



中国铝业股份有限公司

ALUMINUM CORPORATION OF CHINA LIMITED

Stock Code: 2600 (HKSE) ACH (US) 601600 (China)



2018

**Environmental, Social and
Governance Report**



CHALCO



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President's Statement

DEEPENING AND ENHANCING REFORM AND INNOVATION SPEEDING UP TRANSFORMATION AND UPGRADING

Comprehensively Accelerating Chalco's Green and High-quality Development


In the year of 2018, it was the first year of implementing the spirit of the 19th National Congress of the Communist Party of China, and it was the first year for Chalco to start the journey of green and high-quality development. Establishing the objectives of "low cost, high quality, excellent mechanism, and good efficiency", Chalco unswervingly pursues the strategy of prioritising cost-saving and continuously enhances the cost advantage; establishing the image of "Requiring Top-quality Aluminum, Requiring Chalco" in the market, Chalco unswervingly promotes high-quality development, through optimising the industrial location and adjusting the product structure, to provide top quality and high tech products; establishing an operational mechanism that adapts to market competition and has great vitality, Chalco unswervingly deepens and reforms its management; continuously improving the quality and efficiency of its development, Chalco unswervingly accelerates the establishment of a world-class company in the industry of aluminum to achieve excellence, dominance, and expansion. In the past year, advancing with the new development concept, the Company has delivered fruitful results:

– **Breakthroughs in innovation and development.**

New results have been achieved from the high-sulfur bauxite desulfurisation and other research and development projects; significant benefits are gained from the promotion of electrolytic aluminum energy-saving technology; production lines of refined alumina (5N alumina) for demonstration have been completed and applied; the major production modules of the smart factory have been put into use; the platform for excellent technology and innovative services have been selected into the 2018 Big Data Industry Development Demonstration Project of the Ministry of Industry and Information Technology. In the year of 2018, the production of top-quality alumina has successfully replaced the imported alumina, as more than 70% of the indicators were superior than imported products, rewriting the history of producing high-purity aluminum with imported alumina in China.

– **Stepping towards a new phase by coordinating the development.**

Chalco has continued to promote supply-side structural reforms, and the second-round comprehensive adjustment of the economic structure has been started in China. Shanxi Huasheng, other branches and subsidiaries have implemented flexible production in some of the electrolytic aluminum production lines. The quick establishment and operation of the Carbon Project of Fushun Aluminum have driven the new growth of Chalco. The business of alumina and electrolytic aluminum is deliberately transferred to areas with advantages in coal resources, clean energy resources, high environmental capacity, and coastal ports. In the year of 2018, the market-oriented debt-to-equity swap project has overcome the huge difficulties of the stock market's sluggishness and was unconditionally approved by the China Securities Regulatory Commission, thereby being successfully implemented.



President's Statement (Continued)

– **Green development taking a new step.**

In the year of 2018, leading the green development of the aluminum industry, Chalco has started the “Battles for Safety, Environmental Protection, and Quality” and invested RMB1.192 billion to specifically address 188 issues, to continuously consolidate the foundation of management, to establish demonstration companies of safety management such as Guangxi Branch, to promote the green technologies such as harmless treatment of electrolytic aluminum spent potlining (overhaul slag), and to strategically locate the hydropower aluminum production plants in Yunnan Province.

– **Open development delivering results.**

Chalco has made a major breakthrough in its “Overseas Acquisition and Overseas Establishment” strategy. A contract to acquire 1.75 billion metric tons of bauxite resources has been signed successfully for the Boffabauxite project, which has reversed the situation of the Company’s insufficient resources; Boffabauxite Project, Port Project, and Guangxi Fangchenggang Alumina Project have started at the same time, taking a solid step towards the overseas establishment of Chalco. In the year of 2018, Chalco seized on the high international alumina prices to enter the overseas market and realized the historic transformation of China’s metallurgical grade alumina from an importer to an exporter.

– **Sharing the new advantages of development and agglomeration.**

Chalco’s three major business platforms, namely Chalco Trading, Chalco Logistics, and Chalco Materials, have a strong momentum for development and play an important role in unleashing Chalco’s superiority of collaboration. The unified procurement of materials, integration of logistics resources, and the leading position in the industry have given the Company the advantage and the power to lead the industry. In the year of 2018, Chalco stimulated vitality of the Group through resource integration, which includes the completion of the merger and reorganisation of Zunyi Alumina and Zunyi Aluminum and the launch of a pilot program to promote management reform.

He Zihui

President

Aluminum Corporation of China Limited

About this Report

This Report covers Aluminum Corporation of China Limited's ("Chalco" or the "Company") and its branches' and subsidiaries' (collectively referred to as the "Group") latest sustainability related information in the year of 2018. This Report mainly includes the environmental, social and governance ("ESG") issues that are of interest to stakeholders and related to the sustainable development of the Company to facilitate the stakeholders to better understand the values, management approaches, measures and related performances of the Company's sustainable development. This report is to be read in conjunction with the Company's *2018 Annual Report* (especially the Corporate Governance Report) to provide a comprehensive understanding of the Company's performance.

The Board believes that reliable and independent environmental and social strategies and policies are critical to the Company as a production company. The Board is fully responsible for the Company's environmental and social strategies and reporting and has reviewed and approved this Report.

1.1 REPORTING PERIOD

This Report covers the period from 1 January 2018 to 31 December 2018 (the "Reporting Period" or the "Year"), unless otherwise specified. The information presented in this Report includes the Company's specific policies and performance in the ESG aspects. Due to the continuity and comparability of the information disclosed, the timeframe of selected contents is adjusted where necessary.

1.2 REPORTING SCOPE

This Report covers Chalco and its branches and subsidiaries. The scope of environmental key performance indicators ("KPI") only covers the factories of its branches and subsidiaries.

1.3 REPORTING GUIDELINES

This Report was prepared with reference to: the *Environmental, Social and Governance Reporting Guide* (the "ESG Guide") contained in Appendix 27 of the *Rules Governing the Listing of Securities* on The Stock Exchange of Hong Kong Limited; the *Notice on Strengthening Listed Companies' Assumption of Social Responsibility* and the *Guidelines on Listed Companies' Environmental Information Disclosure* of the Shanghai Stock Exchange; *Sustainability Reporting Guidelines (G4) issued by the Global Reporting Initiative ("GRI")*; and the International Organization for Standardization (ISO)'s *Guidance on Social Responsibility (ISO26000:2010)*. Moreover, the selection of information for disclosure was also based on the result of the materiality assessment.



About this Report (Continued)

This Report has complied with “comply or explain” provisions of the ESG Guide and reported according to the “recommended disclosure”. Please refer to Appendix 2.

The reporting principles (of Materiality, Quantitative, Balance, and Consistency) outlined in the ESG Guide have been adopted in the Company’s reporting practices.

1.4 REPORT DATA SPECIFICATION

The data quoted in this Report is final statistics. If there are any discrepancies between the financial disclosures in this Report and the Company’s Annual Report, the figures in the Annual Report shall stand. The financial data in this Report is in Renminbi (“RMB”) unless otherwise specified.

1.5 REPORTING SPECIFICATIONS

In this Report, the following terms shall have the following meanings unless otherwise specified:

“China”	refers to	The People’s Republic of China
“CPC” or the “Party”	Refers to	The Communist Party of China
“18 th Party Congress”	refers to	18 th National Congress of CPC
“19 th Party Congress”	refers to	19 th National Congress of CPC
“SASAC”	refers to	State-owned Assets Supervision and Administration Commission
“Federal Reserve”	refers to	Federal Reserve System
“SEHK”	refers to	The Stock Exchange of Hong Kong Limited
“GRI”	refers to	Global Reporting Initiatives
“Chalco” or the “Company”	refers to	Aluminum Corporation of China Limited

About this Report (Continued)

The “Group”	refers to	Aluminum Corporation of China Limited and its branches and subsidiaries
“Chinalco”	refers to	Aluminum Corporation of China
“Shanxi Branch”	refers to	Shanxi Branch of Chalco
“Guangxi Branch”	refers to	Guangxi Branch of Chalco
“Guizhou Branch”	refers to	Guizhou Branch of Chalco
“Qinghai Branch”	refers to	Qinghai Branch of Chalco
“Lanzhou Branch”	refers to	Lanzhou Branch of Chalco. On September 17, 2018, the Company held the 31 st meeting of the sixth session of the Board of Directors and confirmed the capital increase to Chalco Gansu by transfer of Lanzhou Branch.
“Chalco Gansu”	refers to	Chalco Gansu Aluminum Electricity Co., Ltd.
“Liancheng Aluminum”	refers to	Chalco Gansu Aluminum Co., Ltd.
“Chalco Logistics”	refers to	China Aluminum Logistics Group Corporation Co., Ltd.
“Chalco Materials”	refers to	Chalco Materials Co., Ltd.
“Chalco Shandong”	refers to	Chalco Shandong Co., Ltd.
“Zhongzhou Aluminum”	refers to	Chalco Zhongzhou Aluminum Co., Ltd.
“Ningxia Energy”	refers to	China Aluminum Ningxia Energy Group Co., Ltd.
“Baotou Aluminum”	refers to	Baotou Aluminum Co., Ltd.
“Chalco Trading”	refers to	China Aluminum International Trading Co., Ltd.



About this Report (Continued)

“Shanxi New Material”	refers to	Chalco Shanxi New Material Co., Ltd.
“Zunyi Aluminum”	refers to	Zunyi Aluminum Co., Ltd.
“Zunyi Alumina”	refers to	Chalco Zunyi Alumina Co., Ltd.
“Guizhou Huajin”	refers to	Guizhou Huajin Aluminum Co., Ltd.
“Chalco Mining”	refers to	Chalco Mining Co., Ltd.
“Fushun Aluminum”	refers to	Fushun Aluminum Co., Ltd.
“Shandong Huayu”	refers to	Shandong Huayu Alloy Materials Co., Ltd.
“Shanxi Huaxing”	refers to	Shanxi Huaxing Alumina Co., Ltd.
“Shanxi New Materials”	refers to	Chalco Shanxi New Material Co.,Ltd.
“Chalco Hong Kong”	refers to	Chalco Hong Kong Limited
“Lvliang Mining”	refers to	Chalco Shanxi Lvliang Mining Co., Ltd.

1.6 ACCESS TO THE REPORT

This Report is available in both Chinese and English. Should there be any discrepancy between the Chinese version and the English version, the Chinese version shall prevail.

Electronic copies are available as follows:

The Stock Exchange of Hong Kong: <https://www.hkex.com.hk>

The Shanghai Stock Exchange: www.sse.com.cn

The Securities Times: <http://www.zqrb.cn/>

Chalco: www.chalco.com.cn

About this Report (Continued)

1.7 RESPONSE TO THE REPORT

If you have any comments on the Company's Social Responsibility and ESG reporting, please contact the Company.

Phone no.: 8610-8229 8332

Fax no.: 8610-8229 8158

Email: ir@chalco.com.cn

Besides, a feedback questionnaire is attached at page 104 of this Report, and you are welcome to complete and send it to the email address above.

2.1 COMPANY PROFILE

Chalco, a large listed company controlled by Chinalco, was incorporated on September 10th, 2001 in China and has become a leading company in China's non-ferrous industry, with a strong portfolio of assets among global companies. Chalco's stocks are listed on the New York Stock Exchange (stock code: ACH), SEHK (stock code: 2600), and the Shanghai Stock Exchange (stock code: 601600).

Chalco is the only large company in China's aluminum industry which is engaged in the whole value chain, from the exploration and mining of bauxite and coal, to the production, sales and R&D of alumina, primary aluminum and aluminum alloy products, to international trade, logistics, and power generation from both fossil fuels and new energy.

Chalco has always been committed to ensuring the development and utilisation of national strategic resources. The Company has played an important role in many industry areas, including aviation and aerospace, rail transit, and civilian high-end alloys. The Company is proud to have provided key aluminum extrusions for China's first man-made satellite, Long March rockets, Shenzhou spacecrafts, Chang'e Programme, jumbo air crafts, high-speed trains, and many other construction and transportation projects.

This is a pivotal stage for transforming the Chinese growth model, improving the economic structure, and fostering new drivers of growth. With the philosophy of scientifically controlling the up stream, optimising the midstream and rapidly developing the downstream, Chalco has been speeding up structural readjustment, promoting transformation and upgrading, continuously improving the industrial chain, deepening reform and innovation, and accelerating the pace of production. These measures have been taken with the goal of making Chalco a competitive world-class company, adding value for its shareholders, increasing benefits for the Company, and raising the incomes of its employees. In driving and achieving these goals, Chalco can contribute to a new chapter of the Chinese Dream.

About Chalco (Continued)

2.2 CORE PHILOSOPHY

Corporate Social Responsibility philosophy:	Turning Stone into Gold and Benefiting Mankind
Core values:	Responsibility, Integrity, Openness, and Excellence
Chalco's vision:	To Become a World-class Global Company with Global Competitiveness in the Non-ferrous Industry
Corporate's spirit:	Striving for Better Performance and Innovating for Prosperity
Corporate's mission: Customers, Communities and Environment Corporate's image:	Bring Benefits to the Country, Shareholders, Employees, Responsible, Integrious, Ecological, Rule of Law, Peaceful, and Harmonious
Operation philosophy:	Creating Value and Maximizing Returns
Management philosophy:	Striving for Excellence and Collaborating for Efficiency
Cultural Atmosphere	Transparency, Honesty, Simplicity, and Open-mindedness
Business concept:	Working without Corruption and Performing with Virtues
Safety concept:	Safety relating to Effectiveness and Employees Relating to Wealth

2.3 HONORS AND AWARDS

Chalco's honors and awards in the year of 2018 are listed below.

Company Awarded	Award	Awarding Unit
Chalco	2018 All-Asia Executive Team Most Honored Companies Award	<i>Institutional Investor</i> (financial magazine)
	Jinyi Award Most Valuable Hong Kong Connected Securities	Securities Times
Guangxi Branch	Guangxi Patent Gold Award	The Department of Science and Technology of Guangxi Province
	Guangxi Patent Silver Award	The Department of Science and Technology of Guangxi Province
	Excellent Engineering Design Award (Ministerial Level)	China Nonferrous Metals Industry Association
	Guangxi Top 100	Confederation of Guangxi's Enterprises and Employers
	The Third Batch of National Green Factories	The Ministry of Industry and Information Technology of China

1 On June 29, 2018, the Board of Directors of Chalco issued a progress announcement on the merger and reorganisation of Zunyi Alumina and Zunyi Aluminum. Zunyi Aluminum, a subsidiary of Chalco, successfully completed the merger with Zunyi Alumina, another subsidiary of Chalco. The company name of "Zunyi Aluminum Co., Ltd." is unchanged after the merger.

About Chalco (Continued)

Company Awarded	Award	Awarding Unit
Chalco Shandong	The High and New Technology Enterprise in Shandong Province	The Department of Science and Technology of Shandong Province, the Department of Finance of Shandong Province, and Shandong Provincial Tax Service, State Taxation Administration
ZunyiAluminum ¹	Nationwide Model Home of Workers	All-China Federation of Trade Unions
Zunyi Aluminum	Guizhou Pioneer Worker	Trade Union of Guizhou
Chief Financial Officer and Secretary of the Board of Directors, Chalco	Golden Bauhinia The “Best Chief Financial Officer of Listed Company” Asian Best CFO in the sector of basic material	<i>Institutional Investor</i> (financial magazine)

Stakeholder Engagement

Chalco understands the importance of stakeholders for its sustainability development with the focuses on receiving opinions from and balancing the interests of internal and external stakeholders, and proactively responds to the expectations and concerns of all stakeholders.

To further explore Chalco’s sustainability issues, the Company has conducted stakeholder identification and ESG-related materiality assessment in order to improve its sustainability management system through external professional advice.

The key stakeholders identified and confirmed by Chalco are “Major Shareholders”, “Governments and Regulators”, “Employees”, “Customers”, “Peer Companies”, “Potential Investors and Financial Institutions”, “Suppliers”, “Contractors”, and “Communities”. Chalco has fully considered the needs of various stakeholders and been in close contact with stakeholders.

3.1 COMMUNICATION CHANNELS

Chalco, attaching great importance to the participation of, relationships with, and expectations of stakeholders, not only understands and responds to the opinions and appeals of stakeholders through various channels, but also reviews and improves its performance at the ESG aspects. The Company’s effectiveness of communication with stakeholders is enhanced through continuous improvement in its stakeholder communication mechanism.

Communication channels

Stakeholders	Communication Channels	Expectations and Concerns
Major Shareholders	Annual General Meeting Corporate announcements On-site investigation	Protecting the rights and interests of shareholders Improving corporate governance Improving business performance

Stakeholder Engagement (Continued)

Stakeholders	Communication Channels	Expectations and Concerns
Governments and Regulators	Regular reporting and submission of information Regular communication with regulatory authorities Meetings/Seminars	Operating in compliance with laws and regulations Fulfilling tax obligation Promoting local economic development Creating local job opportunities Ensuring occupational health and safety for employees Producing and operating safely
Employees	Workers congresses Collecting boxes for recommendation	Occupational health Remuneration and benefits Career development Employee caring
Customers	Business communication Customer feedbacks	Sound quality assurance system Providing quality products and services
Peer Companies	Communication with local labour departments Participation in industry forums Visits and inspections with industry peers	Promoting industry development
Potential Investors and Financial Institutions	Listing information disclosures Briefings for investors Roadshows Briefings for analysts	Disclosing information timely and accurately

Stakeholder Engagement (Continued)

Stakeholders	Communication Channels	Expectations and Concerns
Suppliers Contractors	Tendering Seminars&Conferences Entry requirements and evaluation On-site investigation	Entry management Continuous evaluation
Communities	Charitable activities Stakeholder engagement	Improving community environment Supporting community welfare Targeted Poverty Alleviation

3.2 MATERIALITY ASSESSMENT AND RESULT

Chalco has conducted its materiality assessment for its sustainable development through an independent third party. The materiality assessment included ESG issues identification, ESG issues prioritization, result analysis and validation. The environmental and social materiality matrices of Chalco are illustrated from the two dimensions of the “Importance to Stakeholders” and the “Importance to Chalco”.

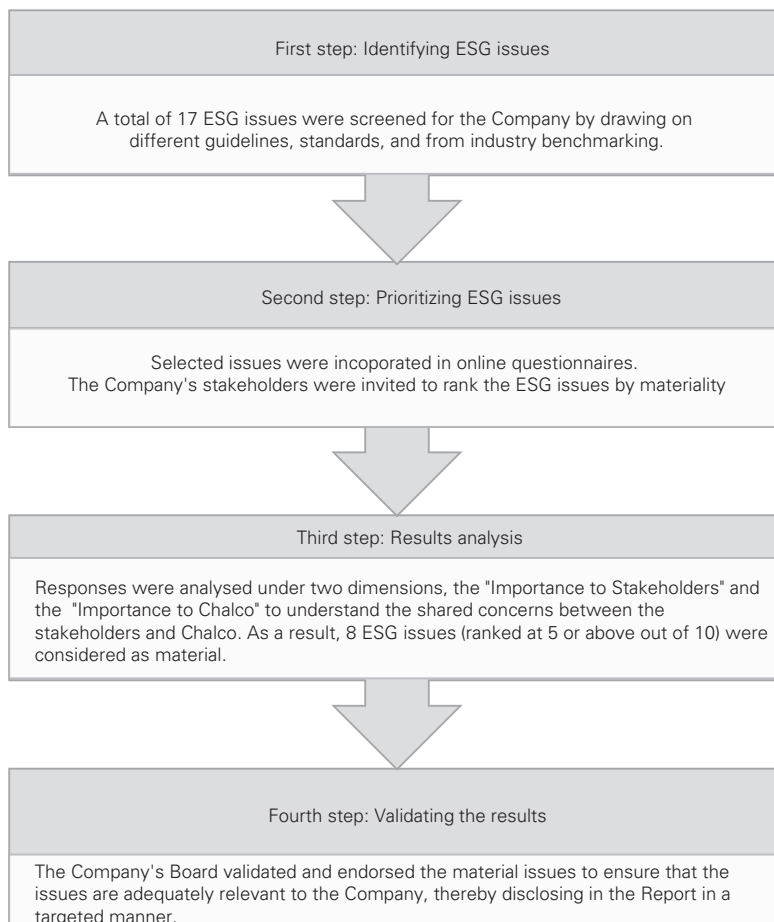
As part of the screening and identification of ESG issues, Chalco extracted relevant issues from SEHK’s ESG Guide, GRI’s *Sustainability Topics for Sectors*(2013)², and the ISO’s *Guidance on Social Responsibility (ISO26000:2010)*, the General Administration of Quality Supervision, Inspection and Quarantine of China’s and the Standardization Administration of China’s *Guidance on Social Responsibility Reporting (GB/T36001–2015)*, and the result of peer benchmarking to form its pool of ESG issues (the “Pool”). A clear definition of each issue was given to facilitate the understanding of all stakeholders. Subsequently, Chalco’s management selected the most relevant issues from the Pool based on their knowledge about the Group’s business and the industry. The opinions from the stakeholders on the most relevant issues were then collected through questionnaires.

