



中鋁國際工程股份有限公司

China Aluminum International Engineering Corporation Limited

(A joint stock limited company incorporated in the People's Republic of China with limited liability)

Stock Code of H Shares: 2068

Stock Code of A Shares: 601068



Social Responsibility Report 2019

INTRODUCTION

The purpose of this report is to respond to stakeholders' expectations and illustrate CHALIECO's principles, management, actions and effectiveness of environmental, social, corporate governance and sustainable development.

Reporting Standards

This report complies with *Environmental, Social and Governance Reporting Guide* in Appendix 27 of *Listing Rules* of the Hong Kong Exchanges and Clearing Limited (hereinafter referred to as the "HKEX") and the relevant provisions and requirements of *Guidelines of the Shanghai Stock Exchange for Environmental Information Disclosure*. It also extensively refers to domestic and international social responsibility reporting standards including *Guidelines for Sustainable Development Reporting* (G4) by the Global Reporting Initiative (GRI), and *Guide for the Development of Chinese Corporate Social Responsibility Reports* (CASS-CSR4.0) by the Chinese Academy of Social Sciences.

Reporting Coverage

Unless otherwise specified, this report covers the headquarters, branches and subsidiaries of China Aluminum International Engineering Corporation Limited (hereinafter referred to as "CHALIECO").

Data Sources

Unless otherwise specified, the information and data cited in this report are from the company's official documents, statistical reports and financial statements, as well as environmental, social and governance information that has been compiled, summarized and audited by the company.

Reporting Period

From January 1, 2019 to December 31, 2019. Part of the content involves some historical data.

Notes on Some Terms in this Report

For the convenience of illustration and readability, "(this/the) company" means the headquarters and branches of China Aluminum International Engineering Corporation Limited, while "CHALIECO", "(this/the) Group" or "we" means the headquarters, branches and subsidiaries of China Aluminum International Engineering Corporation Limited. Unless otherwise specified, the terms "yuan", "ten thousand yuan" and "100 million yuan" in this report respectively represent "RMB", "RMB ten thousand" and "RMB100 million".

Reporting Cycle

This report is an annual report.

How to access

The Chinese and English versions of this report can be viewed or downloaded on the official website of CHALIECO, the website of the HKEX or the website of the Shanghai Stock Exchange.

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MESSAGE FROM THE CHAIRMAN



王健强

2019 marked a link between the past and future developments of CHALIECO. In that year, we aimed to improve the company's quality and achieve long-term development, and effectively implemented the principles of sustainable development. While giving full play to the leading role of the party building work, we mobilized efforts at various levels of our organization to integrate production, management, innovation, safety, environmental protection with our social responsibility. In 2019, the company built up its powerful core strength for driving practically sustainable development with a sound performance of zero safety, environmental or quality accidents.

Adhering to the quality-first principle, we advocate industrial craftsmanship and refine our expertise to create top-quality works. In 2019, CHALIECO completed a number of high-quality projects and thereby set a new historical record by winning three Luban Awards. The company turned innovation into a powerful engine for sustainable development and guided research forces to continually converge in the forward-looking, innovation-based fields, with major breakthroughs made in the large-scale, intelligent and digitized transformation of equipment as well as other key areas. By comprehensively growing the company into an innovative engineering and research enterprise, we are committed to leading and supporting the technological advancement of the aluminum industry, and contributing to the high-quality development of the industry.

Ecological development heralds social progress. We proactively implement environmental responsibilities and contribute to the construction of a beautiful China. In the “ecology foremost” principle, we implement construction projects while strictly maintaining the ecological and environmental red line; guided by a green design, we keep exploring energy-saving and environmental technology of the aluminum industry in an in-depth manner. In 2019, we successfully developed the “pressure leaching technology for copper sulfide concentrate” and the “reserve burning oven (RTO) technology, which effectively solved the bottleneck of resource utilization, and uplifted our environmental technology to the internationally advanced level. By building up an industrial chain of green technology R&D, green survey and construction, green operation and management, and green project development, we have embarked on a green development path with CHALIECO characteristics.

Caring for employees and society, we make our commitment, and extend the corporate value to society. With a scientific outlook on talents duly established, we respect talents and their creation, and work to provide employees with an equal, open, warm and harmonious development environment. Regarding our social commitment, we participate in the joint work for building communities, support social welfare undertakings such as targeted poverty alleviation, voluntary services, charitable donations, and perform the responsibility of a state-owned enterprise; actively respond to the “Belt and Road Initiative”; based on our first-class aluminum technology and in the principle of “mutual negotiation, joint construction and shared benefits”, contribute CHALIECO’s strength to the peaceful development of the industry by exporting a number of advanced projects and production capacities.

As a poem goes, “As the tide is calm and the banks broad, my sail is stretched by the favorable wind”. On the road toward high-quality development, CHALIECO always keeps in mind its goal in the “centennial plan”, its original vision and social responsibility. CHALIECO makes consistent efforts to turn a great, new chapter in its sustainable development.

ABOUT US

Corporate Profile

Established in December 2003, CHALIECO is the engineering technology sector of Aluminum Corporation of China (hereinafter referred to as “CHINALCO”), a holding subsidiary of CHINALCO. CHALIECO was listed on the Main Board of the Stock Exchange (Stock Code: 2068) on 6 July 2012 and on the SSE (Stock Code: 601068) on 31 August 2018. The company became the first non-ferrous engineering technology company with listed A Shares and H Shares. CHALIECO is a leading technology, engineering service and equipment provider in the non-ferrous metals industry in China.

CHALIECO is a high-tech enterprise integrating technology research and development, surveying and mapping, engineering design, engineering construction, general contracting, and various investment businesses. 6 national class-A design and research institutes and 5 large building installation companies are affiliated to CHALIECO. Over the past ten years since the establishment of CHALIECO, it has created several “First in China” and set a number of industrial records, and has won more than 500 various engineering awards at all levels, including the China Construction Engineering Luban Award and the National Quality Engineering Award. CHALIECO enjoys high reputation due to the notable contribution it has made. In recent years, the company has focused on research and development of energy conservation and emission reduction technology, and actively participated in the investment, construction and development of local infrastructure construction, shanty town reconstruction, ecological construction, environmental engineering and urban utilities, making significant contribution to building a resource-saving and environment-friendly society.

Mission for Development: Create a Beautiful Future with Diligent Efforts

Vision: A world-class non-ferrous engineering and technological group with international competitiveness

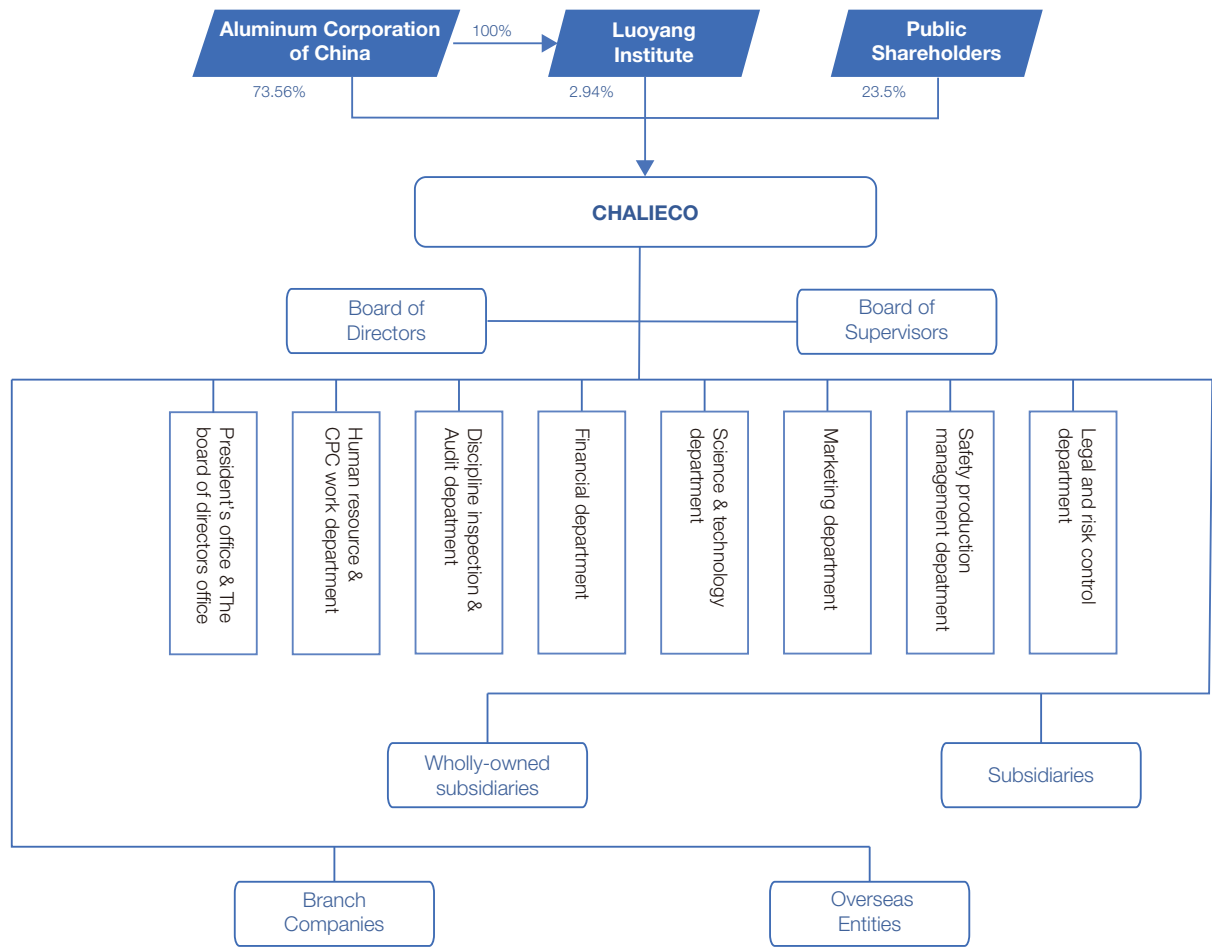
Positioning: Leading and supporting the technological progress of the aluminum industry and the engineering applications of aluminum products; guiding and promoting international cooperation in the upgrade of aluminum and copper production capacity; actively participating in the “Belt and Road” initiative; vigorously driving cooperation in overseas project construction and capacity upgrade in the non-ferrous industry; and serving as a major contributor to CHALIECO’s overseas development.

Development Strategy: With high-quality development as the leading force, technology as the driver and engineering construction as the basis, providing services throughout the entire industrial chain in the non-ferrous industry; driven by innovation and fully based on the roles of intelligent manufacturing and construction technology, serving the non-ferrous industry and gradually expanding to markets beyond the non-ferrous businesses while maintaining the Group’s technological advantages in the non-ferrous industry; in a market-oriented manner, focusing on and building up the leading edge in the traditional non-ferrous market, and improving the company’s efficiency and scale in the emerging and overseas businesses; with green principles as the keynote for development, vigorously promoting the production of aluminum for engineering use, actively expanding energy-saving and ecological industries, and seeking new growth poles for increasing profit; with capital-based operations as a bridge, establishing close ties with local governments, and taking an active part in

national and urban infrastructure construction; and closely following the national “Belt and Road” strategy while exploring overseas markets in an in-depth manner to improve the company’s international competitiveness and brand influence.

Directions for Business Development: A “4+1” blueprint which comprises “general contracting for non-ferrous projects, general contracting for municipal and civil projects, aluminum production for engineering use, and engineering consulting services” + “overseas businesses”.

Corporate Structure



Business Layout

By the end of the reporting period, the important subsidiaries, branch companies, overseas and Hong Kong, Macao and Taiwan institutions of CHALIECO are as follows:

Wholly-owned Subsidiaries:

- SHENGYANG ALUMINUM & MAGNESIUM ENGINEERING & RESEARCH INSTITUTE CO., LTD.
- GUIYANG ALUMINUM & MAGNESIUM ENGINEERING & RESEARCH INSTITUTE CO., LTD.
- CHANGSHA ENGINEERING & RESEARCH INSTITUTE LIMITED FOR NONFERROUS METALLURGY.
- CHINA CHANGSHA NONFERROUS METALS INVESTIGATION AND DESIGN RESEARCH INSTITUTE CO., LTD.
- CHINA KUNMING NONFERROUS METALS INVESTIGATION AND DESIGN RESEARCH INSTITUTE CO., LTD.
- 6TH METALLURGICAL CONSTRUCTION CO., LTD.
- 12TH METALLURGICAL CONSTRUCTION CO., LTD.
- CHINALCO SOUTHWEST CONSTRUCTION INVESTMENT CO., LTD.
- CHALIECO TIANJIN CONSTRUCTION CO., LTD.
- CHINA ALUMINUM INTERNATIONAL TECHNOLOGY DEVELOPMENT CO., LTD.
- CHALIECO ENGINEERING EQUIPMENT CO., LTD.
- BEIJING ZICHEN INVESTMENT DEVELOPMENT CO., LTD.
- CHALIECO ALUMINUM TECHNOLOGY INDUSTRY CO., LTD.

Subsidiaries:

- CHINA NONFERROUS METALS PROCESSING TECHNOLOGY CO., LTD.
- 9TH METALLURGICAL CONSTRUCTION CO., LTD.
- CHINALCO SHANDONG ENGINEERING TECHNOLOGY CO., LTD.

Branch Companies:

- CHALIECO SHENYANG BRANCH
- CHALIECO GUIYANG BRANCH
- CHALIECO CHANGSHA BRANCH
- CHALIECO LUOYANG BRANCH
- CHALIECO CHANGKAN BRANCH
- CHALIECO KUNMING BRANCH

Overseas and Hong Kong, Macao and Taiwan institutions:

- CHALIECO HONGKONG CO., LTD.
- CHINA ALUMINUM INTERNATIONAL ENGINEERING (INDIA) PTY. LTD.
- CHALIECO VENEZUELA BOLIVARIAN REPUBLIC CO., LTD.
- CHALIECO MALAYSIA CO., LTD.

CORPORATE GOVERNANCE

CHALIECO keeps strictly complying with relevant laws and regulations including *Company Law of the People's Republic of China*, *Securities Law of the People's Republic of China*, and the listing and trading rules of the HKEX and the Shanghai Stock Exchange, at the same time of continuously improving the management level and operating capabilities of the Group. In 2019, CHALIECO won the honor of “Best Listed Company in Corporate Governance” for the fifth consecutive year.

In 2019, CHALIECO held a total of 12 board meetings, 5 audit committee meetings, 1 meeting of the Remuneration Committee, 2 meetings of the Nomination Committee, 1 meeting of the Risk Management Committee, and 1 meeting of the Strategy Committee of the board of directors; 7 meetings of the board of supervisors; and 5 general meetings of shareholders. The Group maintained close contact with its shareholders, listened to their suggestions or opinions, and safeguarded the interests of shareholders and other stakeholders.

Compliance with Law

Compliance serves as the foundation and prerequisite for the long-term, healthy operation of enterprises. In our efforts to strictly abide by laws and regulations, we developed compliance measures including *Implementation Measures for Major Leaders of CHALIECO to Perform the First Responsible Persons' Duties to Promote the Rule of Law*, and *CHALIECO Measures for the Management of Legal Disputes*. We further implemented the principle of “adhering to the baseline for compliance while operating businesses”, and integrated supervisory resources from the sectors in relation to law, audit, internal control and regulation. By doing so, we gradually established a compliance management system that is led by the legal risk control department and participated by related enterprises, so as to fulfill the Group's general blueprint for compliance.

