



中国铝业股份有限公司

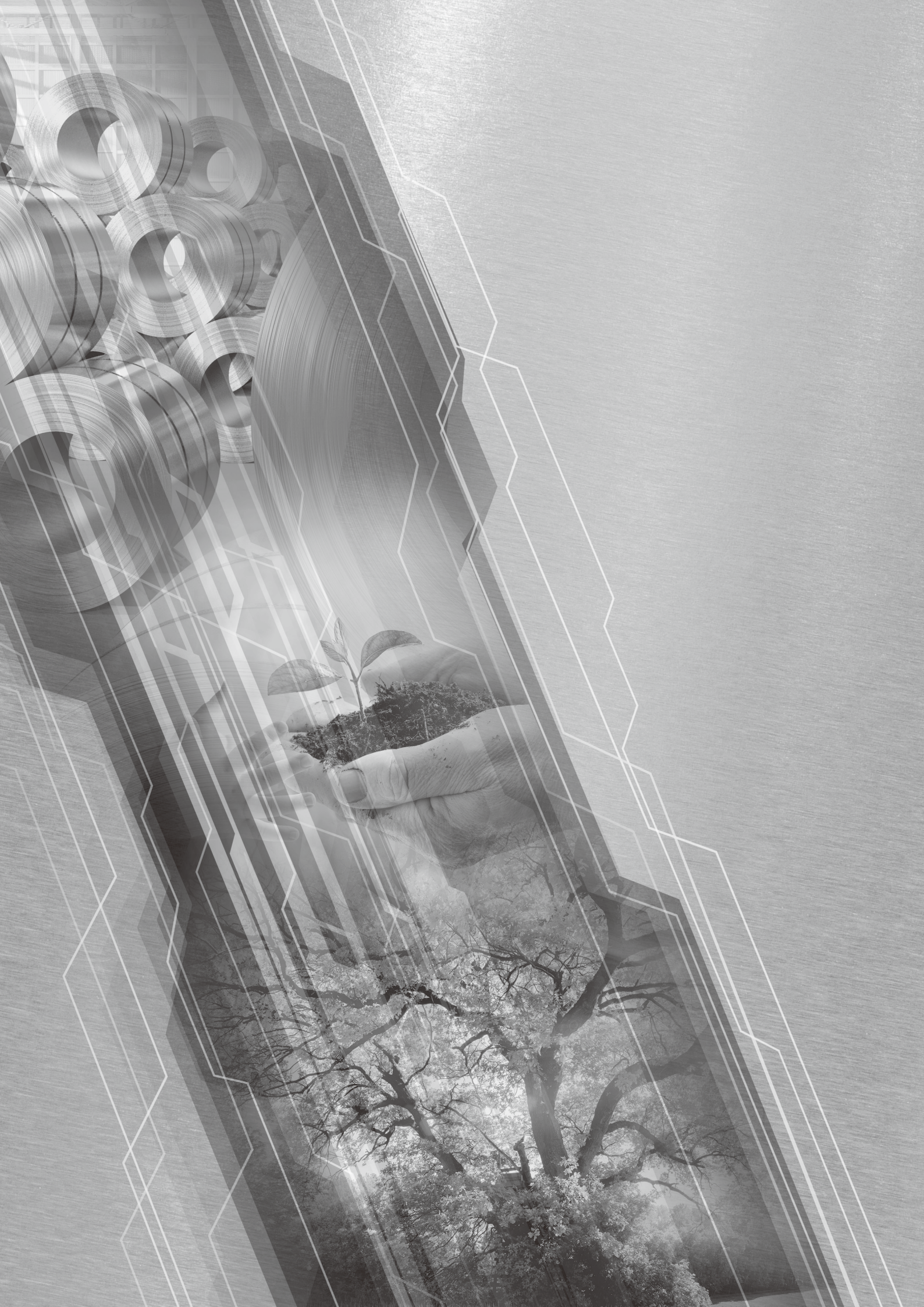
ALUMINUM CORPORATION OF CHINA LIMITED

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

2017

Environmental, Social and Governance Report





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Chairman's Statement

PIONEER IN HIGH-QUALITY ALUMINUM DEVELOPMENT FOR THE NEW ERA

In 2017, the Chinese government continued to deepen the supply-side structural reform, achieving prominent effect in the control and prevention of air pollution among the Beijing-Tianjin-Hebei region. In addition, the aluminum market went up, and the demand was upgraded. Chalco seized the opportunity brought by policies and the market, stuck to the strategy of cutting cost, and further promoted targeted management, which helped the Company gain significant achievement. We saw strong potential of industrial transformation and upgrading, obtained abundant R&D outcomes, and completed a historical turn in business operation, achieving the best level since 2008 regarding annual income, and the total pre-tax profits. We also gained much higher attention and recognition from the capital market.

In 2017, Chalco implemented an overall reform in an orderly way, and accelerating the establishment of the marketing headquarters in Chalco Shanghai and the transformation and upgrading of trade. We gained approval to establish Chalco's first transaction warehouse for futures, which connected domestic and foreign supply chains, and equipped the Company with the ability of cross-industrial services.

In 2017, Chalco upheld the philosophy of innovative and green development, increased the investment in R & D and achieved a large amount of green and environmental outcomes with the help of our advantage in professional R&D institutes and real enterprises. We gained significant progress in the "Energy saving technology for aluminum electrolysis", successfully applied the desulfurization technology under "Industrialization of eco-friendly technology" plan in big boilers, constructed a trail line that produced 20,000 tons of soil conditioner per year, developed multiple soil conditioner formulations products, and promoted the harmless treatment process of spent potlining (overhaul slag), all of which had endowed the Company with a green image.

Chairman's Statement (Continued)

In 2017, Chalco steadily promoted safe, eco-friendly, and high-quality management, starting a consolidation campaign themed "Comprehensive Engagement, Inspection and Rectification". In addition, echoing the green and eco-friendly policy of the country, we took a lead in executing ultra-low-emission standards in the "2+26" cities in Beijing, Tianjin, Heibei, and surrounding areas, investing RMB1.068 billion in 176 safety and environmental projects. The mass loss rate of aluminum products was also reduced by 29.75% year on year.

In 2017, Chalco broadly deepened cooperation with other companies. For example, the Company and CNPC established a joint venture CNPC-Chalco (Beijing) Petro-Chemical Engineering Co., Ltd., obtaining procurement advantage for gasoline, diesel and petroleum coke. In addition, we further developed the electrolytic aluminum alloy market through multiple cooperation deals with big customers including China Shipbuilding Industry Corporation and Dicastal. We also signed a cooperation deal with China Merchants Group, combining industrial and financial advantages and setting a model for the cooperation between central enterprises.

In 2017, Chalco saw prominent effect in the cooperation between industrial and financial enterprises. The Company actively cooperated with financial organizations, establishing a Four-rule Industrial Investment Fund of RMB10 billion, and introducing an investment fund of RMB10 billion from China Life Investment for supply-side structural reform. The Company seized opportunities provided by the marketization and legalization of debt-to-equity policy, and achieved a total debt-to-equity scale of RMB12.6 billion, becoming a benchmark for central enterprises' debt-to-equity projects recommended to the State Council by the National Development and Reform Commission.

Lu Dongliang

Secretary of party committee and chairman

Chalco

1. About the Report

REPORTING PERIOD

1st January 2017 to 31st December 2017. Some content exceeds this scope.

REPORTING CYCLE

The Corporate Social Responsibility Report of Aluminum Corporation of China Limited is an annual report. This report is our tenth report.

REPORTING SCOPE

The report content covers the information of Aluminum Corporation of China Limited and its subsidiaries.

REPORTING GUIDELINES

This report was prepared with reference to: the *Environmental, Social and Governance Reporting Guide* of 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 *ISO26000 Social Responsibility Guidelines*.

1. About the Report (Continued)

REPORTING SPECIFICATIONS

For ease of reading, Aluminum Corporation of China Limited is referred to as “Chalco”, “the Company” and “We” throughout the report. The group of the Aluminum Corporation of China is referred to as “Chinalco” and “the Group”. Other definitions are as follows:

“Shanxi Branch”	refers to	Chalco Shanxi Branch
“Guangxi Branch”	refers to	Chalco Guangxi Branch
“Guizhou Branch”	refers to	Chalco Guizhou Branch
“Henan Branch”	refers to	Chalco Henan Branch
“Qinghai Branch”	refers to	Chalco Qinghai Branch
“Lanzhou Branch”	refers to	Chalco Lanzhou Branch
“Liancheng Branch”	refers to	Chalco Liancheng Branch
“Chalco Energy”	refers to	Chalco Energy Co., Ltd.
“Chinalco Shanghai”	refers to	Chinalco Shanghai Company Ltd;
“Chalco Logistics”	refers to	Chalco Logistics Group Co., Ltd.
“Zhengzhou Institute”	refers to	Chalco Zhengzhou Research Institute of Non-ferrous Metal
“Chalco Shandong”	refers to	Chalco Shandong Co., Ltd.
“Zhongzhou Aluminum”	refers to	Chalco Zhongzhou Aluminum Co., Ltd.
“Ningxia Energy”	refers to	Chalco Ningxia Energy Group Co., Ltd.
“Zhongzhou Logistics”	refers to	Chalco Zhongzhou Logistics Group Corporation Co., Ltd.
“Inner Mongolia Logistics”	refers to	Chalco Logistics Group Inner Mongolia Co., Ltd.
“Lvliang Logistics”	refers to	Chalco Logistics Group Inner Mongolia Co., Ltd. Lvliang Branch
“Baotou Aluminum”	refers to	Baotou Aluminum Co., Ltd.
“Chalco Trading”	refers to	China Aluminum International Trading Co., Ltd.
“Inner Mongolia Trading”	refers to	China Aluminum Inner Mongolia International Trading Co., Ltd.
“Shandong Huayu”	refers to	Shandong Huayu Alloy Materials Co., Ltd.
“Shanxi Huaze”	refers to	Shanxi Huaze Aluminum & Power Co., Ltd.
“Shanxi Huaxing”	refers to	Shanxi Huaxing Aluminum Co., Ltd.
“Shanxi Huasheng”	refers to	Shanxi Huasheng Aluminum Co., Ltd.
“Shanxi New Materials”	refers to	Chalco Shanxi New Materials Co., Ltd.
“Shanxi Aluminum”	refers to	Chinalco Shanxi Aluminum Co., Ltd.
“Zunyi Alumina”	refers to	Chalco Zunyi Alumina Co., Ltd.
“Zunyi Aluminum”	refers to	Zunyi Aluminum Co., Ltd.
“Fushun Aluminum”	refers to	Fushun Aluminum Co., Ltd.
“Gansu Hualu”	refers to	Gansu Hualu Aluminum Co., Ltd.
“Guangxi Hualei”	refers to	Guangxi Hualei New Material Co., Ltd.
“Wangwa Coal”	refers to	Chalco Ningxia Wangwa Coal Co., Ltd.

1. About the Report (Continued)

REPORT DATA SPECIFICATION

The data quoted in this report are 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 the report is in RMB unless otherwise specified.

ACCESS TO THE REPORT

This report is published in both Chinese and English, electronic copies are available as follows:

From the website of The Stock Exchange of Hong Kong, <http://sc.hkex.com.hk>

From the website of the Shanghai Stock Exchange, www.sse.com.cn

From the website of The Securities Times, <http://www.stcn.com>

From the website of Aluminum Corporation of China Limited, www.chalco.com.cn

2. About Us

2.1 COMPANY PROFILE

Aluminum Corporation of China Limited is a large listed company controlled by Aluminum Corporation of China, with its stock listed on the New York Stock Exchange (stock code: ACH), the Stock Exchange of Hong Kong (stock code: 2600), and the Shanghai Stock Exchange (stock code: 601600). Chalco 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 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. By the end of December 31st, 2017, Chalco had 10 branch companies, 19 shareholding companies, and 38 affiliated companies, including 16 wholly-owned subsidiaries and 22 partially-owned subsidiaries.

Chalco has always been committed to ensuring the development and utilization of national strategic resources. The Company has played an important role in many industry areas, including aeronautics and space, rail transportation, and civilian high-end alloys. The Company is proud to have provided key aluminum materials for China's first man-made satellite, Long March rockets, Shenzhou spacecrafts, Chang'e lunar probes, aircraft carriers, high-speed trains, and many other construction and transportation projects.

This is a pivotal stage for transforming our growth model, improving our economic structure, and fostering new drivers of growth. With the philosophy of scientifically controlling the upstream, optimizing 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 our shareholders, increasing benefits for our company, and raising the incomes of our employees. In driving and achieving these goals, we hope that Chalco can contribute to a new chapter of the Chinese Dream.