² GRI’s *Sustainability Topics for Sectors* (2013) is *Sustainability Topics for Sectors: What do stakeholders want to know?* released by GRI.

Stakeholder Engagement (Continued)

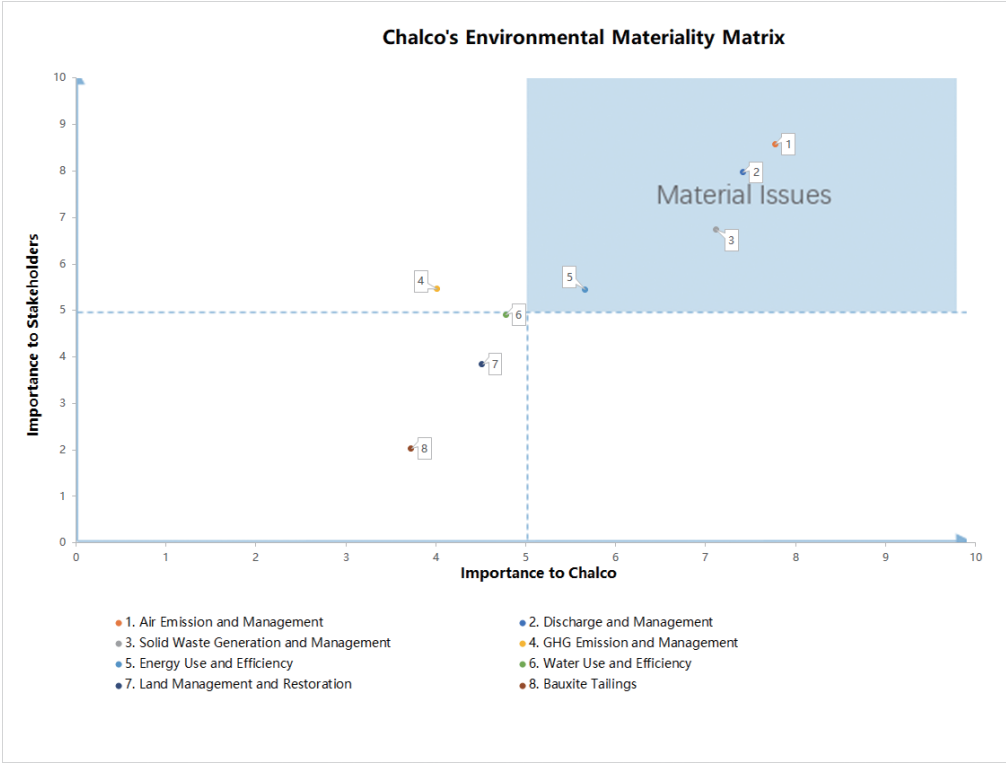
Chalco invited internal and external stakeholders to participate in the materiality assessment, including "Major Shareholders", "Board of Directors", "Board of Supervisors", "Management", "Government and Regulators", "Employees" and "Customers". "Peer companies", "Potential Investors and Financial Institutions", "Suppliers", "Contractors", "Retail Investors", and "Communities" so as to obtain the stakeholders' expectations for and concerns over Chalco's sustainability development. The participants gave important comments to the Company on identifying its material issues. The number of valid questionnaires received was 3,993.

Chalco considers the environmental and social aspects as equally important for its sustainable development and divides its materiality into two major aspects: environmental and social. Chalco constructed its materiality matrices according to the analytical results of the questionnaires to illustrate its material ESG issues to its stakeholders.



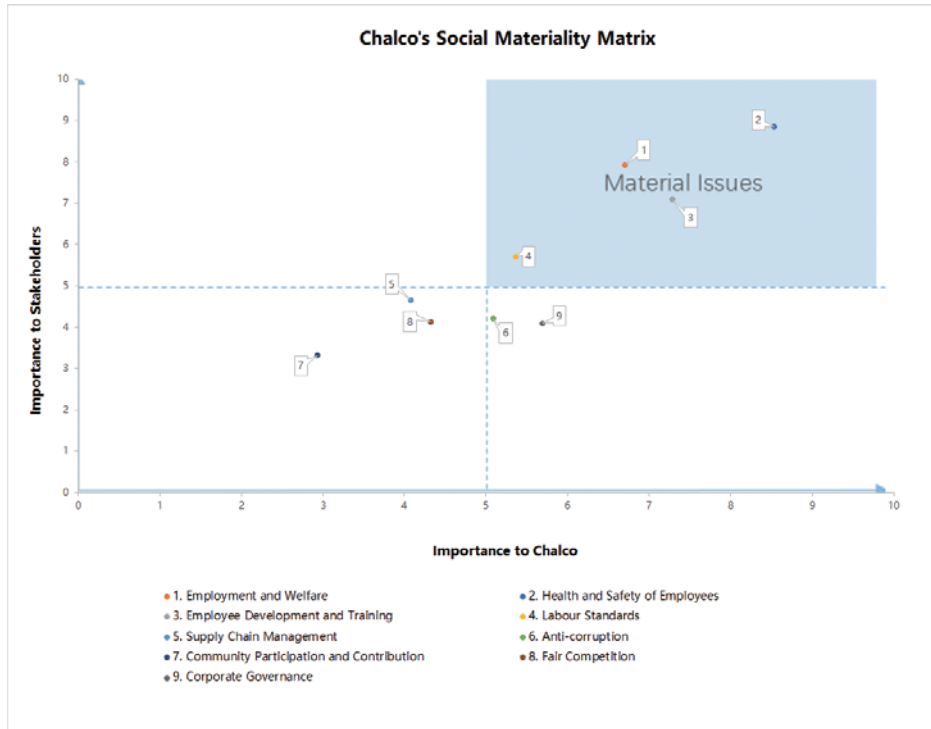
Stakeholder Engagement (Continued)

Chalco’s Environmental and Social Materiality Matrices



3 In the materiality assessment, the “Major Shareholders” ‘s, “Board of Directors” ‘s, “Board of Supervisors” ‘s, and “Management” ‘s opinions represent “the importance to Chalco”. on behalf of “Main holders”, “Government and Regulators”, “Employees”; the views of “Customers”, “Peer Companies”, “Potential Investors and Financial Institutions”, “Suppliers”, “Contractors”, “Sticky” and “Community and the Public” represent “importance to stakeholders” The importance of the opinions of the various stakeholders in “Importance to Stakeholders” is the same.

Stakeholder Engagement (Continued)



Stakeholder Engagement (Continued)

ESG issues prioritization

**Materiality
(Sorting
from high
materiality
to low
materiality)**

	Environmental Aspects	Social Aspects
1	Air Emission and Management	Health and Safety of Employees
2	Discharge and Management	Employment and Welfare
3	Solid Waste Generation and Management	Employee Development and Training
4	Energy Use and Efficiency	Labour Standards
5	Water Use and Efficiency	Corporate Governance
6	Greenhouse Gas ("GHG") Emission and Management	Anti-corruption
7	Land Management and Restoration	Supply Chain Management
8	Bauxite Tailings	Fair Competition
9		Community Participation and Contribution

Chalco has been able to identify 8 material issues by analysing the results of the survey and disclosed them in detail in this report. In the future, the Group will continue to deepen and strengthen the communication with stakeholders.

Stakeholder Engagement (Continued)

The results of the materiality assessment show that stakeholders consider the following issues to be material for Chalco:

Environmental Aspects	Responding Section
Air Emission and Management Discharge and Management Solid Waste Generation and Management Energy Use and Efficiency	Green Development – Achieving Green Production
Social Aspects	Responding Section
Employee Health and Safety Employment and Welfare Employee Development and Training Labour Standards	Caring Employees – Ensuring Production Safety

Responsibility and Governance – Continuously Creating Value

Chalco strives to improve its corporate governance and to fulfil its corporate responsibilities in the political, economic, and social spheres. The Company strives to improve its major business in terms of quality and scale and to give full play to its role as a state-owned enterprise (“SOE”) to demonstrate the values of a SOE directly under the central government (“CSOE”). With pragmatic and prudent management, Chalco’s commitments to shareholders, investors, employees, and partners are fully fulfilled.

4.1 PROMOTING THE IMPROVEMENT OF CORPORATE GOVERNANCE

The Group has become a leading company in China’s non-ferrous industry, with a strong portfolio of assets among global companies. Chinalco has been the Company’s ultimate holding company, which directly held 33.87% equity interest of the Company and together with its subsidiaries held an aggregate of 36.62% equity interest of the Company. The Company issued 2,118,874,715 A shares upon the confirmation of the issue of shares to purchase assets on February 25, 2019⁴. As of the issuance, Chinalco has directly held 29.67% of the Company’s shares, and together with its subsidiaries, holds 32.06% of the Company’s shares.

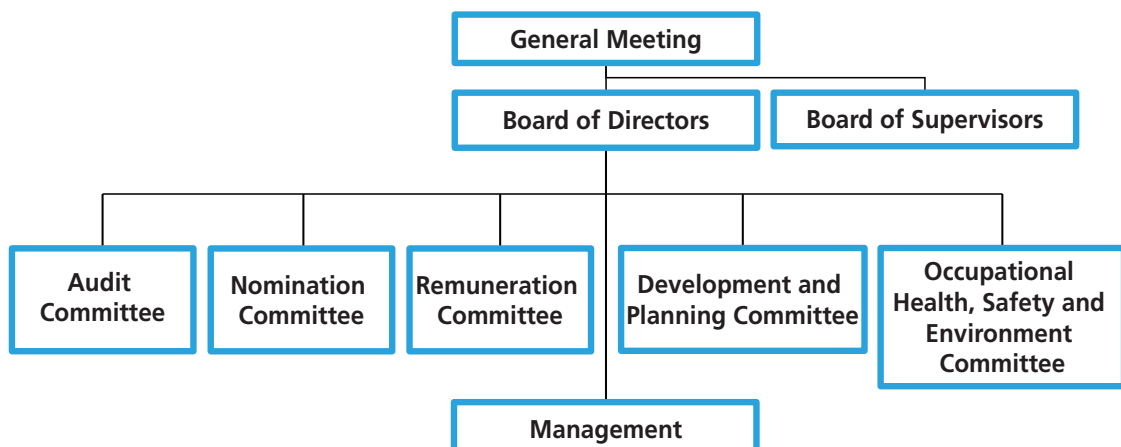
If you would like to know more about the Company’s operation and management, please refer to its *2018 Annual Report*. Please refer to the Company’s website for information on the organisational structure of the Company: http://www.chalco.com.cn/chalco/gsgk/cyqy/A120107web_1.htm.

4 The details are set out in the announcement of the Company dated 26 February 2019

Responsibility and Governance – Continuously Creating Value (Continued)

Chalco has strictly complied with the requirements of the *Company Law of China*, *China Securities Regulatory Commission's Code of Corporate Governance for Listed Companies in China* and *Rules Governing the Listing of Stocks on Shanghai Stock Exchange*, *Rules Governing the Listing of Securities on SEHK*, and *The New York Stock Exchange Listed Company Manual*. The Company has formulated a clear governance system, procedures and working processes, continued to deepen and improved the governance structure "Three Boards and One Layer" consisting of General Meeting, Board of Directors, Board of Supervisors, and Management, as well as other governance systems. Chalco's goals are to further improve the Company's governance, to regulate the work flow and management processes of the Company's operations, and to maintain sustainable, stable, and sound development, creating values for both the shareholders and the society.

Chalco's "Three Boards and One Layer"



Responsibility and Governance – Continuously Creating Value (Continued)

General Meeting

The general meeting is the highest authority of Chalco, legally exercising its rights: to decide on the Company's management principles and investment plans; to review and approve profit distribution and loss recovery plans; and to revise the Company's constitution and the rules and procedures for general meetings, meetings of the Board of Directors and Board of Supervisors. During the reporting period, Chalco held 3 general meetings, and reviewed and passed 33 proposals.

Board of Directors

Board of Directors is the operating decision-making body of Chalco, accountable to the general meeting. The Board of Directors legally exercises its duties including but not limited to the following items: executing the resolutions of general meetings; deciding on the Company's development strategies, business plans and investment plans; and formulating the Company's annual financial budget, financial statement, profit distribution plan, loss recovery plan, as well as any proposal to increase or decrease registered capital. The Board also determines basic management systems, including policies and processes for the management of risk, internal controls and compliance, equity incentive plans etc., as well as supervises the implementation of the Company's regulatory obligations.

Responsibility and Governance – Continuously Creating Value (Continued)

As of the end of the Reporting Period, the Company's sixth session of Board of Directors consisted of 9 directors: Mr. Yu Dehui⁵, Chairman and Executive Director; Mr. Lu Dongliang, Mr. Jiang Yinggang, and Mr. Zhu Runzhou, Executive Directors; Mr. Ao Hong⁶, and Mr. Wang Jun, Non-Executive Directors; and Ms. Chen Lijie, Mr. Hu Shihai and Mr. Li Dazhuang, Independent Non-Executive Directors. The Board held 18 meetings, reviewed and passed 79 proposals during the Reporting Period.

Board of Supervisors

The Board of Supervisors is the Company's supervisory body, accountable to the general meeting. The Board of Supervisors legally exercises its duties to inspect and investigate the Company's financial and risk management and internal controls, to supervise and appraise the performance of the Board of Directors, senior management and their members, as well as to give opinions and make recommendations.

As of the end of the Reporting Period, the Board of Supervisors consisted of: Mr. Ye Guohua⁷, Chairman; and Mr. Wang Jun⁸ and Mr. Wu Zuoming, Supervisors. The Board held 8 meetings, reviewed and approved 14 proposals during the Reporting Period.

-
- 5 On February 21, 2019, Mr. Yu Dehui proposed to resign as the chairman and the executive director of the Company and from all other positions in each of the special committees under the Board due to work and reform needs. Mr. Lu Dongliang proposed to resign as the president of the Company due to work and reform needs and took effect on the same day. As considered and approved at the 39th meeting of the sixth session of the Board convened by the Company on the same day, the Board elected Mr. Lu Dongliang as the chairman of the sixth session of the Board of the Company. On the same day, the Board of the Company considered and approved to appoint Mr. He Zihui ("Mr. He") as the president of the Company as well as to agree to nominate Mr. He Zihui as a candidate for an executive director of the sixth session of Board of Directors of the Company.
- 6 Due to change in work arrangements, Mr. Liu Caiming proposed to resign as a Non-executive director of the Company on 25 May 2018 and the resignation has taken effect on the same day.
- 7 On November 20, 2018, Mr. Liu Xiangmin proposed to resign as the chairman and supervisor of the Company's Board of Supervisors due to work transfer. The Company held the 14th meeting of the sixth session of the Board of Supervisors and agreed to nominate Mr. Ye Guohua as a candidate for a shareholder representative supervisor of the sixth session of the Board of Supervisors of the Company on the same day. After the election of the 2nd Extraordinary General Meeting of Shareholders held on December 11, 2018, Mr. Ye Guohua was elected as the shareholder representative supervisor of the sixth session of the Board of Supervisors of the Company. On the same day, the Company held the 15th meeting of the sixth session of the Board of Supervisors to elect Mr. Ye Guohua as the chairman of the Board of Supervisors of the sixth session of the Board of Supervisors of the Company. The resignation of Mr. Liu Xiangmin took effect on the same day.
- 8 On December 24, 2018, Mr. Wang Jun proposed to resign as the supervisor of the Company due to work transfer. On the same day, the Company held the 16th meeting of the sixth session of the Board of Supervisors and agreed to nominate Ms. Shan Shulan as a candidate for a shareholder representative supervisor of the sixth session of the Board of Supervisors. After the election of the Company's first Extraordinary Shareholders Meeting held on February 20, 2019, Ms. Shan Shulan was elected as the shareholder representative supervisor of the sixth Board of supervisors of the Company. The resignation of Mr. Wang Jun took effect on the same day.

Responsibility and Governance – Continuously Creating Value (Continued)

Management

The main functions of management include being in charge of the Company's production and other operations, organising the implementation of the Board of Directors' resolutions and the Company's development strategies, annual business plan, investment plan, financial budget plan, as well as formulating and carrying out performance appraisals and the remuneration incentive scheme. The Board of Directors reviews the functions and performance of management to protect the interest of the Company as a whole. Executive management reports on the signing and implementation of major contracts, the use of funds, and the Company's profit and loss situation.

As of the end of the Reporting Period, the Company's key management included: Mr. Lu Dongliang⁹, President; Mr. Jiang Yinggang¹⁰, Senior Vice President; Mr. Zhu Runzhou, and Mr. Tian Yong¹¹, Vice President; Mr. Zhang Zhankui¹², Chief Financial Officer and the Company's Secretary (Board Secretary). For specific information on management, please see the Company's website: http://www.chalco.com.cn/chalco/gsgk/glry/A120110web_1.htm.

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- 9 Due to change in work arrangements, Mr. Ao Hong proposed to resign as the President of the Company on 13 February 2018. The Company approved to remove Mr. Ao Hong from the position of President and approved to appoint Mr. Lu Dongliang as the President of the Company and to dismiss Mr. Lu Dongliang from the original position of Senior Vice President of the Company at the 20th meeting of the sixth session of the Board held by the Company on the same day. The resignation and appointment have taken effect on the same day. As Mr. Ao Hong will not hold any executive position in the Company upon his resignation as the President of the Company, Mr. Ao Hong was reassigned from an Executive Director to a Non-executive Director.
- 10 The Company approved to appoint Mr. Jiang Yinggang as the Senior Vice President of the Company and remove him from the position of Vice President at the same time at the 27th meeting of the sixth session of the Board held on 26 June 2018, and the appointment and removal have taken effect on the same day.
- 11 The Company approved to appoint Mr. Zhu Runzhou as the Vice President of the Company at the 24th meeting of the sixth session of the Board held by the Company on 25 May 2018, and the appointment has taken effect on the same day. Due to change in work arrangements, Mr. Xu Bo proposed to resign as the Vice President of the Company on 6 June 2018. On the same day, the Company appointed Mr. Tian Yong as a Vice President of the Company at the 25th meeting of the sixth session of the Board held by the Company, and the resignation and appointment have taken effect on the same day. Due to the re-arrangement of work for other appointment, Mr. Leng Zhengxu had resigned as Vice President of the Company on 26 October 2018, and the resignation took effect from the same day.
- 12 On February 20, 2019, Mr. Zhang Zhankui proposed to resign as the Company's Chief Financial Officer and Secretary of the Board of Directors (the Company's Secretary). On the same day, the Company held the 38th meeting of the sixth session of the Board of Directors to approved to dismiss Mr. Zhang Zhankui from the positions of the Chief Financial Officer and Secretary of the Board of Directors (the Company's Secretary) and approved the appointment of Mr. Wang Jun as the Company's Chief Financial Officer and Secretary of the Board of Directors (the Company's Secretary).

Occupational Health, Safety and Environment Committee

During the Reporting Period, Chalco has further specified the work of the Occupational Health, Safety and Environment Committee (“OHSEC”) by revising its duties. OHSEC is responsible for decision-making and execution related to occupational health and safety and environmental protection issues of Chalco. OHSEC also studies and assess major issues in the areas of occupational health and safety and environmental protection across the Company’s business. The President of the Company serves as the director of the OHSEC, and the Vice President of the Company in charge of safety and environmental protection serves as the deputy director. In order to comprehensively respond to the issues related to occupational health and safety and environmental protection, OHSEC is composed of the personnel from the Safety, Environmental Protection and Security Department (“SESD”), the President’s Office, the Human Resources Department, the Financial Management Department, the Investment Management Department, the Corporate Management Department, the Marketing & Procurement Department, the Internal Audit Department, the Sci-Tech Management Department, the Information Management Department, the Legal Department, the Culture Department, Chalco Trading, Chalco Hong Kong, Chalco Energy, and Chalco Logistics. SESD, which is under OHSEC, has been established to assist OHSEC in its daily duties.