In 2019, the Group improved its compliance management and the ability to promote the rule of law in a number of ways, and reduced legal risks in the production and operation process. In the work on developing rules and regulations, the Group drafted and issued *Accountability Measures for Illegal Investment and Operations* to ensure that the decision-making content and procedures are in compliance with the law. In terms of internal audit, four related projects were completed in the year, and 67 management recommendations were proposed to the corresponding audit departments. In terms of the settlement of problems raised, we compiled internal problems of the company, and sorted out those at the headquarters and member companies' levels of the Group. In addition, we summarized cases of legal disputes, internal audit projects and violations in the past three years. The group also held various compliance trainings.

Case: Guiyang Institute actively held compliance trainings

The Guiyang Institute conducted legal compliance trainings as part of its active response to CHALIECO's “Rule of Law Publicity Month” activities. Guiyang Institute held two publicity and training sessions on *Tendering and Bidding Law* in late August 2019. During the trainings, legal professionals lectured about compliance issues and solutions that may be involved in the bidding process. These compliance trainings have enhanced relevant personnel's awareness on the rule of law and compliance management capabilities. The Institute conducted a total of eight legal compliance trainings in 2019, each of which was attended by 20-50 persons.

Risk Control and Management

CHALIECO has gradually consolidated its risk management and control system. we developed *CHALIECO Implementation Rules for Total Risk Management*, *Implementation Rules for the Total Management*, *Monitoring and Reporting of Risks*, *Measures for the Testing and Assessment of the Total Risk Management System*, *Measures for Risk Assessment and Management*, and other requirements. It established three lines of defense for total risk management through functional management departments, legal and risk control department, and risk management committee. By the end of December 2019, the Group and its member units found no significant risks and performed well in the risk prevention and control work.

In 2019, the Group strengthened its internal risk management from such perspectives as legal risk control and management, monitoring of risk management, training on rule of law and risk control, and building of the risk information system. It continuously improved risk prevention mechanism that stresses pre-risk prevention, ongoing control, and post-risk remedy. The Group: drafted a number of rules and regulations such as *CHALIECO Measures for the Management of External Lawyers*, to improve the construction of the legal risk control management system; required relevant departments to prepare total risk monitoring reports on a monthly basis, and made strengthened efforts in the implementation of total risk management; and held trainings to improve the legal awareness and risk control capabilities of employees. In addition, the Group promoted the use of internal control and risk information system, established a risk event database, monitored and assessed the in-process and post-risk response strategies; and based on past cases as lessons, improved the risk management capabilities and reduced the occurrence of risk events.

Case: Changsha Institute held special law training for risk prevention and control

On August 9, 2019, the Changsha Institute held a training session entitled “A Colorful Lecture Hall: Contracts and the Prevention and Control of Contract Risks”. By exemplifying the cases that occurred in the company, legal professionals lectured about the risks that the company may encounter during its production and operation, and in the processes of contract signing, execution, change, and termination. From a legal perspective, they explained how to safeguard our rights and interests when legal disputes arise and what effective measures shall be taken to mitigate various risks.



Law Training Held by Changsha Institute

Work on Party Style and Clean Governance

The group strictly observes relevant laws and regulations including *Anti-Unfair Competition Law of the People's Republic of China* and *Interim Provisions on the Prohibition of Commercial Bribery*. We developed *Responsibility System for the Work on Party Style and Clean Governance*, *Implementation Measures for the Clean and Honest Practice of Leaders*, *Regulations on the Clean and Honest Practice of Purchasing Personnel*. It continuously promoted the establishment of a system that deters, prohibits, and roots out the desire to have corrupt deeds, so as to provide a powerful guarantee for the Group's high-quality development through our high-quality performance in the work on the party style and clean governance. In 2019, the Group did not have any corruption lawsuits throughout the year.

In 2019, the Group's Party Committee earnestly performed its responsibility as the major body for leading the work on the Party style, clean governance and the anti-corruption progress. It also worked out *Opinions on the Advancement of the Party Style, Clean Governance and Anti-Corruption Work in 2019*. The Party Committee made inspection tours to follow up the correction of problems identified, and held such programs as the educational event entitled "Remain true to our original aspiration and keep our mission firmly in mind", in a bid to continuously promote the Party's strict self-governance in an in-depth and overall manner. It developed *Measures for the Management of Inspection Draft Reports*, and inspected four member companies, thus further strengthening employees' awareness on discipline and rules. The Group held publicity and education activities on the improvement of the party style and clean governance. The education and training led our staff to show respect to the objective laws and duly confine their behaviors, cultivated the personnel's good conduct and awareness, and improved the CPC carders' consciousness on honesty and self-discipline and their ability to resist corruption and degeneration.

Table: Major Measures for Building the Party Organization in 2019

-
- Conducting "Remain true to our original aspiration and keep our mission firmly in mind" theme education.
 - Organizing a themed seminar entitled "Strengthening the Party's Political Development and Advancing the Strict Administration of the Party in an All-Round Way".
 - Carrying out "branch is built on the project" and strengthening party building in the project department.
-

Table: Major Measures for Publicity and Education of the Party Style and Clean Governance in 2019

-
- While increased the stringent level of the accountability measures, the Group held a warning and education conference on the improvement of the party style and clean governance to sound alarms and call upon discipline by the illustration of past cases, so as to suspend high the "sword" for punishing corruption and exert a powerful deterring effect.
 - The Group established and improved rules and regulations, strengthened corresponding publicity and implementation, and used the set rules to effectively manage the key personnel, work and issues at the key periods.
 - In addition to the signing activity on the theme of "Party Style and Clean Governance" and the education on the theme of "Integral and Clean Work Practice", party members and cadres were organized to visit and study at the Museum of the War of the Chinese People's Resistance Against Japanese Aggression and the Lugou Bridge.
-

SOCIAL RESPONSIBILITY MANAGEMENT

CHALIECO continuously improves its ability to fulfill its social responsibilities, strengthens the building and implementation of the Group's internal social responsibility system, and promotes sustainable development together with its stakeholders by taking practical actions.

Social Responsibility Management System

We integrated social responsibility into our daily operations and management activities, so as to gradually standardize our social responsibility management system. We developed *CHALIECO Social Responsibility Management Modules and Negative List* and *CHALIECO Implementation Rules for Social Responsibility Work*, and established a social responsibility work leading group that is led by the company's party committee secretary and chairman, with the president as the executive deputy leader, the other members of the leadership and related executives as deputy leaders, and heads of departments as group members. The leading group is responsible for reporting to superior bodies on the progress of social responsibility work, and to subordinate units on CHALIECO's guidance on the social responsibility work, and it's also responsible for the overall planning of the company's social responsibility work. Within the leading group there is an office responsible for the daily social responsibility work, namely, for guiding the social responsibility work of CHALIECO's departments and subsidiaries.



Figure: CHALIECO's Social Responsibility Management Structure

Board Participation

The company's board of directors assumes the responsibility for social responsibility strategies and reports. It is responsible for assessing the company's social responsibility-related risks; regularly monitoring matters that may affect the company's business or operations, shareholders and other stakeholders; and developing corporate policies, strategies and goals for social responsibility management. The board of directors approves the corporate social responsibility report, the communication results of stakeholders and the judgments results of issues of major significance, to ensure the board's participation in the whole process of social responsibility governance and related information disclosure.

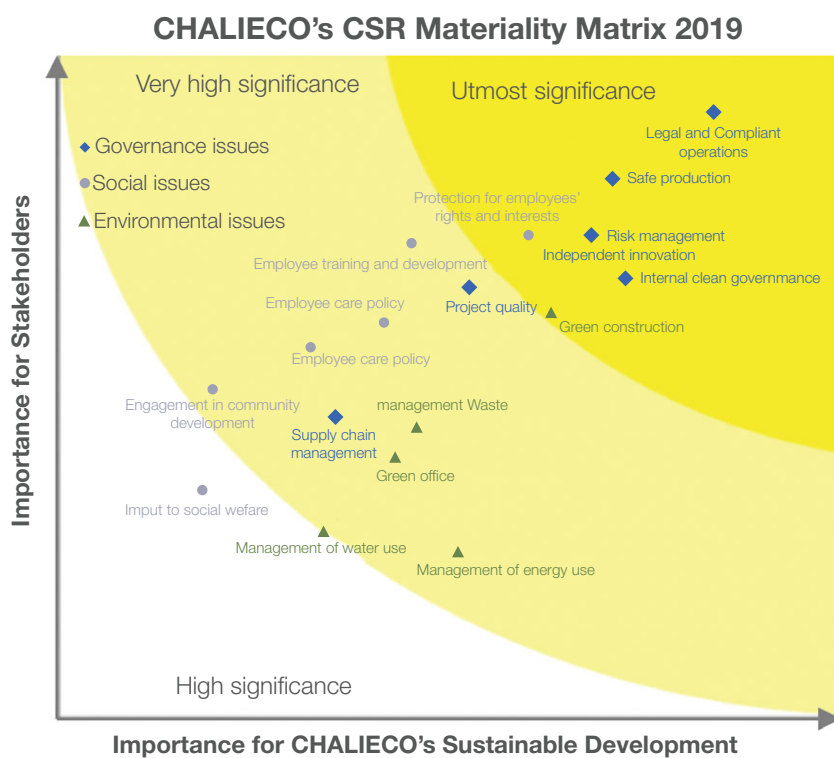
Stakeholders' Participation

CHALIECO attaches great importance to communication with stakeholders, and listens to the demands, opinions and suggestions of multiple stakeholders including the government, shareholders, clients and employees via different channels, and strives to create a convenient, effective communication and feedback mechanism, so as to promote its operation, management and healthy development.

Stakeholders	Expectations and Requirements	Communication and Response
Governments and regulators	<ul style="list-style-type: none"> – Implementing national policies, laws and regulations – Promoting local economic development – Advancing industry development 	<ul style="list-style-type: none"> – Submission of files – Suggestions and proposals – Special reports – Cooperation talks
Shareholders	<ul style="list-style-type: none"> – Return on income – Compliant operations – Safe production 	<ul style="list-style-type: none"> – Company announcements – Special reports – On-site visits
Clients and partners	<ul style="list-style-type: none"> – Contract performance in accordance with the law – Business integrity – Quality products and services 	<ul style="list-style-type: none"> – Business communication – Clients' feedback – Exchanges and seminars
Environment	<ul style="list-style-type: none"> – Compliant emissions – Energy conservation – Ecological protection 	<ul style="list-style-type: none"> – Work reports – Submission of reports – Investigation and inspection
Employees	<ul style="list-style-type: none"> – Protection of rights and interests – Occupational health – Salary and benefits – Career development 	<ul style="list-style-type: none"> – Employees' congress – Collective negotiation – Democratic communication platforms
Community and the public	<ul style="list-style-type: none"> – Improving the community environment – Participating in public-welfare understandings – Open and transparent information 	<ul style="list-style-type: none"> – Company website – Company announcements – Interviews and exchanges

Identifying Issues of Major Significance

CHALIECO observes the requirements of *Environmental, Social and Governance Reporting Guide in Appendix 27 of Listing Rules* of HKEX (ESG Guide). Based on the Guide and by way of various interactions and communications with stakeholders of all kinds, it conducted benchmarking analysis on the issues disclosed in the CSR report of industry peers, and identified its own CSR issues in 2019. In light of the evaluation of the social responsibility issues identified by stakeholders and company executives, we finally determined CHALIECO's CSR materiality matrix for 2019 as follows.



LEADING HIGH-SPEED DEVELOPMENT WITH CONCERTED EFFORTS

As the leading provider of technological, engineering services and equipment in China's non-ferrous metal industry, CHALIECO adheres to the quality principle of "carrying forward craftsmanship and implementing excellent projects". It takes quality and safety as pivots, reform and innovation as access to breakthroughs, and self-improvement as the key to growth, with a view to continuously improve modern construction capabilities and contribute to society with more quality projects.

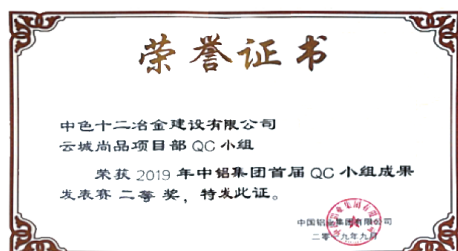
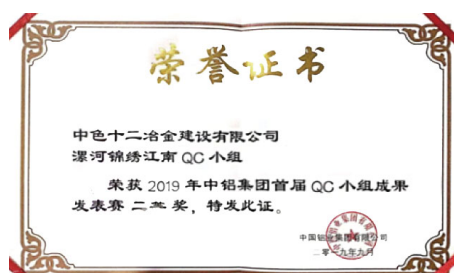
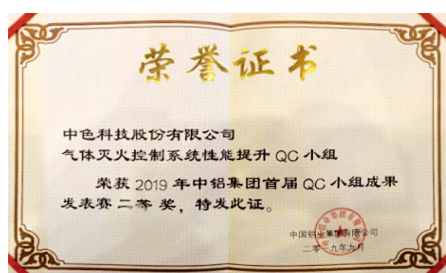
Implementing Quality Projects

CHALIECO complies with laws and regulations including *Product Quality Law of the People's Republic of China*, *Regulations on the Quality Management of Construction Projects*, and has developed *CHALIECO Quality Management Measures*, *Control Procedures for Design and Development Processes* and other systems to set control and management standards for the entire design and development processes of projects. It's unswervingly committed to the implementation of high-quality projects through precise project management and the implementation of responsibility systems at various levels.

In the quality-centered principle, the Group focused on promoting the "two systems" for projects in 2019, namely the project manager responsibility system and the project cost responsibility system. Through the unified project management model, project managers' responsibilities, rights and benefits were further defined, and their project-centered awareness strengthened to achieve precise management of projects. Moreover, the Group kept holding the Quality Month activities and organized various enterprises to carry out design (construction) quality inspections, with a total of 37 design projects and 41 construction projects inspected, and 2,040 problems identified for rectification.

Case: Comprehensively holding the Quality Month event and promoting development by enhanced management

In September 2019, CHALIECO launched the Quality Month event during which enterprises were organized to participate in quizzes on comprehensive quality management, as an attempt to strengthen publicity of quality. It also conducted quality education and training to heighten employees' awareness on quality, and organized inspections and self-examinations to correct problems. The Quality Month event helped all units fully identify opportunities for quality improvement and achieve tangible results. Five achievements from the Group's member companies participated in the CHINALCO's first contest for QC group results, with four second prizes and one excellent prize obtained.



A number of achievements were awarded with honorary certificates by CHINALCO

In 2019, the Group held internal benchmarking activities to strengthen the project management process, in addition to external accreditations for excellent performance, with an aim to consolidate project implementation results. The internal benchmarking activities for excellent performance encouraged all units to improve project compliance and control of construction quality, thereby continuously improving the level of project management. In the external accreditations for excellent performance, the Group won three Luban Awards for Chinese Construction Engineering, seven national quality engineering awards, 18 provincial and ministerial quality engineering awards, and 47 design and survey awards. In August, the Group was listed again on the Top 250 Global Contractors (ranked the 74th, up by 13 as against the previous year) and International Top 250 Contractors for 2019 (ranked the 209th) by the US *Engineering News Record* (ENR) Magazine.