2. About Us (Continued)

2.2 CORE PHILOSOPHY

Our vision:	To become a world-class global company with global competitiveness
Our spirit:	Striving for strength and excellence through endeavor and innovation
Core values:	Responsibility, integrity, openness, and excellence
Our purposes:	Add value for our shareholders, increase benefits for our company, and raise income for our employees
Our goal:	Contribute to a new Chalco chapter of the Chinese Dream
Our mission:	Bring benefits to the country, shareholders, employees, customers, communities and environment
Operation philosophy:	Create value and earn returns
Management philosophy:	Striving for excellence and collaborating for efficiency
Responsibility philosophy:	Turning stone into gold and benefiting mankind
Corporate culture:	Transparency, honesty, simplicity, and open-mindedness

2.3 HONORS AND AWARDS

Honors and Awards Gained by Chalco in 2017

Chalco joined the Forbes Global 2000, topping the list of domestic non-ferrous metals companies

Chalco was awarded the “2016 Listed Companies – Best Investor Relations” award by the China Financial Market

Chalco achieved Class A Information Disclosure Credit Grade by the Shanghai Stock Exchange

Honors and Awards Gained by Individuals of Chalco and its subsidiaries in 2017

Executive Director Ao Hong was awarded the “China Nonferrous Metals Industry’s Man of the Year” award

Zhang Zhankui, Chief Financial Officer and Secretary of the Board of Directors, was awarded the “Best Chief Financial Officer” in the basic materials industry by the financial magazine of “Institutional Investor” and the “7th Golden Bauhinia Award – Best Secretary of the Board of Directors of the Listed Company” by the China Securities

Shi Zhi, the General Manager of Chalco Zhengzhou institute, was awarded the “Distinguished Engineer Encouragement Award”

2. About Us (Continued)

Honors and Awards Gained by Branches in 2017

Two patents of the Guangxi Branch won awards, one a Gold Award, the other a Silver Award at the 7th Guangxi Invention and Creation Achievement Awards

Shanxi Branch achieved Class A Enterprise Tax Credit Grade in 2016

Qinghai Branch was awarded the title of Advanced Enterprise in Energy Conservation Management by Qinghai Province during the 12th Five-year Plan

The Wang Yongwei Technology Innovation Studio of Henan Branch was awarded Model Innovation Studio status by Zhengzhou City

Honors and Awards Gained by Subsidiaries in 2017

Baotou Aluminum was named one of the first batch of “Hundred-year-old Enterprises” in Baotou

Ningxia Energy was awarded “The Best Practice of 2017 China Enterprises in Achieving Sustainable Development Goals” by the United Nations and the Global Compact Network China

Chalco Shandong was awarded with one second prize and two third prizes of “Non-ferrous Metal Industry Science and Technology Progress”

Zhengzhou Research Institute was awarded with the second prize of “Non-ferrous Metal Industry Science and Technology Progress”

Shandong Huayu was awarded with the second prize of “Non-ferrous Metal Industry Science and Technology Progress”

Chalco Qinghai Branch was awarded with the second prize of “Non-ferrous Metal Industry Science and Technology Progress”

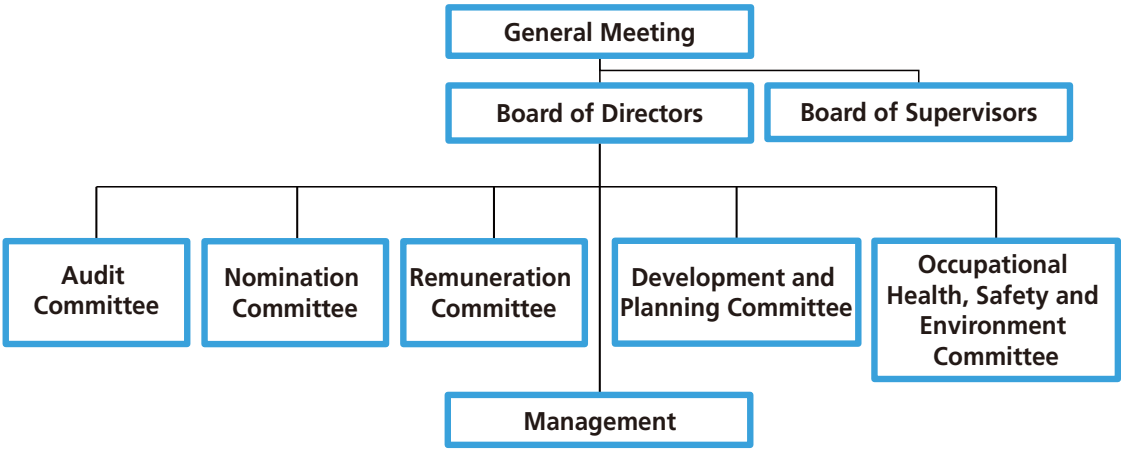
Chalco Zhongzhou was awarded with the third prize of “Non-ferrous Metal Industry Science and Technology Progress”

3. Governance • Responsibility

Chalco actively promotes good governance and continuously improves its corporate governance. We proactively fulfills our corporate responsibilities in the political, economic, and social spheres, striving to be a stronger, larger, and more excellent state-owned enterprise, with our role as state-owned enterprise fully played and the values of central enterprise completely demonstrated. With efficient management, our commitments to shareholders, investors, employees, and partners are fully fulfilled.

3.1 STRENGTHEN GOVERNANCE AND REWARD SHAREHOLDERS

Chalco strictly follows the laws, regulations and regulatory rules for securities in the listing locations of Shanghai, Hong Kong and New York City. The Company formulates clear procedures and working processes, continues to deepen and improve 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. Our goal is 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, enabling good performance from the points-of-view of both shareholders and wider society.



Three Boards and One Layer

3. Governance • Responsibility (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 20 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 and similar, as well as supervises the implementation of the Company's regulatory obligations.

In 2017, the Company's 6th session of Board of Directors consisted of nine directors: Chairman and Executive Director Mr. Yu Dehui; Executive Directors, Mr. Lu Dongliang, and Mr. Jiang Yinggang; Non-Executive Directors Mr. Ao Hong, Mr. Liu Caiming and Mr. Wang Jun; and Independent Non-Executive Directors, Ms. Chen Lijie, Mr. Hu Shihai and Mr. Li Dazhuang. The Board held 13 meetings, and reviewed and passed 56 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. In 2017, the board's key personnel consisted of: Chairman Mr. Liu Xiangmin, and Supervisors Mr. Wang Jun and Mr. Wu Zuoming. The board held 5 meetings and reviewed and approved 12 proposals during the reporting period.

3. Governance • Responsibility (Continued)

Management

The main functions of management include being in charge of the Company's production and other operations, organizing 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.

In 2017, the Company's key management included: Mr. Lu Dongliang, President; Mr. Xu Bo, and Mr. Jiang Yinggang, Vice President; Mr. Zhang Zhankui, Chief Financial Officer and the Company's Secretary (Board Secretary), and Mr. Leng Zhengxu, Vice President. For specific information on management, please see the Company's website: http://www.chalco.com.cn/chalco/gsgk/glry/A120110web_1.htm

Note 1: On August 17, 2017, considering that Mr. Yu Dehui's decision-making authority and main work content corresponded to the definition of the obligation of Executive Director, Mr. Yu Dehui was transferred as Executive Director from Non-executive Director.

Note 2: On February 13, 2018, due to career move, the 20th meeting of the 6th session of Board of Directors approved Mr. Ao Hong to be relieved of his Chairman office and transferred from Executive Director to Non-executive Director.

Note 3: On February 13, 2018, the 20th meeting of the 6th session of Board of Directors approved Mr. Lu Dongliang to be the President of the Company, and be relieved from his senior Vice President office.

Note 4: On January 20, 2017, the 6th meeting of the 6th session of Board of Directors approved Mr. Leng Zhengxu to be the Vice President of the Company.

Advance Governance through System Building

Under the governance structure "Three Boards and One Layer", Chalco continuously strengthens and improves the corporate governance through system building. In 2017, based on the Company's vision, core values, and the Company's medium and short term governance goals, the Company implemented the Chalco Business System (CBS) to incorporate social responsibility into precise management. The system provides a unified appraisal system and problem-solving procedures for the Company's operation and management. It provides effective system support for the Company to improve standards, summarize and share best practices, accelerate the training of talents, and continuously improve performance and reduce costs.

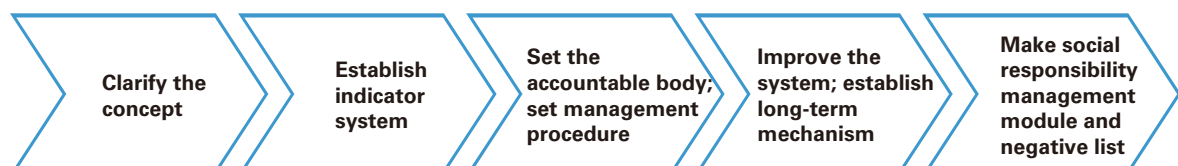
3. Governance • Responsibility (Continued)

The results achieved by CBS in Chalco in 2017:

1. Forming the strategic development vision of “to become a world-class global company with global competitiveness”
2. Reflecting guiding principles in implementing the Company’s overall strategy
3. Extracting and summarizing 24 universal tool methods which can be rolled out
4. Establishing continuously improving standards and the platform for summarizing and sharing best practices, in the areas of project-based management, waste elimination, standardization, model factory building
5. Accelerating the training of talents, attracting high-end talents, and providing effective support for the continued cost reduction of the Company

3.2 MANAGE WITH RESPONSIBILITY AND INTEGRATE SUSTAINABLE DEVELOPMENT

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

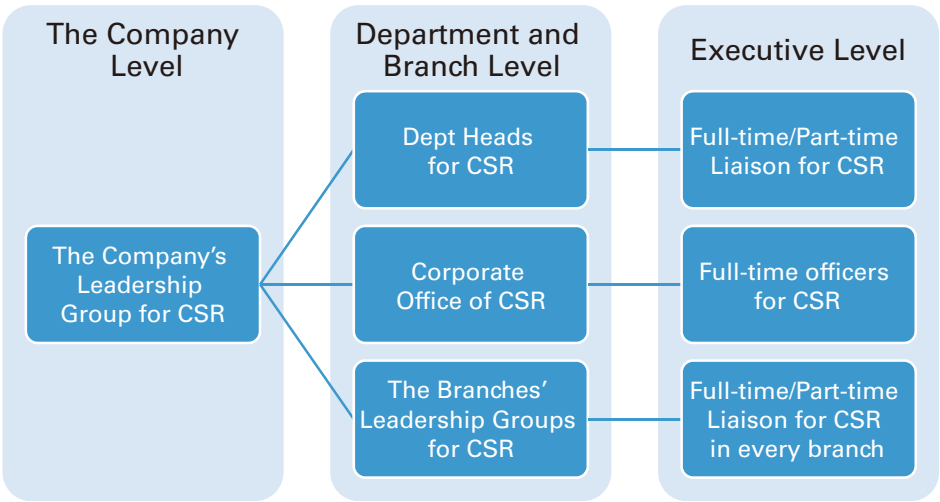


Five Steps of Integrating CSR into Management

3. Governance • Responsibility (Continued)

Organizational System Building for Fulfilling Responsibilities

Chalco set up 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, full-time agencies are set up at the department and branch levels, making the relevant departments accountable for responsibility management in five fields: company governance, the environment, employment and employee rights, operating practices and community. In addition, management positions and liaisons for CSR are appointed to execute the Company's CSR policies in every section of operations.



Management Structure of CSR

3. Governance • Responsibility (Continued)



Departments Responsibility Management

CSR Pilot Scheme

Guided by the leadership group for CSR, the Company launched CSR practical pilot work, to facilitate performance, improve customer satisfaction, upgrade operation philosophy, and bring benefits to stakeholders. The Company always fully understands the significance of pilot work, so it promotes the CSR management and reform pilot with obvious results achieved.

In 2017, Chalco Trading achieved success in four areas by integrating CSR into management, namely, performance, customer satisfaction, operation philosophy, and community building, which laid a solid foundation for the Company to further launch CSR management and reform work, provided precious experience for the Company to fully integrate CSR into management practices, and enhance the confidence for making further CSR improvements.

3. Governance • Responsibility (Continued)



3.3 PERFORM COMPLIANCE INSPECTION AND ACHIEVE COMPREHENSIVE RISK MANAGEMENT

Chalco closely follows the national requirements for state-owned enterprises and the newest requirements of the industrial standards and internationally accreditation requirements, and continuously updates management measures inside the Company to achieve comprehensive compliance. In the global risk report of the 2017 WEF, environmental and social risk indicators accounted for 70% of the top ten risk indicators for enterprises, which aroused global attention. Chalco always integrates the environmental and social risks into the Company's risk management and control, and implements comprehensive risk management to satisfy the expectations and requirements of investors and stakeholders.

Strictly Control Environmental and Social Risks

Under the serious situation of environmental and social risk, Chalco pays great attention to safety and environmental protection. Through enhancing safety and environmental protection supervision and accountability, the Company implements safety and environmental protection work, improves the capability and level of safety and environmental protection management, and takes a zero-tolerance attitude towards work-related death and environmental accidents. The Company proactively adopts safety management standardization, continuously enhances safety management, actively responds to the national green policies and environmental protection policies, and carries out special campaigns to build upon and consolidate progress made in these areas. Of particular note is the simple policy of listing and assessing safety problems required by the SASAC (State-owned Assets Supervision and Administration Commission) in a coordinated and systematic manner.

3. Governance • Responsibility (Continued)

In 2017, Chalco actively carried out its responsibilities under the *Air Pollution Prevention and Control Work Plan for 2017 for Beijing, Tianjin, Hebei and the Surrounding Areas*, taking a lead in executing ultra-low-emission standards in the “2+26” cities (air pollution spreading path of Beijing, Tianjin, Hebei, and surrounding areas). Chalco organized the ultra-low-emission reform of furnace gas in Chalco Shandong, Zhongzhou Aluminum, and Henan Branch, launched 176 safety and environmental protection projects including raising the standard of wastewater treatment of Chalco Ningxia Energy in Guyuan city, eliminated 102 potential safety hazards, and solved 71 environmental problems.



Comprehensive Building of Risk System

Chalco’s internal risk control is conducted by the Board of Supervisors and the Internal Audit Department, which launch special work on formally listed safety problems in departments and branches annually on time, to help with corporate self-inspection and correct problems. In 2017, the Company, on the basis of formal operation of Internal Audit Department in 2016, continues to promote comprehensive risk management and control, improves the procedure of comprehensive risk recognition, streamlines the work, finds problems, supervises problem correction, maintains the effective operation of risk management system, and improves internal control level and risk prevention. This is of great significance for enterprises at all levels to enhance management and improve quality and efficiency. The Company implements “double level” risk identification and assessment processes, through which employees can participate in basic risk management work such as risk identification and assessment.

