unit of production volume, per facility).	環境績效 Environmental Performance	P48-49
	A2.3 描述所訂立的能源使用效益目標及為達到這些目標所採取的步驟。 A2.3 Description of energy use efficiency target(s) set and steps taken to achieve them.	完善環境管理 Environmental Management Improvement	P63-64

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
	A2.4描述求取適用水源上可有任何問題，以及所訂立的用水效益目標及為達到這些目標所採用的步驟。 A2.4 Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency target(s) set and steps taken to achieve them.	本報告期內暫不披露 Not Disclosed in this Reporting Period	不適用 N/A
	A2.5制成品所用包裝材料的總量 (以噸計算) 及 (如適用) 每生產單位佔量。 A2.5 Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced.	本報告期內暫不披露 Not Disclosed in this Reporting Period	不適用 N/A
A3 環境及天然資源 A3: Environment and Natural Resources	壹般披露：減低發行人對環境及天然資源造成重大影響的政策。 General Disclosure Policies on minimising the issuer's significant impacts on the environment and natural resources.	環保技術應用 Application of Environmentally-Friendly Technologies 完善環境管理 Environmental Management Improvement	P51 P61
	A3.1描述業務活動對環境及天然資源的重大影響及已採取管理有關影響的行動。 A3.1 Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	環保技術應用 Application of Environmentally-Friendly Technologies 完善環境管理 Environmental Management Improvement	P52-57 P62-67
A4 氣候變化 A4: Climate Change	壹般披露：識別及應對已經及可能會對發行人產生影響的重大氣候相關事宜的政策。 General Disclosure Policies on identification and mitigation of significant climate-related issues which have impacted, and those which may impact, the issuer.	應對氣候變化 Response to Climate Change	P50

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
	A4.1描述已經及可能會對發行人產生影響的重大氣候相關事宜，及應對行動。 A4.1 Description of the significant climate-related issues which have impacted, and those which may impact, the issuer, and the actions taken to manage them.	應對氣候變化 Response to Climate Change	P50
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	B1.1按性別、僱傭類型（如全職或兼職）、年齡組別及地區劃分的雇員總數。 Total workforce by gender, employment type (e.g., full or part-time), age group and geographical region.	社會績效 Society Performance	P70-73
	B1.2按性別、年齡組別及地區劃分的雇員流失比率。 B1.2 Employee turnover rate by gender, age group and geographical region.	社會績效 Society Performance	P70-73

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
B2 健康與安全 B2: Health and Safety	壹般披露: 有關提供安全工作環境及保障雇員避免職業性危害的: (a)政策; 及 (b)遵守對上市公司有重大影響的相關法律及規例的資料。 General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to providing a safe working environment and protecting employees from occupational hazards.	築牢安全防線 Safety Defense Line Consolidation	P82
	B2.1過去三年(包括匯報年度)每年因工作亡故的人數及比率。 B2.1 Number and rate of work-related fatalities occurred in each of the past three years including this Reporting year.	社會績效 Society Performance	P70-73
	B2.2因工傷損失工作日數。 B2.2 Lost days due to work injury.	社會績效 Society Performance	P70-73
	B2.3描述所採納的職業健康與安全措施, 以及相關執行及監察方法。 B2.3 Description of occupational health and safety measures adopted, and how they are implemented and monitored.	築牢安全防線 Safety Defense Line Consolidation	P82-84
B3 發展與培訓 B3: Development and Training	壹般披露: 有關提升雇員履行工作職責的知識及技能的政策。描述培訓活動。 General Disclosure Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.	關注員工發展 Focus on Employee Development	P77
	B3.1按性別及雇員類別(如高級管理層、中級管理層等)劃分的受訓雇員百分比。 B3.1 The percentage of employees trained by gender and employee category (e.g., senior management, middle management).	社會績效 Society Performance	P70-73
	B3.2按性別及雇員類別劃分, 每名雇員完成受訓的平均時數。 B3.2 The average training hours completed per employee by gender and employee category.	社會績效 Society Performance	P70-73

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
B4 勞工準則 B4: Labor Standards	壹般披露: 有關防止童工或強制勞工的: (a)政策; 及 (b)遵守對發行人有重大影響的相關法律及規例的資料。 General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labor.	保護員工權益 Employee Rights and Interests Protection	P74-75
	B4.1描述檢討招聘慣例的措施以避免童工及強制勞工。 B4.1 Description of measures to review employment practices to avoid child and forced labor.	保護員工權益 Employee Rights and Interests Protection	P74-75
	B4.2描述在發現違規情況時消除有關情況所採取的步驟。 B4.2 Description of steps taken to eliminate such practices when discovered.	保護員工權益 Employee Rights and Interests Protection	P74-75
營運慣例 Operating Practices			
B5 供應鏈管理 B5: Supply Chain Management	壹般披露: 管理供應鏈環境及社會風險的政策。 General Disclosure Policies on managing environmental and social risks of the supply chain.	攜手共築未來 Together for a Shared Future	P42
	B5.1按地區劃分的供應商數目。 B5.1 Number of suppliers by geographical region.	攜手共築未來 Together for a Shared Future	P43
	B5.2描述有關聘用供應商的慣例, 向其執行有關慣例的供應商數目以及有關慣例的執行及監察方法。 B5.2 Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, and how they are implemented and monitored.	攜手共築未來 Together for a Shared Future	P42-43