Case: Baiyinhua Project, a benchmark project, leads the improvement of project management

In 2019, the Baiyinhua Project became a benchmark project of the Group. In the preliminary stage of the project, the team optimized the construction process and structure; in the initial stage, the grassland surface humus was granted special protection; and during the project construction period, the team strictly implemented CHINALCO's precise management concepts for occupational health, safety and environmental protection (CAHSE). They insistently paid close attention to project safety management, and carried out construction in a safe and scientific manner in accordance with high standards and strict requirements.



As the first industrial benchmark project outside the CHALIECO system, the Baiyinhua Project refreshed the image of the Group's project management and played a good exemplary role. On September 6, 2019, the Group held the CHALIECO Benchmark Project On-site Exchange Meeting 2019 at the Baiyinhua Project site, and summarized the results of the meeting as "Nine Advanced Experiences and Three Improvement Measures", which continue to lead the capacity building for project management.

Case: CHALIECO demonstrated its first-class product quality by winning the Luban Award three times a year

During the reporting period, three projects of CHALIECO won the Luban Awards for Chinese Construction Engineering, reaching a record high. The Luban Award is the highest honor in China's construction industry for quality recognition. The Group's winning of three Luban Awards in one year represents an significant achievement in the implementation of benchmark projects and a high-level recognition of the quality and social benefits for CHALIECO's projects.

- The 650kt/a alumina project in Renji, Vietnam co-constructed by the company and the Sixth and the Twelfth Metallurgical Construction Co., Ltd.;



- The floatation works of the Phase I Mining and Dressing Project of the Pulang Copper Mine undertaken by the Sixth Metallurgical Construction Co., Ltd. ("Sixth Metallurgical Construction");



- The Headquarters Construction Project for West Yunnan University of Applied Sciences undertaken by the Kunming Institute of CHALIECO.



At the Awarding Ceremony for CHALIECO "The Luban Award" Certificate



"The Luban Award" Certificate

Leading Technological Innovation

CHALIECO always takes technological innovation as the core for driving high-quality development. The Group focuses on the transformation of technological innovation achievements, and continuously optimizes the allocation of resources, strengthens the building of key research project teams and personnel training. Supported by a team of high-quality professionals and technical staff, as well as by the optimized research incentive mechanism, it keeps accelerating the industrial transformation of research results.

– Development of Innovative Capacity

The Group encourages the development of R&D capacity and personnel training, and has formulated *CHALIECO Regulations for Scientific Research Management and CHALIECO Management Rules for Scientific Research Funds* to ensure research investment. It promoted *Measures for Rewarding Technological Innovations* in 2019, as an attempt to encourage all units to motivate R&D personnel, encourage innovation by the use of related technological incentive policies, special rewards, etc. In 2019, its research and development investment amounted to RMB861.0118 million.

In order to better attract and retain talents, and promote the exchange and application of research results, the Group strives to create a research and innovation platforms. Through the demonstrating and leading roles of the platforms, the Group aims to introduce a group of talents, bring a group of technologies and lead a group of industries. In 2019, the Group's research platforms continued to increase. As of the end of the reporting period, the number of national innovation platforms of the Group rose to six, and that of provincial ones increased to 15. The company has a total of 14 high-tech enterprises.

To effectively guarantee the Group's research and innovation results, CHALIECO developed *CHALIECO Patent Management Measures* to regulate patent and IPR protection. In 2019, the company applied for 313 domestic patents, obtained 176 domestic patents and 9 international patents, and implemented 44 innovative projects.

During the reporting period, four of the Group's achievements won the first and second prizes for technological progress in Guizhou Province, Shanxi Province, Hunan Province and Liaoning Province, and one achievement won the 21st China Excellent Patent Award, eight achievements won the first, second, and third technological prizes of China Nonferrous Metals Industry Association (3, 3 and 2 prizes, respectively), and two achievements won the second prizes of the Engineering Construction Technology Award of the industry association. In addition, 11 important technical achievements of the company were assessed by the industry association as at the international leading and advanced level.

Table: Some Technological Awards of CHALIECO in 2019

First Prize for the Scientific and Technological Award of the China Nonferrous Metals Industry Association	Research and application of automatically-converted ventilation technology for complicated and uncontrollable ventilation networks
First Prize for the Scientific and Technological Award of the China Nonferrous Metals Industry Association	Research on key technologies and equipment for the collaborative smelting and comprehensive recovery of lead-antimony-silver polymetallic materials
First Prize for the Scientific and Technological Award of the China Nonferrous Metals Industry Association	R&D and industrialization of the complete equipment for lead electrolytic production with large-plate cathodes

Case: Changsha Institute takes the lead in undertaking research projects of the Ministry of Science and Technology

In November 2019, the Ministry of Science and Technology announced a list of key special projects for intergovernmental and international technological innovation and cooperation, as part of the national key R&D plan for 2018, in which the “Technological Research Project on Pressurized Leaching Copper Smelting of Copper Sulphide Concentrate and its Comprehensive Utilization” submitted by the Changsha Institute was approved for its project establishment.

This project is a major research project jointly carried out by the Changsha Institute with Mongolia, the Chinese Academy of Sciences and Zhongjin Lingnan Non-ferrous Metal Company Limited. It completed a pilot study in Ulaanbaatar in 2019 and achieved major breakthroughs by innovatively developing the technology for the two-phase oxygen pressure leaching, acid reduction and iron content control for copper sulfide concentrate. The technology is of great promotional value in areas where sulfuric acid is unsaleable and difficult to transport and where with harsh environmental conditions. Till now, the project has applied for one PCT international patent, which will provide strong technical support for the construction of copper smelters in Mongolia.

– **Application of Technological Achievements**

Driven by the industry-leading technology, CHALIECO conducts technical research in major areas of the non-ferrous metal industry such as large-scale transformation of equipment and comprehensive utilization of resources. It engages in the R&D of leading-edge and innovative technologies, promotes the transformation of technological achievements, and leverages technological innovation as an important driving force for high-quality development.

In 2019, a list of important achievements stood out:

- The “500kA, 600kA high-efficiency ultra-large aluminum electrolytic cell technology” developed by the Shenyang Institute was applied to aluminum electrolysis projects at home and abroad;
- The “New technology series for safe and uninterrupted production and maintenance of aluminum electrolysis” pioneered by the Guiyang Institute solved the technical difficulties of the industry and was exported to India and other countries;
- The “Technological Research Project on Pressurized Leaching Copper Smelting of Copper Sulphide Concentrate and its Comprehensive Utilization” developed by the Changsha Institute made a major breakthrough in Mongolia and was successfully included in the list of international cooperation projects of the key R&D plan of the Ministry of Science and Technology;
- The new two-component red mud sintering technology with the Bayer Process led by the Technology Company was promoted and applied within CHINALCO.

In addition, the Group completed the acceptance of the technical achievements from 20 key research projects of the company during the year, held six experts’ review meetings, and invited experts from well-known domestic universities, research institutions and production enterprises to strictly evaluate and provide detailed guidance on the project results. Of the achievements, seven will see the release of technological evaluation results in the coming year. These results carry great practical significance and market value, and will promote the in-depth integration of technology and production.

For the purpose of shaping a new pattern of high-quality development, the Group targets at the right direction for technological development and market demand, and broadens the application fields for digital, intelligent and environmentally friendly technologies. In 2019, the Group's work on building an R&D application and platform for the digital 3D technology made new progress. Its thermal power design, 3D terrain design, comprehensive pipe gallery design, digital delivery, digital twins and other 3D achievements have been successfully tested and applied to projects in Guinea, Raman, Chifeng and other regions.

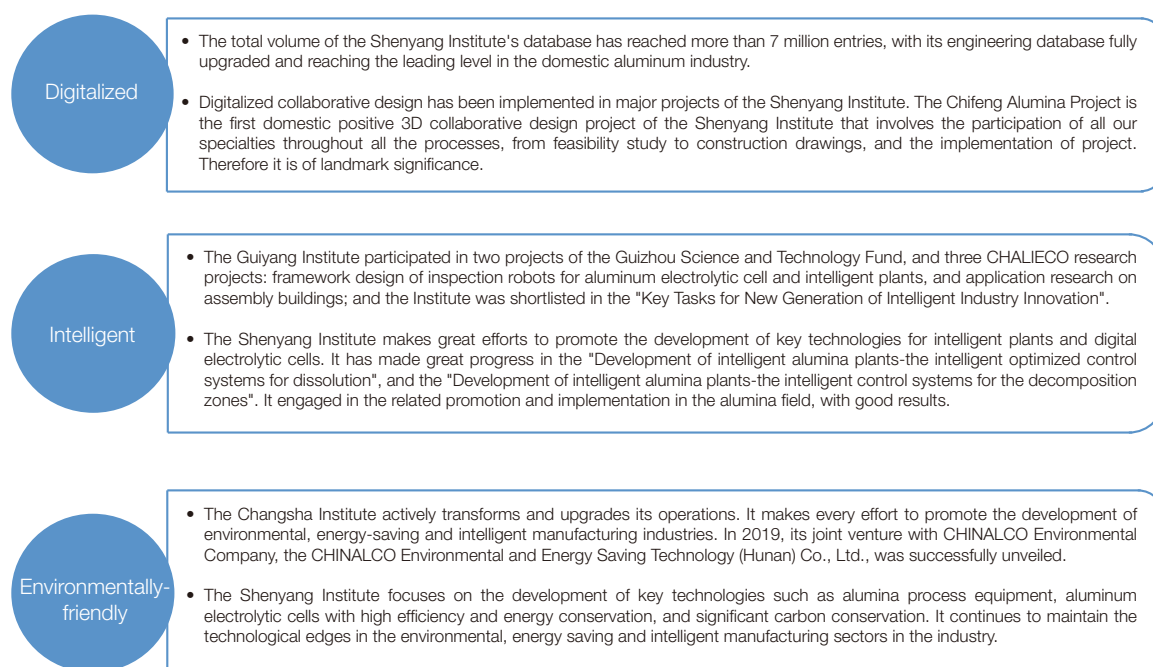


Figure: Application Results of CHALIECO's Digitalized, Intelligent and Environmentally-Friendly Technology

Ensuring Safe Production

For engineering technological enterprise, safety is the utmost priority and an important guarantee for sustainable development. CHALIECO firmly shoulders the responsibility for safe production, consistently advances with the times in terms of safety concepts, continuously upgrades its operations, strengthens the development of systems, and sticks to detail-oriented safety management to achieve "zero work fatalities" in 2019.

– Safety Management System

The Group strictly abides by *Work Safety Law of the People's Republic of China* and *Occupational Diseases Prevention Law of the People's Republic of China*, pays attention to systematic and refined safety management, and effectively promotes the building of a tiered system that comprises the quality, environment, and occupational health and safety (QHSE) system, the CAHSE system, and the classified risk management and control system. In 2019, CHALIECO revised and perfected the QHSE system documents in accordance with the requirements of the new version of ISO45001: 2018, and promoted the in-depth integration of businesses and systems. It incorporated the Changsha Institute and the Changsha Survey and Design Institute (CSDI) into the system development work and successfully passed external audits by third-parties. Through the establishment, operation and continuous optimization of the three-tiered system, the safety management at all levels has been further improved and become more systematic, standard and refined. Thus it laid an important management foundation for the continued improvement of safety management performance.

In 2019, in line with the work idea of implementing safety production in detail, the company signed responsibility contracts for safety and environmental production with heads of its member companies and departments. Taking “grass-roots, foundation, and skills” as the underlying pivots, it realized thorough coverage of the “One Post with Dual Duties” system throughout the Group. By doing so, the responsibilities and goals for safety and environmental management at all levels were clarified, and all employees’ safety and environmental responsibilities were effectively consolidated. In addition, the Group issued *Incentive Measures of China Aluminum International Engineering Corporation Limited for Safety Management* in 2019, to reward units and individuals who have made significant achievements and special contributions in the safety work. This move further improved the company’s incentive mechanism and fully mobilized the initiative for enterprise safety management.

Case: Training of QHSE internal auditors and CAHSE auditors

From April to May 2019, the Group held the training of QHSE internal auditors and CAHSE auditors. Nearly 100 staff participated in the QHSE training and examinations. The training covered analysis of the ISO45001: 2018 standard, ways for hazard source identification, risk assessment principles and methods, and interpretation of the related frameworks and terms, etc. 106 persons participated in the training of CAHSE auditors and received examinations for the certification. In this regard, the training included construction safety technology, analysis of audit points, methods and skills of CHINALCO’s CAHSE management system. The training effectively strengthened the internal auditors’ understanding and mastery of the related standards, improved their internal audit skills, and laid a talent base for the high-quality operation of the company’s QHSE and CAHSE systems.

– Construction of Safe Sites

The grass-roots level is the first and primary field of safety management, and the front line is the forefront of safety production. Persistent effort in on-site management is the basis for ensuring safety production. The Group required each project department to strictly implement “*Eight Prohibitions*” Regulation for Construction Projects, “*Ten Prohibitions*” for Ensuring Work Safety, “*Seven Musts*” for Work Safety and other requirements, so as to effectively clarify the safety technology, implement the safety work with strong attention to details, and make safety-centered culture an enforceable culture.

In 2019, the Group stuck to the approach of convening regular safe production meetings to summarize and deploy the production and safety performance of member companies every month. Taking project sites as the focus of inspection, it held various safety inspections and random checks throughout the year. It launched a number of activities, such as the selection of “Outstanding Security Guards” and special improvements of production equipment, thus consolidating the foundation of safety management. It also encouraged the construction of physical experience halls for safe production to make safety education more practical and effective.