3. Governance • Responsibility (Continued)

Level One (Departments/branches)	Level Two (Internal Audit Department)
Identify, assess, and analyze risk; assess significant risks, important risks, and general risks; analyze significant risks and raise responsive solutions and measures of management and control	Summarize the risk assessment results at branch level and Internal Audit Department level; figure out significant risk sources, and make management strategy and measures of management and control
The risk-management leading departments summarize and adjust the risk assessment results of departments and branches to formulate the result of level one	

“Double Level” Risk Identification and Assessment Process

In 2017, 60 level three risks were identified in the Company’s headquarters. In addition, according to the Company’s risk assessment standard, a comprehensive risk assessment was carried out on 7 significant risks, 15 important risks, and 38 general risks. In 2017, the Company’s 7 significant risks included one strategy risk, three market risks, two financial risks, and one operation risk, as can be seen in the following table:

Number	First-Level Risk	Second-Level Risk	Third-Level Risk
1	Market risk	Market price risk	Product (procurement) price risk
2		Exchange rate risk	Exchange rate risk
3		Interest rate risk	Interest rate risk
4	Financial risk	Capital risk	Cash flow risk
5		Financial derivative risk	Financial derivative risk
6	Strategy risk	Industry risk	Industry competition risk
7	Operation risk	HSE risk	Safety risk

3. Governance • Responsibility (Continued)

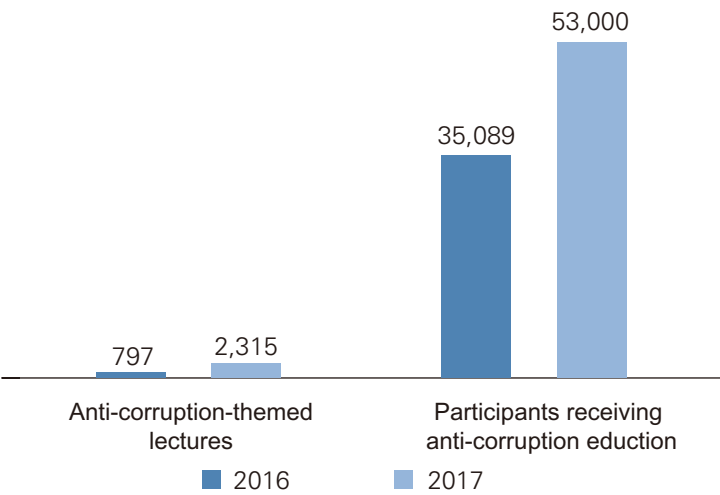
Innovate Internal Audit Methods

Chalco actively innovates internal audit system, working processes and methods. In 2017, the Internal Audit Department launched and rolled out inter-inspection model between subsidiaries and branches, which 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 inter-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. In 2017, the Company organized about 100 people in 23 subordinate enterprises to launch internal control and inter-inspection processes, and identified and rectified 160 internal control weakness and special problems.

Deepen Anti-corruption Work

Since the 18th National Congress of the CPC, Chalco has been working on clean Party, governance building, and anti-corruption as well as unwaveringly carries out the “Two Responsibilities” of clean Party and governance set by the CPC. In 2017, Chalco, while learning hard and carrying out the spirit of the 19th National Congress of the CPC, implemented the Party Central Committee’s eight-point decision on improving Party and government conduct, and took relentless and nonstop effort in clean Party, governance building, and anti-corruption to further promote the Company’s anti-corruption work. The Company keeps enhancing online and offline education on clean governance by establishing platforms for learning and sharing through our corporate newspaper, WeChat official account, working groups, and mini-lectures. In addition, through the quarterly conference on clean-Party-and-governance-themed education, the Company regularly organizes visits to anti-corruption-themed education bases, guides cadres and employees to stick to the baseline, stay away from red line issues, and pursue idealism. Throughout the year, the Company has held 4 conferences on clean-Party-and-governance-themed education, notified 239 cases with 750 people involved, and organized the 13th Anti-corruption-themed Education Month. 2,315 anti-corruption-themed lectures were held by branch enterprises throughout the year with more than 53,000 people directly benefiting.

3. Governance • Responsibility (Continued)



According to the *CPC Discipline Inspection Organ Working Rule*, Chalco established discipline inspection records and adverse indication management records in order to achieve normative process and trace management in every section in dealing with information, and conducted autonomous tracking and expiry notices to dynamic records in order to track and supervise the dealing with information. The Company continuously improves its petition management process and receives petitions by letter, visit, phone call, and so on. This year the Company dealt with 100% of petitions received.



The Party committee of Chalco organized a visit to an anti-corruption-themed education base in Haidian District



The Party committee of Chalco held video meeting of central group (including other party members and people) as part of Anti-corruption-themed Education Month

3. Governance • Responsibility (Continued)

3.4 MANAGE WITH PRECISION AND PROMOTE STANDARDIZATION+ MODEL

In 2017, in order to achieve more meticulous work, more efficient management, and more obvious benefits, Chalco studied the precise managerial expertises from advanced enterprises, and launched a series of special campaigns (such as project-based management, field management, and standardization) to promote precise management and facilitate standardization building, laying the foundation for the Company to improve quality and efficiency as well as to pursue transformation development. Propelled by the Company's management and with the efforts of all branch enterprises, in 2017 the Company established more than 20 new standards, with more than 30% of filed management reaching an advanced level.

“Standardization+” Model Management

In order to improve efficiency and increase benefits, Chalco launched “Standardization+” management in 2017, clarifying a series of content at the headquarters level, including the general thought, working goals, working methods, major tasks, promotion plans and requirements.

General Thought

- Gradually deepen from “point level”, “line level”, to “plane level”, try to make breakthrough in three aspects: “establishing unified standards”; “establishing leading standards”; “strictly executing standards”.

Overall Goal

- Establish first-class standards and build first-class enterprise

Working Methods

- Keep the cycle of “standard setting — standard execution — standard evaluation — standard raising”
- Combine key breakthrough and “Standardization+”

3. Governance • Responsibility (Continued)

In 2017, the Company promoted standardization through establishing key item guidelines for standardization, sharing experience in field meetings, and guiding work in the field, and created 20 standards.

1. Establish Key Item Guidelines for Standardization and Monthly Progress Tracking

In 2017, the Company's departments and enterprises set 73 standardization key items, including 40 in management and 33 in benefits. In addition, they created or improved 146 standards, streamlined processes at all levels, clarified standards, improved the execution and efficiency of management, and promoted the overall level of basic management.

2. Share Experience in Field Meetings and Promote Standardization Work

In 2017, the Company organized 3 promotion meetings in Shandong Huayu, Guangxi Branch, and Baotou Aluminum respectively, where 14 enterprises shared experience in field meetings, effectively promoting standardization work.

3. Guide Work in the Field and Improve Standardization Level

In 2017, the Company appointed 5 members from the precise management core group to enterprises guiding work on field, and formulated Site Management Standards and Site Management Evaluation Details to guide the enterprises promoting standardization according to standards. Up to December 31, 2017, 9 enterprises have passed the Company's check, reaching the "advanced" level.



Chalco held "standardization+" field meeting in Guangxi Branch

3. Governance • Responsibility (Continued)

Standardization is the foundation of precise management. During the reporting period, Chalco unified standards through relevant departments, laying the foundation for making use of the Group's advantages; executing the standards through branch enterprises and promoting the improvement of execution. Chalco tries to make breakthrough in establishing unified standards, establishing leading standards, and strictly executing standards, having laid the foundation for precise management, and strides towards higher goal by improving the whole company's standards, providing fundamental support of improving the Company's core competitiveness.

ERP System Helps to Improve Management

In order to further enhance precise management, improve management efficiency, and reduce internal control risks, the Company fully launched the Enterprise Resource Planning (ERP), which will realize autonomous collection of consolidated financial statement data as well as focused and unified management of business data by Chalco. The ERP system will cover Chalco and all real enterprises, unifying management of the three key business, alumina, electrolytic aluminum, and trade, under the strategic management and control of headquarters, and connecting the business between headquarters and enterprises. It will end the era of manual data management, achieve real-time search in all sections and in-time statistical analysis, enable tracking of all kinds of data at any time, and provide solid digital support for the Company's management improvements.

Uphold Business Ethics

Chalco upholds the clean governance concept of "work without corruption and development with ethics and integrity", strictly follows national laws and regulations such as the *Anti-Unfair Competition Law* of the People's Republic of China and the *Anti-Monopoly Law* of the People's Republic of China, implements rules about work without corruption, strictly observes business ethics and market rules, and firmly rejects unfair competition, in order to safeguard a fair business transaction environment. The Company continuously enhances business ethics education and the management of related people, voluntarily rejects corrupt behavior, and takes a zero-tolerance attitude towards violation of regulations, laws, and rules.

4. Green • Ecology

In 2017, the Report of the 19th National Congress of the CPC proposed the ecological protection scheme of conservation-first, protection-first, and natural-recovery-based, as well as industrial structures for resource-conservation and environmental protection. Chalco, as a world-class enterprise, is committed to establishing clean production projects and green low-carbon projects, and fully implementing energy-saving, recycling, ecological protection and other measures, thus largely alleviating impacts on the environment during production processes.

The Company strictly complied with *Environmental Protection Law of the People's Republic of China*, *the Law of Land Administration of the People's Republic of China*, and related laws and regulations. Chalco strengthens management in treatment of potential environment hazards, reuse of water resources, building of green mines, treatment of hazardous waste, and other aspects, which fully reflects Chalco's leading role in the industry.

4.1 REDUCE EMISSION AND CONSERVE ENERGY TO ACHIEVE GREEN PRODUCTION

Chalco puts great effort into energy management and emission reduction, strictly complies with related national laws and regulations, as well as local policies, observes *the rules on Environmental Protection Management Measures in Chalco*, improves environmental management systems, increases investment in environmental protection, and carries out new-tech transformation, in order to improve energy efficiency and to facilitate clean production.

Increase Investment in Environmental Protection

The Company increases its effort into ecological protection, and integrates the awareness of sustainable development into production. The Company formulated *Chalco Enterprise Management Plan of Independent Decision-making Technological Reform Project*, which requires prioritizing safety and environmental protection projects, energy-conservation and consumption-reduction projects, production in urgent need, and new product R&D, as well as other R&D projects related to process-improvement, to improve existing production lines, and realize safety, environmental protection, energy-conservation and consumption-reduction, as well as cost-reduction and efficiency-improvement goals. In November, 2017, coordinated by related departments in headquarters, the Investment Management Department led and carried out checks and evaluations to the self-evaluation summary reports of enterprises' technological reform projects by independent decision-making. Technological reform projects in environment aim at safe and recycling treatment of waste water, waste gas and solid waste in the aluminum industry and solving production technical problems based on real production situations.

4. Green • Ecology (Continued)

In 2017, we had 257 independent decision-making projects on record. Of these projects, environmental projects accounted for 27.63% with 71 projects. Compared with 2016, investment in building independent decision-making project this year increased by 83.52%; and investment in safety and environmental protection projects increased by 196%.

Case: Ningxia Energy Proactively Launched Carbon Asset Development Work to Promote New Energy Industry

Chalco Ningxia Energy covers coal power, thermal power, wind power, photovoltaic power, and other industries, with 2.787 billion tons of coal reserve, 5.24 million kilowatts of thermal power installed capacity, 1.34 million kilowatts of grid-connected installed capacity of wind energy, and 230 thousand kilowatts of solar installed capacity.

Since 2006, Chalco Ningxia Energy began to develop CDM (Clean Development Mechanism) project, becoming the first Ningxia enterprise developing CDM project and successfully registering in UN Executive Committee of CDM with 21 CDM projects. Among them, there are 22 wind power projects with installed capacity of 1,118.3MW, and 6 photovoltaic projects with installed capacity of 130MWp. Up to December, 2017, Ningxia Energy has issued emission-reduction of 2.199 million tons in UN Executive Committee of CDM.



4. Green • Ecology (Continued)

In 2016, Chalco Ningxia Energy entrusted Shanghai Baotan New Energy and Environmental Protection Technology Co., Ltd., and Ningxia CDM Service Center to develop 5 voluntary emission-reduction projects including the fifth-stage 49.5MW project of Sun Mountain Wind Power Plant. The second-stage CCER project of Hongsibu Wind Power, which was already launched before the registry in UN Executive Committee of CDM, has already recorded 62 thousand tons of emission-reduction in National Development and Reform Commission. Later, Chalco Ningxia Energy will successively launch voluntary emission-reduction projects through new energy projects which have been constructed and put into operation. This will provide offset of carbon quota for other subordinate enterprises of Chalco.



Such projects as CDM and CCER brought economic benefits to Chalco Ningxia Energy as well as provided precious experience of carbon asset trade across the country.

In 2017, Ningxia Energy was awarded as “Pioneer Enterprise for Reaching SDGs” of UN Global Compact China Zone.

4. Green • Ecology (Continued)

Waste Gas Treatment

Major waste gasses produced by Chalco include sulfur dioxide, nitrogen oxides, and soot, and the Company remains committed to reducing emissions of waste gas through improving and innovating production. In 2017, the Zhengzhou Non-ferrous Metal Research Institute successfully developed a key technology for boiler desulfurization applied to red mud, and completed a pilot-scale experiment on a 5t/h coal-fired boiler and industrial scale test on a 75t/h boiler. The technology will enable the Company to meet SO₂ ultra-low emission standards (<35mg/m³), thus largely alleviating impacts on the environment.

Table: 2016–2017 Waste Gas Emission of Chalco

	2016	2017
Sulfur Dioxide Emission (ton)*	40,524.00	42,723
Nitrogen Oxides Emission (ton)	20,300.84	14,624.30
Soot Emission (ton)	2,568.00	2,421.00

* The increased emission of SO₂ is due to the increased production of alumina and electronic aluminium in this year.

Waste Water Reduction

Since 2007, the Company has continuously implemented circulating utilization 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 alumina water. In this way, the Company has improved both gradient utilization (step-wise utilization) 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 can't be reused will be discharged strictly according to national requirements for wastewater treatment. In 2017, total waste water treated was 1,737,438 tons, chemical oxygen demand was 51 tons, and discharge of ammonia nitrogen was 44 tons.

4. Green • Ecology (Continued)

Table: 2016–2017 Recycled Waste Water of Chalco

	2016	2017
Recycled Waste Water (<i>hundred million ton</i>)	24.77	25.69

Solid Waste Treatment

According to the related national laws and regulations, the Company classifies solid waste and regularly treats the waste. Currently, solid waste mainly includes red mud produced in alumina production, waste in the aluminum electrolysis spent potline 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 resource use efficiency, but also achieving safe treatment of waste materials. In 2017, the amount of solid waste generated by the Company reached 33,160,803 tons with 3.6 tons per 10,000 RMB of output value. The amount of fly ash generated was 3,563,000 tons, with 2,452,000 tons reused, and the amount of slag generated was 872,000 tons, with 613,000 tons reused.