The major tasks of OHSEC:

- Promote, implement and fulfil the national policies, laws, regulations and standards related to occupational health and safety and environmental protection
- Research and develop Chalco’s development strategies, guidelines, policies and targets related to occupational health and safety and environmental protection
- Study major issues related to occupational health and safety and environmental protection across Chalco’s business, and review management systems related to occupational health and safety and environmental protection

This Report basically presents the Chalco’s corporate governance system and corresponding work during the Reporting Period. If you want to know more details, please refer to the *Report on Corporate Governance and Internal Control* in the *2018 Annual Report* of the Company.

Responsibility and Governance – Continuously Creating Value (Continued)

Improving the System – Enhancing the Effectiveness of Governance

In the year of 2018, Chalco has continuously improved the Chalco Business System (CBS). The system provides a unified appraisal system and problem-solving procedures for the Company's operation and management. It provides experiences for the Company to improve standards, to summarize and share best practices, to accelerate the training of talents, and to continuously improve performance and reduce costs. Based on the Company's vision, core values, and the Company's medium- and short-term governance goals, the Company has implemented CBS to incorporate corporate social responsibility ("CSR") into precise management. Under the governance structure "Three Boards and One Layer", Chalco has continuously strengthened and improved the corporate governance through system building.

Enhancing the Quality Control of Statement

Chalco has continued to optimise the preparation of various statements and strictly monitor the quality of information and data. During the Reporting Period, the Company progressed towards the establishment of financial informatization. The coverage of the SAP system basically includes the branches and subsidiaries; the figures in the statement required for annual audits are automatically retrieved from the SAP system. The establishment of the SAP system greatly improves the productivity of financial personnel and the accuracy of the financial information. The Company invited tax consultants, professional auditors, and professional management software consultants to provide training to the branches and subsidiaries, and the outcome was excellent. In addition, the Company carries out the financial responsibility system. It keeps adopting the monthly report scoring system and incorporates the scoring results into the assessment of the financial director. The increasing importance of accounting in the Company ensures quality preparation of the financial statements and reports.

Responsibility and Governance – Continuously Creating Value (Continued)

Maintaining Investors' Relations

In the year of 2018, Chalco has continued to increase its communication with investors in different channels. During the Reporting Period, Chalco has received 47 batches of world-renowned institutional investors and analysts (304 visitors in total), and has announced results 4 times and received a total of 474 investors and analysts.

In the year of 2018, Chalco conducted roadshows and 130 investor meetings (468 investors in total) in Hong Kong, Singapore, and Europe, as well as major cities in China after the releases of Chalco's 2017 Annual Report and 2018 Interim Report. Chalco has been given compliments by domestic and foreign investors. Besides, investors have been offered a chance to explore Baotou Aluminum's, Chalco Shandong's and Shanxi New Materials' businesses in detail. Through a series of measures to improve its operations and effectiveness in recent years, and the open, transparent and efficient communication with domestic and foreign investors, the Company has gained recognition in the domestic and overseas capital markets. Chalco was named the "Most Respected Company – Best Corporate Governance" in *Institutional Investor's* 2018 All Asia Executive Team Survey and recognized as one of the "Most Honored Companies" in Asia. Chalco also won the awards of the Securities Times' "Jinyi Award – Most Valuable Hong Kong Connected Securities".

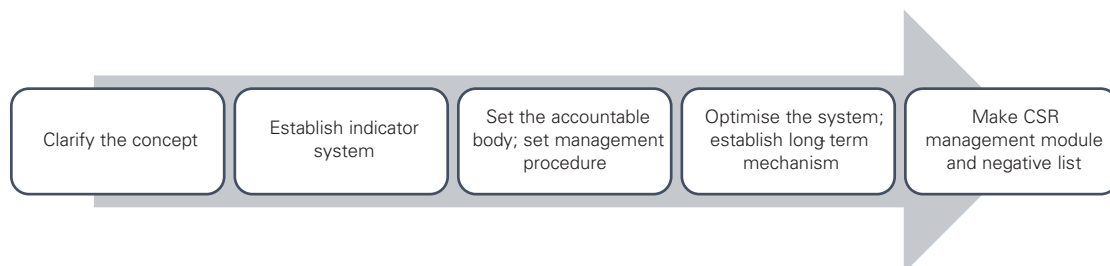
Safeguarding the Interests of Creditors

In the first half of 2018, due to the tight capital supply in the international market and the interest rate hike by the Federal Reserve, the issuances of domestic bonds in China and US dollar bonds were difficult in the market. In response to this difficulty in financing, Chalco has proactively established various plans and prepared several financing tools. With the announcement of the bank reserve requirement ratios cut by the People’s Bank of China in July 2018 and the slowdown in the interest rate hike by the Federal Reserve, Chalco seized the opportunity to launch the issuances of US dollar bonds and corporate bonds, completing the issuance of RMB5 billion domestic bonds and USD400 million senior Bonds with 20–40 basis points lower than the market rate and saving around RMB24 million financial cost. The Company has transitioned safely from the matured USD perpetual bonds and ensured the stability of the offshore capital and preventing overseas regulatory risks.

4.2 SOLIDIFYING SUSTAINABLE DEVELOPMENT

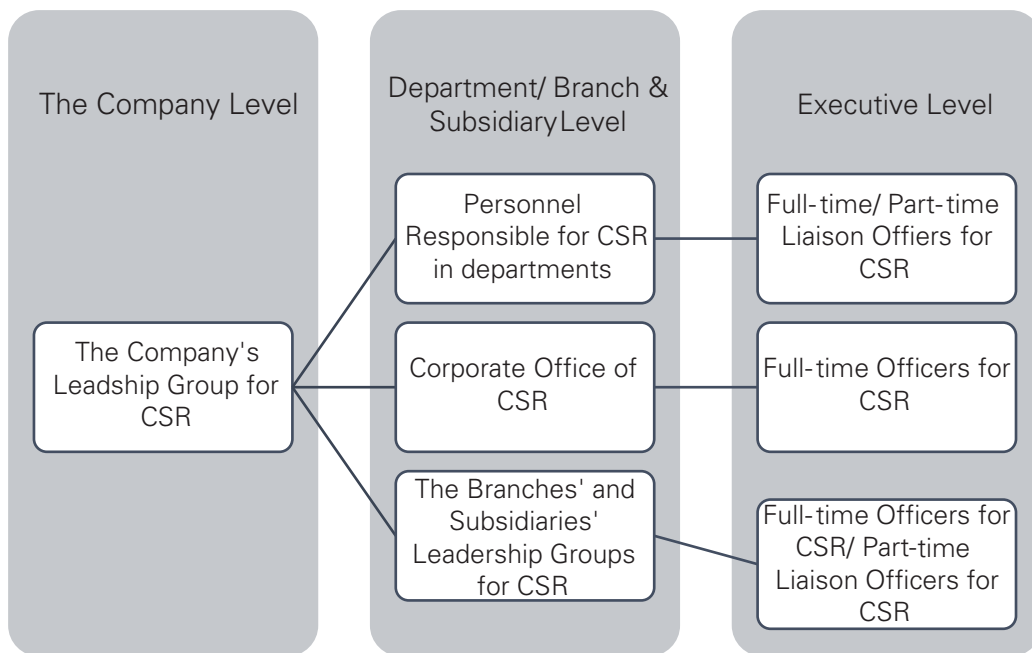
While enjoying the development opportunities brought by the country and society, Chalco has proactively integrated CSR into management, integrated sustainable development into its own long-term development goals, maintained competitiveness for the successful development of enterprise, and shouldered its responsibilities to stakeholders. Guided by the responsibility concept with the CSR philosophy of “turning stone into gold and benefiting mankind”, Chalco has integrated the working guidance for CSR into “five steps” management process, incorporating CSR into daily corporate management systems, making the relevant departments accountable for results, and making such responsibilities part of performance appraisal criteria.

Chalco’s Five Steps of Integrating CSR into Management



Organisational System Building for Fulfilling Responsibilities

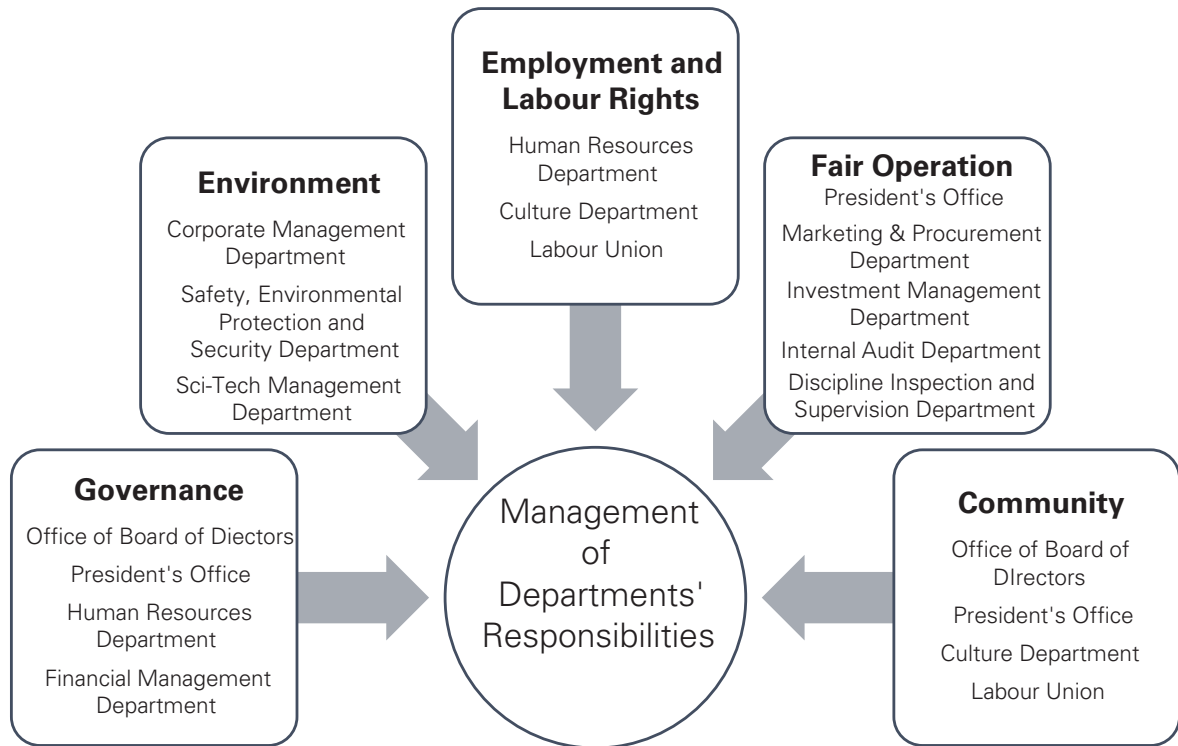
Chalco's CSR Management Structure



In order for Chalco to better carry out the social responsibility work and to keep track of the latest progress of various work, Chalco has established a leadership group for CSR with Chairman of the Board of Directors as the group leader and the President as the representative of CSR management. With the guidance by the leadership group for CSR, specific agencies have been set up at the department, branch, and subsidiary levels to make the relevant departments accountable for management of their responsibilities in five fields: company governance, the environment, employment and employee rights, operating practices and community responsibility. In addition, officers and liaison officers for CSR have been appointed to execute the Company's CSR policies in every section of operation.

Responsibility and Governance – Continuously Creating Value (Continued)

Chalco's CSR Responsibilities and Corresponding Departments



Enhanced Effectiveness through Consolidating Governance System

During the Reporting Period, Chalco launched various CSR work plans to enhance performance, to improve customer satisfaction, to reflect its operation philosophy, and to bring benefits to stakeholders. The Company has achieved good results in the performance, customer satisfaction, operation philosophy and community building, which laid a solid foundation for Chalco to further optimise its reform of CSR management system in the future and provided valuable experience for the Company to fully introduce its concept of sustainable development. Besides, it has effectively enhanced the confidence of all departments and units of the Company to execute CSR work plans.

Responsibility and Governance – Continuously Creating Value (Continued)

Steadily Improve Performance	<ul style="list-style-type: none">• The outputs of major products have increased in different degrees. The cost control of some products has reached the advanced level of the industry. The business performance has been steadily improved.
Continuously Improve Customer Satisfaction	<ul style="list-style-type: none">• Comprehensive solutions and products are welcomed by domestic and overseas customers.
Promote the Reflection of Operation Philosophy	<ul style="list-style-type: none">• The requirements of CSR are integrated into corporate operations; the stakeholders' expectations and needs are incorporated into daily
Benefit Stakeholders	<ul style="list-style-type: none">• The investor rights are maintained; the investment in environmental protection is increased; the employees are cared; Community building and target poverty alleviation are actively participated.

4.3 ENHANCING RISK MANAGEMENT AND CONTROL

Chalco has closely followed the national requirements for state-owned holding enterprises and the newest requirements of the industrial standards and internationally accreditation requirements, and continuously updated internal management measures to achieve comprehensive compliance. In the future, Chalco will focus on preventing environmental, social and governance risks, further strengthen the risk management and control at the corporate operation level and assume comprehensive management of operational risks to meet the investors' and other major stakeholders' requirements and expectations to the Company.

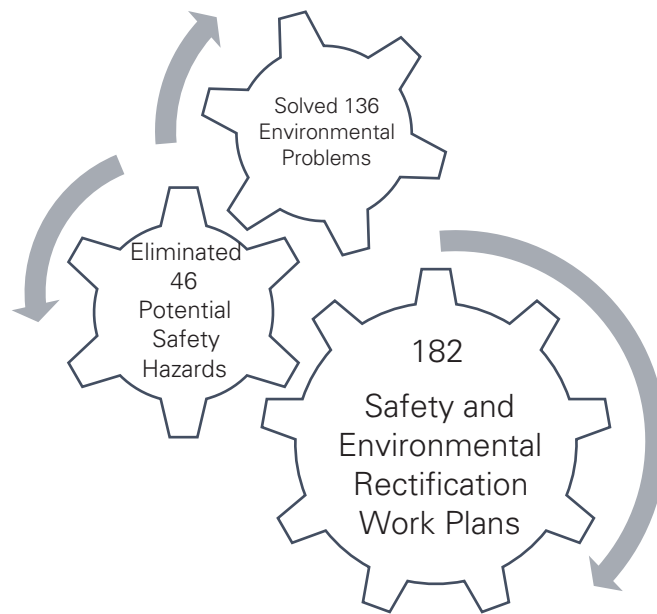
Implementing Environmental and Social Risk Management and Control

Under the increasingly serious situation of environmental and social risk, Chalco strives to enhance the management of employee safety, ecological and environmental protection and community investment. Through enhancing safety and environmental protection supervision and accountability, the Company implements safety and environmental protection work and improves the capability and level of safety and environmental protection management. The Company has integrated environmental and safety monitoring and instruction into a comprehensive system by proactively adopting safety management standardization, continuously enhancing safety management, and actively responding to the national green policies and environmental protection policies. Of particular note is the simple policy of listing and assessing safety problems required by the SASAC in a coordinated and systematic manner. Chalco has been determined to carry out CSR work to invest and serve the local communities, in which the Company has proactively connected with the community and carried out investment work in the locations where the operation projects are located, thus achieving a win-win situation between the communities and the Company.

In the year of 2018, Chalco fully entered into the spirit of the “Chinalco’s Battles for Safety, Environmental Protection, and Quality” promoted in the pledge ceremony. Upholding the commitment to putting into the implementation of the working plans established in early 2018, the Company has adhered to the new development concept, adhered to the bottom-line thinking, adhered to the problem-oriented approach, focused on the key issues, innovated work approach, and enhanced coordination. These working plans have been effective to a certain extent in the areas of employee safety, ecological and environmental protection, and product quality. In the year of 2018, Chalco summarized and listed the issues related to safety and environmental protection, strengthened coordination among departments, increased the frequency of one-to-one video conferences with the branches and subsidiaries, assigned responsible personnel and established a timeline and a roadmap for elimination of potential safety hazards and treatment of environmental issues in the departments, branches and subsidiaries.

Responsibility and Governance – Continuously Creating Value (Continued)

During the Reporting Period, Chalco carried out 46 safety rectification work plans in total in which 46 work plans have been successfully implemented with 100% completion rate; in the year of 2018, 136 environmental rectification work plans have been carried out in which 136 work plans have been accomplished with 100% completion rate. Significant progress on the performance of safety and environmental protection has been highlighted by the safe production maintained and the ecological advancement yielded.



Comprehensive Building of Operational Risk System

Chalco's internal risk control is conducted by the Board of Supervisors and the Internal Audit Department. Annual specific work plans for formally listed safety problems in departments, branches and subsidiaries are launched to assist the branches and subsidiaries in self-inspection and correction of problems. In the year of 2018, the Company has continued to promote comprehensive risk management and control, to improve the procedure of comprehensive risk recognition, to streamline the work, to find problems, and to supervise problem correction. The effectiveness of the risk management system has been maintained, thus improving the levels of internal control and risk prevention. The Company has implemented "Double Level" risk identification and assessment processes, through which employees can participate in basic risk management work such as risk identification and assessment.

Responsibility and Governance – Continuously Creating Value (Continued)

“Double Level” Risk Identification and Assessment Process

Level One (Departments/branches and Subsidiaries)

Level Two (Internal Audit Department)

Identify the risks which the Group has been posed; assess significant risks, important risks, and general risks; analyse significant risks and raise responsive solutions and measures of management and control

Summarize the risk assessment results at branch and subsidiary levels and Internal Audit Department level; figure out significant risk sources, and make management strategy and measures of management and control

The Internal Audit Department summarizes and adjusts the risk assessment results of departments, branches and subsidiaries to formulate the result of level one

Supervise all departments, branches and subsidiaries **to effectively** prevent and control risks, and proactively rectify the issues

Case Study : 2018 Key Risk Management

During the Reporting Period, Chalco identified and confirmed natural gas supply as one of the key risks. Relevant departments immediately analysed the main causes of the risks upon the identification and confirmation of the risk. Emergency measures have been identified and formulated in the meetings. Moreover, the future situation has been conjectured and policies have been formulated to manage the risk.

Part of the management measures:

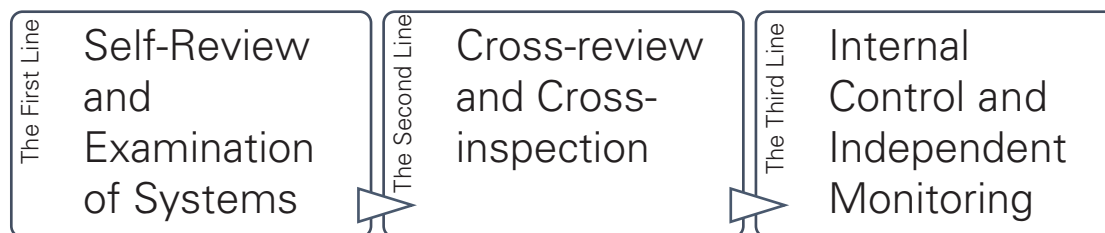
- To negotiate with natural gas suppliers in different areas independently, and to determine the amount and the price of natural gas supply
- To prepare and improve the prearranged plan for emergency to minimize the loss caused by natural gas restriction and stoppage
- Branches and subsidiaries that fail to obtain long-term stable natural gas supply should consider the feasibility of building a gas stove in compliance with environmental protection regulations to ensure stable production

Conducting Internal Audits in a Serious Manner

Chalco recognizes that strengthening internal audit is crucial to enhancing corporate risk management and risk control, to achieving full coverage of audits, and to promoting green and high-quality development. Chalco is committed to maintaining the effectiveness of its production and operation, thus promoting the establishment of a sound internal control system and comprehensive risk management system. In the year of 2018, the Internal Audit Department of the Company has continued to promote and guide all departments, branches and subsidiaries to conduct self-inspection of systems. The Company has encouraged all departments, branches, and subsidiaries to learn from each other through the model of “Cross-review and Cross-inspection” and required all departments, branches, and subsidiaries to actively cooperate with the Internal Audit Department to implement the work plans of “Internal Control and Independent Monitoring”.