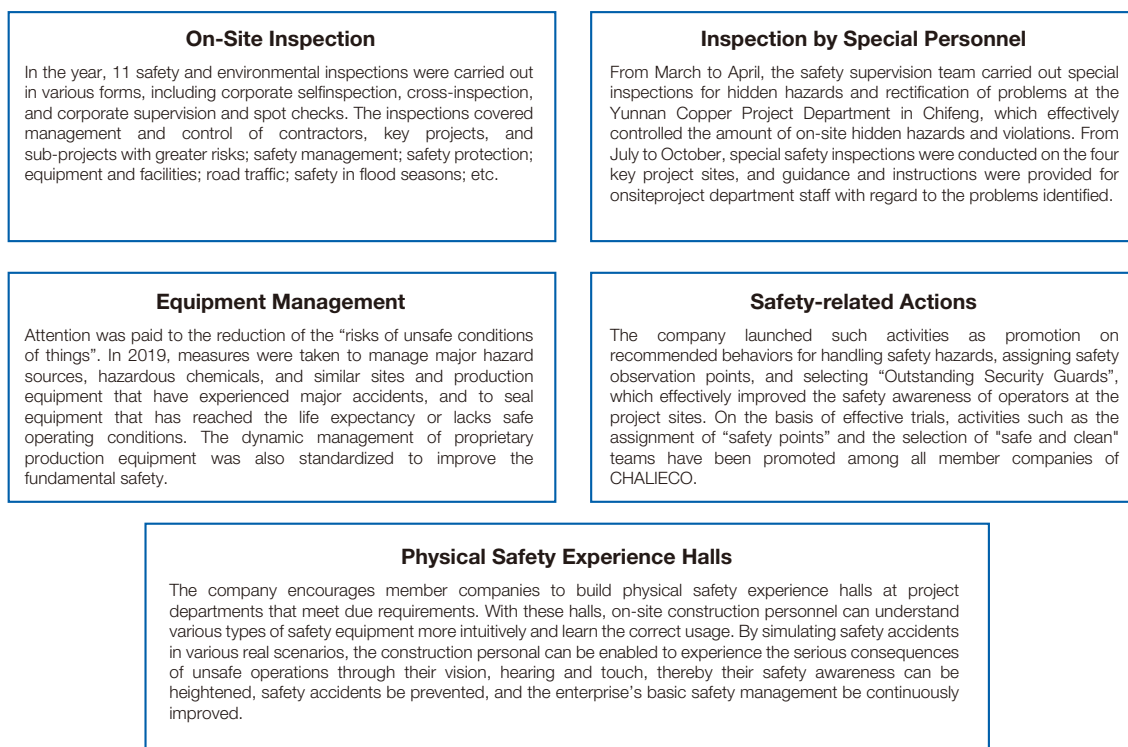


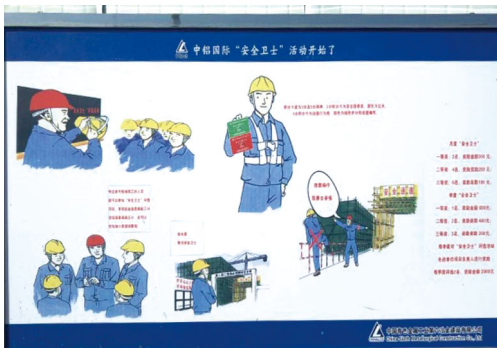
Figure: Main Measures for On-Site Safety Management



Physical Safety Experience Halls

Case: Safety rewards and positive incentives to promote the joint building of a safety-centered culture

In 2019, the Group took the Baiyinhua Project as a pilot to promote such activities as promotion on recommended behaviors for handling safety hazards, assigning safety observation points, and selection of “Outstanding Security Guards”. With the issuance of “Behavioral Safety Prize Cards” and the selection of “Outstanding Security Guards”, both material and spiritual rewards were granted to front-line operators at the production site who have put forward reasonable suggestions. During the event, the project department issued 1,393 “Behavioral Safety Prize Cards”, redeemed RMB7,469 of bonus, selected 36 monthly and quarterly outstanding individuals, and granted RMB6,400 of prize. The activities effectively improved the safety awareness of front-line operators, standardized their safety behaviors, and promoted the healthy development of grassroots safety conditions.



Selection of “Outstanding Security Guards” at the Baiyinhua Project

Case: The “Safe and Clean” Group Competition: The Renovation Project for Shanty Dormitory Facilities

In 2019, the Changsha Institute organized staff of CHALIECO South Engineering Co., Ltd. to launch a “Safe and Clean” Group Competition in the shanty dormitory area at the Shanlv Site. By improving the safety management of the project department, the Institute clarified the key tasks of safety management and improved the effectiveness of safety work.

During the event, the project department seamlessly integrated the establishment standards with the original management system, and formed a project department management system that focuses on building “safe and clean” teams. It made overall planning, and effectively managed the positioning on the construction site, to ensure an overall “safe and clean” image; strengthened the investigation and management of hidden hazards to ensure “safe and clean” details; and took such measures as increasing incentives, building up the capabilities of hardware for protecting essential safety, conducting 5S management, and holding assessment on a daily basis, so as to ensure that the project is “safe and clean”.



The Shanty Dormitory Facilities at the Shanlv Site after Renovation

– Protecting Occupational Health

The Group attaches great importance to the occupational health and safety of employees, and has developed *Measures for Occupational Health, Safety and Environmental Management and Requirements and Use Guide for the Occupational Health and Safety Management System*. It organizes regular physical examinations for employees every year, maintains occupational health files for them, and ensures the provision of appropriate labor protective equipment. The Group pays attention to the units and personnel that closely relate to occupational health and safety performance, such as subcontractors of engineering construction and design, and property companies responsible for office areas, etc. It continuously improves the health and safety conditions of employees and other personnel who enter the workplace, so as to improve the overall occupational health and safety performance.

In accordance with the QHSE management system and rules, the Production Safety Management Department coordinates, inspects and supervises the occupational health and safety of employees. The corresponding departments, branches and project departments of the Group implement related work on the occupational health and safety of their personnel, while the workers' union fully listens to employees' opinions and is committed to continuously improving the work environment, eliminating sources of danger and reducing risks. In 2019, the Group developed *CHALIECO Standards for the Evaluation of Precise Occupational Health, Safety and Environmental Management System*. It then implemented safety performance evaluation that covers the monitoring, review and assessment of safety performance, and promoted personnel at all levels to perform their duties.

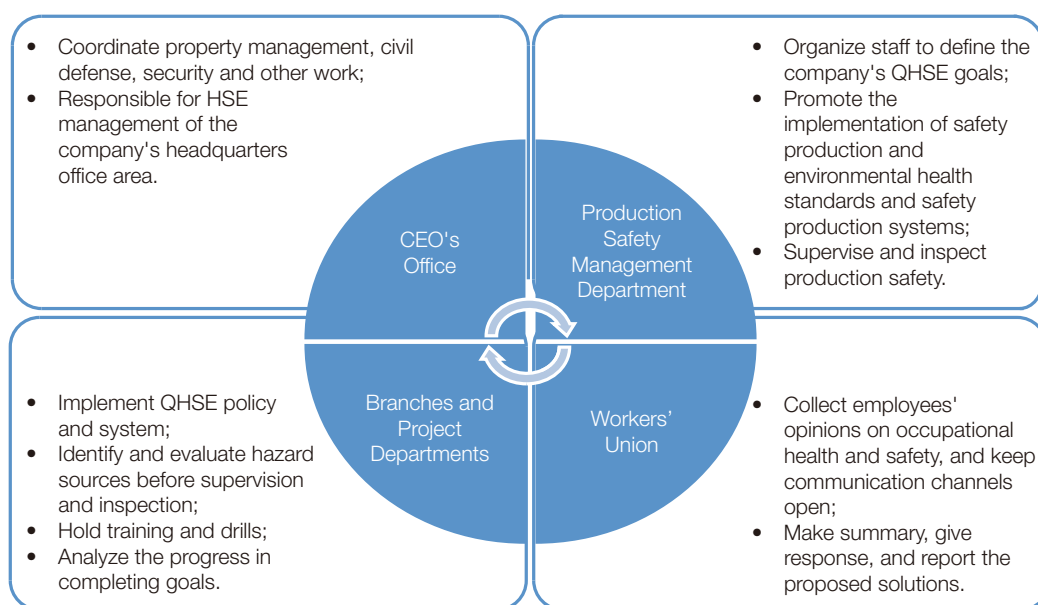


Figure: Structure and Responsibilities for Occupational Health and Safety Management

– Fostering a Safety-Centered Culture

A safety-centered culture is the intellectual outcome of the company and employees over their long-term production. In order to build a safety-centered culture that is commonly recognized, CHALIECO has carried out a series of activities in various forms, with rich contents and highlights. In combination with the annual “Safe Production Month” event, it holds special training, education on warning cases, emergency drills, and cultural publicity to mobilize employees’ active participation in safety management, and foster safety awareness. In 2019, the Group’s total safety training hours reached 291,570 hours, with a training coverage rate of 96%; 349 safety drills were conducted, covering 15,802 person-times.

In 2019, for the purpose of improving the effectiveness of safety education and training, the Sixth Metallurgical Construction took the lead in setting up an online training platform and an online training school. It successively provided courses such as “Safety Management for All Employees”, “Responsibilities of Safety and Environmental Departments”, “Classified Management of Safety Risks”. Besides, it collected and summarized excellent training courseware, recorded lecture videos and broadcast them via the online training platform. The move has not only solved the problem for holding centralized training for scattered construction workers, but also greatly enriched training and teaching resources.

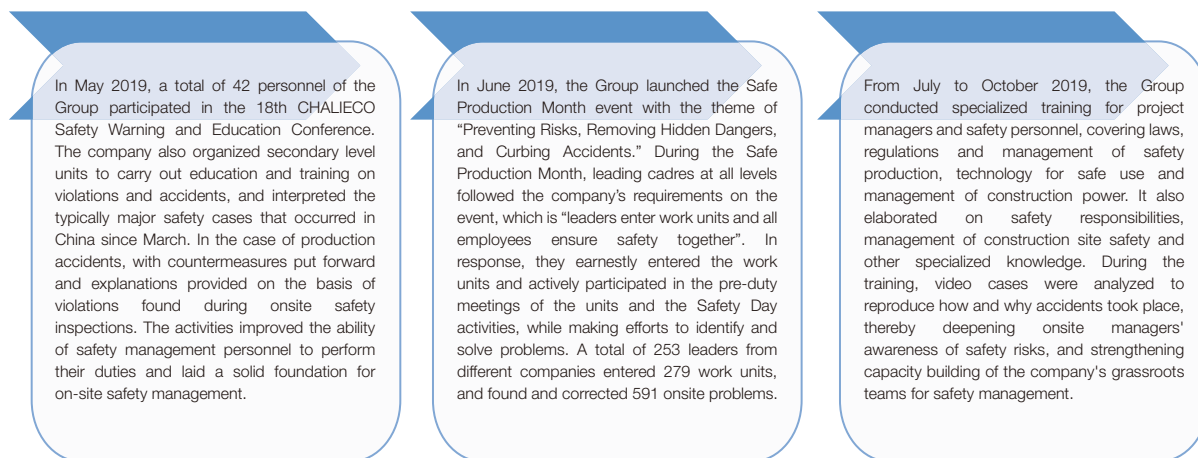


Figure: Major Activities on the Safety-Centered Culture and Education in 2019

Case: CAHSE Knowledge Competition

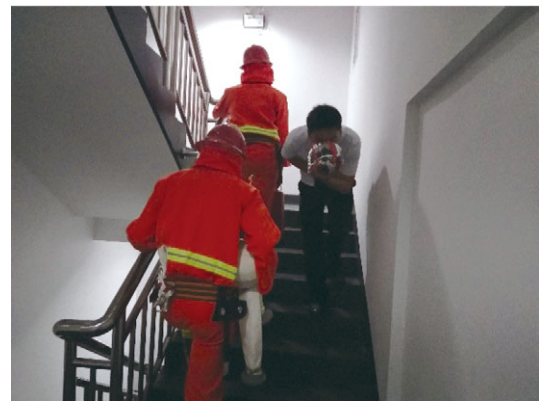
During the Safe Production Month of 2019, China Nonferrous Metals Processing Technology Co., Ltd. (CNMPT) held a CAHSE knowledge competition. The event was staged in two parts, the preliminaries and the finals. The company carefully prepared the test questions' bank while the secondary-level units organized all personnel to engage in continuous learning and take part in the preliminary selection. Finally, six representative teams entered the finals and competed fiercely. This activity effectively enhanced employees' awareness of safety and environmental protection, promoted the related knowledge, and laid a foundation for further advancement of the CAHSE system.



CNMPT held a knowledge competition and awarded employees

Case: Changsha Survey and Design Institute held fire drill in 2019

In June 2019, the Changsha Survey and Design Institute (CSDI) launched a fire drill to educate employees on fire prevention and fire entrapment avoidance. At the drill site, each team clearly defined their own functions, and employees evacuated in an orderly manner. Without any disorder in the face of danger of fire, they handled the emergency properly. The fire drill helped employees better understand the fire handling process, improved their coordination in emergencies, and enhanced their resilience and self-rescue capabilities.



CSDI held a fire drill

Adhering to Responsible Procurement

CHALIECO believes that sincere cooperation with selected, high-quality suppliers helps build a good, integral business environment. The Group strictly implements a series of supplier management provisions, including *Regulations for the Management of Qualified Suppliers*, *CHALIECO Measures for the Management of Suppliers*, and revised *Measures of China Aluminum International Engineering Corporation Limited for the Management of Engineering Construction Subcontractors* in 2019. Based on the principles of “strict access, selected employment, standardized choice of partners, and dynamic management” and other criteria, it has regulated the entire life cycle management system for the access, evaluation and withdrawal of subcontractors.

The Group continuously improves the management system for subcontractors and implements the “seven-step method” and “five musts” principle for the safety management of subcontractors. It strengthens the process-based supervision of subcontractors to prevent construction risks, and adopts daily management, on-site inspection and regular evaluation to strictly manage subcontractors and improve the management and control level of construction projects.

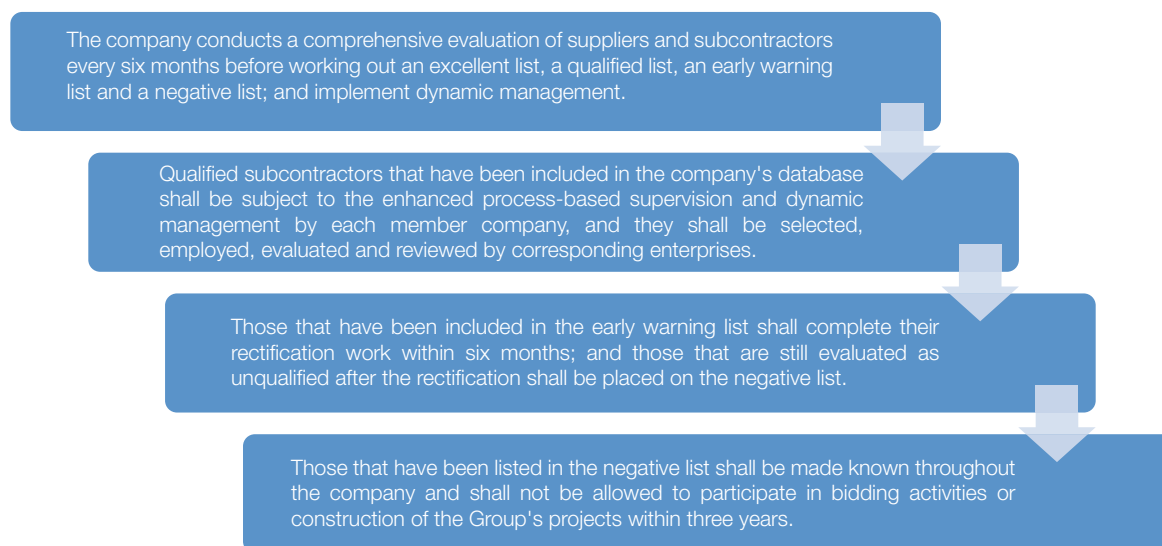


Figure: Dynamic Evaluation and Management of Suppliers

The Group practices the concept of responsible procurement and promotes the sustainable development of the industrial supply chain. During the period for the access of subcontractors, the Group requires subcontractors to provide QHSE certifications and give priority to those that use environmental and energy saving products. During the production and construction process, the Group strictly inspects whether the subcontractors conduct construction in a safe and scientific manner, and regularly conducts evaluations. Subcontractors who perform poorly in the environmental protection and do not make serious rectification, or who have suffered emergent environmental incidents will be dismissed and blacklisted.

Information on the Group's suppliers in 2019 is as follows:

Number of engineering subcontractors	1,405
Number of material suppliers	3,331
Number of service providers	196

In 2019, the Group strengthened the internal control and management of the bidding work to prevent the appearance of "bids won before due approval". Based on the suppliers' negative list, a "firewall" was established on the electronic bidding platform to separate suppliers in the negative list from the system within the required time limit. The Group established two teams to carry out key inspections on the bidding of member enterprises. In 2019, the Group's tendering company held seven rounds of various trainings, covering national laws and regulations related to bidding and tendering, CHALIECO's rules and regulations on bidding and tendering, and specialized knowledge for bid appraisers and bidders. The total training duration reached 88 hours, totaling the volume of 820 person-times.