Reduce Energy Consumption

In 2017, in order to fully implement energy-conservation measures, Chalco set annual energy-conservation goals according to actual operation situations, and included energy-conservation as part of leaders' end-of-year performance appraisals. At the same time, the Company put more effort into technological development, to achieve energy-conservation goals through upgrading technology and improving equipment.

The Combined Heat and Power (CHP) mode is adopted in all of Chalco's heating and power plants in alumina enterprises to improve heating quality, conserve energy, and realize gradient utilization (step-wise utilization) of energy. In 2017, the Company adopted new back-pressure units, first using high-pressure steam for power generation, and then for heating, which avoided the energy lost caused by old-style back-pressure units transmitting steam heating through temperature and pressure reducers. At the same time, it nearly doubled the generating capacity of back-pressure units, conserving much energy. In this year, Chalco provided heating of 98.812 million GJ and power of 3.952 billion kWh for enterprises through the Combined Heat and Power (CHP) mode, achieving the heat-to-electric ratio of 694.53% and energy use efficiency of 74.32%.

4. Green • Ecology (Continued)

In terms of alumina, the Company adopted innovative technology and conducted many experiments, successfully developing “FHEST” technology, which can enable a system with DC power consumption per ton $\geq 13,000\text{kwh/t-Al}$ to realize power-savings of more than 500 kwh/t-Al, with corresponding reductions in emissions of carbon dioxide. In 2017, Chalco rolled out the “FHEST” technology in its alumina enterprises. Up to December 31, 2017, the Company altogether launched 470 electrolytic cells, with 350 thousand tons of production capacity expanded.

For low grade bauxite, the Company successfully developed a $\varnothing 6\text{m}$ large-scale no transmission flotation cell, achieving 39.72% energy-conservation. Currently, Zhongzhou Aluminum is testing a new direct flotation collector, which is predicted to reduce chemicals consumption by 18%.

Shangxi Huaze carried out the project (*dense phase turning into hyper dense phase system*) to reduce compressed air use during transportation, which can reduce compressed air use by 69.59 thousand normal cubic meters per day and can save RMB500,000 in power used for compressing air. Shandong Huayu also implemented the project high pressure fan frequency conversion for energy-saving for 18 high pressure fans in heating and power plants, achieving RMB300,000 in power-saving. Lanzhou Branch completed the transformation project rotary kiln waste heat utilization, saving 35,000 tons of steam annually.

Case: Chalco Shanghai was Awarded Certificate of Green Building Design Label (Three-Star)

In order to actively respond to the goal of energy-conservation and emission-reduction, Chalco Shanghai designed a plan of energy-conservation for the Chinalco Building. By means of roof greening, outdoor permeable paving, a concentrated energy center, a solar water heating system, rainwater and wastewater collecting and reuse, efficient water-saving instruments, as well as special technology such as underground lighting and intelligent equipment monitoring, Chalco Shanghai reached 100% of the standard for indoor environments, optimized energy efficiency, maximized the use of non-traditional water sources, realized green construction and intelligent management, thus being awarded the Certificate of Green Building Design Label (Three Star) by the Ministry of Housing and Urban-Rural Development.

4. Green • Ecology (Continued)



Table : 2016–2017 Energy Utilization of Chalco

	2016	2017
Comprehensive Energy Consumption (ten thousand tons of standard coal)	1,659.00	1,867.60
Synthetic Energy Consuming per 10,000 RMB of output value (tons of standard coal)	2.71	2.03
Purchase Electricity (hundred million degree)	223.00	349.30
CO ₂ equivalent (ten thousand ton)	/	6,862.30
CO ₂ equivalent per 10,000 RMB of output value (ton)	/	7.47
Total Coal Consumption (ten thousand ton)	1,550.00	1,292.20

4. Green • Ecology (Continued)

Table : 2016–2017 Water Utilization of Chalco

	2016	2017
Total Water Consumption (<i>Hundred million ton</i>)	25.71	26.68
Which contains: Circulating Water Consumption (<i>Hundred million ton</i>)	24.77	25.69
Clean Water Consumption (<i>Hundred million ton</i>)	0.94	0.99
Water Consumption per 10,000 RMB of output value (<i>Ton</i>)	401.13	290.38

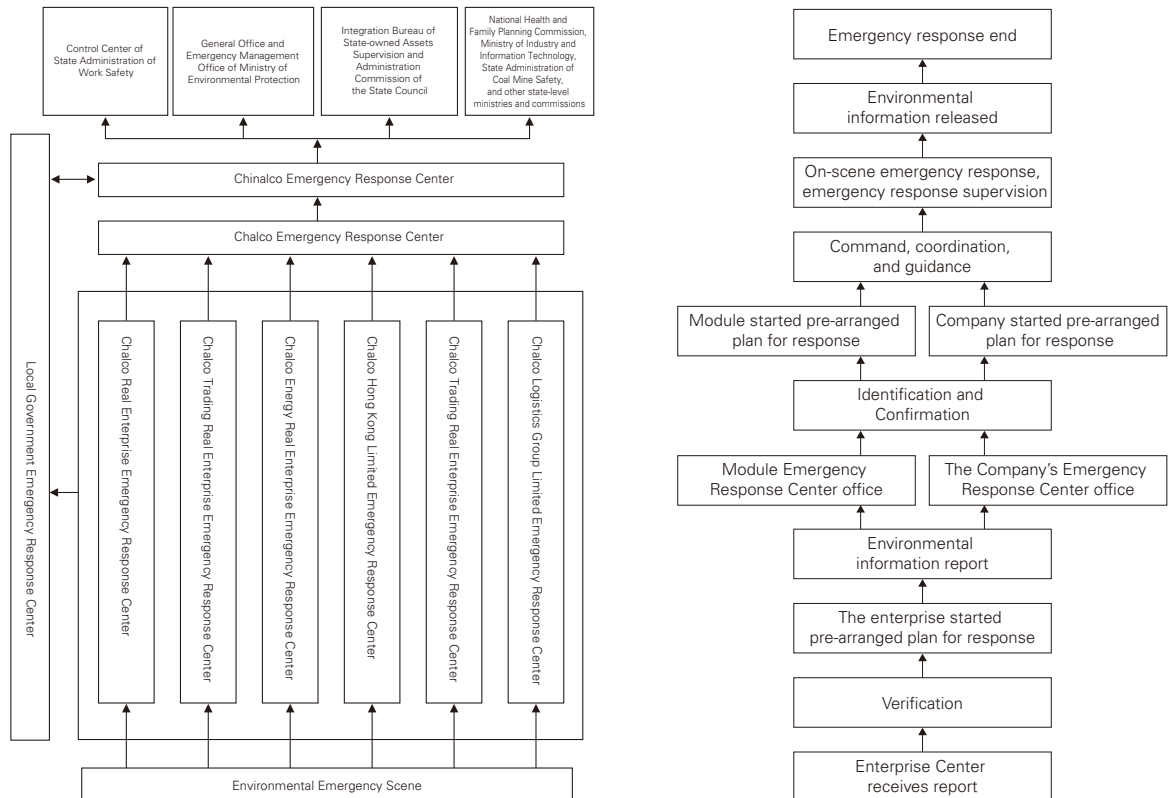
* The above data do not include Ningxia Energy.

* As the production of alumina and electrolytic aluminum increased in this year, the amount of related energy and resources consumption increased compared with 2016, but the corresponding usage density declined.

Deal with Environmental Emergencies

In order to efficiently respond to environmental emergencies and to ensure the successful implementation of environmental management, the Company strictly implements *Pre-arranged Plan for Chinalco Environmental Emergency* and *Pre-arranged Plan for Chinalco Environmental Administrative Penalty*. The Company divided emergencies into four levels by urgency and severity, established an environmental emergency response system, which is led by the Company's emergency response center, and clarified the process of environmental emergencies response and pre-arranged plan for special emergency response. Through communication with related departments, feedback on emergency response measures, statuses, and results can be shared efficiently so that work can be smoothly done.

4. Green • Ecology (Continued)



The Left: Relatively Serious and Above Environmental Emergency Report Process
The Right: Chalco Environmental Emergency Response Process

4.2 RESPECT RESOURCES AND ADVOCATE CYCLIC MODEL

The Company advocates the production system of green and cyclic development, and pays attention to energy development, turning trash into treasure, and reuse of resources. The major waste of the Company comes from transportation and alumina production. A lot of packing materials are consumed during the process of raw material transportation, and a large amount of waste solid (red mud) is produced during alumina production. Improving the reuse of packing materials and developing the uses for red mud are priorities in waste solid treatment and recycling, which can both conserve environmental resources and reduce waste generation.

4. Green • Ecology (Continued)

Packing Material Recycling

In 2017, Chalco Logistics Group Co Ltd. launched “de-packing”, by using recycled packing bags to save packing materials. In May, Zhongzhou-Linzhou line of Zhongzhou Logistics began using recycled packing bags; in July, Huaxing-Baolv line of Inner Mongolia Logistics and Lvliang Logistics began rolling out the use of recycled packing bags. Positive results have been realized since launching the work: Zhongzhou Logistics used a total of 717 recycled bags, which have been recycled and reused 42,258 times, each bag used on average 58.93 times by the end of November 2017; Inner Mongolia Logistics and Lvliang Logistics put a total of 3,200 recycled bags into use, which have been recycled and reused 95,836 times, each bag used on average 29.9 times by the end of October 2017. In 2017, the Company used a total of 10,820 tons of packing materials.

The Development and Utilization of Red Mud

Chalco pays great attention to the development and utilization of red mud, in areas like the treatment of waste gas, waste water, and heavy metal soil as well as land reclamation. Safe storage and reuse of red mud has been comprehensively improved with 6 items of technology for red mud reuse developed by the Company.

Boiler Desulfurization Applied to Red Mud

The Company has completed pilot scale experiment for 5 tons per hour coal-fired boilers and industrial tests for 75 tons per hour boilers, which can be used for desulfurization of coal-fired flue gas, greatly reducing the SO₂ concentration contained to the national ultra-low emission standards. The implementation of this technology can make 1 ton of dry red mud absorb 100–180kg of SO₂, raising the red mud utilization rate by 10%–15%. The process also reduces the alkalinity of red mud during desulfurization. The desalination rate of red mud desulfurization liquid is 70% or more, and meets national requirements for level I waste treatment after purification.

4. Green • Ecology (Continued)

Red Mud as Steelmaking Slagging Constituent	The Company completed the study on using red mud as a steelmaking slagging constituent. A pilot test suggested that the technology can meet production requirements. Smelting a ton of steel can consume red mud $\geq 90\text{kg}$ red mud/ton molten steel and molten iron, which not only provides a solution for large-scale consumption of red mud, but can also improve the quality of molten steel and molten iron.
Industrial Waste water Purification Agent Production	Shandong branch completed an adjustment test of using red mud to purify industrial wastewater with red mud, which currently can be put into production. The success of this measure is indicated by the fact that Shandong branch has signed a 13,000 tons/year order.
Red Mud Soil Conditioners	Zhongzhou Aluminum has developed a red mud soil conditioner. The product is a high molecular space material with stable structure that can reduce cadmium, lead and other heavy metals in the soil. In June, 2017, a 20 thousand ton soil conditioner production line was put into trial production reaching production requirements in August.
Low-Cost Red Mud Land Reclaim	Zhengzhou Non-ferrous Metal Research Institute successfully developed low-cost red mud land reclamation technology, which can make the fertility of red mud reach the level of dry land. At the same time, the institute sorted out 4 types of adaptable crops which are saline-alkaline resistant, and tested them in field farming, to make the crops flourish. Next, it will be rolled out in Zunyi alumina red mud storage field.
Red Mud Bio-remediation	The Company developed Red Mud Bio-remediation, by selecting two types of highly saline-alkaline resistant bacterial strains from red mud storage field. Bio-remediation can rapidly reduce the alkalinity of red mud and can increase the proportion of large soil aggregate, improving soil structure. These technologies not only can use waste to treat waste, but also can make red mud a high added-value product.

In 2017, the Company totally generated 21.05 million tons of red mud, with 2.098 million tons reused.

4.3 MINE WITH RESPONSIBILITY TO MAINTAIN ECOLOGICAL BALANCE

The Company emphasizes the balance between production and development, and ecological protection, and insists on a “responsible mining” philosophy, scientific exploitation, responsible site choosing to protect the ecology of mining areas. The Company has established a long-term mechanism for ecological environment management and land reclamation in mining areas. The integrated “Separation-Mining-Reclamation” mining technology and land reclamation processes in accordance with the actual conditions, such as “Ladder Leveling-Landfilling of Surface Tillage Soil” and “Bulldozer-Front Loader-Car”, can simultaneously implement separation, mining and reclamation. These measures effectively shorten the cycle of land reclamation and realize the effective combination of engineering reclamation and ecological reclamation. In 2017, a total of 3,909 mu (1 mu=0.0667 hectares) of land in mining areas was reclaimed.

At the same time, as China’s high-grade bauxite resources are depleting, the Company set up a “One high, one low and one removal” project to carry out special studies on the issues of high sulfur, low grade ore and removal of organic matter. In Guizhou, the Company carried out research on roasting desulfurization of high-sulfur bauxite, and flotation desulfurization combined with wet processing oxidation technology to achieve the goal of controlling the sulfur content below 0.3%, which forms two sets of processes for production requirements. In Zunyi, the Company carried out research on flotation desulfurization of ultra-high-sulfur bauxite with a sulfur content of 4% or above. The research results enable the Company to obtain aluminum concentrate ore with sulfur content lower than 0.36%, and sulfur concentrate ore with sulfur content higher than 40%, which effectively improves the efficiency of ore mining.