The “Three Lines of Defence” in the Internal Audit

The “Three Lines of Defence” in the Internal Audit



The scope of audit established by the Internal Audit Department covers key business procedures, including capital management and project management, special work including contract cleaning and non-operational real estate management cleaning, and the completion of related reform plans. Through internal control and cross-inspection, Chalco has expanded the coverage of supervision and inspection and facilitated the improvement of weak points in corporate management. At the same time, business communication has been enhanced, the internal audit team has been trained and improved, and the coordination of different departments has been promoted.

During the Reporting Period, Chalco’s Internal Audit Department conducted 8 unannounced inspections to Guizhou Branch, Lvliang Mining, Zunyi Alumina, Zunyi Aluminum, Chalco Shandong, Chalco Logistics, Ningxia Energy and Guizhou Huajin and found nearly 200 problems. Through inspections, the problems in contract approval management and authorization management were solved. This has helped the Legal Department of the Company to fundamentally avoid the risks of contract management and authorization management.

Responsibility and Governance – Continuously Creating Value (Continued)

In the year 2019, the Company will focus on clarifying the core work items and strengthening the supervision and management under the new situation of green and high-quality development of the Company. Highlighting the importance of improving the internal control system and comprehensive risk management system, the Company will promote high-quality development by closely monitoring the progress of rectification of key function units, weaknesses, and disadvantages of operations through supervision according to the model of “Three Lines of Defence”, and promoting the establishment of massive supervision system with the purpose of integration of supervision across the organisation.

Deepening Anti-corruption Work – Implementing Party Building Work

Since the 18th Party Congress, the sixth year of working on fine Party culture and clean organisation building, and anti-corruption, the Company has strived to carry out the “Two Responsibilities” for fine Party culture and clean organisation building through promoting the formulation and implementation of an effective accountability system. In the year of 2018, Chalco, while learning hard and carrying out the spirit of the 19th Party Congress, has implemented the Party Central Committee’s “Eight-point Decision” and took relentless and nonstop effort in fine Party culture and clean organisation building, and anti-corruption to further promote the Company’s anti-corruption and integrity work. The Company has kept enhancing online and offline education on clean governance by establishing platforms for learning and sharing through the corporate newspaper, WeChat official account, working groups, and mini-lectures. In addition, through the quarterly conference on fine-Party-and-clean-organisation-themed education, the Company has regularly organised visits to anti-corruption-themed education stations, guides cadres and employees to stick to the baseline, stay away from red line issues, and pursue idealism.

The Company earnestly implemented the work plans of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and the spirit of the 19th Party Congress. During the Reporting Period, the Company further promoted the “Ten One” series of activities and organised talks and seminars for the leaders at various levels with more than 3000 sessions. 112,000 employees have been trained, and more than 3,100 leaders and cadres (who are above or at the middle level) have been trained intensively. The Party members’ and cadres’ “Four Awareness”, “Four Confidences”, and “Two Maintenance” have been enhanced, solidified, and practiced respectively.

Responsibility and Governance – Continuously Creating Value (Continued)

The Company has established the rules of public work relating to Party Committee formulation and duties, standardized the management measures of Party's branches, and launched the management measures for funding of organising Party activities. During the Reporting Period, the Company optimised the assessment plan and criteria for Party building, promoted the "Two Hundreds" assessment¹³ to the basic level, and achieved full coverage of the "Two Hundreds" assessment. In accordance with the requirements of "Full Coverage within Three Years", the branches and subsidiaries have been supervised to convene a meeting for debriefing, assessing, and evaluating Party Committee Secretaries' Party building work, promoted the transfer of responsibility of Party building across the levels, and implemented the work effectively. The Discipline Inspection and Supervision Department has requested Party Committee Secretaries, Deputy Secretaries and Secretary of the Commission for Discipline Inspection with a total of 120 to provide written reports for debriefing, and 16 comrades have been requested to debrief on-site.



Left: Chalco's Party Committee visited Hebei Langfang Legal System Promotion and Education Center

Below: Chalco's Party Members and Cadres participated in Chinalco's 19th Conference on Warning and Education of Fine Party Culture and Clean Organisation Building



13 "Two Hundreds" assessment refers to the assessment of performances against specific objectives relating to business and Party building.

Green Development – Achieving Green Production

A good ecological environment is required inherently for the realization of Chinese nation's sustainable development. The report of the 19th Party Congress proposes triumphing over the battle for preventing and control pollution. Under the guidance of the spirit of the "Battles for Safety, Environmental Protection, and Quality", Chalco adheres to low-carbon and green development, promotes energy saving, emission reduction and recycling, pursues harmony between corporate operations and environmental protection, and builds a beautiful China.

Adopting the principle of "treasuring resources and using resources wisely", Chalco proactively introduces measures for management of pollution controls, ecological environment protection, mining site reclamation, sustainable use of resources, and biodiversity protection, thus minimizing the environmental impact caused by the production and demonstrating the exemplary role of Chalco in the industry. During the Reporting Period, Chalco reviewed and assessed the environmental issues on the list, confirmed the rectification plan for environmental issues, strengthened coordination among various departments, and thoroughly solved 101 environmental problems. The major achievements included strengthening management and control of wastewater discharge, air emission and solid waste generation; achieving compliance with wastewater standards and zero discharge; Chalco also increased input of resources to promote the establishment of safety and environmental protection construction project. Two aluminum electrolysis spent potlining detoxification process lines have been built (spent potlining is commonly known as "overhaul slag"), 7 furnaces have been treated in time and upgraded according to a higher standard, and 5 thermal power boilers have adopted the ultra-low emission reformation, 4 green mines have been built and land reclamation around the green mines has started. Experts have been coordinated to participate in the cross-inspection among the branches and subsidiaries, on-site environmental inspections have been enhanced, thus improving the exchange of experience among the branches and subsidiaries and the effectiveness of inspections.

5.1 REDUCING ENVIRONMENTAL IMPACTS

Chalco observes the *Chinalco's Management Measures for Environmental Protection* on the basis of strictly abiding by relevant national laws and regulations, as well as local policies. The Company proactively promotes cleaner production, energy saving and emission reduction to minimise resource consumption and emissions. The Company has formulated the *Chalco's 2018 Plan for Energy Saving and Emission Reduction*, which clearly imposes the limits of total emission amount of major pollutants including sulfur dioxide ("SO₂"), nitrogen oxides ("NO_x"), chemical oxygen demand ("COD"), ammonia nitrogen etc. During the Reporting Period, the total emission amounts were below that stipulated limits in the *Emission Reduction Plan*.

Green Development – Achieving Green Production (Continued)

Table: Chalco 2018 Annual Emission Reduction Targets and Performance

Indicators	Unit	2018 Targets	2018 Performance
SO ₂ Emission	Metric Tons	45,310	44,420
NO _x Emission	Metric Tons	23,870	16,421
COD Emission	Metric Tons	564	383
Ammonia Nitrogen Emission	Metric Tons	103	22
The Ratio of Industrial Water Reuse	%	97	96.44

In the year of 2018, Chalco has continued to raise the standard of clean production, energy saving and emission reduction while conducting research and development for production in order to strike a balance between enhancing productivity and achieving energy saving and emission reduction at the level of energy-consuming and emission sources. The Group has also improved the emission standard and reduced the emission by continuously upgrading the environmental protection equipment. In addition, the Group has further improved the basic management of environmental protection from the perspectives of environmental monitoring, maintenance of pollution control facility, pollutant discharge permits system, and legal compliance review.

The Company has strictly observed the *Chinalco's Prearranged Plan for Environmental Emergency* to standardise environmental incident reporting and emergency response procedures, and to establish an emergency response mechanism with unified leadership, hierarchical responsibility, and quick response. The Group continues its zero-tolerance attitude towards environmental pollution accidents. During the Reporting Period, there were no significant environmental accidents caused by the Group.

The environmental impacts of the Group's business mainly include air emission, waste generation, GHG emission and physical destruction to the surrounding environment, which are caused by the exploration and exploitation of natural resources, the production, and the thermal power generation. This section describes how the Group reduces and mitigates its impacts.

Green Development – Achieving Green Production (Continued)

Air Emission Reduction

Major air emissions produced by Chalco include SO₂, NO_x, and soot, and the Company remains committed to reducing air emissions through improving and innovating production. In the year of 2018, the Company has targeted the suitable branches and subsidiaries according to the characteristics of emissions in different production processes to promote the integrated ultra-low emission management and achieved good results; Zhongzhou Aluminum has carried ultra-low soot emission reformation to 4 kilns (for processed materials) to tackle the issue of flue gas with high soot concentration generation during the production of refined alumina, in which reformation of 3 kilns has been completed; Chalco Mining has built a denitration system in the calcination zone to realize ultra-low NO_x emission.

Case Study: Upgrading Flue Gas Purification System of Liancheng Aluminum

Liancheng Aluminum has upgraded the carbon calcination flue gas purification system to lower the air emissions and achieve the environmental protection requirements for particulate matter ("PM"), asphalt fumes, SO₂, fluoride, NO_x and other harmful substances in the flue gas. After the implementation of the system, it is expected to reduce SO₂ emission by 145.68 metric tons per year, to reduce asphalt fumes emission by 3.12 metric tons, to reduce PM emission by 2.96 metric tons, and to reduce fluoride emissions by 0.38 metric tons, making significant contribution to the improvement of the air quality in the surrounding environment.

Wastewater Treatment

Since 2007, the Company has continuously implemented circulating utilisation of water resources project in alumina enterprises and electrolytic aluminum enterprises, building water circulating technological processes, including rectified circulating water, casting circulating water, air compression station circulating water, carbon technology circulating water, green anode circulating water, and water for producing alumina. In this way, the Company has improved both gradient utilisation (step-wise utilisation) of water and the reuse rate, to ensure the reuse rate is more than 96%, and has achieved both economic benefits and environmental benefits. The water that cannot be reused would be discharged strictly according to national requirements for wastewater treatment.

Green Development – Achieving Green Production (Continued)

Case Study: Chalco Gansu Realising Zero-discharge of Pollutants in Wastewater from Desulfurization

Chalco Gansu has implemented a spray-drying treatment system for zero-discharge of pollutants in wastewater from desulfurization in its own power plant. Once the system starts operating, zero-discharge of pollutants in wastewater from desulfurization will be realised. According to the annual operation time of 5000 hours and the treated wastewater capacity of 6 metric tons per hour, the COD concentration of the wastewater from desulfurization is 23 milligrams per litre, and the reduction of COD concentration is expected to be 0.138 kilograms per hour, and the COD emission will be reduced by 690 kilograms throughout the year. At the same time, through the zero discharge of wastewater, it can completely solve the pollution of the surrounding water environment due to the wastewater of the power plant, thereby reducing the impacts that heavy metals may cause to human health and surround environment, and providing significant environmental and social benefits.

Solid Waste Treatment

- **General Solid Wastes**

According to the related national laws and regulations, the Company has classified and regularly treated the general solid wastes. Currently, major solid wastes of the Company are red mud produced in alumina production, overhaul slag generated from the production of aluminum electrolysis, packing materials used in production and transportation, such as strapping tapes and packing bags, fly ash produced by power plants, and domestic waste. The Company turns trash into treasure by doing research on red mud and fly ash as well as recycling and reusing packing materials, not only improving the efficiency of resource utilisation, but also achieving safe treatment of the solid wastes.

During the Reporting Period, the total amount of industrial solid wastes generated by Chalco was 38,114,696 metric tons, and the amount of general industrial solid wastes produced per RMB10,000 of production value was 3.7 metric tons, in which the total amount of fly ash generated was 4,945,633 metric tons with 3,279,997 metric tons reused; the total amount of slag production was 1,411,571 metric tons with 1,011,814 metric tons reused; the total amount of red mud production was 23,449,705 metric tons with 1,930,890 metric tons reused. In the year of 2018, the comprehensive utilisation rate of Chalco's industrial solid wastes was 26%.

Green Development – Achieving Green Production (Continued)

Case Study: Technology Research for Red Mud Application

In order to improve the efficiency of the Company's non-hazardous wastes, Chalco has continued to arrange scientific research projects to tackle the global problem of comprehensive utilisation of red mud. In the year of 2018, a certain level of progress has been made in the technology research project relating to the red mud storage field ecological reclamation. The experiments on the impact of red mud on soil reclamation and pot planting have been completed, in which the normal growth of six crops in the demonstration zone of 3,000 square meters has realized, achieving 95% above greenery coverage.



The reclaimed land on the left and the red mud storage field waiting for reclamation on the right



The level of vegetation growth in the demonstration zone

Green Development – Achieving Green Production (Continued)

- **Hazardous Wastes**

In accordance with the principles of reduction, harmlessness and recycling, Chalco has proactively promoted the disposal of hazardous wastes and strictly implement the *Chalco's Management Measures for Hazardous Waste* to manage hazardous wastes in the processes of collection, packaging, storage, transfer and disposal. The Company's major hazardous wastes area luminum ash, carbon residue and overhaul slag produced during the production of electrolytic aluminum. During the Reporting Period, the Company properly disposed 19,713 metric tons of aluminum ash, 46,512 metric tons of carbon residue, and 23,554 metric tons of overhaul slag.

The Company has classified hazardous wastes and stored hazardous wastes and ordinary industrial solid wastes in different places. In the places where the hazardous wastes are stored, the Company has taken measures, such as rain prevention and see page prevention, and posted waste storage signs. The disposal of hazardous wastes in the available landfills for hazardous wastes have been carried out in compliance with relevant laws and regulations; harmless treatment has been carried out in available process lines for harmless treatment; if neither of hazardous wastes landfills and harmless treatment process lines are available, the Company shall transfer the hazardous wastes to a qualified third party, and hand in the duplicate forms for the transfer of hazardous wastes to make sure the transfer record is properly registered and hazardous wastes are appropriately transferred and disposed of in accordance with the required procedures.

In order to reduce the amount of hazardous waste generation and reduce its impact on the ecological environment, the Company successfully developed and applied the overhaul slag harmless treatment technology. The Company established a demonstration process line for the treatment of overhaul slag harmless treatment in Baotou Aluminum, and completed the promotion and application of the overhaul slag harmless treatment technology in Chalco Gansu. According to the test results of the third party (Metallurgical Product Quality Inspection Institute of Inner Mongolia Autonomous Region), the treated harmless slag and circulating solution have achieved both the national identification standards for hazardous wastes' extraction toxicity and the national primary standard for the disposal of the Type I of industrial solid wastes. The application of this technology not only effectively reduces the cost of hazardous waste treatment, but also fully solves the environmental problems caused by the disposal of hazardous wastes and has both economic and environmental benefits.

Green Development – Achieving Green Production (Continued)

According to the *Monitoring Report* issued by Lanzhou Environmental Monitoring Station on March 3, 2017, the concentration of the asphalt fume from 500KA No.1 calcining unit of Liancheng Branch's (on September 17, 2018, Liancheng Branch was confirmed to be converted into a subsidiary Liancheng Aluminum in the 31st meeting of the sixth session of the Board of Directors of the Company) exceeded the national emission standard. In response to this issue, the Company has completed the project of renovation of the purification system, and put it into operation in April 2017. At present, all pollutants continue to meet the national emission standard.

In the 2017 ESG Report, the Company disclosed that the Lanzhou Branch¹⁴ had issue on illegal overhaul slag storage and was subject to administrative penalties by the Lanzhou Environmental Protection Bureau and was supervised and rectified by the Ministry of Ecology and Environment on its website. Lanzhou Branch has completed the rectification before March 31, 2018 according to the requirements of the Ministry of Ecology and Environment and has been reviewed and approved by the Ministry of Ecology and Environment and experts. Up to now, the Lanzhou branch has been delisted and supervised, and the newly-invested overhaul slag harmless treatment process line has been operating normally. The treated harmless slag has reached the national Type I solid waste level 1 standard.

In the year of 2018, the Company did not have any relatively serious and above level of environmental incidents, but 10 subsidiaries of the Company including Chalco Shandong and Zhongzhou Aluminum, were fined by the local environmental protection departments. The Company has adopted measures such as flue gas emission reform, dust control in raw materials storage yards, and "three simultaneous"¹⁵ procedures for construction projects. The situation has improved significantly.

14 On September 17, 2018, the Board of Chalco issued an announcement about the capital increase to Chalco Gansu by transfer of Lanzhou Branch and converted the Lanzhou branch into a subsidiary by the means of complete capital increase to Chalco Gansu.

15 Three Simultaneous" procedures refer to the design, construction, and operation of pollution control facilities should be carried out simultaneously with the design, construction, and operation of the major project.

Green Development – Achieving Green Production (Continued)

Carbon Reduction Initiative

Carrying out innovative activities, continuously optimising processes, and achieving energy saving and low carbon are the eternal theme for enterprises and important support for enhancing the competitiveness of enterprises and establishing a world-class corporate with global competitiveness. The Company has actively responded to the joint carbon reduction initiative developed by Chinalco. Action plans for carbon reduction covering the aspects of concept, production, management, technology and living are established to ensure that carbon dioxide emission will reach the industry-leading level and achieve effective control of total carbon emission by 2020 with the aim of achieving scientific management of carbon assets.

Regarding the problems relating to high coal consumption of thermal power boilers and rising costs of water production and electricity, during the Reporting Period, Shanxi New Materials has assigned technical staff to improve the existing return flow of condensate. The realised second comprehensive utilisation of condensate has reduced the amount of water produced by thermal power and the cost of water production, thus reducing coal consumption. It is estimated that annual coal consumption will be reduced by 10,300 metric tons and annual coal-saving benefit will be RMB2.88 million.

Ningxia Energy has covered five business sectors, namely thermal power, wind power, solar power, coal, and equipment manufacturing and formed 3 special industry chains covering from thermal power to coal, wind power to wind turbine manufacturing, and photovoltaic power to crystal line silicon production. During the Reporting Period, Chalco has continued to make full use of the platform of Ningxia Energy to actively develop new energy sources. As of the end of the Reporting Period, Ningxia Energy's renewable energy capacity was 1,609.13 MW, in which installed wind power capacity was 1,405.8 MW and solar power installed capacity was 203.33 MW.



Green Development – Achieving Green Production (Continued)

Green Factories Building

Chalco Shandong has continued to protect the ecological environment at its best through putting effort into the production process. Chalco Shandong has built a green, smart and environment-friendly mining site by proactively carrying out work relating to land reclamation, ecological restoration and management during the mining of bauxite to effectively prevent soil erosion and land degradation. Besides, Chalco Shandong has strengthened the environmental protection and control in mining, transportation and storage to avoid dust generation and pollution to the environment. Regarding the storage of bauxite, Chalco Shandong has adopted the closure approach in the storage yard and sprayed water to prevent dust from spreading around.

During the operation of production, Chalco Shandong has realized zero-discharge of wastewater by harmless treatment in the waste water treatment station. The PM concentration has been reduced and better than national emission standard as the flue gas generated in the calcining process is collected by dust collector; dust collection systems have been established in the zones for crushing, screening and transferring materials; the dust collection equipment is upgraded or improved in a timely manner. In order to make full use of red mud, Chalco Shandong has also actively engaged external resources to jointly build a process line for red mud treatment with a daily capacity of up to 2,600 metric tons, which can digest and utilise about 300,000 metric tons of red mud per year.

5.2 EFFECTIVE USAGE OF NATURAL RESOURCE

Resources and energy are the common wealth of mankind. With the purpose of contributing to the community of a shared future for mankind, Chalco pays attention to the rational allocation, efficient and recycling of resources and explores the practical practice of resource-saving production methods in its development. Chalco has incorporated the annual corporate energy-saving performance into performance management, implemented daily tracking, monthly analysis, quarterly video conference notification, and end-of-year evaluation and evaluation management system in order to fully implement the Company's 2018 annual objectives of energy conservation. At the same time, the Company has enhanced its technical development efforts and pursued energy conservation goals through technology upgrade and equipment renovation.

Green Development – Achieving Green Production (Continued)

The Company has adhered to the concepts of low-carbon and recycling development and focused on work relating to sustainable mining, resource utilisation enhancement, and industrial waste recycling. In the year of 2018, the Company has improved its production process through technological innovation and maximised the utilisation of resources in the entire production process.