Case: A high-quality electronic bidding platform was completed with a triple-star certification successfully achieved

Starting from January 2019, all bidding procedures for the Group's construction projects have been put under uniform management by the use of an electronic bidding platform. The platform has the full-process functions including the release of bidding announcements, online clarification, online bidding, online bid opening, online bid evaluation, electronic filing, administrative supervision, and statistical analysis. It has realized electronic operations for the entire bidding process.

In September 2019, the company's electronic bidding platform successfully passed the national electronic certification and obtained a triple-star certificate issued by a national authority. That indicates the company's electronic bidding platform has reached the highest level recognized by the country in terms of its system construction, business functions, platform operations and technical security. The platform will provide reliable technical and security support for the Group's development in the fields of electronic bidding and procurement, and offer more secure, high-quality and efficient services to the majority of business partners.

LOW-CARBON ENVIRONMENTAL PRACTICES ADVANCE ECOLOGICAL DEVELOPMENT

Ecological development is an important strategy in the country's "Thirteenth Five-Year Plan". Over years, CHALIECO has always adhered to "ecological-prioritized and green development" and actively fulfilled its social responsibility. The Group aimed at improving the ecological quality, actively responded to climate change, strived to implement low-carbon energy conservation, strengthened waste management, vigorously promoted green environmental technologies, and engaged in green operations. The Group token effective actions to highlight its corporate responsibility and contributed to the construction of a beautiful China and to ecological development.

Responding to Climate Change

Global climate change has caused widespread attention, and the subsequent extreme weather events have brought many challenges to energy development, the ecological environment and other aspects. In response to climate change, the Chinese government has set the emission reduction goal by 2030, and planned to reduce carbon dioxide emissions per unit of GDP by 60 –65% as against 2005. Based on its own realities, CHALIECO always adhered to the management concept of green development, responded to national environmental policies and the energy development program in the "13th Five-Year Plan", token effective actions to optimize the use of resources and energy, and strived to reduce carbon emissions in the project construction and daily operation process.

– Energy Conservation and Emission Reduction

CHALIECO's greenhouse gas emissions mainly stemmed from project construction and daily operations, as a result of the use of energy like coal, gasoline, diesel, electricity and natural gas by machines, heating facilities, canteens and official cars. In order to reduce resource and energy consumption, CHALIECO has developed internal policies such as *Regulations on Water Management at Sites of Construction Projects* on the basis of strictly abiding by *Energy Conservation Law of the People's Republic of China*. With established goals for saving energy, land, water and materials, it made every effort to improve the efficiency of resource use and reduce the company's impact on the environment and resources by a number of means including the optimization of project design, management of project construction, and strengthened supervision over daily operations. In 2019, the Group's carbon dioxide emission equivalent was 54,613.74 tons, and the carbon dioxide emission per RMB10,000 of operating income was 0.0176 tons.

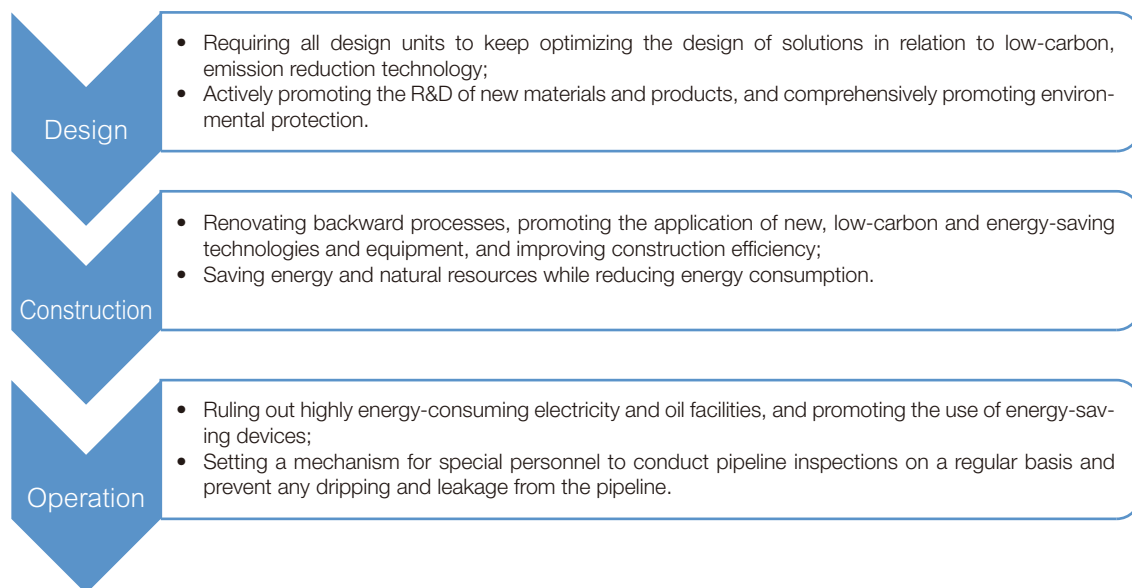


Figure: CHALIECO's Energy Conservation and Emission Reduction in the Whole Process from Project Design, Construction to Operation

In order to strengthen the statistics-based management of consumption of various energy forms and resources during project construction, CHALIECO required member companies to report the consumed volumes of various energy forms and resources on a monthly basis. It also organize enterprises to learn and use the online reporting system to improve efficiency and accuracy of data collection. In addition, CHALIECO encouraged project companies to use clean and sustainable energy such as solar energy, and to make secondary use of water resources to improve energy efficiency. In 2019, the Group made clear its water resources management measures. It required to install rainwater collection systems at construction sites to use rainwater and reclaimed water instead of fresh water for irrigating vegetation, flushing workshops, and cleaning vehicles. Moreover, the Group advocated the use of water-saving equipment and facilities and called upon regularly inspecting and maintaining the water supply system, recycling production water and reducing water consumption, so as to effectively improve water efficiency. In 2019, the total water consumption of CHALIECO* was 679,394.0 tons, and the water consumption per RMB10,000 of revenue was 0.2187 tons.

* In 2019, CHALIECO re-examined and standardized the data statistics of water consumption and wastewater discharge, and launched an online reporting system.

In daily operations, CHALIECO also fully implements the “green office” principle. The Group has strengthened the upgrading of the office system, given full play to the advantages related to office automation and informatization, vigorously promoted paperless office, and required employees to make the best use of consumables, reuse waste paper and avoid waste of resources. It has adopted energy-saving lighting fixtures in office buildings, reduced the intensity of air conditioning, and encouraged employees to commute on LNG or electric buses to effectively reduce energy and resource consumption in the office. In addition, the Group has strengthened the management and control of official vehicles, maintained account books for official vehicles, and regularly inspected the vehicles to avoid oil leakage and reduce energy consumption.

Table: CHALIECO’s Resource Consumption from 2018 to 2019

Indicator	Unit	2018	2019
Total power consumption	degrees	36,471,384.9	44,477,685.8
Natural gas usage	cubic meters	1,915,934.7	1,242,626.7
Fuel consumption	liters	3,325,120.4	3,581,559.9
Comprehensive energy consumption	tons of standard coal	10,589.6	11,384.4
Comprehensive energy consumption per RMB10,000 of revenue	tons of standard coal/ RMB10,000	0.00315	0.00367

– Green Advocacy

CHALIECO actively engaged in publicity on green and environmental concepts, and posted slogans on water-, power-, and energy-saving and waste reducing practices in the office to help employees establish a green and environmental awareness. By advocating all employees to turn to green operations, the Group is making efforts to facilitate ecological development. Moreover, the Group also carried out environmental public-welfare activities and promoted the ecological and environmental concept via the WeChat public account and other media channels. It aimed to enhance the public’s environmental awareness, create a sound environment for energy conservation and emission reduction, and to realize the green development of enterprises.

Case: CHALIECO launched the “June 5th Environment Day” event to promote the concept of green and environmental development

On June 5, 2019, member companies of CHALIECO held activities of publicity, interactions and quizzes with the theme of “To defend the blue sky, I am taking actions”, and with that, 16 outstanding photographs, calligraphy and paintings were received. On the Environment Day, various enterprises interacted with communities, and held garbage pick-up activities at communities and publicity activities themed on the ecology and environment-related hot issues that employees and the public care about. These actions demonstrated the company’s concept on green development, and increased public support for the company’s ecological and environmental work.



A Promotional Slogan



A Race Event

Case: The Uniform Branch of the Sixth Metallurgical Construction organized volunteers to conduct a tree planting activity entitled “Reduce haze and start from me”

On the 41st Arbor Day, the Uniform Branch of the Sixth Metallurgical Construction organized volunteers to the residential area at the High Water Level Reservoir in Shangjie District, Zhengzhou City, and carried out a tree planting activity entitled “Reduce haze and start from me”. At the event site, volunteers made concerted efforts in planting and watering saplings which added vibrant green to roads around the community. This tree planting activity further enhanced employees’ green and environmental awareness.



A Tree Planting Activity

Reducing Impact on the Environment

CHALIECO strictly abides by *Environmental Protection Law of the People’s Republic of China*, *Law of the People’s Republic of China on the Prevention and Control of Atmospheric Pollution*, *Law of the People’s Republic of China on the Prevention of Water Pollution*, *Law of the People’s Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes*, *Law of the People’s Republic of China on the Prevention of Environmental Noise Pollution* and other laws and regulations. It has developed *QHSE Procedures*, *Manual for the QHSE Management System* and other institutional documents to continuously strengthen environmental management. In 2019, the Group actively adopted various measures to strictly standardize waste management in project construction and daily operations, minimize the impact on the ecological environment, and to promote green operations.

– Waste Management

In accordance with relevant laws and regulations, CHALIECO has developed such internal rules as *Provisions for the Management of Dust and Poisons in Engineering Projects*, *Provisions for Project Environmental Management*, *Provisions for the Management of Solid Wastes of Projects*, with a view to regulate ways for waste treatment, improve waste management, and to create a safe, green and clean public environment. In 2019, the amount of waste water discharge of CHALIECO was 177,581.0 tons, and the amount of waste water discharge per RMB10,000 of revenue was 0.0572 tons.

In order to prevent the willful disposal of wastes, CHALIECO has implemented a series of strict management measures, requiring all corporate projects to strictly implement national and local government standards, treat both non-hazardous and hazardous waste in accordance with relevant regulations, and to reduce the impact on and destruction to the ecological environment. In 2019, no sudden environmental incident took place at CHALIECO.

Table: CHALIECO's Waste Management Measures

Harmless waste management	– Collecting kitchen wastes and other wastes separately, and uniformly handing them over to the municipal government organs for treatment.
	– Providing necessary facilities at the construction site for the collection of waste earth, stones, steel bars, concrete, and the like, so that the site can be “cleaned up as soon as the work is completed”.
	– Sorting out and store various construction wastes collected from the project site in the designated place and handing them over to a qualified unit for treatment.
Hazardous waste management	– Sorting out and store the hazardous wastes produced, and strengthening the fire prevention work in the storage place.
	– Strictly prohibiting any backfill of any toxic and hazardous waste produced during construction.
	– After uniform collection, handing over the wastes to a qualified third-party unit for treatment, and preventing potential harm to the environment from the hazardous wastes.

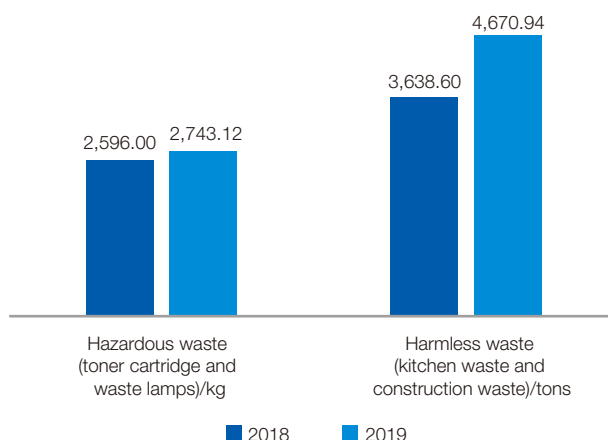


Figure: Solid Waste produced by CHALIECO from 2018 to 2019

– Green Construction

CHALIECO advocates the green concept of “harmonious coexistence with nature” and actively implements the green and environmental requirements during the project construction process. The Group taken the “Six 100%” (see the following chart) as a criterion to minimize atmospheric and noise pollution, to treat wastewater generated in a compliant manner, and to reduce the impact of project construction on the ecological environment and surrounding residents.

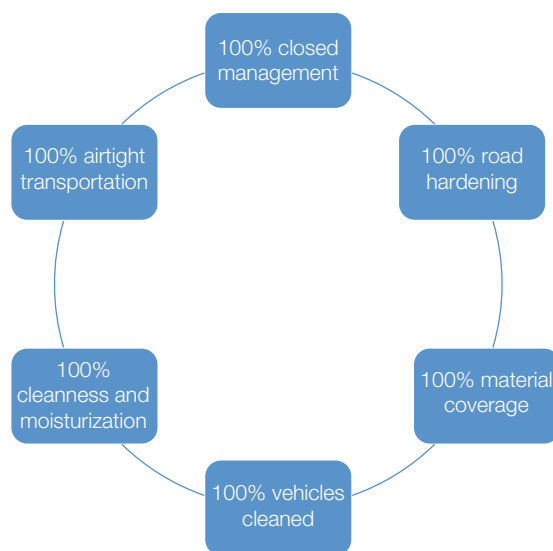


Figure: CHALIECO’s “Six 100%” Targets for Project Construction

During project construction, scattered dust produced from earth work and cutting processes causes pollution to the atmosphere, reduces air quality, and adversely affects human health. For the management of dust pollution, CHALIECO strictly regulated the construction process, conducted closed management on the construction site, and set up enclosures to block dust. Moreover, the Group required the use of dust nets and dust blankets at the project site to cover piles of earth, and to configure dust removal and spray equipment such as sprinklers, cannon foggers, and dust detectors to prevent dust from scattering and reduce dust pollution.

Noise pollution caused by machinery operation during construction can cause serious interference to employees and residents. For the management of noise pollution, CHALIECO adopted methods to reduce noise from the source and block the transmission process, so as to prevent and reduce the impact on residents to the minimum extent.

- Noise reduction from the source: The project companies were required to adjust the working hours of large machinery such as earthmoving machines and slag vehicles to avoid construction at night and during breaks; noise reduction devices are installed near noisy equipment and facilities, with regular inspection and maintenance conducted on schedule.

- Blocking the transmission process: Noise monitoring devices such as noise decibel detectors were installed at the construction site to detect noises, while noise sheds or walls were built for large equipment close to residents.

As for the problem of water resource pollution during the production and construction process, CHALIECO strictly regulated the related management process and requires the project company to build drainage ditches on the construction site to collect sewage and mud, and to prevent them from penetrating into the groundwater body or entering the river, and from causing water pollution. Moreover, the Group required that a sedimentation tank was set up at the construction site for the sedimentation treatment of the collected sewage and then discharge it into the municipal sewage pipe network system when the discharge standard is met.

Promoting Environmental Protection Technologies

By undertaking green and environmental projects, CHALIECO focused on the R&D and application of environmental technologies, and assumed corporate responsibility for improving the quality of the ecological environment and protecting biodiversity, in a bid to achieve a win-win outcome that enables “harmonious development between man and nature”.