4. Green • Ecology (Continued)

4.4 TREAT HAZARDOUS WASTE APPROPRIATELY TO PROTECT ECOLOGICAL ENVIRONMENT

Chalco attaches great importance to compliance with relevant provisions, such as *the Law of the People's Republic of China on the Prevention and Control of Environmental Pollution Caused by Solid Waste, and Management Guidelines of Duplicate Forms for Transfer of Hazardous Wastes*, and strictly treats hazardous wastes from the perspectives of safe storage, transfer, and disposal.

1 Disposal according to Regulations

The Company classifies hazardous waste and stores hazardous waste and ordinary industrial solid waste in different places. In the places where the hazardous wastes are stored, the Company takes measures, such as rain prevention and seepage prevention, and posts waste storage signs. If a hazardous wastes landfill is used, the Company disposes of hazardous waste there according to regulations; if there is a harmless treatment process, the Company will perform the treatment on the waste; if both are absent, the Company will transfer the hazardous waste 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. Hazardous wastes include aluminum ash, carbon residue, and spent potlining produced during aluminum electrolytic process. In 2017, the Company totally safely treated 1,113 tons of hazardous wastes with 0.12 tons per 10,000 RMB of output value.

2 Harmless Treatment

To reduce the discharge of hazardous waste and the impact on the ecological environment, the Company successfully developed and applied the harmless treatment of aluminum electrolysis spent potlining technology. The production demonstration line of this technology is set up in Baotou Aluminum, which can process 10,000 tons of spent potlining every year. The demonstration line is a continuous production line with the longest running time and the largest capacity in China, and it can completely detoxify the aluminum electrolysis spent potlining. According to the test results of a third party (Metallurgical Product Quality Inspection Institute of Inner Mongolia Autonomous Region), after the treatment, the content of soluble fluoride decreased from 4,581mg/L to 9.07mg/L and 4.73mg/L and soluble cyanide content decreased from 6.24mg/L to 0.022mg/L and 0.016mg/L, and the pH value ranged from 6 to 9. These numbers are lower than the national standard for identification of hazardous

4. Green • Ecology (Continued)

wastes leaching toxicity and at the same time reach the national Class I industrial solid waste emissions level standard. The technology not only reduces the disposal cost for hazardous waste, but also solves the environmental problem caused by hazardous waste discharge, thus bringing both economic and environmental benefits.

On March 5, 2018, Lanzhou Branch also applied the harmless treatment of aluminum electrolysis spent potlining (overhaul slag) technology.

Lanzhou Branch paid RMB100,000 of administrative penalty (Lanzhou Municipal Environmental Protection Bureau Penalty Number [2017]25) executed by Lanzhou Municipal Environmental Protection Bureau on 20, November, 2017, due to its failure to apply for hazardous waste registration of spent potlining storage according to related regulations. Then, on 29, December, 2017, Ministry of Environmental Protection announced the decision on its website to supervise the rectification work (Ministry of Environmental Protection Emergency Response Letter [2017]2038), mandating that Lanzhou Branch should finish rectification before 31, March, 2018.

According to above requirements of the Ministry of Environmental Protection, the Company took a series of measures to guarantee smooth supervision, as follows:

1. On 18, December, 2017, the Company immediately mandated that Lanzhou Branch should figure out the problems. Lanzhou Branch was demanded to conduct rectification immediately, to make related people accountable, to accelerate cleaning of potential hazards, and to thoroughly rectify the remaining problems.
2. The Company began to supervise Lanzhou Branch with weekly meeting to monitor the rectification process. Lanzhou Branch, regarding this issue as a primary problem, immediately organized to transport the spent potlining (overhaul slag) back to plant for regulation-complied storage.
3. The Company accelerated environmental protection technology in aluminum industry, with a spent potlining (overhaul slag) detoxification production line established in Lanzhou Branch, which has been put into use on 5, March, 2018.
4. The Company entrusted a designing institute to design environmental remediation for the two spent potlining (overhaul slag) storage fields, and remedied environment strictly according to designing requirements.
5. The Company revised the regulations regarding solid waste management, with stricter requirements for avoiding such accidents.

5. Business • Win-Win

Chalco always pays attention to all kinds of influences on various stakeholders during the operation. As a leading enterprise of the state-owned nonferrous metal industry, the Company 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 sustainable development of the industry.

In 2017, the Company continued to invest in product R&D and industrialization, actively developing new technologies to improve resource utilization and reduce environmental impacts and optimizing industry standards to regulate the development of the industry. While providing customers with high-quality products, the company also deeply understands the needs of customers and enhances the level of customer service so as to set up personalized service plans that better suit the market demands. In addition, the Company established a series of comprehensive monitoring produces to regulate its upstream and downstream suppliers. While guaranteeing its own environmental protection and safe production, the Company also applies the corresponding requirements to all aspects of the entire supply chain and promotes the common progress of the industry as a whole in environmental and social governance.

5.1 ENCOURAGE INNOVATION TO PROMOTE 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 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. In 2017, the Company invested RMB270 million in R&D.

5. Business • Win-Win (Continued)

R&D System

Over the years, Chalco has continuously consolidated and improved various science and technology management systems and provided a solid backing for the Company's product and technology research and development. In 2017, the Company amended the *Measures for the Administration of Science and Technology Projects of and Guidance on Strengthening the Promotion of Scientific and Technological Achievements of Aluminum Corporation of China Limited (Trial)*, and drafted *Measures for the Administration of Credit Points of Related Subjects of Scientific and Technological Projects of China Aluminum Corporation Limited (Trial)*. In addition, the Company manages the internal intellectual property rights, trademarks, and awards to comprehensively ensure the sustainable development of the R&D in the Company, according to *Measures for Intellectual Property Right Management of the Group of the Aluminum Corporation of China*, *Interim Measures for Management of Technical Standards of the Group of the Aluminum Corporation of China*, and *Measures for Technology Award Management of the Group of the Aluminum Corporation of China*.

In 2017, the Company filed 105 patent applications, among which are 65 invention patents, and 40 utility model patents. Meanwhile, Chalco was granted 71 patents, with 34 invention patents and 35 utility model patents. During the year, the Company registered a total of 25 trademarks.

R&D Achievement

Currently, more than 90% of bauxite abroad is of high quality, and alumina production generally adopts the Bayer Process which is simple, low energy consumption and low cost. However, most of bauxite resources in our country contains high aluminum, high silicon, but low aluminum to silicon ratio. In this circumstance, the Company successfully developed the "Flotation Desilication-Bayer Alumina Production" in 2004 and industrialized such process, effectively raising the utilization rate of middle and low-grade bauxite and greatly increasing the industrial output of bauxite beneficiation. With the development of technology, the Company is able to protect the non-renewable natural resources.

5. Business • Win-Win (Continued)

In 2017, with the transformation and upgrade of the Company and the promotion of high value-added product, the Company emphasizes the implementation of “One high, one low and one removal” project and the development and application of energy saving technology for aluminum electrolysis, and further integrates the strategies of reducing cost, adding value, transformation, and upgrading in the Company. In particular, the Company highlights the promotion and application of industrialized demonstration, and the promotion of the development and industrialization of new products.

In 2017, the Company set up 69 R&D projects, of which 50 are laboratory and pilot-scale experimental projects, 12 are industrialized R&D achievements demonstration and promotion projects of (including “FHEST Technology” with 8 sub-projects). While we solve the actual production needs of the enterprise, the Company also brings significant economic benefits to itself in energy saving, consumption reduction and quality improvement, and efficiency enhancement, which effectively responds to the goal of achieving sustainable development through technology.

5. Business • Win-Win (Continued)

Key Technological Achievements of Chalco in 2017

Mining

- Research on safe and efficient mining technology for bauxite under coal seam strata covering to realize safe mining and to obtain a production capacity of nuggets $\geq 150\text{t/d}$ at a comprehensive recovery rate of $\geq 75\%$.
- Cooperated with Changsha Nonferrous Metallurgical Design and Research Institute.

Alumina

- Set up a "One high, one low and one removal" project to carry out special studies on the issues of high sulfur, low grade and removal of organic matter: research on roasting desulfurization of high-sulfur bauxite, and flotation desulfurization combined with wet processing oxidation technology; research on flotation desulfurization of ultra-high-sulfur bauxite; and the research into the organics in the alumina process has led to the technical prototype of industrial sodium oxalate removal.

Electrolytic Aluminum

- Set up "Aluminum Electrolysis Energy-saving Project", promote "FHEST Technology" in the whole company, and continue to carry out special research and development for "Lower Energy Technology".

Resources Utilization

- The harmless treatment of aluminum electrolysis spent potlining technology was successfully applied. The production demonstration line of this technology can process 10,000 tons spent potlining every year, which treated 7,050 tons of spent potlining in 2017 and makes the treatment cost much lower than the third-party treatment cost. This demonstration line is a continuous production line with the longest running time and the largest capacity in China, and it can completely detoxify the aluminum electrolysis spent potlining. The demonstration line has passed the third-party analysis and inspection for many times, and the treated innocuous slag and recycled water solution completely meets the harmless standard and national Class I industrial solid waste emissions level standard.
- A series of technical research on comprehensive utilization of red mud resources was carried out. A key laboratory and an improver production line were established by Zhongzhou Aluminum to deal with 20,000 tons of heavy metal pollution remediation every year. Three acid soil conditioner formulations, one arsenic residue treatment formula, and three lime soil conditioner formulations were developed, and the technologies of red mud low-cost reclamation and red mud as purifying agent products were successfully developed.

5. Business • Win-Win (Continued)

Chalco's Award-Winning Scientific and Technological Achievements in 2017

Number	Project Name	Achieved by	Award and Rank
1	High Organic Australia Ore Processing Technology Innovation	Chalco Shandong Co., Ltd.	Second Prize of Non-ferrous Metal Industry Science and Technology Progress
2	Aluminum Electrolytic Bath with Dry Impermeable Material	Chalco Zhengzhou Research Institute of Non-ferrous Metal	Second Prize of Non-ferrous Metal Industry Science and Technology Progress
3	Comprehensive Technology Research of Improving Anodic Antioxidation Performance Based on Low Quality Raw Materials	Chalco Zhengzhou Research Institute of Non-ferrous Metal Shandong Huayu Alloy Materials Co., Ltd. Chalco Qinghai Branch	Second Prize of Non-ferrous Metal Industry Science and Technology Progress
4	Application of Spent Carbonated Liquor Purification Technology in Mineral Processing System	Chalco Zhongzhou Aluminum Co., Ltd.	Third Prize of Non-ferrous Metal Industry Science and Technology Progress
5	Industrialization of Key Technology for Micronized Low Iron Red Mud High Efficiency Separation	Chalco Shandong Co., Ltd. Chalco Shandong Engineering Technology Co., Ltd.	Non-ferrous Metal Industry Science and Technology Progress Third Prize
6	Application of Non-contact Interface Instrument in Alumina Deposition Process	Chalco Zhongzhou Aluminum Co., Ltd.	Third Prize of Non-ferrous Metal Industry Science and Technology Progress
7	Online Analysis Technology Research and Application of Intelligent Manufacturing of Alumina – Low Temperature Bayer Batching System	Chalco Shandong Co., Ltd.	Third Prize of Non-ferrous Metal Industry Science and Technology Progress Third Prize Non-ferrous Metal Industry Science and Technology Progress
8	Aluminum Electrolytic Bath with Dry Impermeable Material Standard Revision	Chalco Zhengzhou Research Institute of Non-ferrous Metal	Third Prize of Non-ferrous Metal Industry Science and Technology Progress

5. Business • Win-Win (Continued)

Lead the Industry

Taking the industry development as its own mission, Chalco has continuously enhanced its independent innovation, regularized sector standards and promoted cutting-edge technology to lead the common green and sustainable development of the whole sector. The Group participated in the formulation of 6 national and provincial standards as well as 14 sector standards, among which the Research Institute of Nonferrous Metal in Zhengzhou of Chalco drafted three parts of the *Methods for Chemical Analysis and Physical Performance Measurement of Potassium Oxide*, namely the sixth part: the measurement of potassium oxide content; the twelfth part: flame method for the measurement of potassium oxide content; and the nineteenth part, flame atomic absorption spectroscopy and other standards for the measurement of potassium oxide content, Chalco Shandong drafted standards like the fifth part of the *Methods for Chemical Analysis of Aluminum Oxide*: the measurement of AL3+ content in zeolite.

Case: Globally-leading FHEST Technology Generating Electrolytic Aluminum of Low Energy Consumption and Green Development

To promote energy conservation and emission reduction in the electrolytic aluminum industry, Chalco developed the FHEST Technology and is on the way for a more electrolytic aluminum technology with lower energy consumption.

The FHEST Technology has contributed considerably to energy emission reductions. If it is promoted to the nationwide aluminum sector, with the conservation of electricity of 500kWh for each ton of aluminum, the annual conservation of electricity could be greater than 18.5 billion kWh, equal to the total amount of electricity generated by 638,000 tons of standard coal. This technology could realize reduction in carbon dioxide by 18.4 million tons.

The innovation, research and promotion of the FHEST Technology can upgrade electrolytic aluminum technology, lead it to green development of low energy consumption globally and propose solutions to problems occurring in this process.

5. Business • Win-Win (Continued)

5.2 REDUCE COST AND IMPROVE EFFICIENCY TO ELEVATE THE GROUP'S VALUE

Chalco persistently cut costs and improved efficiency in 2017 through four channels: the improvement of assessment mechanisms, the expansion of channels for financing, the consolidation of internal management and control and by enhancing security and environmental protection, to inject sustainable vitality to the Group's development.

➤ Improve the assessment mechanism linked with costs

The Company kept perfecting its assessment mechanism by extending the “assessment linked to three elements” to all departments so that all-round assessment is achieved inside the Company.

When formulating the assessment mechanism, the Company fully took into account the impact of crude fuel price fluctuations on the product costs so a dynamic assessment linked to cost was adopted, which made the assessment results more fair and reasonable. In the meantime, the Company established a performance assessment system of “1+9+4” featuring the categorization of different types of subsidiaries. Specifically, progressive incentives were adopted for aluminum production enterprises to motivate them to reduce and share costs; characterized assessment was conducted on nine non-aluminum enterprises like Chalco Ningxia Energy and China Aluminum International Trading Co., Ltd; special assessment was carried out in four elements, including the alloying of electrolytic aluminum, alumina mines, carbon and project leaders.