During the Reporting Period, comparing with the annual energy consumption plan, the Group saved a total of 115,483 metric tons of standard coal.

Table: Chalco’s 2018 Annual Energy Consumption Targets and Performance

Indicators	Unit	2018 Targets	2018 Performance
Energy Consumption per RMB10,000 of production value	Metric Tons of Standard Coal per RMB10,000	2.76	2.01
Total Electricity Consumption for Aluminum Ingot	kWh per Metric Ton	13,400	13,310
Total Energy Consumption for Alumina	Kilogram of Standard Coal per Metric Ton	404	400
Standard Coal Consumption for Electricity Supply	Grams of Standard Coal per kWh	337	336.55
Total Energy Consumption for Carbon	Metric Tons of Standard Coal per Metric Ton	1.15	1.16

Energy Management

Chalco has continued to promote and implement the work of reducing energy and enhancing efficiency. According to the requirements of the *Notice on Strengthening the Management of Large-Scale Energy Cost Saving Projects* and the *Notice on the Evaluation and Acceptance of Large-Scale Energy Cost Saving Projects*, annual energy cost saving related targets were set in the aspects of reducing the costs of electricity and steam of alumina producing companies, improving energy management system, and reducing the cost of electricity generation. Moreover, the Company has confirmed the implementation of relevant projects, checked



Green Development – Achieving Green Production (Continued)

and evaluated the projects in a timely manner. As of the end of the Reporting Period, 24 large-scale energy projects have started operation. The total energy cost saving has reached RMB426.60 million in which the saved cost relating to management has reached RMB260.18 million, relating to the external income reaching RMB111.01 million and the direct project cost reducing by RMB59.41 million. The annual energy cost saving related targets were successfully completed.

Investment

In the year of 2018, the Company has approved 24 energy saving projects with a total investment amount of RMB176.899 million in order to reduce the consumption of water, electricity, compressed air, steam, gasoline, diesel, and the standard coal consumption for power supply. Among the projects, Shanxi New Materials has adopted energy performance contracting and invested RMB49.89 million to implement reformation of units.

Technology and Reformation

Regarding the production of alumina, Chalco has put more effort into technology development and accelerated equipment upgraded during Year. Shanxi New Materials, for instance, has applied the innovative technology to produce alumina in series with an alumina production capacity of 2.5 million metric tons. Besides, regarding the production of electrolytic aluminum, the Company has continued to promote the application of the new type of Flow Heat Energy Saving Technology (“FHEST”), which can significantly reduce the power consumption and carbon dioxide emission of electrolytic aluminum process. As of end of the Reporting Period, the Company has promoted the implementation of 846 electrolytic cells, with 650,000 million metric tons of production capacity expanded.

Green Development – Achieving Green Production (Continued)

Organising a Competition for Reducing Energy Consumption Among Employees

In order to solve the problems of high energy consumption and high cost, Chalco has organised a competition among employees for reducing energy consumption. The competition has been applied a rule of monthly monitoring and the form of year-end appraisal, stimulating the enthusiasm and initiative of the cadres and staff, and helping to reduce unnecessary energy waste during operation. A competition for reducing natural gas consumption intensity of the calcination process among employees, for example, has been carried out in the carbon production plant, in which the competition was divided into 16 calcinating zones with a total of 962 participants. Through the implementation of the competition for reducing the natural gas consumption intensity of the calcination process, the Company's natural gas consumption intensity has been decreased by 61.7 normal cubic metres per metric ton, 3.9 normal cubic metres per metric ton less than 2017, creating a total economic benefit of RMB14.45 million.

Energy Saving Training

In order to keep abreast of the national energy policy, to master the requirements of the energy management system, to adapt to the Company's refined requirements for energy management, and to complete the 2018 tasks of large-scale energy saving and effectiveness increasing, Chalco held an energy management training course in August 2018. Relevant employees from the branches' and subsidiaries' Energy Management Department, power plants, Corporate Management Department, Financial Management Department, Investment Management Department, and Marketing and Procurement Department have been invited to participate in the training. Apart from explaining the current national energy policy and energy management system, site visits of new energy power plants and power stations and final examinations were arranged for the employees.

Water-use Efficiency

The Group has actively explored ways to improve the water-use efficiency, and there were no issues in sourcing water.

During the Reporting Period, the Group's total water consumption was 2.615 billion metric tons, in which the fresh water consumption was only 0.093 billion metric tons and circulating water consumption was 2.512 billion metric tons with a circulating rate of 96.44%.

Green Development – Achieving Green Production (Continued)

Case Study: Rectification of Chalco Mining Integrated Water System

During the Reporting Period, Chalco Mining has issued the *Notice on Carrying out the Rectification of the Integrated Water System of Chalco Mining* and established a team to responsible for the rectification of the integrated water system management team. The team, upholding the principles of “merging and simplifying processes, making full use of waste heat, improving the cleanliness of circulating water, reducing the use of fresh water, reducing the cost of the system”, has deepened the work relating to the rectification of the integrated water system. Chalco Mining’s water system mainly includes domestic water, production water, circulating water, condensed water, red mud filtrate, industrial wastewater, domestic sewage and reclaimed water. Through the diagnosis and analysis of the problems existing in the water system of Chalco Mining, the Company has established 27 measures relating to six aspects, namely “reducing the consumption of fresh water”, “reducing the amount of circulating water”, “reducing the amount of industrial wastewater”, “stepwise utilisation of condensed water”, “integrated utilisation of waste heat”, and “informatization”, in which 22 projects have been successfully implemented.

Through the joint efforts of all parties, the work relating to rectification of the integrated water system of Chalco Mining has achieved remarkable results: perfecting the metering system for production water, domestic water and reclaimed water has laid a foundation for the management of the water system; effectively control of the consumption of new water has made the consumption of new water per unit of produced alumina gradually decreasing from 1.01 metric tons per metric ton in 2016 to 0.74 metric tons per metric ton in the year of 2018; reclaimed water has been fully utilised, and the utilisation of reclaimed water has gradually increased from 1.1 million metric tons in 2016 to 2 million metric tons in the year of 2018; the quality of circulating water has also been significantly improved.

Green Development – Achieving Green Production (Continued)

Promoting Green Packaging

“De-packaging” for logistics is conducive to environmental protection, carbon reduction and cost saving. Based on the experience of packaging reusing for logistics in the past, Chalco Logistics has promoted “de-packaging” since 2018.

Regarding the transportation of alumina by vehicles, the transportation of alumina by vehicles with one-time packaging has been replaced with transporting alumina by special aluminum alloy vehicles and ordinary high-sided vehicles. It has not just reduced the use of packaging bags, but also reduced the leakage during packaging and stacking, thus improving the transportation efficiency and reducing the cost for the branches and subsidiaries. At the same time, the use of circulation bags for alumina, which can be reused many times, has further reduced the use of disposable bags. According to incomplete statistics, during the Reporting Period, the Group shipped nearly 500,000 metric tons of alumina through railway containers, vehicles with circulation bags and bulk transportation, saving more than 300,000 disposable packaging bags.

Reusing Mineral Resources

The Company has encouraged the introduction, innovation and use of advanced technologies in mining to strengthen the technical management of mine production and improve the mining recovery rate and ore dressing rate. Regarding smelting, green smelting technology has been researched and promoted, a recycling industry chain has been built, and resources have been utilised efficiently. Regarding mineral recovery, integrated ore recovery and utilisation projects have been embarked on to maximise the use of waste rock and waste residue through new technologies, such as magnetic separation.

5.3 PROMOTING RESPONSIBLE MINING

The importance of resources and mines to Chalco is self-evident. The Company’s mining is in compliance with the relevant national laws and regulations and internal systems and operated in a lawful and compliant manner, thus reducing business risks and maintaining sustainable and stable development.

Green Development – Achieving Green Production (Continued)

Chalco adheres to the philosophy of “lucid waters and lush mountains are invaluable assets” and pursues the balance between production development and ecological protection. In the year of 2018, in order to meet the requirements of the *Three-Year Action Plan for Winning the Blue Sky Defence War*, the Company has promoted the reform of mine management, promoted the improvement of mine management, and ensured the central tasks of mine quality improvement, cost reduction, green, safety and sustainable development are completed. Chalco with the aim of improving quality and efficiency has issued the *Chalco’s Guiding Opinions on Further Strengthening the Work relating to Resources and Mines* to strengthen the management of resources and mines and propose tighter requirements for product quality, safety and environmental protection. In addition, Chalco issued the *Chalco’s Special Action Plan to Strengthen Responsibility, Tighten Control, and Enhance the Quality of Mine Site Management* to comprehensively sort out and check the main problems of the Company’s mines and adopt the problem-oriented approach to conduct rectification to mine sites, promote the upgrading and reformation of the ecological environment of mine sites, and accelerate the construction of green and environmentally friendly ecological mines. Regarding the entrusted bauxite mining, Chalco issued the *Chalco’s Measures for Entrusted Bauxite Mining Management* in May 2018 to strengthen the management and control of entrusted bauxite mining and ensure the safety, economic efficiency, and stability of mining, thus preventing risks of management and control in the aspects of production, operation and social responsibility of mines.

Chalco’s Management Measures for Entrusted Bauxite Mining Management aims to:

- clarifying the management organisation and its responsibilities
- clarifying the basic regulations for entrusted mining
- clarifying the details on technology, environmental protection, and contract management.

In the year of 2018, the Company has continued to strengthen the implementation of mine management related policies. In accordance with the principle of “efficient use of resources, scientific mining, environmentally friendly approach, and harmonious mining areas”, the Company has continued to promote the construction of green mine sites. On the basis of operating national green mines or piloting green mines, the Company has started the construction of green mine sites during the Year, in which 4 projects relating to the construction and reclamation of green mines. As of the end of the Reporting Period, the Company has one national green mine site in total.

Green Development – Achieving Green Production (Continued)

Besides, the Company has focused to organise specific actions of management improvement on mine sites and achieved significant improvements in mine reclamation, re-greening, and on-site environment. Regarding the areas that may be affected during the mining process (including the mine sites in Guangxi, Shanxi, Henan, and Guizhou provinces), the relevant branches and subsidiaries of the Company have established a mechanism for managing ecological treatment and land reclamation around mine sites so as to shorten the impact of mining on the ecology of the surrounding areas. During the Reporting Period, the Company's branches and subsidiaries have carried out mine site reclamation and regreening work in 7 regions, and reclaimed 9,067-mu of land. At the same time, the Company's mining boundaries have been approved by local governments at all levels, and the national protected fauna and flora and endangered species cannot be found in the mining areas.

In addition, for the purpose of avoiding and reducing the sudden environmental risks caused by mining, such as secondary geological disasters in mines, soil erosion in mining areas, water and soil pollution, the Company strictly follows the approved plan of mine development and utilisation in the mining process to achieve the simultaneous implementation of stripping, mining, and reclamation. It not only shortens the land reclamation cycle but also achieves an efficient combination of engineering reclamation and bio-reclamation. In the event of a sudden environmental incident, the Company shall properly deal with the incident in accordance with the *Chinalco's Emergency Response Plan* and *Chinalco's Emergency Response Plan for Environmental Incidents* to minimise environmental impacts.

Picture 1: Planting Vegetables in the reclaimed land in the mine site of Guangxi Branch



Green Development – Achieving Green Production (Continued)

Picture 2: Reclamation and Regreening of the cavities in mine sites of Guangxi Branch



Picture 3: Land Reclamation and Regreening of Yangquanmine site of Chalco Shandong



Picture 4: Regreening by Workers from the Mian Chimine site of Chalco Mining on the reclaimed land



Green Development – Achieving Green Production (Continued)

5.4 ENVIRONMENT PERFORMANCE

The environmental performance data of the Group from 2016 to 2018 are presented in the table below.

Table: Chalco's emissions in 2016–2018

Performance Indicators	Unit	2016	2017	2018
Basic Information				
Annual Production Value	RMB10,000	6,409,575.6	9,206,729.2	10,162,954.9
Emissions				
Air Emissions¹⁶				
The amount of SO ₂ emission	t	40,524.00	42,723.00	44,420.00
The amount of NO _x emission	t	20,300.84	14,624.30	16,241.00
The amount of PM emission	t	2,568.00	2,421.00	2,244.00
GHG Emissions				
The amount of carbon dioxide emission (in CO ₂ equivalent)	10,000 t of CO ₂ e	–	6,862.30	7,848.66
The amount of carbon dioxide emission (in CO ₂ equivalent) per RMB10,000 of production value	t/RMB10,000	–	7.47	7.72

¹⁶ The increases in the Company's emissions in the Year were mainly due to the increases in the outputs of alumina and electrolytic aluminum with increase rates of 3.71% and 23.76% respectively.

Green Development – Achieving Green Production (Continued)

Performance Indicators	Unit	2016	2017	2018
Wastewater Discharge				
The amount of industrial wastewater discharged in compliance with relevant standards	t	–	1,737,438.00	2,413,829.00
The amount of ammonia nitrogen discharged	t	–	44.00	22.00
The amount of wastewater circulated	100 million t	24.77	25.69	25.22
General Industrial Solid Wastes¹⁷				
The amount of general industrial solid wastes generated	10kt	–	3,316.08	3,811.47
The amount of general industrial solid wastes generated per RMB10,000 of production value	t/RMB10,000	–	3.6	3.7
The amount of red mud generated	10kt	–	2,105.30	2,344.97
The amount of red mud utilised	10kt	–	209.80	193.09
The amount of fly ash generated	10kt	–	356.30	494.56
The amount of fly ash utilised	10kt	–	245.20	328.00
The amount of slag generated	10kt	–	87.20	141.16
The amount of slag utilised	10kt	–	61.30	101.18
Hazardous Wastes				
The amount of disposal of waste oil (including machine oil and mineral oil)	t	–	1,113.00	938.00
The amount of disposal of waste oil per RMB10,000 of production value	t/RMB10,000	–	0.00012	0.00009

17 The major reason of the increases in the generated and utilized amounts of fly ash and slag in the Year was the inclusion of Ningxia Energy in the scope, which was not included in the year of 2017. The amounts of fly ash and slag generated by Ningxia Energy were 1,137,500 metric tons and 391,700 metric tons respectively in the year of 2018.

Green Development – Achieving Green Production (Continued)

Performance Indicators	Unit	2016	2017	2018
Use of Resources¹⁸				
Comprehensive energy consumption ¹⁵	10 ktce	1,659.00	1,876.60	2,039.21
Comprehensive energy consumption per RMB10,000 of production value	tce/RMB10,000	2.71	2.03	2.01
The amount of purchased electricity	100 million kWh	223.00	349.30	398.84
Total coal consumption	10,000t	1,550.00	1,292.20	1,495.95
Total water consumption	100 million t	25.71	26.68	26.15
In which: circulating water consumption	100 million t	24.77	25.69	25.22
Total fresh water consumption	100 million t	0.94	0.99	0.93
Water consumption per RMB10,000 of production value	t/RMB10,000	401.13	290.38	257.38
The amount of packaging material used	t	–	10,820.00	12,271.00

¹⁸ Due to the increase in production of alumina and aluminum during the Year, the related energy resource consumption increased compared with the year of 2017, but the corresponding density decreased.

Caring Employees – Ensuring Production Safety

Human resources have always been the best resources of the Company. Chalco adheres to the concept of “talents as the first resource”, establishes a harmonious labour relationship with its employees, which enables the Company to develop continuously and healthily, and enables the employees to grow together with the Company, thereby realising the enhancement of shareholders’ value, corporate effectiveness and employees’ income.

6.1 SAFEGUARDING THE OCCUPATIONAL HEALTH

As a responsible corporate citizen, Chalco attaches great importance to safeguarding employees’ safety and occupational health, constantly improves the construction of the system and strengthens the supervision of responsibility. Chalco always prioritises employees’ safety and health, with the goal of achieving zero accident and zero damage. Chalco supports the comprehensive establishment for a safety culture of “safety relating to effectiveness and employees relating to wealth”, where all personnel, in all areas and processes, must avoid hurting themselves and others, as well as avoid being hurt by others, in order to provide a safe platform for employees to progress with dignity. Chalco upholds the HSE management concept that “all risks can be controlled, and all accidents can be prevented”. In order to continuously improve the Company’s HSE performance, Chalco promises to comply with the national and local HSE laws, regulations, and related requirements; to regard health, safety, and environment as premises for corporate production and operation; to take all possible steps to ensure that all employees should observe the Company’s HSE scheme, with HSE being an important part of performance appraisal for enterprises and employees; to earnestly fulfill the CSR and establish sound community relationships; and to publicly disclose the details of HSE performance.

Chalco has complied with the relevant national safety production laws and regulations, formulated relevant safety and health management regulations, and further clarified the Company’s responsibilities relating to occupational health, safety and environmental protection based on the actual operation of Chalco. During the Reporting Period, a total of 16 enterprises of the Group obtained OHSAS 18001 Occupational Health and Safety Management System Certification.

Caring Employees – Ensuring Production Safety (Continued)

Deepening the Risk Management and Control

The Group adheres to the safety production approach of “safety first, prevention-oriented” and prevent safety accidents through the implementation of safety risk management and control projects. In the year of 2018, the Company has implemented hierarchical safety risk management and control in the branches and subsidiaries. The branches and subsidiaries have established reliable prevention measures for material and comparatively material safety risks based on hierarchical safety risk identification and evaluation, thus promoting the work of hierarchical safety risks.

During the Reporting Period, three companies including Chalco Mining, Guangxi Branch and Qinghai Branch were rated as the Group’s hierarchical safety risk management and control demonstration enterprises.

Case Study: Qinghai Branch promoting hierarchical safety risk management and control

Qinghai Branch’s units promote all work in strict accordance with the Company’s requirements of the implementation of hierarchical risk management and control projects. At present, hierarchical risk management and control of hazard factors, risks, dangerous operations, and the lock-up and tagging list have been established.

Training relating to risk management and control for employees at all levels has been conducted in the Company’s electrolysis plants, focusing on the methods of identification of dangerous hazards in the post and analysing the possible risks, and formulating corresponding preventive measures. The approach of “bottom-up, top-down, and participation by all employees” has been adopted in the carbon plant, in which comprehensive and systematic identification of occupational health and safety risks in the factory has been conducted, evaluated and graded by an appropriate risk assessment methods, thereby improving the dangerous factor identification list, lock-up and tagging list, and task analysis list in the branches, the Production Management Department, and the teams. The quality and material management and control centre has conducted internal inspections of the operation of the system for each department and team relating to management, supervised and promoted the hierarchal risk management and control work to each post. In addition, the inspection of the electrolytic cell solidifying site has been enhanced to prevent the occurrence of ignition, short circuit and fire in the heating components during the heating process, and to ensure the quality of the electrolytic cell.

Caring Employees – Ensuring Production Safety (Continued)

In addition, regarding continuously strengthen the safety management of Chalco, the Company uses the dynamic cycle management mode (PDCA), combined with the Company's own management characteristics, to achieve The unified concept, unified standards, and uniform accuracy have effectively improved the Company's management level based on the requirements of the occupational health, safety and environmental protection precision management system (CAHSE) and enterprise safety production standardization.

During the period from November to December 2018, the Company's Safety, Environmental Protection and Security Department organised the 2018 Chalco's CAHSE audit. 141 CAHSE auditors have been assigned and divided into 10 audit teams. The audit, which took 1,385 man-days, covered 26 business units of the branches and subsidiaries and identified the weaknesses of the Company's safety and environmental management. At the same time, the Company has continued to enforce the list of "Two Responsibilities for One Position" for safety and implemented a responsibility-clarified system during the Year, which means throughout Chalco and all branches and subsidiaries, according to the level structure of enterprise, branch factory, workshop, and group, one level leads another, and upper levels check subordinate level. All levels create responsibility lists according to the "two safety Responsibilities for One Position" system and report to Chalco. The key is to clarify the safety responsibility of every employee, to practically manage and control safety risks, and to create an environment where everyone is responsible for safety management. During the Reporting Period, the Group did not have any relatively serious and above level of safety incident.