Over years, CHALIECO has actively developed and promoted green and environmental technologies with regard to energy, materials, pollution control and resource recovery to fully save and use natural resources, minimize environmental impacts and control environmental pollution. These moves have contributed to the improved quality of the ecological environment and helped the Group to achieve good social and environmental benefits.

Technology	Environmental benefits
Shenyang Institute: The reserve burning oven (RTO) technology	– RTO is used to treat organic waste gas by burning and decomposing it into carbon dioxide and water, and thus the organic waste gas in the carbon production process can be completely treated. It not only meets the requirements of current and future environmental emission standards, but also can ensure long-term, stable operation of the purification system, with lower energy consumption. Capable of realizing the fundamental treatment of organic waste gas in the carbon industry, this technology has reached internationally advanced levels.
Changsha Institute: Wet smelting process	– It features a high degree of automation, a closed production process, and no emission of dangerous by-products like sulfur dioxide flue gas, sulfuric acid, etc. Therefore, it is a green and environmental smelting process. It solves the problem of sulfur dioxide emissions in the copper smelting industry, reduces environmental pollution, and promotes technological progress in the industry.

Technology**Environmental benefits**

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- | | |
|---|---|
| New technology for lead anode slime treatment | – The combination of side-blow reduction and blowing achieves the goals of reducing energy consumption, increasing metal recovery, and reducing environmental pollution. This technology reduces flue gas emissions by 60% to 70%, and saves energy consumption by 40%, therefore it enjoys significant resource value, economic value and environmental value. |
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CSDI:

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| Unmanned automatic detection technology for underground mine goafs | – This technology allows for comprehensive consideration of the geological conditions of the mine, and the location and shape of the goaf. Supporting accurate detection of the goaf, it helps avoid the deterioration of the mine environment and waste of resources, as well as problems such as rock movement and surface subsidence. Therefore, it's of great social significance for integrating mining resources. |
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The Group actively undertook various environmental projects including water pollution treatment, atmospheric pollution treatment, soil restoration, and mine restoration. While implementing the green and environmental concept in the entire process of project design and construction, the Group engaged in ecological environment design and promotes environmental technology. From the dual perspectives of protecting environment and promoting business development, the Group worked to reduce resource consumption, avoid emission pollution, and achieve sustainable development.

- CHALIECO held six expert review meetings centering on the treatment of the “three wastes”, and key processes, technologies and equipment in the non-ferrous industry. The meetings selected 10 environmental projects involving treatment of aluminum electrolytic pollution, mining and dressing technologies and equipment, and ecological improvement in mining areas. The R&D projects have entered the implementation phase as planned.
- In 2019, the Kunming Institute won the bid to undertake the Pachi Mountain ecological restoration and management project of the Jiuzhai Village Committee, Kunyang Sub-district Office, Jinning District, Kunming. By the end of the reporting period, 21,432 square meters of net was put in place, 600 cubic meters of retaining walls was built, and 1,741 meters of rock bolts were installed.

SHOWING MUTUAL RESPECT AND ENGAGING IN PEOPLE-CENTERED MANAGEMENT

CHALIECO always adheres to the people-centered development principle. While respecting and protecting the rights and interests of employees, we actively broaden the channels for introducing talents and promoting their career. We attach importance to employees' training and career development, hold rich activities, listen to their opinions, and create a good environment for talent development.

Protecting Employees' Rights and Interests

CHALIECO complies with *Labor Law of the People's Republic of China*, *Labor Contract Law of the People's Republic of China* and other relevant laws and regulations. We developed *Management Measures for the Recruitment of Employees at CHALIECO Headquarters*, *Measures of China Aluminum International Engineering Corporation Limited for the Management of Labor Contracts (Tentative)* and other internal rules to protect the legitimate rights and interests of employees.

The Group strictly prohibits the employment of child labor, forced labor and other disputed labor forms, and makes its best efforts to create an equal and diversified working environment for employees. It eliminates all forms of inequalities based on gender, region, ethnicity, religion, age, political stances and other aspects in the issues related to recruitment, salary, training, promotion and others, so as to ensure that all employees enjoy fair, just and open job opportunities.

In 2019, CHALIECO employed a total of 14,685 persons, with a 100% signing rate of formal labor contracts and a total employee turnover rate of 3.9%. CHALIECO respects the cultures of ethnic minorities and actively promotes the common development of multiple ethnic groups. By the end of the reporting period, the Group employed a total of 680 ethnic minority persons.

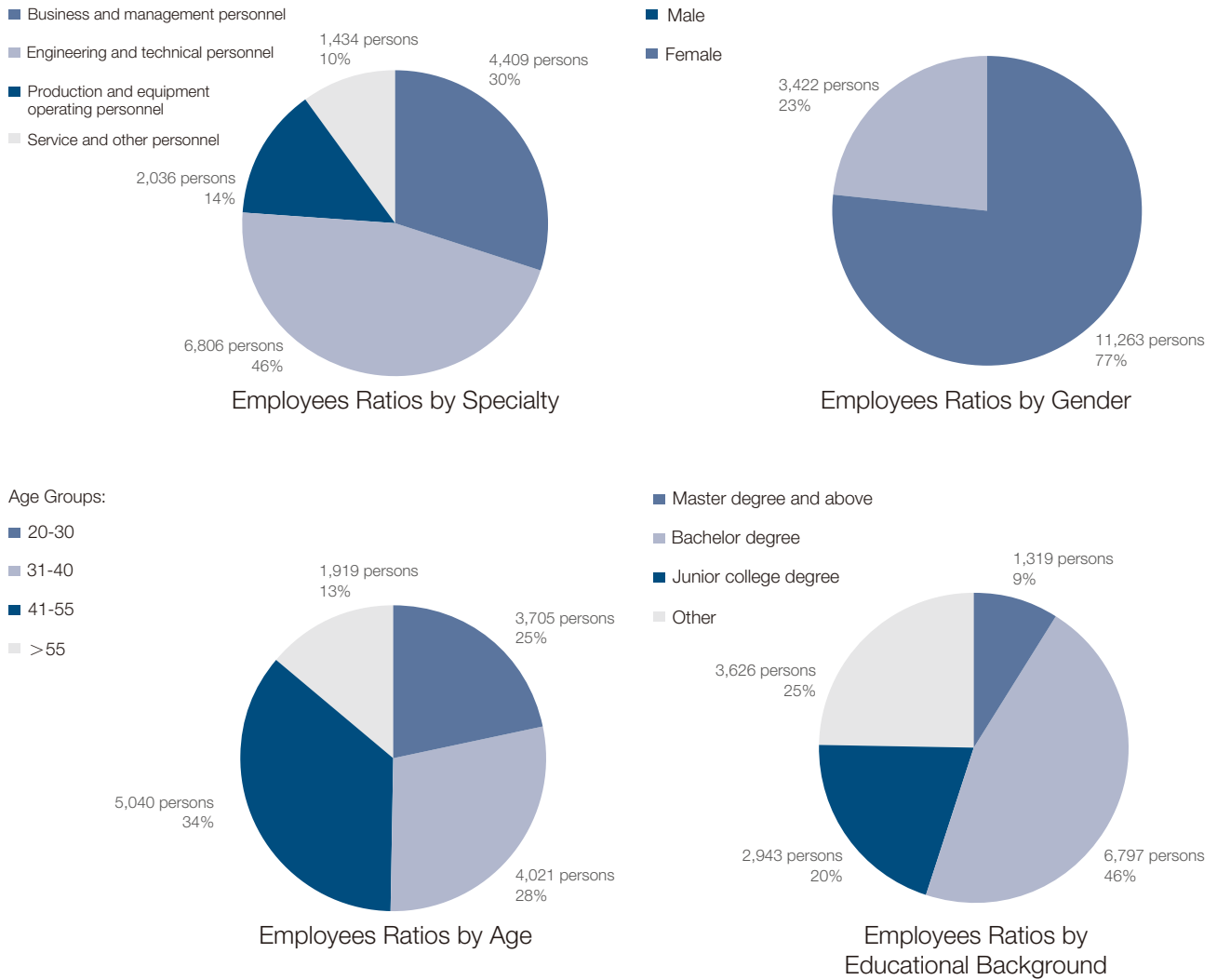


Figure: Classified Employee Numbers of CHALIECO in 2019

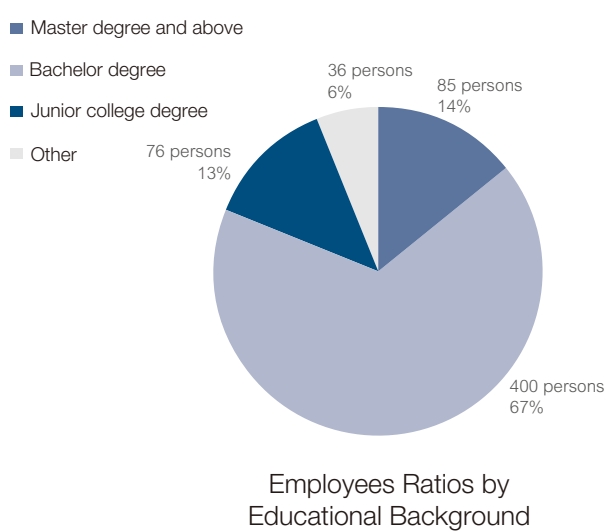
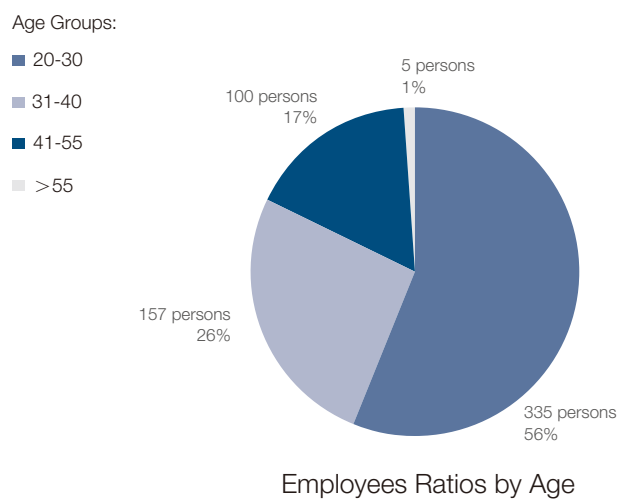
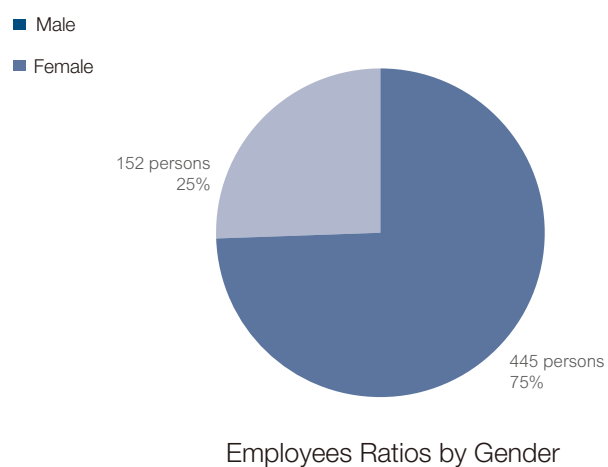
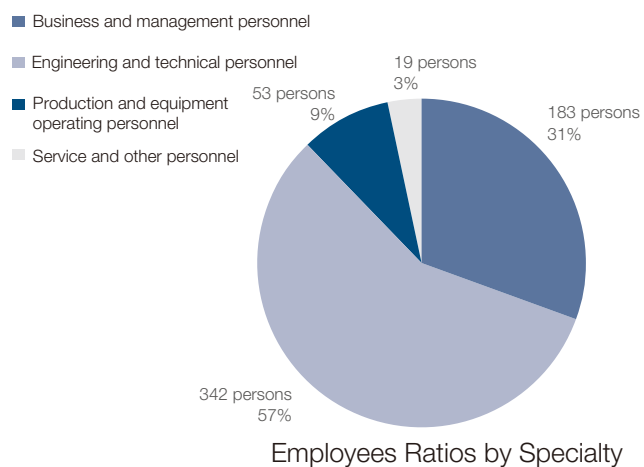


Figure: Classified Employee Turnover Ratios of CHALIECO in 2019

Building Growth Platforms

Employees are the driving forces for the Group's development and an important component of the Group's core competitiveness. CHALIECO always attaches importance to the growth of employees. While providing fair career development opportunities for the majority of employees, it constantly improves the talent incentive mechanism and training system, to promote its common growth and development with employees.

CHALIECO developed *CHALIECO Implementation Plan for the Selection and Cultivation of Outstanding Cadres* and other plans to promote the transparent selection and promotion of employees and pave the path for talent development. In 2019, we organized various departments and member companies to complete the recommendation of 220 outstanding young cadres. In addition, we reviewed the job titles of 104 persons, with 51 persons (including 20 with senior titles and 31 with intermediate titles) participating in the review, and 53 persons held junior job titles or had been duly certified.

We encouraged and comprehensively supported employees to keep improving their capabilities and making progress. In 2019, the Group held various professional and technical competitions to promote internal mutual learning. It made arrangements for eligible member companies to establish and regulate enterprise annuities and further improved the employee incentive mechanism. The Group developed *CHALIECO Special Training Program for Project Management*, held training sessions for newly recruited employees, the 19th English language training course, and the training on information disclosure for listed companies in the engineering sector, and it also organized relevant personnel to participate in trainings including CHINALCO's "Alloy Plan" and "Cutting Edge Plan". During the reporting period, the Group trained a total of 15,086 person-times and the employees received 167,680 hours of training, about 11.4 hours per person.