➤ Expand financing channels to reduce financial costs

In cooperation with financial institutions in 2017, the Company set up a fund of RMB10 billion dedicated to investment in four sectors and introduced a LFC-funded fund of RMB10 billion aiming at supply side structural reform. Meanwhile, grasping the opportunities granted by national marketization, law-based governance and debt-to-equity swaps, the Company realized RMB12.6 billion of debt swapped for equity in marketization. Thus, this project was recommended by the National Development and Reform Commission (NDRC) to the State Council as an exemplar of a debt-to-equity swap in the marketization of state-owned enterprises.

5. Business • Win-Win (Continued)

➤ Enhance the basic management of physical enterprises

By convening the “conference of early inspection and conference of special topics” in 2017, the Company enhanced its management and control in four aspects: result assessment, problem detection, immediate solution and process supervision. Applying the mode of “management + technology”, the Company established three types of groups, respectively for work, service and solutions to special problems. In addition, the Company employed diverse strategies for different enterprises according to a good understanding of the difficult technical problems in each subsidiary and proposing corresponding countermeasures. Not only has this model improved the internal management and control of the Company, but also has raised service quality and improved the production technology of subsidiaries.

➤ Promote management on security, environmental protection and quality

Aiming at consolidating the security management of grass-root units, Chalco fully standardized its security management to detect and rectify problems regarding security, environmental protection and quality inside the Company. In addition, in response to the national green policy, the Company became the first enterprise that had implemented the standard for ultra-low emissions in 2+26 regions (“2+26” city is the city of air pollution transmission channel in Beijing, Tianjin and Hebei) in 2017. Guided by this standard, the Company coordinated programs like the transformation of ultra-low smoke emission in three enterprises located respectively in Chalco Shandong, Zhongzhou Aluminum and Henan Branch, as well as the project of the improving standard and upgrading of sewage disposal by Chalco Ningxia Energy.

5. Business • Win-Win (Continued)

5.3 IMPROVE QUALITY AND STRENGTHEN RELATIONS WITH CUSTOMERS

Chalco always puts customers first, paying attention to providing customers with products and services of high quality. While we improve the quality of our products, we also deepen our 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.

Optimize Product Quality

Providing products with high quality is always the promise of Chalco towards our customers and end consumers. We guarantee the high quality of our 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 our main products such as aluminum and alumina. We strictly comply with the national product quality related regulations and our internal product standards to ensure the quality of our products. Our headquarters set up a marketing and purchasing department to be responsible for making relevant guidelines for marketing and management, establishing marketing management systems, making sales plans, managing risk control and coordinating marketing operations. In 2017, the Company had no electrolytic aluminum or alumina products recalled because of safety, health or quality problems.

Furthermore, in 2017, Chalco continued the overall product layout and achieved stable progress. The Company actively promoted the implementation of alloy projects, sped the transference of capacity, achieved industrial restructuring, expanded the industrial chain and improved the added value for products. Meanwhile, the Company dug into refined alumina, effectively maximizing benefits while safeguarding market share.

5. Business • Win-Win (Continued)

➤ Alloy Products

In 2017, Chalco continued to complete the overall plan for alloy products. The Company improved the alloying rate, optimized the industrial layout for alloy products, enhanced the R & D for new and high added value products through optimizing product structures, and improved the rate for internal support to improve the production and sales of alloy products in all directions and to maintain and improve the quality of products, so as to provide strong guarantee of supply to various market segments.

Effectively improve alloying rate

- The sales volume increased to 1.37 million tons in 2017 from 1.177 million tons in 2016. Meanwhile, the alloying rate increased from 36% in 2016 to 41% in 2017 (estimated), with some enterprises even beyond 60%.

Optimize product layout

- The product layout of alloy products developed from dispersed to unified based on the production condition of all enterprises, technological level and market demands in order to lower repeated construction and internal competition. In this way, we helped electrolytic aluminum enterprises form their dominant alloy products and special industries so as to maximize their benefits
- In places abundant of waste aluminum resources, we comprehensively dug into their recycle potential through waste aluminum recycle bases.

Upgrade product structure

- In 2017, we developed 11 new products with high added value, overperforming our target of 8 products set at the beginning of the year.
- The Guizhou Branch successfully developed rare earth aluminum bus bars with high electric conductivity, which helped save 32.2 kWh of electricity per ton of aluminum, saving 16.12 million kwh of electricity throughout the year.
- Baotou Aluminum developed alloy products with high added value such as ZLD105A, 6401, GCXT and AlSi8Cu3, and completed the cultivation of 18 3N2 high precision aluminum electrolytic cells in the 240kA series, increasing the output of senior aluminum and highly purified aluminum.
- Shandong Huayu developed Series 6 round bar products with high added value that can be used in mobile phone shells, filling the gap of 3C electronic field of the Company.

Improve the rate for internal support

- We achieved effective connection between upstream and downstream of the industrial chain inside the Company, with the rate for internal support reaching 80%. In particular, ordinary aluminium ingot were all supplied by Chalco Trading, with the volume reaching 370 thousand tons in 2017.

5. Business • Win-Win (Continued)

➤ Refined Alumina

Chalco is the largest manufacturer and supplier of refined alumina in the world, with a yearly capacity reaching 2,800 thousand tons. In 2017, the Company produced 2,360 thousand tons of refined alumina, a year-on-year increase of 15%, reaching a sales-output ratio of 100.7%. In addition, with the development of science and technology and the expansion of market demand, emerging material industry related to the application of refined alumina is facing an unusual developing opportunity. The demand for alumina for traditional sectors remains stable; the application of alumina in electronic fields such as sensor and thermosensitive elements is surging; biological ceramics made of alumina with good bending resistance and wear-proof and heatproof performance are developing quickly, broadly used as the material for artificial bones, teeth, joints and bolts; the market demand for ceramic lithium battery separators, which are used as part of lithium batteries in new energy cars, will also increase. In 2017, the Company depended on R & D projects and increased the market share and application of all types of refined alumina comprehensively, gaining common recognition from the market with high quality products.

Achievement of Chalco in the development on all types of refined alumina in 2017

Zeolite

- The yearly global capacity of zeolite is 840 thousand tons, and China accounts for 490 thousand tons, of which Chalco tops the world with a capacity of 300 thousand tons.
- The domestic sales volume of zeolite from Chalco reached around 150 thousand tons, accounting for 56% of the total domestic demand of 270 thousand tons.

Aluminum hydroxide for filler

- The yearly global consumption of high whiteness aluminum hydroxide for filler used in artificial marble is around 480 thousand tons, and Chalco accounts for 81% of the market share. Currently, overseas markets mainly include South Korea, Japan and countries in Southeast Asia.
- The yearly domestic capacity of aluminum hydroxide micro powder is around 280 thousand tons, and Chalco accounts for 90 thousand tons, which is broadly used in industries such as LSZH cable material, silicone rubber and composite insulator, and rubber thermal insulated building material, including electric power and electric net, nuclear power, high-speed train and building materials, etc.

Pseudo boehmite

- The yearly domestic capacity of pseudo boehmite is around 155 thousand tons, of which Chalco accounts for 60 thousand tons.
- Chalco Shandong adjusted the product structure and developed special pseudo boehmite to increase the added value.

5. Business • Win-Win (Continued)

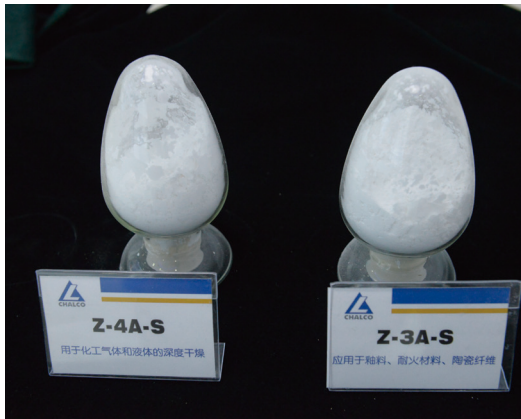


Figure: Zeolite

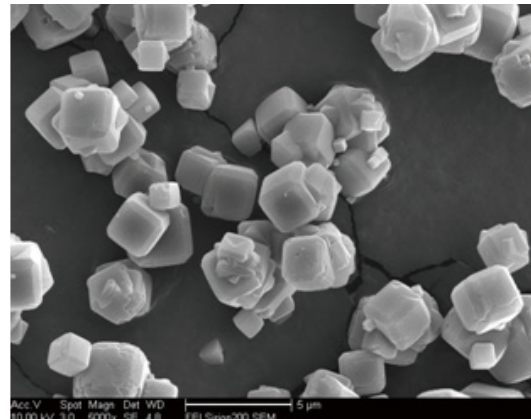


Figure: Zeolite in Electron Microscope

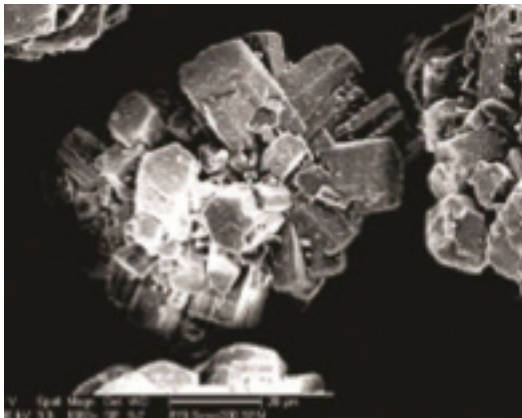


Figure: Aluminum hydroxide for filler

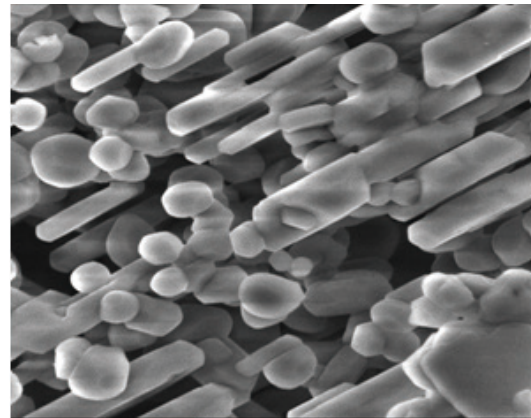


Figure: Calcined Alumina



Figure: Pseudo boehmite

5. Business • Win-Win (Continued)

Enhance Communication with Customers

Chalco continuously deepens communication with customers to understand their demands so as to provide them with products and services with higher quality that meet market demands better. The Company has established various channels to communicate with customers. Besides regular channels such as phone calls and emails in daily business, visits, field investigations, the Company also adopts diversified online and offline communication channels. For example, we promote our products through our official website, third- party website platforms, and by sending brochures. We have also established the WeChat account “Lv Da Niu” to push updated quotations for aluminum ingots. Furthermore, the Company holds regular summit forums with key customers to consolidate our cooperation, and we also take part in various industrial exhibitions to enhance our communication with upstream and downstream customers.

Case: Chalco Held the 2017 Customer Summit Forum



On November 13, 2017, Chalco held the 2017 Customer Summit Forum in Fuzhou, City Fujian Province. A total of 45 alumina customer enterprises and 53 electrolytic aluminum customer enterprises were invited to the forum. Through WeChat Q & A and screen exhibition, customers present exchanged and shared their thoughts over different dimensions, including their expectation over the effect of the supply-side structural reform of the country in 2018, trends in the aluminum market, supply-demand relation in the market, and customer satisfaction.

5. Business • Win-Win (Continued)

Improve Sales Services

The Company has set up a pre-sale, sale and after-sales service management system, which negotiates, settles and replies to customers' complaints in accord with related regulations of the Company. In addition, we provide consumers with well-established channels for complaints and feedback to improve service levels through daily regulation and management. The Company also investigates customer satisfaction in the form of questionnaires in line with the ISO9001 management system. After deeply understanding the demands of customers, we provide customers with comprehensive solutions including lowering the cost of procurement and enhancing coordination capacity. As a result, we largely improve customers' satisfaction.

Case: Chalco Trading Promoted the Establishment of the Coking Coal Supply Chain at Home and Abroad

Echoing the "Belt and Road Initiative", Chalco Trading enhanced international cooperation and linked the coking coal supply chains at home and abroad, largely developing its coking coal business. In 2016, the company set up Chalco's first coking coal transaction warehouse in Tangshan area—Dashangsuo Coking Coal Transaction Warehouse, and in the first half of 2017 exported TT coking coal for the first time, making Chalco the fifth largest coal exporter in China. In addition, Shaheyi Coking Coal Transaction Warehouse finished its first transaction, meaning that Chalco has achieved autonomous control over coking coal transaction for the whole process. Chalco has therefore become China's largest importer operating Mongolia coking coal business. Coking Coal | produced and sold by Chalco has gained wide praise from customers at home and abroad.

In 2017, the Company followed the "On-demand Production" principle in production and sales, and devoted greater efforts in developing the alloy product market. We adjusted marketing strategy in time and improved the level and quality of sales services, targeting at developing large-volume end customers, which has seen remarkable success.

5. Business • Win-Win (Continued)

Case: The Company Completed Marketing Strategy for Alloy Products and Improved Sales Services

In 2017, the Company further completed a marketing strategy for alloy products and improved sales services through three aspects: team construction, mechanism establishment and customer development.

➤ **Create professional alloy sales team to further expand alloy market**

Chalco Trading created a professional alloy sales team for two purposes: one was to sell aluminum bar products produced by the company, and the other was to obtain external resources in order to expand sales volume and increase market share. In 2017, Chalco Trading sold 450 thousand tons of alloy products, of which 200 thousand tons were outbound sales of internal alloy products.

➤ **Establish quick reaction mechanism for sales services**

Through quick reaction mechanism for sales services, we transformed the way we serve our customers, which was to change from passively reacting to customer complaints to actively serving our customers.