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
	B5.3描述有關識別供應鏈每個環節的環境及社會風險的慣例，以及相關執行及監察方法。 B5.3 Description of practices used to identify environmental and social risks along the supply chain, and how they are implemented and monitored.	攜手共築未來 Together for a Shared Future	P42-43
	B5.4描述在揀選供應商時促使多用環保產品及服務的管理，以及相關執行及監察方法。 B5.4 Description of practices used to promote environmentally preferable products and services when selecting suppliers, and how they are implemented and monitored.	攜手共築未來 Together for a Shared Future	P42-43
B6產品責任 B6: Product Responsibility	壹般披露：有關所提供產品和服務的健康與安全、廣告、標籤及私隱事宜以及補救方法的： (a)政策；及 (b)遵守對發行人有重大影響的相關法律及規例的資料。 General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to health and safety, advertising, labelling and privacy matters relating to products and services provided and methods of redress.	打造優質工程 High-Quality Projects 持續技術創新 Unstoppable Technology Innovation	P33 P35
	B6.1已售或已運送產品總數中因安全與健康理由而須回收的百分比。 B6.1 Percentage of total products sold or shipped subject to recalls for safety and health reasons.	本報告期內暫不披露 Not Disclosed in this Reporting Period	不適用 N/A
	B6.2接獲關於產品及服務的投訴數目以及應對方法。 B6.2 Number of products and service related complaints received and how they are dealt with.	打造優質工程 High-Quality Projects	P34
	B6.3描述與維護及保障知識產權有關的慣例。 B6.3 Description of practices relating to observing and protecting intellectual property rights.	持續技術創新 Unstoppable Technology Innovation	P41

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
	B6.4描述質量檢定過程及產品回收程序。 B6.4 Description of quality assurance process and recall procedures.	打造優質工程 High-Quality Projects	P33
	B6.5描述消費者資料保障及私隱政策，以及相關執行及監察方法。 B6.5 Description of consumer data protection and privacy policies, and how they are implemented and monitored.	打造優質工程 High-Quality Projects 持續技術創新 Unstoppable Technology Innovation	P34 P40
B7反貪污 B7: Anti-corruption	壹般披露：有關防止賄賂、勒索、欺詐及洗黑錢的： (a) 政策；及 (b)遵守對發行人有重大影響的相關法律及規例的資料。 General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to bribery, extortion, fraud and money laundering.	反腐倡廉 Anti-corruption and Integrity	P23
	B7.1于匯報期內對發行人或其雇員提出並已審結的貪污訴訟案件的數目及訴訟結果。 B7.1 Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during this Reporting period and the outcomes of the cases.	反腐倡廉 Anti-corruption and Integrity	P23
	B7.2描述防範措施及舉報程序，以及相關執行及監察方法。 B7.2 Description of preventive measures and whistle-blowing procedures, and how they are implemented and monitored.	反腐倡廉 Anti-corruption and Integrity	P23
	B7.3描述向董事及員工提供的反貪污培訓。 B7.3 Description of anti-corruption training provided to directors and staff.	反腐倡廉 Anti-corruption and Integrity	P23

議題 Issues	績效指標 KPIs	位置 Section	對應頁碼 Page(s)
社區 Community			
B8 社區投資 B8: Community Investment	<p>壹般披露: 有關以社區參與來了解發行人營運所在社區需要和確保其業務活動會考慮社區利益的政策。</p> <p>General Disclosure Policies on community engagement to understand the needs of the communities where the issuer operates and to ensure its activities take into consideration the communities' interests.</p>	助力和諧社會 Contribution to Building A Harmonious Society 強化海外履責 Stricter Fulfillment of Responsibilities on Overseas Markets	P85-93
	<p>B8.1 專注貢獻範圍 (如教育、環境事宜、勞工需求、健康、文化、體育)。</p> <p>B8.1 Focus areas of contribution (e.g., education, environmental concerns, labor needs, health, culture, sport).</p>	助力和諧社會 Contribution to Building A Harmonious Society 強化海外履責 Stricter Fulfillment of Responsibilities on Overseas Markets	P85-93
	<p>B8.2 在專注範圍所動用資源 (如金錢或時間)。</p> <p>B8.2 Resources contributed (e.g., money or time) to the focus area.</p>	助力和諧社會 Contribution to Building A Harmonious Society	P85-86