Enhancing the Supervision

During the Year, the Group has conducted safety and environmental protection on-site inspections, and experts have been coordinated by the headquarters to participate in the cross-inspection among the branches and subsidiaries, which improved the effectiveness of supervision. Check lists have been prepared for on-site inspections to standardize the procedures for supervision. Brief meetings regarding near misses have been conducted to issue warnings to and educate offenders timely. The *Training Courseware for Cadres' Subcontractor Guarantee* and the *Training Courseware for Team Safety* have been prepared to ensure that corporate subcontractor guarantee teams receive pre-training and improve their relevance to work relating to subcontractor guarantee. The visualization of operation procedures for posts has been promoted, in which employee portable cards have been produced to guide the work, thus improving the accuracy of the operation of the frontline staff. The evaluation standards for safety management have been introduced to promote the precision of safety production. By the end of October 2018, the Group has taken an exemplary role in eliminating safety hazards and managing violations, which 1,098 safety issues had been discovered and 117 violations of various types had been investigated.

Caring Employees – Ensuring Production Safety (Continued)

Employees' Health and Safety

Chalco regards employees as the most valuable assets, puts health first, safeguarding their health and safety during work and other activities. Furthermore, to guarantee employees' physical health, the Company has established the system of occupational health management and gradually carried out occupational health and safety measures. Meanwhile, the Company provides regular physical examinations for employees, sets up employee health files, and provides employees with safe and comfortable working conditions and protective equipment. In the year of 2018, the Group has continued to promote occupational health management, requiring all branches and subsidiaries to perform satisfactorily in occupational hazard notification, daily monitoring, regular testing, personal protection and occupational health examinations, as well as managing work space risk factors in according to regulations, such as dust, chemical poisons, noise, radiation and other places.

During the Year, regarding the employees' education in occupational health and safety, the Group has organised various training activities for employees to enhance their awareness of health and safety. During the Reporting Period, the number of employees participated in training reached 485,218 in total for the Group.

Caring Employees – Ensuring Production Safety (Continued)

- | | |
|---------------------|--|
| Training Contents | <ol style="list-style-type: none">1. National and local government laws, regulations and standards related to occupational health and safety2. The Company's occupational health and safety rules and regulations3. The foundation of occupational health and safety management and professional technical knowledge4. The characteristics of production, major risk and hazard factors, and preventive control measures of the Company and production lines5. Three major rules and procedures for occupational health and safety6. The instruction of safety, hygiene, environmental protection, fire protection facilities, protective equipment, and labour protection products7. The typical accident cases, accident prevention and emergency response measures etc. |
| Training Activities | <ol style="list-style-type: none">1. Safety work permit training covering all staff2. Safety work permit qualification and review training for responsible personnel3. Special work permit and review training for responsible personnel4. Registered Safety Engineer Training5. New employee three-level safety training6. Training for personnel transferred post and recovered from any kind of situation7. Other related personnel training |

Besides, regarding the "Battles for Safety, Environmental Protection, and Quality", the Company has launched a series of youth "safety month" activities, created 1,244 safe production posts for demonstration, and set up 2,586 youth safety supervisors.

June 2018 is the 17th national "Safety Production Month" in China. The Company has focused on and combined the theme of the "Safety Production Month" with the "Battles for Safety and Environmental Protection". The employees have been seriously mobilised, and the Company has carried out a series of effective safety activities to ensure the deepened promotion of "Safe Production Month", which promoted the further improvement of the Company's safety management level.

Caring Employees – Ensuring Production Safety (Continued)

During the “Safety Production Month”, the Company’s branches and subsidiaries carried out 765 education activities relating to accident and disaster warning with 44,523 persons received education, distributing 10,673 materials, filming 9 videos about warning and education, receiving 2,439 public enquiries, holding 2 cultural performances, and 998,339 persons participated in the online safety knowledge contests.

Case Study: In November 2018, Chalco organised employees to participate in fire safety drills.



Contractors’ Safety Production

The safe and environmental-friendly production of suppliers and project contractors is closely linked to the sustainable development of Chalco. The Company always emphasizes that completing projects should first guarantee safety and quality. Through the *Chalco’s Management Measures for Safety Production and Operation*, safe inspection, self-examination and correction of projects under construction, and safety regulations and requirements during flood season, the Company regulated and rectified the compliance procedure of projects, bid processes, construction safety, entity quality of projects and quality conducts of different sides involved in construction. The Company strictly implemented the *Standard of Safety Baseline in Construction Field* in order to comprehensively guarantee safety in construction field and clear risks. At the same time, during the Reporting Period, the Company conducted safety awareness training for contractors in accordance with the *Contractor Safety Management and Control Work Guide*.

Caring Employees – Ensuring Production Safety (Continued)

Case Study: An Establishment of Demonstration Enterprise for Contractor Safety Management and Control by Chalco Shandong's Second Alumina Plant

With an aim of “contractors’ zero injury”, Chalco Shandong’s Second Alumina Plant has provided “one-stop” service for contractors from three aspects: education and training, business management, and close supervision, thus creating a demonstration enterprise for contractor safety control.

The Second Alumina Plant has organised multi-level education and training activities to enhance the safety awareness and risk identification capabilities of the contractors. Before the commencement of construction, the contractors shall prepare the documents, such as copies of ID cards, occupational health certificates, and special work permit, and submit to the Safety and Environmental Protection Department for filing. The local safety personnel shall carry out safety notification and examination for all the contractors. The contractors who do not reach 80 points need to re-take the training exam until passing the examination.

6.2 SAFEGUARDING LEGAL RIGHTS

Chalco respects employee’s rights and dignity. When developing policies, the Company pays full attention to the impact of these policies on employee rights and benefits. The Company strictly adheres to relevant laws and regulations on employment, establishes sound policies and mechanisms, protects employee legitimate rights and interests, and reflects its determination to safeguard human rights. Meanwhile, the Company understands and collects employee comments and suggestions on its policies, working environment, and development strategies through different channels. The Company is also committed to enriching the Company’s employee composition and establishing the team of personnel with diverse races, educational backgrounds, work experience, nationalities and expertise. As of the end of the Reporting Period, the Group had a total of 52,341 serving employees.

Caring Employees – Ensuring Production Safety (Continued)

During the recruitment and employment, the Group proactively checks the identity documents of applicants to prevent the employment of child labour, and absolutely prohibits forced labour by clearly stipulating employee working hours per day. If any violation of the relevant laws and regulations is found, the relevant departments will report to the management according to the internal policies of the Group. After investigation, the relevant departments rectify issues or circumstances in response to the investigation results. The Company has established policies to clarify the rights of female employees and disabled employees to ensure equal treatment of all employees. Besides, based on fair, equal and diversified recruitment principles, the Group has established and gradually improved the recruitment mechanism, using work experience, skills and professional ethics as key reference indicators. The signing and dismissal of employment contracts are strictly conducted in accordance with the relevant local laws and regulations to fully protect the rights and obligations of both employees and the Group.

The establishment of sound and positive policies not only protects the rights and interests of employees, but also builds a good labour relationship to enhance the cohesion among employees. Chalco encourages the communication between management and employees, proactively establishes communication channels with employees, regularly collects employee opinions and suggestions through regular employee representative meetings and forums, and continuously optimises the Company's internal management based on employee feedback to create harmony, efficient and enjoyable working environment. The Group also formulates a comprehensive and effective welfare and indemnity system for employees, providing statutory holidays and additional holidays, such as annual leave, marriage leave, maternity leave, paternity leave, family leave, etc., and provides medical insurance in compliance with the requirements of local regulations to effectively protect employee's quality of lives.

Caring Employees – Ensuring Production Safety (Continued)

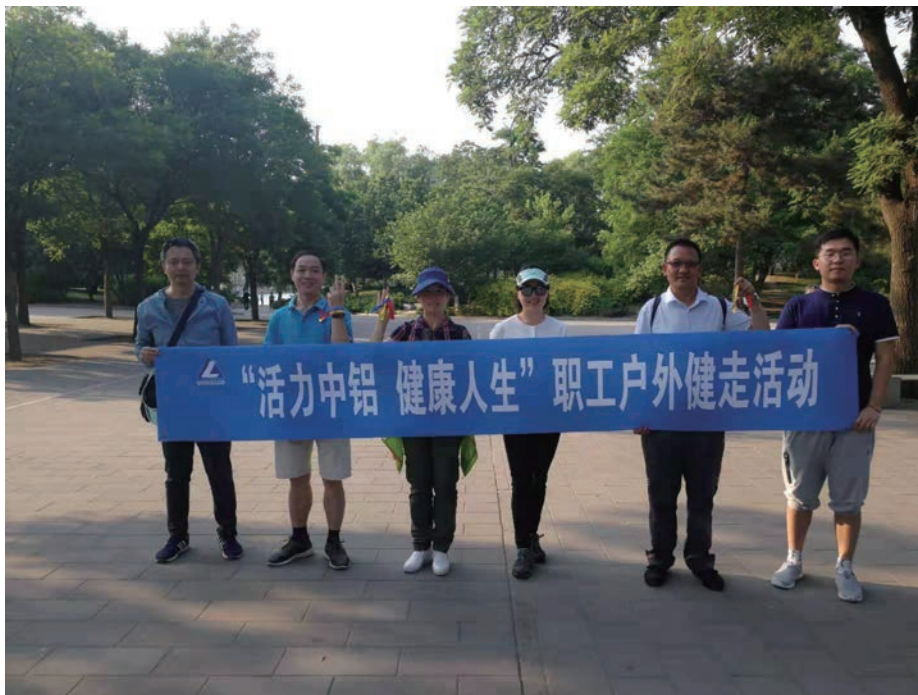
Table: Chalco's Employment in the year of 2018

Number of total serving employees at the end of the Reporting Period		52,341
By gender	Male	44,287
	Female	8,054
By age group	<25	2,592
	25 -29	5,449
	30 – 34	6,577
	35 – 39	7,212
	40 – 44	10,924
	45 – 49	13,697
	50 – 54	5,569
	>54	384
By category	Senior management	189
	Department supervisor	957
	Other office employee	6,390
	General and technical worker	44,805
Number of total turnover employees during the Reporting Period		1,169
By gender	Male	974
	Female	195
By age group	<25	216
	25 to 29	134
	30 – 34	184
	35 – 39	149
	40 – 44	304
	45 – 49	182
	>49	0
By category	Senior management	0
	Department supervisor	0
	Other office employee	362
	General and technical worker	807

Caring Employees – Ensuring Production Safety (Continued)

Enriching Employees' Life

In order to enrich the lives of employees and reduce the work pressure, Chalco plans and conducts different cultural and sports-related activities in response to the needs of its employees. During the Reporting Period, Chalco has started the construction of “Workers’ Little Houses” and proactively participated in the Women’s Day activities, the “Energetic Chalco Walk” outdoor walking activities, and the 4th “Energetic Chalco – Healthy Life” jumping rope competition, “Never Forget Why You Started, Keep Your Mission in Mind, Sing a New Era” singing competition, “Chalco Employees Classroom”, movie watching. The Company insists on basketball, football, badminton, table tennis, fitness, Tai Chi Training and other related activities and training courses for employees.



“Energetic Chalco – Healthy Life” Labour Outdoor Walking Organised by the Company

Caring Employees – Ensuring Production Safety (Continued)

Respecting Female Employees

Chalco attaches great importance to the protection of women employees' rights and interests, complies with national laws and regulations, and implements policies concerning the rights and interests of women workers. The Group has established relevant management systems through the formulation of relevant policies, formed the list of female employee protection at each level, checked and supervised the protection of female employees. In addition, Chalco has gradually improved the protection system for female employees' special rights during pregnancy, childbirth, lactation, menstruation and menopause, ensured equal pay and equal opportunities for promotion among female employees and male employees, conducted regular medical examination for female employees, and fully paid maternity insurance.

Chalco has established a women's workers' committee. The *Employee Collective Agreement* signed by the branches and subsidiaries and their employees is accompanied by the *Special Collective Contract for the Protection of Female Workers' Special Rights and Interests*. The trade unions organiser the signature of the *Special Collective Contract* by each female employee to confirm the rights of each female employee. During the Reporting Period, the signing rate of collective contracts by female employees has reached 100%.

Regarding the provision of the special medical examination for female employees, Chalco has provided a special medical examination to female employees over 35 years old on the basis of provision of annual medical examination, which further protects the health of female employees. In the year of 2018, special medical examinations have been continued for 35-year-old female workers, and 301 hospital directors have been invited to conduct health talks.

6.3 PAYING ATTENTION TO EMPLOYEE DEVELOPMENT

The Group is committed to building a community of shared future for the corporate and employees, providing employees with the opportunity for learning and training, smoothing the personal development channels for employees, and allowing employees to share the fruits of corporate development.

Caring Employees – Ensuring Production Safety (Continued)

Attaching Importance to Education and Training

The Company is committed to the strategy of “reinvigorating itself through talents”, with a focus on career education and training. A training system that covers employees according to their ranks and professional background has been set up, along with innovative ideas of training and development and working mechanisms. Chalco is determined to be a lifelong learner, with efforts to build a learning team, to cultivate and create a well-structured, professional, and innovative talent pool, thus contributing to the Company’s continuous and healthy growth

It is the Company’s priority to provide all-round education and professional training, with a focus on how to address hard-to-solve problems and hot-spot issues in production both in theory and in practice. Key positions and core talents have been supervised with extra attention. The Company believes it is important to comprehensively improve the occupational competency and capacity of employees so as to help them achieve healthy growth.

To meet demands from growing businesses, Chalco has constantly added young employees with professional and higher education backgrounds to its workforce through internal training and external recruitment. As a result, Chalco now boasts a management team with global vision and the ability to run a modern corporate, a team of professionals and experts who are good at R&D, and well equipped with knowledge about core industrial know-how and cutting edge technologies, a team of talents with professional qualification who master both theoretical and practical expertise and skills.

Caring Employees – Ensuring Production Safety (Continued)

Table: 2018 Chalco Employees' Training Performance

	Number of employees being trained	Percentage of trained employees (%)	Average trained hours (hour)
Training by category			
Senior management	189	100	120
Department supervisor	957	100	110
Other office employee	5,751	90	90
General and technical worker	36,366	81.17	60
Training by gender			
Male	36,052	81.41	67
Female	7,211	89.53	58

Smoothing the Career Development Channels

Chalco has ensured an unimpeded company promotion channel and met the demands of different position development while setting up corresponding employee career development and promotion mechanisms. For managers, technical professionals and production operators, different career paths have been set up. Meanwhile, through a variety of skills competition, opportunities for employees have been provided to show their expertise and personal abilities and to meet their professional interests, and various career development paths for employees in different ranks have completed. In this way, Chalco helps employees to choose their optimal paths fairly.

Chalco has organised labour and skill competitions, improved the labour competition management mode of "Platforms Built by Trade Unions, Professional Management, Performance by the Public", focusing on Chalco's eight indicators and seven aluminum processing indicators for labour competition. The three indicators of alumina, natural gas consumption for carbon calcination, and power consumption for electrolysis have once again set a new record. The Company has organised national and industry-level skill competitions such as Chalco Cup, Logistics Cup, Ningneng Cup, and Chalco Craftsman Competition. Thirteen people were selected and rated as the "Chalco Craftsman".

Caring Employees – Ensuring Production Safety (Continued)

The final of the 12th National Nonferrous Metals Industry Skill Competition of “Chalco Cup” was held in Zhengzhou Enterprise and Shanxi Huasheng from October 12th to 18th. The competition consists of three occupations (work types) of aluminum electrolysis workers, electricians and chemical inspectors. 55 teams and 290 players from the national non-ferrous metal industry participated in the competition, which is the highest in recorded history. A total of 168 players from 29 companies of Chalco participated in the finals. The contestants won the top three of in the aspects of aluminum electrolysis and electrician, and the third of the chemical inspectors, 7 were awarded the title of national technical expert, 9 were awarded the title of technical expert of the CSOEs, and 19 were awarded the title of technical expert of non-ferrous metal industry.



The electricians participated in the competition for related subjects



The 12th National Nonferrous Metals Industry Skill Competition of “Chalco Cup”

Win-win Operation – Achieving Fair Production

As a leading enterprise of nonferrous metal industry in China, Chalco insists on setting itself as an example to take advanced science and technology as the driving force and to focus on high-quality products and services. By comprehensively strengthening the Company's operation and control, the Company leads the development of all stakeholders in the industry chain and promotes the healthy and sustainable development of the industry.

7.1 UPHOLDING BUSINESS ETHICS

Chalco is committed to building a fair operating system. The Group strictly abides by the *Anti-Unfair Competition Law of the People's Republic of China* and the *Anti-Monopoly Law of the People's Republic of China*, opposes unfair competition, maintains a fair, just and open market environment, and bears the responsibilities of products and services within an effective period. The Company strictly abides by business ethics and market rules, resolutely resists unfair competition and is committed to maintaining a fair and equitable business environment. Besides, the Company has zero tolerance to violations of laws and regulations, and its business ethics education and management of relevant personnel have been continuously strengthened, while *Anti-Commercial Bribery Letter* have been signed with suppliers.

The Company has established a collective decision-making mechanism and a responsible system for integrity, perfected the credit management system, allowed full play to the supervisory role of the Discipline Inspection and Supervision Department at all levels, while the clean organisation building, production and operation have been closely integrated through prevention and control of integrity risks to effectively prevent and investigate the cases relating to commercial bribery, which risk control is continued at all stages from system to operation. During the Reporting Period, Chinalco, including the Company, has held 4 education and warming sessions for fine Party culture and clean organisation, notified 134 cases relating to accountability, and notified 434 persons with disciplinary issues.

7.2 PROMOTING INDUSTRY DEVELOPMENT

Innovation is the foundation for ensuring the sustainable development of Chalco and also the method that Chalco takes to fulfill its social responsibilities, give back to the community and promote the progress of the industry. With its sound technological innovation system as its guarantee, Chalco constantly enhances its research and development ("R&D") capabilities and expands product promotion and application. While building the Company to become a world class global company with global competitiveness, Chalco ensures the national security and people's livelihood. During the Reporting Period, the Company invested RMB310 million in R&D.

Win-win Operation – Achieving Fair Production (Continued)

Chalco has insisted to continuously consolidate and improve various science and technology management systems and provided a solid backing for the Company's product and technology research and development. The Company has clearly defined how to strengthen the management of the Company's science and technology projects, to accelerate the transformation of scientific and technological achievements, to enhance the relevant personnel awareness of credit of science and technology projects, and to regulate the management of independent research and development projects through the establishment of *Chalco's Management Measures for the Administration of Science and Technology Projects*, *Chalco's Guidance on Strengthening the Promotion of Scientific, Technological Achievements (Trial)*, *Chalco's Management Measures for the Administration of Credit Points of Related Subjects of Scientific and Technological Projects*, and *Chalco's Management Measures for Enterprise Independent R&D Project*. During the Reporting Period, Chalco has carried out 135 science and technology projects with 46 company-level science and technology projects and 89 branch and subsidiary level independent research and development projects.

Besides, the Company has managed the internal intellectual property rights, trademarks, and awards to comprehensively ensure the sustainable development of the R&D in the Company, according to *Chinalco's Management Measures for Intellectual Property Right*, *Chinalco's Interim Measures for Technical Standards Management*, and *Chinalco's Management Measures for Technology Award*. During the Reporting Period, the Company has proactively carried out intellectual property rights protection work and successfully completed the rights protection work against the use of the "Chalco Industry Network" without authorisation by third-party enterprises, which the infringer changed the website name.

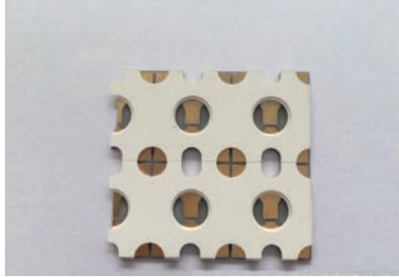
During the Reporting Period, the Company filed 122 patent applications, among which are 50 invention patents, and 72 utility model patents. Meanwhile, Chalco was granted 58 patents, with 24 invention patents and 34 utility model patents. The Company registered a total of 25 trademarks.

Win-win Operation – Achieving Fair Production (Continued)

2018 The Company Scientific and Technological Achievements Showcases



Precision electronic components for high thermal conductivity filler alumina production technology



Electronic ceramic substrates for aluminum nitride production technology



Manufacturing technology of aluminum alloy castings for aircraft photoelectric pod parts

7.3 IMPROVING THE PRODUCT AND SERVICE EXPERIENCE

Chalco always puts customers first, paying attention to providing customers with products and services of high quality, committing to building the quality branding of “requiring top-quality aluminum, requiring Chalco”. While the Company improve the quality of its products, the Company also deepen its communication with customers to learn more about the demands of the market and provide customized solution for customers, so as to create more value for them.