➤ **Devote more efforts in developing large-volume end customers**

We achieved a gradual shift of customer structure for alloy products from mainly trading companies to mainly end customers. In 2017, the Company sold about 65% of alloy products to end customers. At the same time, the Company is stably promoting cooperation with China Shipbuilding Industry Corporation and Dicastal.

5. Business • Win-Win (Continued)

5.4 IMPROVE MANAGEMENT TO ESTABLISH A 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. The Company believes in a win-win philosophy and helps suppliers and contractors improve their ability to manage environmental problems and fulfill their social responsibilities. Therefore, we improve our economic benefits together and at the same time, we fulfill our environmental and social responsibilities for the purpose of creating a sustainable supply chain. The Company streamlined the number of suppliers for more effective management, and thus, by the end of the reported term, Chalco had 3,577 domestic suppliers.

Management of Suppliers

The Company formulated the *Regulation for Suppliers of Chalco* for more effective management over suppliers. For supplier access, Chalco clarifies that all suppliers need to possess basic certificates that are valid and legitimate, and also they 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 do not have any law-breaking record or major legal disputes, especially for major law-breaking records related to the environment and labor.

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

5. Business • Win-Win (Continued)

In terms of the evaluation of suppliers, Chalco keeps to comprehensive evaluation and real-time investigations. The Company regularly records suppliers' overall strength, supply share, performance of contracts and supplier rewards and discipline in supplier files. Meanwhile, the Company continuously follows up suppliers' performance of contract about products and services. Furthermore, Chalco will summarize an annual evaluation report based on the evaluation system for suppliers. The report will show new suppliers and eliminated ones in the year, including suppliers' annual comprehensive evaluation results, rectification measures and recommendations, directory for outstanding suppliers and for those eliminated from the directory.

The Company has established long-term and stable communication channel for suppliers. Besides daily communication, the Company also holds annual supplier meetings, summarizes procurement work and participates in the National Coal Trade Fair every year to discuss and analyze with suppliers the market information for raw and auxiliary materials, including coal, caustic soda and petroleum coke.

In 2017, the Company made significant progress in developing a sustainable supply chain. For example, in 2017, Chalco Trading promoted social responsibility management for supply chain. Chalco Trading aims at creating a top-ranking integrated service provider in the supply chain for industrial products. In 2017, Chalco Trading set three indices in the social responsibility management module for supply chain to complete the company's social responsibility mechanism, covering the settlement of disputes over quantity and quality, the enforcement of centralized purchasing plans and communication with shareholders. The company also implemented social responsibility management for every step of its centralized purchasing business. Meanwhile, the management module required suppliers to sign a Letter of Responsibility for Integrity and to include social responsibilities into their daily work from five dimensions: company governance, employee rights and benefits, environmental protection, fair operation and community support.

Safety and Quality Management for Contractors

The sustainable development of supply chain, especially 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 *Measures for Production and Operation Safety of Chalco*, 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.

5. Business • Win-Win (Continued)

The Company strictly implemented the *Safety Baseline Standard in Construction Field of Chalco* in order to comprehensively guarantee safety in construction field and clear risks. In 2017, the Company organized all Group enterprises to publicize and study the standard through themed video meetings and themed lectures by experts, and replied to differentiated understandings and answered questions and doubts raised in the process over the enforcement.

Case: Chalco Launched Inspection over Project Safety and Contractors

To further enhance the safety management over projects and contractors, prevent and contain accidents, Chalco launched safety inspections for projects under construction from September to October in 2017.

The safety inspection adopted three forms, including self-examination by projects, comprehensive inspection by inspection teams of the Company and cross inspection among different enterprises, and inspected and rectified eight aspects, including the education and training of safety, the enforcement of the list of “Two Responsibilities for One Position” for safety, the establishment of safety management systems and the deployment and performance of safety managerial staffs, the usage of safety fund, the implementation of safety risk control by contractors, the safety management in construction fields, the comment on contractors’ ability for safety management, and the inspection and rectification of safety production and risks. The Company required all project enterprises to formulate complete scheme for inspection, to prepare report materials on aspects inspected, to conduct in-time communication and rectification of problems inspected and to report on the rectification progress. Meanwhile, the Company carried out detailed inspections of whether contractors conducted safety management for project contractors and whether they launched special campaign according to the deployment based on the “Seven Steps” in the *Notice on Launching Safety Risk Management and Control by Contractors*. The Company paid close attention to the assessment of project enterprises during the safety inspection process, and included the result in an annual assessment. The result covered risk discovery, measure adoption and rectification, etc., and is ultimately reported to headquarters for unified management and filing.

6. Safety • Talents

6.1 COMMIT SAFETY AND SAFEGUARD OCCUPATIONAL HEALTH

As a responsible company, securing occupational health and safety is one of Chalco's priorities for practicing social responsibility. Chalco always prioritizes employees' safety and health, with the goal of achieving zero accident and zero damage. Chalco supports comprehensively establishing a safety culture of "a comprehensive framework with four beams, eight pillars, and ten foundations", where all people, 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. We uphold the HSE management concept that "all risks can be controlled and all accidents can be prevented". In order to continuously improve our HSE performance, we promise: 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 our HSE performance.

We comply with the *Production Safety Law of the People's Republic of China*, the *Law of the the People's Republic of China on the Prevention and Control of Occupational Diseases*, the *Coal Mine Safety Administration Regulation*, *Implementation Measures for Work Safety License of Coal Mining Enterprises*, and other national production safety laws and regulations. In addition to such compliance measures, based on Chalco's operation situation, we formulated the *Safety Production Management Measures of Chinalco*, the *Safety and Environmental Protection Responsibility Rules of Chinalco Headquarters*, the *Chinalco Safe Production Responsibilities for both Party Committee and Other Departments* and other safety and health management rules. As early as 2004, we passed the accreditation ISO14001 environmental management system and the occupational health and safety system of OHSAS18001. In order to maintain the running of the system, Internal Audit Department incorporates safety risks into significant risk monitoring report annually, and tracks the report monthly. In 2017, in order to enhance the safety management of project construction, to secure personal and property safety, and to ensure safety production, the Company established the *Security Baseline Standard in Construction Field*, the *Chalco Coal Mine Safety Supervision and Management Regulation*, and other procedure documents and further detailed the management and control of safety and health risks. According to "two responsibilities for one position" requirements, we implemented a responsibility-clarified system, which means throughout Chalco and all subsidiaries and branches, according to the

6. Safety • Talents (Continued)

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.

The Company pays close attention to the improvement of employees’ safety awareness and quality. Up to December 2017, 259,543 people have received safety training; 2,468 emergency drills have been carried out, with 81,751 people participating. At the same time, we closely supervise our employees to strictly follow effective safety and health management systems.

Innovate Safety and Health Management

In 2017, the keynote of Chalco’s safety management focuses on “3336” measure:

The first “3” refers to “paying close attention to 3 fields”, production field, maintenance field, and construction field, the three key risky fields which are most vulnerable to accidents.

The second “3” refers to “focusing on 3 kinds of work”, working at height, working in flammable and combustible (high-temperature and high-pressure) conditions, working in underground mines and other high-risk and dangerous work (the category of dangerous work can be decided by enterprises themselves according to specific situations);

The third “3” refers to “implementing 3 safety projects”, physical isolation projects, Visualization Monitoring System projects, and dangerous work zero-violation projects, for improving safety production conditions and security levels;

“6” refers to “promoting 6 items of safety management standardization”, management standardization in safety education, in danger source identification, management, and control, in dangerous work, in contractor safety, in personal protective equipment, and in safety checking.

Through “3336” safety management measure, we ensure safety management system operation, safety and health risk management and control, as well as professional construction in the field, to guarantee the safety of construction projects.

6. Safety • Talents (Continued)

Wangwa Coal was listed by the Ningxia Administration of Coal Mine Safety as one of the pilot mines which meets the first-level standard of the new Coal Mine Safety Production Standardization for the region

In order to enhance safety management and actively respond to the “3336” measure , the energy management department organized Chalco Ningxia Energy to launch “coal mine position procedure standardization” and “coal mine product standardization”. Wangwa Coal was listed, by Ningxia Administration of Coal Mine Safety, as one of the pilot mines which meets the first-level standard in the new *Coal Mine Safety Production Standard* for the region.

Strengthen Leaders’ Responsibility and Supervision

In 2017, Chinalco established several inspection teams, followed by Chalco and its subsidiaries and branches. Such teams helped companies receive inspection and conduct self-inspection, enabled companies to deeply inspect field situations and the implementation of policies. Meanwhile, they supervised leaders and the fulfillment of their responsibilities in order to trace the roots of prominent problems and provide comments and suggestions for companies.

The inspection covered a wide range including but not limited to the following points. First, it covered the implementation of national laws and regulations related to safety and health, and the Company’s health, safety and environment (hereinafter referred to as “HSE”) management system and its standards. Second, it covered the Company’s major decisions, deployments and special campaigns related to HSE and company leaders’ major instructions and written comments to enhance HSE related tasks. Third, it covered leaders’ fulfillment of the requirements to “ensure work safety”, establish safety and environment departments (and deploy related employees), provide safe training, make investments in safety, prevent and control safety risks, and fulfill and trace separate responsibilities based on projects. Fourth, it covered different HSE accreditations and certifications, “Three Simultaneities” procedures and the management and control of major HSE risks (including major sources of danger). Fifth, it covered the safety management situation of related sides and the establishment of directories, credit management and a “blacklist” system.

6. Safety • Talents (Continued)

Comprehensive Engagement in the Consolidation Campaign for Safety, Environment and Quality

In 2017, Chalco launched the *Consolidation Work Plan for Safety, Environment and Quality of Aluminum Corporation of China Limited*, starting a consolidation campaign themed “Comprehensive Engagement, Inspection and Rectification” to inspect safety problems in 20 fields, environmental problems in 19 fields and quality problems in 11 fields. During the campaign, the *List of Safety Problems*, *List of Environmental Problems*, and *List of Quality Problems* were formed respectively. To solve the problems listed, we formulated rectification schemes and made sure they were settled timely and accurately based on the “Five Clarification” principle. Party organizations at all levels paid high attention to enhancing learning by launching concentrated speeches, improving political stances, deepening “Two Studies, One Action” and extensively mobilizing the masses combining “Two Motivations, Two Creations”. Members of the Party Committee went to workshops and teams to launch speeches for frontline employees, ensuring a coverage rate of 92.41% among “Two Studies, One Action” contact points that are higher than the section level in all enterprises. To make sure that the consolidation campaign penetrated every level, the Company established a system to hold the Company leaders responsible for different branches and to hold branch company leaders responsible for teams. With the help of such system, we made sure that each and every problem inspected during the comprehensive inspection period got rigid and thorough rectification, so as to achieve real rectification results and ensure real safety consolidation.

Chalco always focuses on employees’ benefits and puts health first, safeguarding their health and safety during work and other activities. We abide by national management regulations like *the Measures for the Administration of Occupational Health Examination and the Measures for the Supervision and Administration of Employers’ Occupational Health Surveillance*. 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 to ensure good occupational health management. The Company also provides employees with safe and comfortable working conditions and protective equipment. The Company’s care for employees’ health can be seen in the details. For example, when organizing field construction in hot weather, the Company provides employees with an allowance for the high temperature, and equips them with appropriate labor insurance supplies to ensure their health.

6. Safety • Talents (Continued)

Chalco pays high attention to raising employees' health and safety awareness through training, and safety activities. In 2017, the Company launched an activity to "Further Study, Publicize and Implement the Safety Baseline Standard in Construction Field" and issued the *Safety Baseline Standard in Construction Field of Chalco*. We organized related departments and employees in different field construction projects to publicize and study the Standard and implement it in accord with actual situations. In this way, we found out problems in time, strictly rectified them and concluded experiences. As a result, we implemented safety requirements in daily work and greatly improved employees' understanding of safety requirements, thus enhancing employees' health and safety awareness.

Meanwhile, implementing the *Notice of the Work Safety Committee of the State Council on Launching National Safety Inspection*, Chalco launched comprehensive self-inspecting and self-rectifying activities among projects under construction to carry out continuous safety inspections. Furthermore, we gave full play to Party organizations at the primary level in their role as battle fortress, actively launching activities such as setting party member vanguard positions and commandos. With a strong sense of political responsibility and mission, these organizations strictly followed the requirements of grid management and deeply inspected and rectified each and every safety risk in the construction field so as to ensure safe and stable progress in project constructions. The activity helped employees to understand safety risks around them and thus improved their awareness of safety in their daily work.

6. Safety • Talents (Continued)

Chalco Held the 2017 Coal Mine Safety Management Training

Directed by the Coal Safety Management Department of Chinalco and organized by Chalco Ningxia Energy, the 2017 Coal Mine Safety Management Training was held in Yinchuan, Ningxia. A total of 65 people participated in the training, including but not limited to heads and managerial staffs from the Coal Safety Management Department of the Company, and from all levels of safety and environment departments and safe production standard related departments of Chalco Energy Co., Ltd. and Chalco Ningxia Energy; major people in charge of operating mines (and mines under construction), and people in charge of their safety and environmental work.

The training focused on the weaknesses of the Company in the construction of coal mine safe production standard for targeted efforts. It comprised five topics: classified management and control of safety risks, investigation and settlement of accidents and hidden dangers, prevention and measurement of geological disasters, occupational health and safety training, and emergency coping management. We invited four experts who had drafted the *2017 Standardization System* to deliver training to participants. Participants generally expressed that the training helped them systematically understand the connotation and essence of the “Three in One” prevention and control system for coal mine safe production, and also solved their doubts and difficulties during the implementation of the safe production standards, and they were confident that it would play a significant role in improving the Company’s achievement of safe production standards.