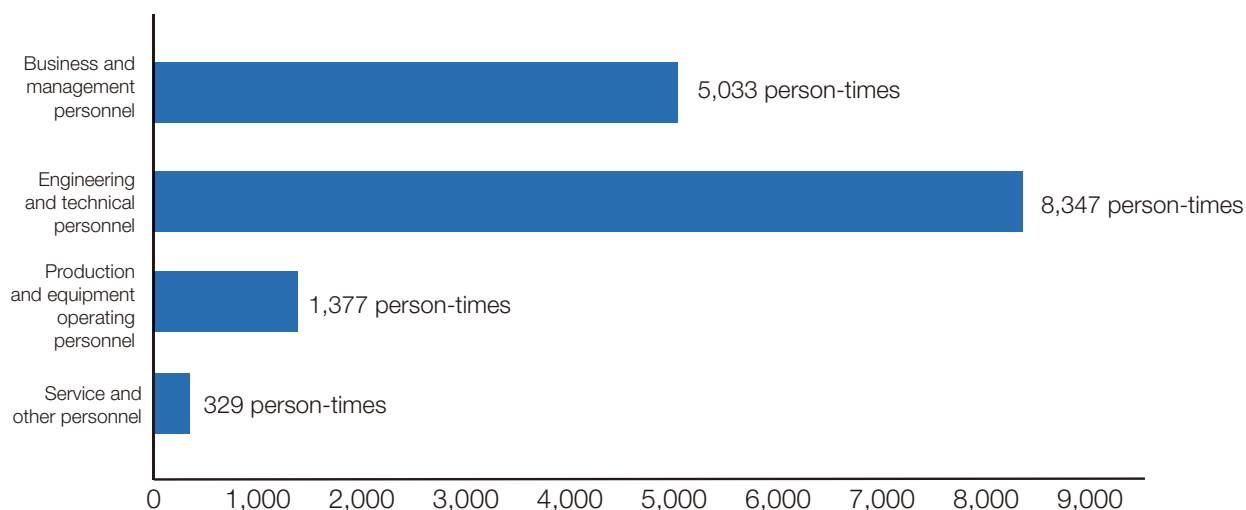


Figure: Total Number of Trainees Classified by Specialty

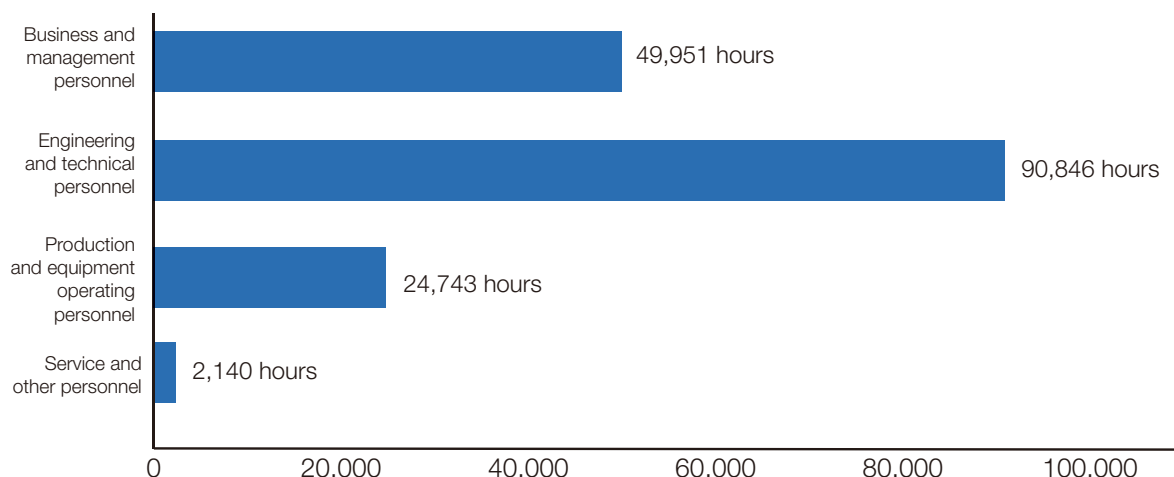
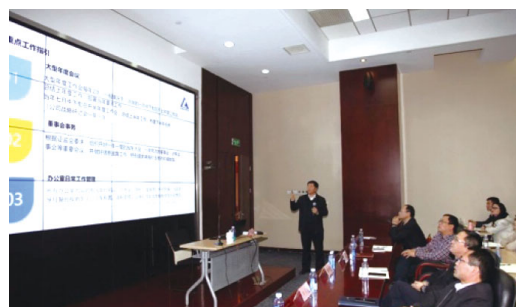


Figure: Total Training Lengths of Employees Classified by Specialty

Case: New Employees' Induction Training in 2019

From February 20 to 21, 2019, CHALIECO held the induction training for new employees in 2019, which was attended by over 40 persons from various departments of CHALIECO headquarters and units in Beijing. The training content comprised seven parts such as work process, employees' legitimate rights and interests, and the company's main businesses. The course featured a practical and targeted framework, and it laid a good foundation for the trainees to change their roles as soon as possible and better adapt to future work.



New Employees' Induction Training in 2019

Case: Sixth Metallurgical Construction established an online training school

While launching various training courses, the Group continuously innovated its training platforms and approaches. On July 9, 2019, the online training school of the Sixth Metallurgical Construction was formally established. Since then, various training activities were carried out in a specialized and informatized way at the school. Its courses involve law, internal control, disciplinary inspection, company operations and a number of other fields, thereby providing more convenient, efficient and systematic learning channels for the company's employees. From its establishment to the end of the reporting period, the online training school conducted 42 training sessions, with 2,910 persons trained.

Case: CHALIECO held the “First 3D Digital Modeling and Design Competition”

In order to improve engineering designers' level and ability of 3D digital modeling and design, CHALIECO held the “First 3D Digital Modeling and Design Competition” on December 3, 2019. As a new design mode, the 3D digital design method not only improves the design quality, but also serves as an important foundation for the enterprise's reform, transformation and business development. After rounds of selection and recommendation, a total of 18 outstanding design works were submitted from 12 companies. 15 expert and non-expert judges scored and evaluated the works in an earnest, fair and just manner. In the end, the first prizes were granted to the Guiyang Institute and the Shenyang Institute.



Group Photos of Participants in the Design Competition

Strengthening Employee Care

CHALIECO attaches importance to the working and living conditions of employees and tries its best to help employees solve their life difficulties. It organizes rich activities, actively listens to employees' opinions, and strives to build a harmonious labor relationship.

– Providing Greater Care and Assistance

The Group continuously improved the employee welfare system and developed institutional documents such as *CHALIECO Measures for Headquarters Employee Welfare Management*. It provides employees with multiple benefits including holiday blessings, wedding blessings, birth gifts, birthday gifts, consolation for demobilized military personnel, hospitalization welfare, so as to help employees feel the care and warmth of the Group.

The company and its member units actively assist employees in need and help solve their life problems. The company developed *Management Measures of China Aluminum International Engineering Corporation Limited for the Use of Workers' Union Funds*, which specifies the standards for the funds to be used for employee assistance. In 2019, a total of RMB2,156,033.8 of workers' union funds was allocated for assisting employees in need. Member companies such as the Sixth Metallurgical Construction developed *Management Measures for the Assistance Funds of Employees in Need* and established the Assistance Fund Committee and the Assistance Fund Office; and they regular visit and send condolences to employees in need to effectively resolve their difficulties.

Case: Workers' union of the Ninth Metallurgical Construction promoted the employees' mutual insurance business

Workers' union of the Ninth Metallurgical Construction actively promoted the employees' mutual insurance business. In 2019, a total of 1,285 employees were covered by the "Mutual Assistance Scheme for Working Women with Special Illnesses" and the "Hospitalization + Accidents Mutual Assistance Guarantee Plan", with over RMB52,800 paid to 44 employees whose insurance claims were duly accepted. These efforts embody the mutual assistance concept that is known as "At usual times every one donates just a drop to the pool, but in tough times mutual assistance can be enjoyed by all."

Case: The Shenyang Institute cared for female employees

The Group strictly abides by *Provisions on Labor Protection for Female Employees* and supports the headquarters and member enterprises to implement caring measures for female employees. In March 2019, the Shenyang Institute launched a series of March 8th International Women's Day activities, during which not only books and household water filter pitchers were gifted to all female employees, but also female employees' health insurance was purchased for all of them. In addition, based on the age, health conditions and other different factors of employees, five check-up package options were made available for them.

Case: The “Conveying Warmth” activity by the workers’ union of the Ninth Metallurgical Construction

In order to further hold the “Conveying Warmth” activity, the workers’ union at two levels in the Ninth Metallurgical Construction actively applied for special aid funds from provincial and municipal workers’ unions and the central government’s fiscal authority. On the eve of the Spring Festival in 2019, the workers’ union of the Ninth Metallurgical Construction paid visits and sent condolences to model workers at and above provincial and ministerial levels, party members in difficulty, and incumbent and retired employees in need. They provided RMB141,100 in condolences for eight model workers at the provincial and ministerial levels, 35 party members in difficulty, 81 employees in difficulty, and 22 retired employees in need.



*Chairman of the Workers’ Union of the Ninth Metallurgical Construction
Sent Condolences to Employees in Need*

– Enriching Employee Life

We care about employees' balance between work and life, and hold diverse activities to enhance communication between them and strengthen their sense of participation, belonging and happiness.

Case: CHALIECO's "Truth Cup" Table Tennis Competition was successfully held in 2019

In order to further strengthen the company's cultural development and build a healthy and active environment, CHALIECO's workers' union and Youth League Committee jointly held the "Truth Cup" Table Tennis Competition 2019, which comprised men's singles, women's singles, men's doubles, women's doubles and mixed doubles. Participating players were recommended and selected from CHALIECO's various departments and units in Beijing. A total of 54 players and 9 teams played in the competition which was divided into two groups: A and B. After two and a half days of fierce competition, the teams of the Bidding Company and the Technical Aluminum Committee finally won the championship and runner-up.



Photos of the "Truth Cup" Table Tennis Competition 2019

Case: “The Taste of Books” Reading Workshop of the Ninth Metallurgical Construction

In order to create a “learning, intelligent and efficient” enterprise, the Women’s Working Committee of the workers’ union of the Ninth Metallurgical Construction held in August 2019 the “100 Books for 1000 Persons” Reading Workshop on the theme of “Seeking our dreams in the new era and showing the splendor of women” and commemoration for the 5th anniversary of the “The Taste of Books” Women’s Reading Event. During the event, the work results over the past five years were summarized, and six outstandingly organizing units and writers of 33 excellent essays were awarded. 16 excellent original works were widely publicized through the Digital Ninth Metallurgical Construction official account, which aroused strong response among female employees.



Exhibition and Performance Site of “The Taste of Books” Reading Workshop of the Ninth Metallurgical Construction

– Promoting Democratic Management

CHALIECO promoted democratic management in its daily operations to protect the democratic rights of employees. The Group formulated *Implementation Measures for the “Leadership Reception Day” Event* and held employee representative conferences and employee meetings. It also actively made various democratic communication channels more available for employees and encourages them to grow into corporate builders, to promote democratic decision-making, to build fair and equitable relations of interests, and to strengthen the endogenous driving force for corporate development.

In order to strengthen democratic management, the Group held the Fifth Plenary Session of the Second Employee Representatives Congress in 2019, during which six proposals were received and responded to. It also held the headquarters staff meeting to review and pass the enterprise annuity plan.

Case: CHALIECO held a seminar on seconded and exchanged personnel

On August 14, 2019, CHALIECO held the “CHALIECO Seminar on Seconded and Exchanged Personnel” at its headquarters. It was attended by Fan Guangsheng, Deputy Secretary of the Party Committee and Secretary of the Committee for Discipline Inspection, as well as more than 20 seconded and exchanged employees.

Seconded and exchanged employees’ representatives shared their opinions and conducted in-depth exchanges on issues of everyone’s concern, including accommodation, medical treatment, training, the sense of belonging and personal development. Fan Guangsheng recognized the contributions that the employees made to the development of CHALIECO over the years, and required relevant departments to study carefully the issues of their common concern, and try their best to help seconded and exchanged personnel to solve the real problems in their work and life.



Fan Guangsheng, Deputy Secretary of the Party Committee and the Discipline Inspection Committee of CHALIECO communicated with seconded and exchanged employees

SHOULDERING RESPONSIBILITY AND CONTRIBUTING TO THE WELL-BEING OF SOCIETY

The Group actively responds to the “Belt and Road Initiative”, implements a global development layout, and combines the development of China with that of BRI countries through a cooperative model of mutual benefit, win-win outcome and shared benefits. It makes full efforts to push forward the foremost livelihood program, namely, poverty alleviation, and shoulders its social responsibility as a corporate citizen. In the inclusive principle, it promotes social progress and development, and strives to turn a new chapter in our common development.

Promoting Overseas Integration

CHALIECO adheres to the “going global” strategy and leverages its technological advantages to actively participate in international project bidding. It has exported technology, equipment and labor services to more than ten countries and regions including India, Kazakhstan and Vietnam, and has provided a number of overseas projects with engineering design and consultancy, contracting service, and equipment supply and other services. By doing so, the Group has become one of the world’s major technology suppliers in the aluminum industry. It integrates overseas projects to create a system for the design and management of international projects and to set the corresponding implementation standards, with a view to promote in-depth exchanges and integration with international technologies.

In 2019, the Group leveraged its core technology and cost advantages to build a new pattern of leap-type development in overseas markets. As of the end of December, it signed international business contracts worth RMB3.53 billion.

- Signed a preliminary project design contract for a 2 million tons/year alumina project with Indonesian Laman Mining and an EPC contract for Indonesia’s BAI alumina project.
- Established a partnership with the only two bauxite producers in Sierra Leone, and signed a consulting contract to further develop the alumina business.
- Signed an EP + S contract for the production recovery and electrolytic upgrading project of the Portovesme electrolytic aluminum plant in Italy, which marked the first export of the electrolytic aluminum technology developed with China’s independent IPR to the developed European market.

Case: CHALIECO Guinea Boffa Project Received Thank You Letter

CHALIECO Guinea's Boffa project, which is undertaken by CHALIECO's Sixth Metallurgical Construction, is CHALIECO's first large-scale overseas aluminum project. The cable-stayed bridge of the Boffa project is 486 meters in total length, 270 meters in the main river span, 11 meters in bridge width, and 70 meters in the height of the main towers on both banks. The project is characterized by a tight construction schedule and a great extent of difficulties. Since the start of construction on February 27, 2019, the team has overcome a number of difficulties such as shortage of overseas materials and equipment, frequent obstructions to construction progress, rampant diseases, and continuous rain storms. Finally, they ensured the smooth progress of the project and received a letter of appreciation from the project owner. The responsible and refined working style of all the participating staff fully demonstrates CHALIECO's strong technical strength and courage to rise to challenges, and showcases the outstanding craftsmanship of a state-owned enterprise.

Case: CHALIECO's Renji Alumina Project in Vietnam won the Luban Award

On December 10, 2019, the Renji 650kt/a alumina project in Vietnam undertaken by CHALIECO (involving the Company, the Sixth and the Twelfth Metallurgical Construction) won the Luban Award of Chinese Construction Engineering (for overseas projects) for 2018-2019, representing the Group's first award for an overseas engineering project.

The Renji 650kt/a alumina plant Vietnam is a national key project for Vietnam's economic revitalization. The Group made overall plans and integrated the project's quality management into the entire construction process, so that the project can fully demonstrate "Chinese quality" while meeting the Vietnamese standards.

Since it was put into production, the project has seen stable production, with relevant goals reached and corresponding standards met. With remarkable economic and social benefits, the project has been well recognized by all sectors of Vietnam. This project has improved the influence and competitiveness of China's aluminum processes and equipment in the international market, and is of great significance for promoting Chinese enterprises to participate in overseas competition and cooperation.

Commitment to Social Welfare

CHALIECO actively fulfills its social responsibility, and makes consistent efforts in targeted poverty alleviation. It mobilizes all the Group's resources and employees to participate in public welfare undertakings. The Group has developed *CHALIECO Donation Management Measures* to strengthen the management of donations and better fulfill its corporate social responsibility and citizen's obligations.

– Targeted Poverty Alleviation

The Group has thoroughly implemented General Secretary Xi Jinping's important exposition on poverty alleviation, and performed its main responsibility for poverty alleviation. In the principle of "making plans as a whole, highlighting key priorities, making every possible effort, and comprehensively pushing forward the work", the Group adheres to the fundamental practice of scientific and targeted poverty alleviation. Through targeted assistance, survey visits and condolences, donations, construction of basic and public service facilities, and introduction of agricultural machinery and technology to rural areas, the Group keeps advancing its poverty alleviation work.