Enhancing Quality Management

Providing products with high quality is always the promise of Chalco towards its customers and end consumers. The Company guarantees the high quality of its reliable products through the quality management system that covers the whole industrial line, including the procurement of materials, production and manufacturing, sales and services. The Company conducts centralized and unified management of the marketing and operation of its main products such as aluminum and alumina. The Company strictly complies with the national product quality related regulations and its internal product standards to ensure the quality of its products. The China National Quality Supervision and Test Center for Light Metal is engaged each year to supervise and spot check the main products of the branches and subsidiaries to ensure stable and quality products for customers. In addition, the Company requires all branches and subsidiaries to label product in strict accordance with the Company's regulations. In the year of 2018, Guangxi Branch issued the *Analysis and Control System for Raw Fuel and Ex-factory Products* to ensure that the quality inspection, sampling, sample preparation, analysis, spot check, review and assessment of the Company's original

Win-win Operation – Achieving Fair Production (Continued)

fuel and manufactured products can be timely and accurately conducted. As of the end of the Reporting Period, 17 of the Group's enterprises have obtained ISO 9001 quality management system certification, and 17 enterprises have obtained ISO 14001 environmental management system certification. During the Reporting Period, the products sold by the Group have not been recalled due to safety, health and quality problems.

As one of the Group's Battles for Safety, Environmental Protection, and Quality, the Company has formulated three plans for the quality upgrade, quality research, and brand building in the year of 2018. The Company has researched and revised *Chalco's Management Measures for Quality* to further clarified the approach, objectives, control, rewards, and punishments relating to product quality. The 6 quality objectives of the Company's management and control have been continuously achieved, and all 22 marked quality research projects have reached the annual target.

- **Metallurgical grade alumina**

In the year of 2018, Chalco has further strengthened the quality management of metallurgical grade alumina, revised *Chalco's Regulations on the Management of Excellent Quality and Excellent Price of Metallurgical Grade Alumina*, clarified the punishment measures for unqualified products, and led the Company's high-quality development through mechanism construction, thus improving product quality and market competitiveness. In the year of 2018, the Company's metallurgical grade alumina particle size and other quality indicators are at the leading level in China.

In the year of 2018, the Company has promoted Chalco Shandong's high-quality alumina to replace imported alumina for the production of high-precision aluminum and achieved a major breakthrough. At present, Baotou Aluminum, Shandong Huayu and Qinghai Branch purchase 16,000 metric tons of high-quality alumina monthly from Chalco Shandong for replacing imported alumina. According to the price difference of RMB700 per metric ton, it is expected to achieve an annual benefit of RMB130 million. In addition, regarding the Shanxi Huaxing's stable alumina particle size project, the standard rate per batch of alumina-45 μ m particle size distribution ($\leq 15\%$) increased from 89% in 2017 to 100% in the year of 2018.

Win-win Operation – Achieving Fair Production (Continued)

- **Alloying of electrolytic aluminum**

According to the Group's overall planning for alloy products, Chalco has continued to accelerate the development of electrolytic aluminum alloys in the year of 2018, guided branches and subsidiaries to proactively develop high value-added alloy products, coordinated branches and subsidiaries to conduct R&D, production of new products, thus promoting the further optimisation of the alloy product structure. During the Reporting Period, the Company's alloying rate was 38.4%, exceeding the Company's target of annual alloying rate of 37%.

Improving Customer Service

Chalco has continuously optimised the customer service experience and established a sound customer service management system. The Company also focuses on the impact of products on customers' health and safety and guarantees customers' safety and legal rights to the greatest extent.

- **Comprehensive Service Management System**

The Company has set up a pre-sale, sale and after-sales service management system, which negotiates, settles and replies to customers' complaints in accordance with related regulations of the Company. In addition, the Company provides consumers with well-established channels for complaints and feedbacks to improve service levels through daily regulation and management. The Company also investigates customer satisfaction in the form of questionnaires in line with the ISO 9001 management system. After deeply understanding the demands of customers, the Company provides customers with comprehensive solutions including lowering the cost of procurement and enhancing coordination capacity. As a result, the Company largely improves customers' satisfaction. During the Reporting Period, the Group did not receive any complaints about services but received 27 times of complaints about products, which was a significant decrease from last year. In response to customers' complaints received, the Company has carefully analysed the causes of the complaints and proactively communicated with customers to solve the problems.

Win-win Operation – Achieving Fair Production (Continued)

- **Safeguarding Health and Safety**

In the process of sales of aluminum liquid, regarding the characteristics of regular visits to the Company by the delivery agent, Chalco has conducted safety training delivery agents and the responsible personnel relating to delivery vehicle for aluminum liquid, clarified the hazard sources and precautions on the site, and improved their safety awareness. At the same time, the branches and subsidiaries strictly follow the national safety production and environmental protection requirements, enforce the national standards relating to the product element content, and provide qualification certificates, thus preventing the addition of harmful elements such as lead, mercury and arsenic and ensuring the health of the end consumers.

- **Maintaining Customers' Privacy**

In the process of product marketing, Chalco also attaches great importance to protecting the privacy of both the Company and its customers. The Company's marketing plan stipulates that marketing personnel at all levels should consciously abide by the Company's confidentiality regulations, strengthen the awareness of the confidentiality of sales information and market information, and strictly prohibit the disclosure of the Company's business secrets. Besides, the standard template of the Company's electrolytic aluminum product sales contract also stipulates that: in the process of entering into, performing and terminating the contract, the parties shall be obliged to keep confidential the technical, commercial information and materials that the other party has not yet disclosed to the public, and be forbidden to leak or improperly use, except for the disclosure by one party in accordance with the provisions of laws, administrative regulations or relevant government departments; if any party violates the confidentiality clause of the contract and causes losses to the other party, it shall be liable for damages.

7.4 IMPROVING THE EFFECTIVENESS OF OPERATION

Chalco has always insisted on giving cost control the highest priority. Chalco has continuously promoted the “standardisation+” management, clarifying a series of content at the headquarters level, including the general thought, working goals, working methods, major tasks, promotion plans and requirements. In the year of 2018, while ensuring the steady growth of product quality, the Company has continued to focus on cost control. The absorption costs of alumina and electrolytic aluminum have both decreased, and the production costs of some branches and subsidiaries have reached the advanced level in the industry.

Promoting Cost Reduction and Effectiveness Enhancement

In order to further promote the transformation and upgrading of the Company and implement the work of reducing cost and enhancing efficiency in large-scale energy management, the Group has included the electricity use by electrolytic aluminum enterprises, the electricity use by alumina enterprises, steam, water, wind, gas, and oil for production in the energy management system in the year of 2018. The energy costs of the main products have been reduced through the precise management of energy work, the technical improvement of energy systems and energy-consuming equipment, and the utilisation of energy surplus and price advantage for generating energy, the Group has established a large-scale energy performance appraisal mechanism; every single enterprise reports the cost reduction project on a monthly basis, conducts a video conference every quarter to confirm the progress of the project, organises on-site inspection and supervision for the problems arising during the project promotion, takes measures to rectify by a deadline, and establishes a platform for energy business information.

Win-win Operation – Achieving Fair Production (Continued)

Chalco Mining's Alumina Plant has renovated the existing domestic mine pipeline dissolving device with the minimum expenditure to meet the conditions of use of imported ore and converted foreign resources of bauxite into the Company's output, thereby effectively reducing local ore mining and achieving maximum social and economic benefits. Since the introduction of the low-temperature dissolution system of imported ore in August 2018, it has produced 70,000 metric tons of alumina by the end of the year and created economic benefits of more than RMB14 million for Chalco Mining. In addition, the replacement of domestic mines by imported ore, which contains a smaller amount of mud, has reduced the mining of local ore, and it was estimated to reduce red mud generation by 21,000 metric tons. Through technological innovation, the Company has achieved cost reduction, efficiency improvement, energy conservation and emission reduction, and fulfilled its corporate social responsibility.

Enhancing Procurement Management

In the year of 2018, Chalco has continued to strengthen procurement management and implemented a number of initiatives to reduce procurement costs. The Group has strengthened market research and accurately made judgment through proactively organising and adopting the approach of unified negotiation and separated signing for coal procurement. While ensuring production and supply, the Company has gotten the timing right for procurement, thus avoiding peaks and promoting the reduction of procurement cost. Regarding the bulk procurement of raw materials, the Company has procured high-quality materials through the advantages of regional resources and reserved materials through scientific prediction and accurate analysis of the price trend of the fuels and raw materials market, thus achieving better cost reduction.

Chalco Mining has made a saving on its procurement funding through innovative limestone procurement model. Zhongzhou Aluminum has proactively promoted strategic anthracite procurement, maximising the quantity with a certain price, and maximised the profit of the Company. Chalco Shandong has incorporated the PM2.5 big data into the procurement model for market research and judgment, providing a new way to interpret relevant national policies from multiple angles; Chalco Trading has innovated the pricing mechanism and trade model for anode carbon product, optimised regional resource allocation, reduced internal production costs and operational risks by coordinating supply chain resources, thus providing an effective way to integrate the Company's anode carbon product resources.

Win-win Operation – Achieving Fair Production (Continued)

Standardizing the Logistics Management

In the year of 2018, Chalco Logistics has improved the guarantee capability of its logistics service, promoted logistics integration, strengthened business development and functional construction through standardizing the management principles for logistics business and internal freight pricing mechanisms, thus improving the Company's logistics industry's ability to create efficiency. Firstly, the coordination capacity building has been strengthened in the warehousing, shipping, pathway optimisation, information sharing etc., improving the safeguarding ability. Secondly, logistics integration has been promoted. Thirdly, focusing on the three pillar industries of transportation, warehousing and supply chain, multi-point linkage has been created, logistics business has been continuously expanded, thus continuously improving the efficiency.

7.5 BUILDING SUSTAINABLE SUPPLY CHAIN

Chalco cannot achieve its long-term and stable development without the common efforts by upstream and downstream suppliers and contractors of the supply chain. In order to promote the social responsibility of the enterprises in the supply chain and establish a sustainable supply chain for Chalco, the Company has continuously optimised the supply chain management system and improved the ESG performance of the Company and the enterprises in the supply chain. At the same time, the Company must maintain full communication with suppliers to establish long-term partnerships and achieve win-win cooperation.

In order to optimise the supply chain management system, the Company has managed the procurement, marketing and logistics of products as well as the selection, supervision and evaluation of suppliers through establishment of the *Chalco's Management Measures for Purchasing*, *Chalco's Management Measures for Supplier*, *Chalco's Regulations on the Management of Key Purchasing Operation Mode*, *2018 Plans for Product Marketing and Logistics of Electrolytic Aluminum Enterprise and Alumina Enterprise*. The Company's Marketing Management Department is responsible for the unified management of the whole process of the Group's supply chain, covering procurement management, logistics management, and finished product management. In addition, the Company has established an electronic procurement platform focusing on supply chain management, integrated the Company's supplier access and management, contract management, quotation management, inventory management and other related functions, integrated upstream and downstream related enterprise resources, thus achieving online tendering and bulk procurement for raw materials and important materials.

Win-win Operation – Achieving Fair Production (Continued)

Managing Suppliers' Environmental and Social Impacts

According to the *Chalco's Management Measures for Suppliers*, the Company has checked the relevant environmental protection qualifications of the suppliers in the supply chain management and ensured that the suppliers are legal manufacturers that meet the national environmental protection requirements. In the aspects of raw material production, use, recycling and waste disposal, the suppliers have been required to make full use of energy and resources, and reduce environmental pollution; the suppliers have been confirmed to meet the requirements of Chalco's CSR management system, and there is no record of clear violation relating to CSR related regulations in the society and the industry. Regarding the suppliers with poor CSR performance causing a certain level of adverse effects in the society, the Company lowers their rating in the system, while the coordination with the suppliers shall be terminated with the requirement of rectification by a deadline regarding the suppliers with poor CSR performance causing serious adverse effects in the society. Besides, the suppliers shall be suspended in the Company's Enterprise Resource Planning (ERP).

Strict Supplier Access

For supplier access, Chalco clarifies that all suppliers need to possess basic certificates that are valid and legitimate, and they also need to abide by the *Confidential Terms of the Chalco Electronic Procurement Platform*. Meanwhile, the Company will inquire the operational information of suppliers; when necessary, the Company will conduct field investigation to make sure that the suppliers have the ability to perform contracts, have good operational performance, and good after-sales service, and that within three years, the suppliers shall not have any law-breaking record or major legal disputes, especially for major law-breaking records related to the environment and labour.

In addition to ordinary requirements, the Company has also formulated specific management requirements targeting special supply chain fields. For manufacturing enterprises, the Company has required a complete quality assurance system; for traders, the Company has required sales permission or authorization for agents granted by product manufacturers. For the transportation of dangerous goods, the Company has also set requirements for suppliers, in which suppliers of hazardous chemicals and special manufacturing industries need to possess corresponding certificates and qualifications. For example, enterprises involved in the manufacture of hazardous chemicals must possess documents and certification including a safety production license, a hazardous chemical business license, and a transportation license for hazardous chemicals.

Win-win Operation – Achieving Fair Production (Continued)

Improving Supplier Evaluation

In terms of the evaluation of suppliers, Chalco keeps to comprehensive evaluation and management with the combined forms of annually and timely. The timely evaluation and evaluation indicators are the supplier's execution of the contract and recorded in the suppliers' archives through the real-time counting and inquiry on the electronic procurement platform. The annual assessment and evaluation indicators include the overall strength of the supplier, the amount of supply, the execution of supplier contract, and the reward and punishment of supplier, and the branches and subsidiaries have to report the supplier's performance in terms of quality, price, delivery date, after-sales service and clean organisation building to the Company's Marketing and Procurement Department on an annual basis. Through the amount of supply, the contribution rate of average procurement price, the execution rate of plan, the quality and after-sales service, the suppliers are evaluated comprehensively. In addition, the Company and the enterprise discipline inspection and supervision department monitor and regularly check the supplier's management in accordance with the scope of duties. As of the end of the Reporting Period, the Group had a total of 2,260 qualified suppliers, all of which were suppliers in Mainland China, and there were no suppliers from Hong Kong, Macao, Taiwan and overseas countries.

The Company has insisted on maintaining sufficient interaction with suppliers and formed a variety of communication channels. In addition to irregular field visits and industry conference meetings, the Company also regularly organises annual supplier meetings, summarizes the procurement work of the year, analyses the market trends of major raw materials, and commends outstanding suppliers. In the year of 2018, Chalco has selected a total of 23 outstanding suppliers and commended them.



In the year of 2018, the outstanding suppliers were commended by Chalco

Supporting Community – Promoting Charity in the Society

The Company has always adhered to the CSR philosophy of “turning stone into gold and benefiting mankind”, thus repaying the society with high-quality development. Regarding the poverty alleviation and charity, the Company strives to achieve developing with local support and with return to the local and to treasure the resources, the land where the resources locate, and the people nearby the resources, thus fulfilling CSR while creating economic benefits.

The Company has managed the Group’s external donation activities in accordance with *Chalco’s Management Measures for External Donation*, optimised the external donation approval process, improved the planning of external donation management, and enhanced the rationality of external donation management. During the Reporting Period, Chalco has donated a total of RMB23.684 million for poverty alleviation and various types of donations, which is RMB13.366 million more than in 2017.

8.1 SUPPORTING POVERTY ALLEVIATION

The Company has proactively responded to the national call for poverty alleviation, combined its advantages, effectively carried out poverty alleviation work, rationally identified targets for poverty alleviation, scientifically set up and managed projects, fully mobilised the enthusiasm of various departments in the Company, and given full play to the initiative of employees to ensure effective poverty alleviation work.

Targeted Poverty Alleviation Work

Yangxin County, Hubei

Poverty alleviation by expanding consumption Relevant units of Chalco has purchased more than RMB690,000 of various agricultural products in Yangxin County, with a 16-fold increase over the same period last year. In addition, the Company has proactively assisted agricultural products dealers in Yangxin County to broaden the marketability of their agricultural products, which achieved an increase in sales by more than RMB800,000.

Poverty alleviation by expanding industries The local poor households have been helped to sell agricultural products through the e-commerce platform for special agricultural product. It is expected to create more than RMB3 million per year for local benefits.

Supporting Community – Promoting Charity in the Society (Continued)

Since 2018, Chalco has:

- Participated in the implementation of 17 supporting projects in industrial development;
- Driven 704 registered poor persons shake off poverty;
- Supported in the introduction of an enterprise's investment with a fund of more than RMB6 million; and
- Supported 15 agricultural leading enterprises and rural cooperatives in Yangxin County.

Encouraging traditional industries

The Company is in line with the idea of “building a village with a product” to achieve industrial poverty alleviation:

- Encouraging Xiamo Village to develop the shiitake industry through cooperative form. The first phase has completed the 30-mu construction, directly creating 69 jobs for the poor people;
- Supporting the development of the traditional industry of Fenzhe to help 53 poor persons shake off poverty;
- Supporting the Mugang's *Polygonatum odoratum* Farmers Cooperative to build a new chicken farm of 2,000 square meters and creating 27 new jobs, which help 15 people in poverty;
- Supporting the development of silkworm breeding bases in Tangpan Village, Mugang Town, providing working opportunities to 65 poor people, helping 21 registered poor house holds get rid of poverty;
- Supporting the development of integrated rural tourism;
- Building a citrus industrial park, developing a thousand-mu old fruit base, and creating a “citrus park” to support the development of tourism, home stays, wedding photography bases and agricultural activities, and helping 469 registered poor persons; and
- Supporting the construction of migrant villages, encouraging the development of unique fruit industry in Gaoshan Village, Wangying Town, designing and building a 520-mu tourist sightseeing orchard, and creating pillar industries.

Supporting Community – Promoting Charity in the Society (Continued)

Poverty alleviation by deepening employment

The Company has supported local organisations to utilise the “Chalco Field School” as a platform and conduct the following industry- and market- oriented activities:

- Organising skills training for paving, mason, welders, electricians, painting, etc. in Xingguo Town, Baisha Town, Huangsangkou Town, Futu Town, Paishi Town, etc.; and
- Conducting agricultural practical and technical training such as hybrid citrus cultivation, crayfish breeding, and *Cyclocybaeagerita* cultivation.

As of the end of the Reporting Period, more than 2,000 people have participated in the trainings, in which 931 people have been trained as professional and technical personnel, of which more than 300 people have mastered the employment skills such as paving bricks, sealing, rural tourism reception, more than 900 people have learned various agricultural planting techniques, thus promoting the benefit of the industrial chain and helping poor households to achieve 300-person employment. At the same time, the Company has held several “Yangxin County Training Courses for Improving the Ability of Grassroot-Level Cadres” in the Party School of Yangxin County Party Committee, Xingguo Town, Futu Town and other towns, and trained 338 cadres of the basic level.

Deepening the work relating to assisting Tibet and Qinghai

Assisting Tibet

The Company has conscientiously implemented a series of strategic arrangements by the central government on assisting Tibet and put massive effort into matching and supporting. It is constantly innovating its mode of assisting Tibet, increasing its efforts in assisting Tibet, and broadening the area of assisting Tibet. Full support and selfless assistance with projects, funds, talents, and technology, thereby promoting all-round, multi-level and wide-area development of assisting Tibet.

Supporting Community – Promoting Charity in the Society (Continued)

Beginning in April 2018, the new funding plan with RMB1.2 million has included three major aspects. The first is to implement the skills training for farmers and herdsmen; the second is to establish “Chalco-*Potentilla fruticosa*” education fund. The fund assists students from poor families; the third is to customise and order aluminum alloy office furniture and improve the working conditions of the local community-level Party organisation’s the people activity center. In November 2018, after the investigation and negotiation, the “Project on New Funds for the 13th Five-Year Plan” was completed; since 2018, the funding amount to Tibet has been increased to RMB10 million per year; the second is to actively develop new aluminum products suitable for alpine regions and high-altitude, vigorously promoting the application of new aluminum products in Tibet, and ordering 120 sets of all-aluminum office integrated cabinets to improve the conditions of rural offices; The cooperation with Changdu Tourism Commission has driven to complete the transformation of aluminum alloy walkway and observation deck in Ranwu Lake Scenic Spot in Basu County; in the year of 2018, the Group has held employment recruitment fairs in Lhasa and Changdu respectively, providing 169 jobs for college students and 77 jobs for farmers and herdsmen. The posts are located in mainland China in Shandong, Tianjin, Chongqing, Gansu, Ningxia, Fujian, Yunnan and other provinces and cities. 50 people were trained in the township cadres of Karuo District, Chaya County, members of the “two committees” of the village, registered poor farmers and herdsmen, and unemployed college graduates.

In the year of 2018, the “Chalco-*Potentilla fruticosa*” education fund has subsidised 238 teachers and students in Chaya County, and distributed funds of RMB597,000.

Supporting Community – Promoting Charity in the Society (Continued)

The performance of Chalco's work relating to assisting Tibet is illustrated by the following achievements: the first is to improve the infrastructure and promote targeted poverty alleviation by vigorously carrying out the building of moderately prosperous demonstration villages, faculty homes, and tourist facilities, thus effectively promoting targeted poverty alleviation; the second is to support the education industry and solved a number of bottleneck problems that restrict the development of education. It has made positive contributions to the successful pass the assessment and acceptance of the balanced development of compulsory education in Chaya County and Karuo District in the year of 2018; the third is to develop characteristic industries and promote local economic restructuring; the fourth is to expand the channels for assisting Tibet and developing cadres and talents through conducting the teaching, assisting, supervising activities among Tibetans cadres, professional and technical personnel, offering the opportunities of serving temporary positions, and providing trainings, thus enhancing their work capacity; the fifth is to strengthen communication and enhance the friendship between the two sides. Through mutual visits, the two sides strengthened their bonding, promoted mutual understanding, enhanced friendship, increased the effort into assistance, and promoted ethnic unity.



2018 the Company's Chalco New Village Project in Zuotong, Rongzhou Township, Chaya County, Changdu, Tibet

Supporting Community – Promoting Charity in the Society (Continued)

Assisting Qinghai

- In the year of 2018, the “13th Five-Year Plan” supporting project has served as the backbone of assisting Qinghai, highlighting the two work priorities of “people’s livelihood” and “poverty alleviation”, and building three working platforms of “connection network, technical assistance, education”, thus promoting the economic and social development of aided counties and enterprises. In the year of 2018, Haiyan County’s working of poverty alleviation made achievement of reaching poverty alleviation standard.
- Starting from 2018, the annual assisting fund has been increased from RMB1.75 million to RMB2.25 million to help Haiyan County get rid of poverty.
- The construction of Tibetan Medicine Cultural Exchange Centre and Haiyan County Tibetan Youth Physical Fitness Testing Centre has been started. The two projects have been invested with a total of RMB10.5 million, in which Chalco assisted to build from 2017, and has invested a total of RMB3.5 million in 2017 and 2018. The construction of main body has been completed and it is expected to be put into use in August 2019.

Assisting Students in Pair

Chalco has continued to carry out “heart-to-heart, hand-in-hand” pairing to help students with difficulties in Haiyan County, Haibei Prefecture, Qinghai Province. In the year of 2018, the number of company-assisted students has increased to 150. Since August 2016, the cadres and employees were mobilised to actively contribute with dedication. They, as extracurricular counselors, has helped two batches with 231 poor people in Haiyan County, donating nearly RMB500,000 in cash.



2018 Chalco Issued the Second Batch of Funds to Pairing Assistance to Poor Students

Supporting Community – Promoting Charity in the Society (Continued)

“Heart-to-heart,
hand-in-hand”

During the Reporting period, 35 employees of the Company have participated in the pairing assistance activities, providing cash support of RMB39,000. Among the assisting students, 100% of the primary school students have enrolled in junior high school, 90% of the junior high school students have entered the ordinary high school or secondary vocational school, and 100% of the high school students have entered the university, thus giving full play to the positive role in stopping intergenerational poverty.

8.2 SERVING THE NEIGHBOURHOODS

The Company adheres to the principle of “developing with local support and returning to the local”. The Company has proactively participated in community building and given back to the society by unleashing its advantages in technology, management and talents. In the year of 2018, the Company has guided the establishment of the Lei Feng volunteer service team, carried out environmental remediation volunteering activity, “youth security volunteer” activities, “3.12” voluntary tree planting and other charitable activities, and given maximum support to the social welfare programs in which employees participate, calling for giving back to the society with dedication and delivering truth through dedication.

Case 1: Chalco Trading (headquarters) donated RMB1,000,000 to the China-Mongolia Friendship Children’s Clinic in Bayanzurkh District, Ulaanbaatar, Mongolia.

Case 2: Zhongzhou Aluminum donated RMB45,000 directly to the beneficiaries of the Tiejiang Village of Qixian Town, Xiuwu County, Jiaozuo City.

Supporting Community – Promoting Charity in the Society (Continued)

Case 3: Liancheng Aluminum donated RMB120,000 to the beneficiaries of Qinqi Township, Weiyuan County, Gansu Province.

Case 4

Guyang County, Baotou City is one of the two contiguous poverty areas in Inner Mongolia Autonomous Region. Baotou Aluminum has carried out targeted poverty alleviation in Xidoupu Town of the county for 10 years. On November 15th, the Party committee of Huayun Electrolytic Aluminum Second Factory in Inner Mongolia has formed a Party Member Service Team and carried out targeted poverty alleviation in Hongnijing Village, Xidoupu Town, Guyang County, Baotou City, which is the poverty alleviation contact point of Baotou Aluminum Industry.,

The pictures below show that the Party Member Service Team of the Second Factory visited the cattle and sheep breeding base in the Hongnijing Village for under standing the situation of the “Break-Even and Benefit-Sharing through Entrusted Cattle and Sheep Breeding” project and purchasing local agricultural products, through these to conduct targeted poverty alleviation.



Looking to the Future

In the year of 2019, it is the 70th anniversary of the founding of China. It is the first year of the refreshing of reform and opening up. However, the current situations as slowdown in market growth and increasing of price volatility indicate 2019 will be a more challenging year for Chalco. As a leading company in China's aluminum industry, Chalco shall exercise strict self-governance in the Party and provide strong political protection, continue to make an effort and strengthen its "low cost" competitive advantage, accelerate transformation and upgrading, move towards a new stage of "high quality" development, deepen management reform, establish an operational system with "excellent mechanisms", seize key minority groups, and demonstrate new opportunities in the new era with "good returns." In the coming year, Chalco will firmly reform its confidence and maintain its strategic strength. Through reforms, it will release its potential, stimulate its vitality, foster its momentum, achieve green and high-quality development, and forge ahead with a new era of passion.

He Zihui

President

Aluminum Corporation of China Limited

Appendix 1 The Material Laws and Regulations Complied by the Group During the Reporting Period

Laws and regulations corresponding to the aspects of the ESG Guide^{1,2}

Chalco's policies and regulations to ensure compliance with applicable laws and regulations corresponding to aspects of ESG Guide³

A. Environment

Aspect A1: Emissions

<p><i>Environmental Protection Law of the People's Republic of China</i></p> <p><i>Land Administration Law of the People's Republic of China</i></p> <p><i>Water Pollution Prevention and Control Law of the People's Republic of China</i></p> <p><i>Soil Pollution Prevention and Control Law of the People's Republic of China</i></p> <p><i>Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes</i></p> <p><i>Environmental Protection Tax Law of the People's Republic of China</i></p> <p><i>Atmospheric Pollution Prevention and Control Law of the People's Republic of China</i></p> <p><i>Mineral Resources Law of the People's Republic of China</i></p> <p><i>Emergency Response Law of the People's Republic of China</i>*B1</p> <p><i>Measures for the Administration of Duplicate Forms for Transfer of Hazardous Waste Management Measures for the Combined Forms for Transfer of Hazardous Wastes</i></p> <p><i>Atmospheric Pollution Comprehensive Control 2018–2019 Action Plan in the Beijing-Tianjin-Hebei Region and Surrounding Areas</i></p> <p><i>Atmospheric Pollution Prevention and Control 2017 Work Plan in the Beijing-Tianjin-Hebei Region and Surrounding Areas</i></p>	<p><i>Chalco's System of Responsibilities for Safety and Environmental Protection in the Headquarters (Trial)</i></p> <p><i>Chalco's Temporary Management Measures for Overhaul Slag</i></p> <p><i>Chalco's Management Regulations on the Safety of Molten Aluminum Transportation (Trial)</i></p> <p><i>Chinalco's Prearranged Comprehensive Plan for Emergency</i>#</p> <p><i>Chinalco's Prearranged Plan for Environmental Emergency</i>#</p> <p><i>Chinalco's Management Measures for Environmental Protection</i>#</p> <p><i>Chinalco's Temporary Regulations on Environmental Statistics</i>#</p> <p><i>Chalco's Management Regulations on the Safety and Environmental Protection of Outsourcing Relating to Protection</i></p> <p><i>Chalco's Management Measures for Hazardous Wastes</i></p> <p><i>Chalco's Management Measures for Independent Decision-making for Technological Renovation Project</i></p> <p><i>Management Measures for Mining Technologies</i></p> <p><i>Guiding Opinions on the Standardisation of the Design of Mining Sites</i></p>
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¹ Particular laws cover several topics provisioned in the Aspects; these laws are marked with an asterisk and codes of Aspects being covered.

² There is a limitation to disclose all laws and regulations that the Group complies with, and only laws and regulations that have a significant impact on the Group are disclosed.

³ Particular policies and regulations that the Company strictly observes are derived from Chinalco; these policies and regulations are marked with a hash.

Appendix 1 The Material Laws and Regulations Complied by the Group During the Reporting Period (Continued)

Laws and regulations corresponding to the aspects of the ESG Guide ^{1,2}	Chalco's policies and regulations to ensure compliance with applicable laws and regulations corresponding to aspects of ESG Guide ³
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B. Society

Aspect B1: Employment

Labour Law of the People's Republic of China ^{*B2, B4}	Labour Protection Measures for Female Employees
Labour Contract Law of the People's Republic of China Social Insurance Law of the People's Republic of China	Regulations on Compensation during Child-bearing Period
Labour Dispute Mediation and Arbitration Law of the People's Republic of China	
Law of the People's Republic of China on the Protection of Women's Rights and Interests	
Law of the People's Republic of China on Protection of Disabled Persons	

Aspect B2: Health and Safety

Law of the People's Republic of China on Work Safety	Chinalco's Management Measures for Safety Protection
Law of the People's Republic of China on Prevention and Control of Occupational Diseases	Chalco's System of Responsibilities for Safety and Environmental Protection in the Headquarters
Law of the People's Republic of China on Safety in Mines	Chalco's Safe Production Responsibilities for both Party Committee and Other Departments
Regulations on Safety Supervision over Coal Mines	Chalco's Management Regulations on the Safety Supervision of Coal Mine
Implementation Measures for the Work Safety Licenses for Coal Mining Enterprises	Chalco's Standard of Safety Baseline in Construction Field (Trial)
Measures for the Administration of Occupational Health Examination	Professional Standards of Evaluation of Safety Management in Metal and Non-metallic Mine Site and Processes
Measures for the Supervision and Administration of Employers' Occupational Health Surveillance	
Notice of the Work Safety Committee of the State Council on Launching National Safety Inspection	

Appendix 1 The Material Laws and Regulations Complied by the Group During the Reporting Period (Continued)

Laws and regulations corresponding to the aspects of the ESG Guide ^{1,2}	Chalco's policies and regulations to ensure compliance with applicable laws and regulations corresponding to aspects of ESG Guide ³
Aspect B4: Labour Standards	
Law of the People's Republic of China on the Protection of Minors Provisions on the Prohibition of Using Child Labor	
Aspect B6: Product Responsibility	
Trademark Law of the People's Republic of China Patent Law of the People's Republic of China Tort Law of the People's Republic of China Anti-Unfair Competition Law of the People's Republic of China ^{*B7}	Chinalco's Management Measures for Intellectual Property [#] Chinalco's Temporary Management Measures for Technical Standards [#] Chalco's General Regulations on Products' Labelling, Packaging, Transporting, and Storing
Aspect B7: Anti-corruption	
Anti-Money Laundering Law of the People's Republic of China	

Appendix 2 HKEx ESG Guide Contents Index

Subject Areas, Aspects, General Disclosures and KPIs		
"Comply or explain" Provisions		Section
A. Environment		
Aspect A1:	General Disclosure	
Emission	Information on:	Reducing Environmental Impacts
	(a) the policies; and	
	(b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste.	Promoting Responsible Mining
<p><i>Note:</i> Air emissions include NO_x, SO_x, and other pollutants regulated under national laws and regulations. Greenhouse gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. Hazardous wastes are those defined by national regulations.</p>		
KPI A1.1	The types of emissions and respective emissions data.	Reducing Environmental Impacts Environment Performance
KPI A1.2	Greenhouse gas emissions in total (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	Environment Performance
KPI A1.3	Total hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	Environment Performance
KPI A1.4	Total non-hazardous waste produced (in tonnes) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	Environment Performance
KPI A1.5	Description of measures to mitigate emissions and results achieved.	Reducing Environmental Impacts
KPI A1.6	Description of how hazardous and non-hazardous wastes are handled, reduction initiatives and results achieved.	Reducing Environmental Impacts

Appendix 2 HKEx ESG Guide Contents Index (Continued)

Subject Areas, Aspects, General Disclosures and KPIs		
"Comply or explain" Provisions		Section
A. Environment		
Aspect A2: Use of Resources	General Disclosure Policies on the efficient use of resources, including energy, water and other raw materials. <i>Note:</i> Resources may be used in production, in storage, transportation, in buildings, electronic equipment, etc	Effective Usage of Natural Resources
KPI A2.1	Direct and/or indirect energy consumption by type (e.g. electricity, gas or oil) in total (kWh in '000s) and intensity (e.g. per unit of production volume, per facility).	Environment Performance
KPI A2.2	Water consumption in total and intensity (e.g. per unit of production volume, per facility).	Environment Performance
KPI A2.3	Description of energy use efficiency initiatives and results achieved.	Effective Usage of Natural Resources
KPI A2.4	Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and results achieved.	Effective Usage of Natural Resources
KPI A2.5	Total packaging material used for finished products (in tonnes) and, if applicable, with reference to per unit produced	Environment Performance
Aspect A3: The Environment and Natural Resources	General Disclosure Policies on minimising the issuer's significant impact on the environment and natural resources.	Reducing Environmental Impacts Promoting Responsible Mining
KPI A3.1	Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	Promoting Responsible Mining

Appendix 2 HKEx ESG Guide Contents Index (Continued)

Subject Areas, Aspects, General Disclosures and KPIs			
"Comply or explain"		Section	
	Provisions	Recommended Disclosures	
B. Social			
Employment and Labour Practices			
Aspect B1:	General Disclosure		Safeguarding Legal
Employment	Information on:	KPI B1.1	Total workforce by gender, employment type, age group and geographical region.
	(a) the policies; and		
	(b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination, and other benefits and welfare.	KPI B1.2	Employee turnover rate by gender, age group and geographical region.

Appendix 2 HKEx ESG Guide Contents Index (Continued)

Subject Areas, Aspects, General Disclosures and KPIs				
	"Comply or explain"		Section	
	Provisions	Recommended Disclosures		
B. Social				
Aspect B2: Health and Safety	General Disclosure Information on: (a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to providing a safe working environment and protecting employees from occupational hazards.	KPI B2.3	Description of occupational health and safety measures adopted, how they are implemented and monitored.	Safeguarding the Occupational Health
Aspect B3: Development and Training	General Disclosure Policies on improving employee knowledge and skills for discharging duties at work. Description of training activities. <i>Note:</i> Training refers to vocational training. It may include internal and external courses paid by the employer.	KPI B3.1 KPI B3.2	The percentage of employees trained by gender and employee category (e.g. senior management, middle management). The average training hours completed per employee by gender and employee category.	Paying Attention to Employee Development

Appendix 2 HKEx ESG Guide Contents Index (Continued)

Subject Areas, Aspects, General Disclosures and KPIs				
		"Comply or explain"		Section
		Provisions	Recommended Disclosures	
B. Social				
Aspect B4:	General Disclosure			Safeguarding Legal Rights
Labour Standards	Information on:	KPI B4.2	Description of steps taken to eliminate such practices when discovered.	
	(a) the policies; and			
	(b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labour.			
Operating Practices				
Aspect B5:	General Disclosure	KPI B5.1	Number of suppliers by geographical region.	Building Sustainable Supply Chain
Supply Chain Management	Policies on managing environmental and social risks of the supply chain.	KPI B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored.	

Appendix 2 HKEx ESG Guide Contents Index (Continued)

Subject Areas, Aspects, General Disclosures and KPIs			
“Comply or explain”			Section
Provisions	Recommended Disclosures		
B. Social			
Aspect B6: Product Responsibility	General Disclosure		Promoting Industry Development
			Improving the Product and Service Experience
	Information on:	KPI B6.1	Improving
	(a) the policies; and	Percentage of total	the Product
	(b) compliance with relevant	products sold or shipped	and Service
	laws and regulations that	subject to recalls for	Experience
	have a significant impact	safety and health	
	on the issuer	reasons	
	relating to health and	KPI B6.2	
	safety, advertising,	Number of products	
	labelling and privacy	and service related	
	matters relating to	complaints received and	
	products and services	how they are dealt with	
	provided and methods of	KPI B6.3	Promoting Industry
	redress.	Description of practices	Development
		relating to observing and	
		protecting intellectual	
		property rights	
		KPI B6.4	
		Description of quality	Improving
		assurance process and	the Product
		recall procedures.	and Service
			Experience
		KPI B6.5	
		Description of consumer	
		data protection and	
		privacy policies, how	
		they are implemented	
		and monitored.	

Appendix 2 HKEx ESG Guide Contents Index (Continued)

Subject Areas, Aspects, General Disclosures and KPIs				
		"Comply or explain"		Section
		Provisions	Recommended Disclosures	
B. Social				
Aspect B7: Anti-corruption	General Disclosure Information on:	KPI 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.	Enhancing Risk Management and Control Upholding Business Ethics
	(a) the policies; and (b) compliance with relevant laws and regulations that have a significant impact on the issuer			
	relating to bribery, extortion, fraud and money laundering.			
Community Aspect B8: Community Investment	General Disclosure Policies on community engagement to understand the needs of the communities where the issuer operates and to ensure its activities take into consideration the communities' interests.	General Disclosure KPI B8.1 KPI B8.2	Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport). Resources contributed (e.g. money or time) to the focus area.	Supporting Poverty Alleviation Serving the Neighbourhoods



Feedback Form

Dear reader:

Hello! Thank you very much for taking time to read the Report. In order to continuously improve the preparation of the report and promote the Company's work in ESG, we especially hope to listen to your opinions and suggestions, please let us know!

1. What is your identity regarding to Chalco (e.g. investor, employee, etc.)?

- Government Employee Business Partner Environmental Organization Media
Community Others (Please specify)

2. Your overall assessment to the Report is:

- Very Good Good Fair Poor Very Poor

3. How do you think of the structure of the Report?

- Very Reasonable Reasonable General Poor Very Poor

4. How do you think of the design of the Report?

- Very Good Good Fair Poor Very Poor

5. How do you think of the readability of the Report?

- Very Good Good Fair Poor Very Poor

6. How do you think of the quality of the ESG information in the Report?

- Very Good Good Fair Poor Very Poor

7. Which disclosed issues do you pay attention to in the Report? (please choose 3 issues at most)

- Product Quality Control Safety Production Community Services Green Operation
Charity Employee Development Cooperation and Development
Others (Please specify)

Feedback Form (Continued)

8. What are your opinions on or suggestions to the ESG Report and our performance?

You can mail the above feedback form to the following address:

Address: No. 62, Xizhimen North Street, Haidian District, Beijing, People's Republic of China

Tel: 8610-8229 8154

Fax: 8610-8229 8158

Email: ir@chalco.com.cn

Website: www.chalco.com.cn

Thank you very much for your understanding on and support of our work!

Aluminum Corporation of China Limited



中国铝业股份有限公司
ALUMINUM CORPORATION OF CHINA LIMITED

No. 62 North Xizhimen Street, Haidian District, Beijing, the People's Republic of China (100082)

Tel: 8610 - 8229 8332

Fax: 8610 - 8229 8158

Web: www.chalco.com.cn