In 2019, the Group guided its cadres and employees to actively engage in social welfare activities and fulfill their social responsibilities. On the occasion of the National Poverty Alleviation Day in late October, all the employees of the Group donated over RMB1 million to the CHINALCO Love Scholarship to help students in poverty-stricken areas in CHINALCO's alleviation program to complete their study. The Group guided its subordinate enterprises to participate in poverty alleviation work in targeted places. It adopted an approach that combined direct donations and the cultivation of growth momentum, and placed the emphasis on helping the recipient localities to economically grow stronger. Engaged in the development-oriented method for poverty alleviation, the Group adopted multiple means and relied on various channels. It sent four cadres to work on a temporary basis, in addition to three work teams in the villages. Its total amount of direct input and material donations reached RMB2.215 million, with RMB14.56 million of aid fund introduced for targeted counties. The Group also helped sell agricultural products from the poor areas worth RMB1.13 million, and offered professional training amounted to 196 person-times.

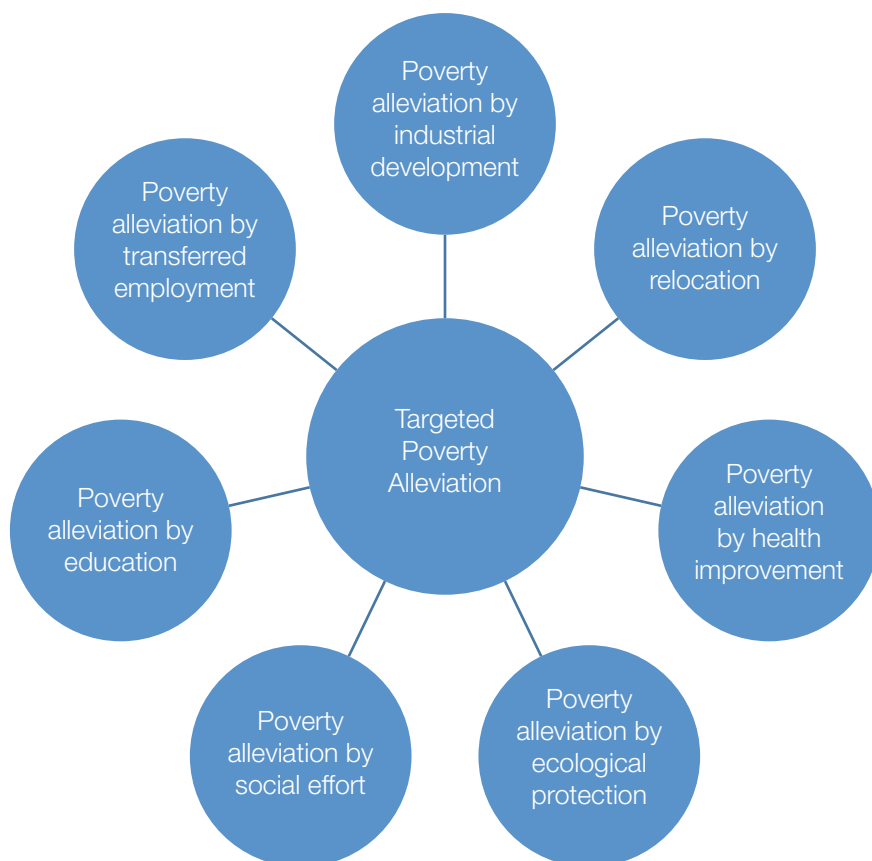


Figure: Major Types of the Group’s Targeted Poverty Alleviation Approaches in 2019

In 2019, CHALIECO achieved outstanding results in its its targeted poverty alleviation efforts and received recognition from wide parties. Comrade Lu Tingge, the First Secretary of CNMPT dispatched to the village, was awarded the “Xin’an County Contribution Award for Poverty Alleviation,” and the First Secretary of the Guiyang Institute dispatched to the Village, Comrade Li Tong, was awarded the honorary titles of “Outstanding First Secretary in Guizhou Province” and “Outstanding Prefecture Cadre on Assistance Duty in Southeast Guizhou”; Minshi Village, the assistance target of CSDI was rated as a “Civilized Village/Town” by the Civilization Office of Shuangfeng County, and the assistance case was selected as one of the “Top Ten Excellent Cases of Social Responsibility Practice in 2018” by CHINALCO; and CSDI’s assistance work in targeted villages was recognized as of provincial outstanding performance in 2019.

Case: Care Sent to Minshi Village and a Path Paved for Targeted Assistance

In 2019, CSDI sent a poverty alleviation task force to Minshi Village, Shuangfeng County, Loudi City, Hunan Province to carry out in-village assistance work, and another 50 middle-level cadres at CSDI were dispatched to participate in paired assistance. With the concerted efforts of all the CSDI cadres and staff together with the Minshi Village Committee, the village gradually found its direction for shaking off poverty: first, give full play to the pioneering role of the village's party members and mobilize the subjective initiative of the poor villagers; second, based on the local resource advantages, develop photovoltaic power generation, red juice orange and other planting businesses.

The assistance work has brought fruitful results. The per capita net income of the village increased from RMB3,479 in 2017 to RMB7,800 in 2019. The village's infrastructure for electricity, roads, network communications, water and other public service facilities were greatly improved, and the villages fundamentally took on a new look. In December 2019, all 263 people in 77 households in Minshi Village successfully shook off poverty, without any case of omission, wrong assessment or repeated poverty. The public satisfaction reached 100%.



A Planting Base for Red Juice Orange



*Reconstruction of a River Course and
Construction of a Farm Track*

Case: Deep ties established in the mountains: The Changsha Institute assessed Gaojia Village based on local conditions

In March 2018, the Changsha Institute sent three people to form a village assistance team to carry out a three-year village assistance task in Gaojia Village, Lixi Township, Yuanling County, Huaihua City, Hunan Province. The village suffered deep impoverishment, with poor transportation conditions, weak infrastructure, and the living conditions of poor households needed to be improved.

In 2019, the Changsha Institute's in-village assistance team went to the farming fields and homes of poor households to conduct field surveys, and they summarized and analyzed the key and difficult issues of precise poverty alleviation work there. Then they developed practical and localized poverty alleviation measures to: establish a pairing assistance responsibility mechanism, and get an in-depth understanding of the causes of poverty and the willingness of each household to seek development; establish an agricultural product cooperative and a catalog for consumption-based poverty alleviation products, mobilize employees to "purchase products as donations", namely to purchase various agricultural products to generate income for the village; set the Gaojia Village Education Fund for awarding students in the village. By adopting targeted and effective poverty alleviation measures, the poverty reduction effect was substantially improved.

– **Volunteer Services**

For the purpose of further carrying forward the core values of socialism and advocating donations and care for others, the Group has held rich social volunteer service activities. The majority of party members and cadres actively lead the volunteer services, devote themselves to serving the masses, and contribute to the society. On the other hand, young volunteers show their love and leverage their strengths to convey warmth and promote social harmony. In 2019, the Group's volunteer services amounted to 14,989 hours in total.

Case: The Shenyang Institute launches the "Community Dedication Day" for CPC members

With a view to thoroughly implement the requirements of the 20th "CPC Community Dedication Day" in Shenyang City, to make improvements for the city, to inspire the enthusiasm of party members and give full play to their pioneering role, the Party Committee of the Shenyang Institute mobilized the party members to conduct the "CPC Community Dedication Day" activities themed on "Playing a modeling role in optimizing the environment and serving as a pioneer to promote revitalization". Based on the city's ongoing waste classification work, the participating party members engaged in cleaning and beautifying communities. They cleared more than 200 pieces of white garbage and the "three piles" of wastes in the communities, cleaned the environment, put the items in the passageway in order, and thus brought a new look to the community environment.

Case: The Sixth Metallurgical Construction shows care for children and helps students

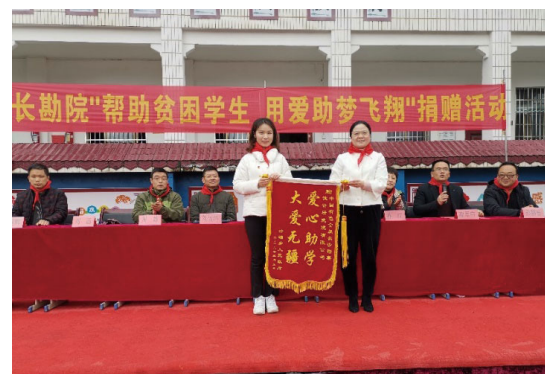
The Sixth Metallurgical Construction strongly supports the work on child care and is committed to showing social care to vulnerable groups such as exceptional or poor children. In 2019, the company sent some personnel to the Zhengzhou Children's Welfare Institute to carry out volunteer service activities and they brought children's daily necessities, health products, and other items to the welfare institute. Their care and assistance benefited 488 persons. In addition, the company and Pingba District Education Bureau jointly carried out the "Compulsory Educational Balance" project, and held assistance activities at the Qingshan Elementary School and Heping Elementary School in a poor township known as Shizi Township. Their assistance included helping the two schools to refurbish the campus, and sending books and other school supplies to students.

Case: CSDI held the "March 5 Learn from Lei Feng" volunteer service activities

On March 5, 2019, CSDI's Youth League Committee and the Poverty Alleviation Task Force went to Shiqiao School, Shatang Township, Shuangfeng County, Loudi City, Hunan Province to carry out the "Learn from Lei Feng" volunteer activities on the theme of "Assisting poor students and igniting their dreams with love", which were attended by 33 young volunteers from CSDI. The event was divided into three main parts: voluntary teaching classes, donations for students and educational pairings. The young volunteer representatives from CSDI shared the students with the nation's aerospace development course and some environmental knowledge, which attracted enthusiastic participation of the students. Later, CSDI donated schoolbags and stationery to 49 poor students in the school. At the end of the event, the young volunteers formed pairs with 30 left-behind children in Minshi Village, which means the volunteers will provide regular one-on-one coaching to the students to facilitate their healthy growth. Persons in charge of Shatang Township, on behalf of the Shatang Township Government, expressed their gratitude to the CSDI volunteers, and presented to the Youth League Committee of CSDI a banner which read "Assistance for students shows love with no boundaries".



Group Photo of Volunteers during the Event



CSDI Youth League Committee Accepted the Banner

FUTURE OUTLOOK

2020 marks the end for the work on building a well-off society in an all-round way and the “Thirteenth Five-Year Plan”. It is a key year for CHALIECO to deepen its comprehensive reform and realize transformation and upgrade. It is also a crucial year to for CHALIECO to promote sustainable and healthy development.

We will continue to deepen reforms under the guidance of Xi Jinping’s thoughts on socialism with Chinese characteristics in the new era and take “accuracy, refinement and quality” as the direction for our work; take “technology+ international” as the development path and the “talent-based corporate development” strategy as the guideline, continue to increase investment in technological research and strengthen the development of a series of talent teams; with a clear mindset and strong actions, resolutely win the battle against poverty; closely follow the national “Belt and Road Initiative”, integrate internal efforts and outside favorable conditions, and make efforts to build CHALIECO into a world-class comprehensive engineering enterprise.

Remain true to our original aspiration and keep our mission firmly in mind. We will continue to deepen the concept of sustainable development and build a better future with more resolute confidence, more effective measures and more practical actions!

HKEX ESG INDEX

Disclosures and KPIs		Chapter
Environmental		
A1: Emissions		
General Disclosure		Responding to Climate Change; Reducing Impact on the Environment;
A1.1	The types of emissions and respective emissions data	Reducing Impact on the Environment;
A1.2	Greenhouse gas emissions in total (in tons) and, where appropriate intensity (e.g. per unit of production volume, per facility).	Responding to Climate Change;
A1.3	Total hazardous waste produced (in tons) and, where appropriate intensity (e.g. per unit of production volume, per facility).	Reducing Impact on the Environment;
A1.4	Total non-hazardous waste produced (in tons) and, where appropriate intensity (e.g. per unit of production volume, per facility).	Reducing Impact on the Environment;
A1.5	Description of measures to mitigate emissions and results achieved.	Reducing Impact on the Environment;
A1.6	Description of how hazardous and non-hazardous wastes are handled reduction initiatives and results achieved.	Reducing Impact on the Environment;

Disclosures and KPIs

Chapter

A2: Use of Resources

General Disclosure

Responding to
Climate Change;

A2.1 Direct and 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).

Responding to
Climate Change;

A2.2 Water consumption in total and intensity (e.g. per unit of production volume, per facility).

Responding to
Climate Change;

A2.3 Description of energy use efficiency initiatives and results achieved.

Responding to
Climate Change;

A2.4 Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and results achieved.

Responding to
Climate Change;

A2.5 Total packaging material used for finished products (in tons) and, if applicable, with reference to per unit produced.

Not relevant to the
business of the
Group;

A3: The Environment and Natural Resources

General Disclosure

Reducing
Impact on the
Environment;

A3.1 Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.

Reducing
Impact on the
Environment;

Disclosures and KPIs

Chapter

Social

Employment and Labor Practices

B1: Employment

General Disclosure

Protecting
Employees' Rights
and Interests;

B1.1 Total workforce by gender, employment type, age group and geographical region.

Protecting
Employees' Rights
and Interests;

B1.2 Employee turnover rate by gender, age group and geographical region.

Protecting
Employees' Rights
and Interests;

B2: Health and Safety

General Disclosure

Ensuring Safe
Production;

B2.1 Number and rate of work-related fatalities.

Ensuring Safe
Production;

B2.2 Lost days due to work injury.

Ensuring Safe
Production;

B2.3 Description of occupational health and safety measures adopted, how they are implemented and monitored.

Ensuring Safe
Production;

Disclosures and KPIs		Chapter
B3: Development and Training		
General Disclosure		Building Growth Platforms;
B3.1	The percentage of employees trained by gender and employee category (e.g. senior management, middle management).	Building Growth Platforms;
B3.2	The average training hours completed per employee by gender and employee category.	Building Growth Platforms;
B4: Labour Standards		
General Disclosure		Protecting Employees' Rights and Interests;
B4.1	Description of measures to review employment practices to avoid child and forced labour.	Protecting Employees' Rights and Interests;
B4.2	Description of steps taken to eliminate such practices when discovered.	Protecting Employees' Rights and Interests;
Operating Practices		
B5: Supply Chain Management		
General Disclosure		Adhering to Responsible Procurement;
B5.1	Number of suppliers by geographical region.	Adhering to Responsible Procurement;
B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored.	Adhering to Responsible Procurement;

Disclosures and KPIs		Chapter
B6: Product Responsibility		
General Disclosure		Implementing Quality Projects;
B6.1	Percentage of total products sold or shipped subject to recalls for safety and health reasons.	Not relevant to the business of the Group
B6.2	Number of products and service related complaints received and how they are dealt with.	Not relevant to the business of the Group
B6.3	Description of practices relating to observing and protecting intellectual property rights.	Leading Technological Innovation;
B6.4	Description of quality assurance process and recall procedures.	Implementing Quality Projects
B6.5	Description of consumer data protection and privacy policies, how they are implemented and monitored.	Not relevant to the business of the Group
B7: Anticorruption		
General Disclosure		Work on Party Style and Clean Governance;
B7.1	Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during the reporting period and the outcomes of the cases.	Work on Party Style and Clean Governance;
B7.2	Description of preventive measures and whistle-blowing procedures, how they are implemented and monitored.	Work on Party Style and Clean Governance;

Disclosures and KPIs

Chapter

Community

B8: Community Investment

General Disclosure

Commitment to
Social Welfare;

B8.1 Focus areas of contribution (e.g. education, environmental concerns,
labour needs, health, culture, sport).

Commitment to
Social Welfare;

B8.2 Resources contributed (e.g. money or time) to the focus area.

Commitment to
Social Welfare;



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