6. Safety • Talents (Continued)

“Stronger Safety Management, Safer Live Protection”	
<p>In order to raise the safety awareness of all employees, to share advanced managerial ideas and to enhance the safety management of Chalco, we followed the <i>Notice of Chalco on Launching the Second “Innovation Online”</i>, and held two safety management “Innovation Online” thematic forums themed “Stronger Safety Management, Safer Life Protection” on November 2, and 9, 2017. The Company’s leaders and related departments as well as related subsidiaries and branches were either present on-site or participated through HD video. At the end, we elected one “Best Performer” and awarded the prize-winner with a certificate of honor and a financial bonus. The activity received general praise from all departments of the Company and of all subsidiaries and branches, useful for branches to learn from and share with others their safety management experiences.</p>	
Cases of alumina companies	Cases of electrolytic aluminum companies
<ol style="list-style-type: none"> 1. Chalco Shandong <i>Safety Management for Cleaning and Overhaul of Related sections</i> 2. Henan Branch <i>Implementation of the List of Two Responsibilities for One Position for Safety</i> 3. Shanxi New Materials <i>Safety Standardization Construction of Teams 58361</i> 4. Guangxi Branch <i>Care for Special Groups and Innovate Safety Management</i> 5. Zhongzhou Aluminum <i>Safety Consolidation Campaign</i> 6. Zunyi Alumina <i>Innovate Training Method to Improve Training Effect</i> 7. Shanxi Huaxing <i>Strengthen Special Management and Control for Contractor and Hold Company Responsible for Safety Problems</i> 	<ol style="list-style-type: none"> 1. Guizhou Branch <i>Sharing of Stand-and-Watch Managerial Experience</i> 2. Qinghai Branch <i>Physical Isolation</i> 3. Shanxi New Materials <i>Standardization of Safety Management for Overhead Crane</i> 4. Lanzhou Branch <i>Cultivate Culture with Safety and Guarantee Safety with Culture</i> 5. Shanxi Huasheng <i>Female Picket Guarantees the Implementation of Safety Work</i> 6. Zunyi Aluminum <i>Establish Rotating Mechanism for Team Safety Guard</i> 7. Shandong Huayu <i>Mutual Assistance Management among Employees</i> 8. Liancheng Branch <i>Special Campaign to Improve Managerial Level for Field Safety Equipment and Inspect Execution of Work</i> 9. Fushun Aluminum <i>Implementation of the List of Two Responsibilities for One Position for Safety</i> 10. Gansu Hualu <i>Management and Control over 20 Types of “Important Person” in Teams</i> 11. Guangxi Hualei <i>Establish Smart Access Control System to Keep out Unwanted Persons</i>

6.2 VALUE TALENTS AND NURTURE FOR EMPLOYEES' DEVELOPMENT

Human resources have always been the best resources of Chalco. The Company respects and guarantees the legitimate rights and interests of employees, and pursues an employment policy of equality and non-discrimination. Furthermore we prohibit child labor or forced labor and support equal pay for equal work. We assure female employees and disabled employees of their entitlement to have fair, equitable working opportunities. Chalco shall strictly implement the *Labor Law of People's Republic of China* and relevant regulations of corresponding punishment measures in case of any violation.

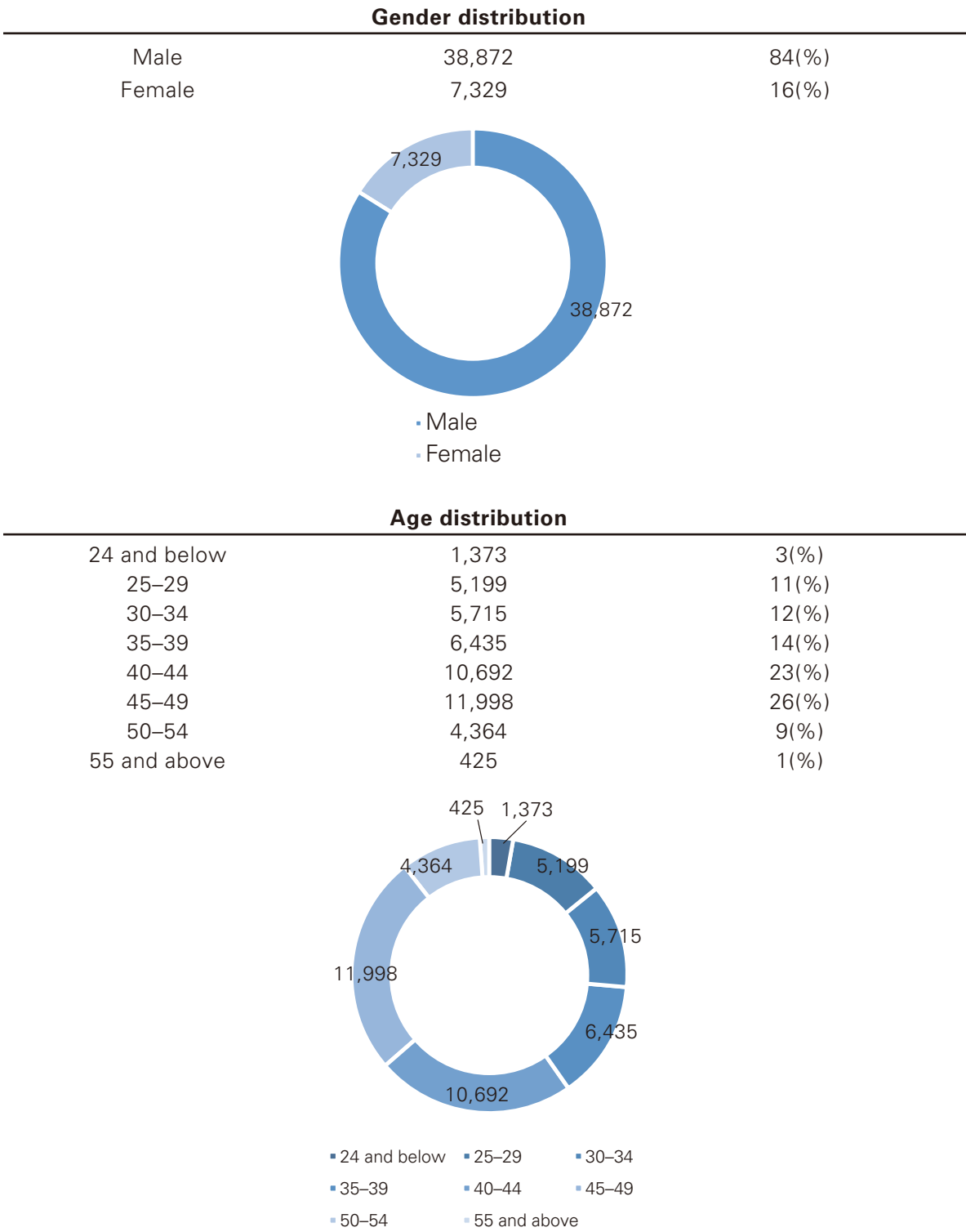
Chalco is committed to its talents philosophy of "talents as the first resource". We offer employees a fair, just, and harmonious working environment, provide them with a big stage to put their talents to good use, and provide study and training opportunities, build convenient career development channels for them, and reassure them with competitive remuneration and welfare. We believe that such measures are necessary to create a harmonious labor relations, which will allow employees to grow with the Company. In this way, we aim to "add value for our shareholders, increase benefits for the Company, and raise incomes for our employees". At the end of 2017, Chalco had a total of 46,201 employees.

<p>Chalco Human Resources Innovation Seminar Making sure that talented recruits stay and fully exert their ability</p>
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<p>Chalco held the Human Resources Innovation Seminar, which centered on "Innovating the mechanism to attract, cultivate and use talents and developing reserve talents for the Company". In the seminar, Executive Director Ao Hong pointed out that if the youth are prosperous, the country will be prosperous and if the youth are strong, the country will be strong. Chalco paid high attention to attracting, cultivating and properly using talents. In the new era, such work requires innovative thinking. Innovation is not necessarily fancy or hard to reach. In fact, as long as we think, see and do what others are incapable of thinking, seeing and doing, we are already innovating. The result of innovation lies in "Three Es": good effect, good economic returns and high efficiency. During the seminar, six companies spoke about their experience in selecting, using, cultivating, and keeping new graduates. They attracted talents with "Three Es" innovative thinking, rejuvenating the different real enterprises of Chinalco.</p>

6. Safety • Talents (Continued)

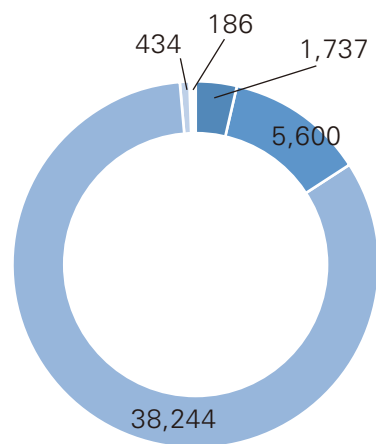
Employee Distribution of chalco:



6. Safety • Talents (Continued)

Rank distribution

Senior managements	186	0.4(%)
Heads of departments	1,737	3.8(%)
Other office staffs	5,600	12.1(%)
Workers and technicians	38,244	82.8(%)
Temporary workers	434	0.9(%)



- Senior managements
- Heads of departments
- Other office staffs
- Workers and technicians
- Temporary workers

Talents Strategy

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 life-long 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.

6. Safety • Talents (Continued)

It is our 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. And we believe 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.

Wangwa Coal Industry Launched “Training Package” to Reserve Talents	
As the number of new employees continuously increases, Wangwa Coal Industry faces problems such as disperse distribution of employee structure, and uneven employee education levels. To solve these problems, Wangwa Coal Industry keeps on exploring new training models and has gradually formed a training package:	
Trainees	Ways of Training
Managers and Key Engineers	<p>Improve the Quality of the Managerial Team through Communication</p> <p>Led by leaders, executives from all departments of all levels conclude their work and promote their own excellent management models and technological experiences through training and communication. On this basis, participants raise bold assumptions and questions for later settlement by employees of all levels through common efforts. In this way, we gather the wisdom of all to solve specific problems and effectively improve the quality of the management team.</p>

6. Safety • Talents (Continued)

Frontline Workers	“Hand by Hand” and “Dish Order” Training Mechanism “Hand by Hand” refers to a “master-apprentice” mechanism, which involves a specific contract, and requires a tracking training model for both theoretical knowledge and field operation that specifies “hand by hand, face to face, and mouth to mouth”. “Dish Order” refers to a tailored mechanism where employees can raise specific questions or requirements about their work and later, technicians and Party secretaries will try their best to solve those problems.
Teams at Primary Level	Gradual Improvement through Comprehensive Mechanism The Company formulates study and training plans at proper times and improves from primary-level teams through various training model such as “Work Shift for Teams”, combining “Inviting in” and “Going out”, and “One Helps One”.

Numbers of Chalco Employees Trained in 2017

Rank (Number)		
Senior managements	167	0.38(%)
Heads of departments	1,639	3.74(%)
Other office staffs	5,263	12.01(%)
Workers and technicians	36,622	83.53(%)
Temporary workers	150	0.34(%)
Gender (Number)		
Male	37,099	84.62(%)
Female	6,742	15.38(%)

6. Safety • Talents (Continued)

Rank (Average Training Hours)	
Senior managements	77
Heads of departments	62
Other office staff	45
Workers and technicians	69
Temporary workers	18

Gender (Average Training Hours)	
Male	73
Female	59

Broaden the Occupational Development Channel

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

6. Safety • Talents (Continued)

Chalco Lanzhou Branch Promotes Advanced Operation Skills to Stimulate Innovation

Lanzhou Branch collected advanced and unique operation skills and named them after employees who raised the ideas, which were turned into advanced production forces for the company. In this way, the company encouraged and gave full play to employees' initiative and innovation. The company started an activity "Chalco Lanzhou Craftsmen" to select excellent employees at primary level with unique skills who had contributed significantly to technological innovation and the spread of their skills, and to name their contributions after them. Through the activity, the company guided and encouraged employees to learn from the craftsmen and their benchmark contributions.

In March, 2017, in order to expand the effect of "Chalco Lanzhou Craftsmen" and give full play to their role as models and pioneers, the company further collected advanced operation skills among them to complete and improve their content and quality and guarantee their implementation.

The company will continue such collecting and selecting activities in order to encourage employees' innovation enthusiasm and improve our primary-level capacity for technological innovation. Under such guidance, employees will be encouraged to focus on solving difficult and important problems in their production and strive to conserve energy and reduce emissions, lower cost and improve efficiency.

6. Safety • Talents (Continued)

6.3 CARE FOR EMPLOYEES AND ATTEND TO THEIR NEEDS

Chalco pays high attention to employees' lives and health, benefiting all the employees with the development fruits of the Company. We create a healthy and vigorous environment to ensure their health and enrich their recreational lives. Chalco cares for the happiness of each employee from life, growth, and emotional perspectives. We are especially aware of the rights and interests of female employees and employees in need.

With great effort, we have kept the employee demission rate at a low level.

Employee Demission of Chalco in 2017:

Gender		
Male	1,225	2.19(%)
Female	401	0.72(%)
Age		
24 and below	127	0.23(%)
25-29	310	0.55(%)
30-34	289	0.52(%)
35-39	135	0.24(%)
40-44	209	0.37(%)
45-49	325	0.58(%)
50-54	155	0.28(%)
55 and above	76	0.14(%)
Rank		
Senior managements	21	0.04(%)
Heads of departments	82	0.15(%)
Other office staffs	269	0.48(%)
Workers and technicians	1,254	2.24(%)

6. Safety • Talents (Continued)

Communication with Employees

Chalco regularly holds workers congresses for employees to better participate in democratic decision-making, democratic management and democratic supervision. We collect employees' suggestions and opinions through various channels, including regular meetings of the Company or departments, circulars and announcements, internal forums, employee interviews, panel discussions, and employee polls. We encourage managers and other employees to have two-way communication, and hope to improve the Company's internal management through listening to the feedback of employees. By such efforts, we hope to pursue a harmonious, effective and pleasant working environment.

Honor Advanced Models to Enhance Employee Morale 2017 Chalco Panel Discussion with Excellent Employees



In order to honor excellent employees who work hard and contribute to the Company without any complaint, who stick with the Company through thick and thin, Chalco organized a panel discussion with excellent employees in 2017. A total of 30 excellent employees were selected as models and presented at the discussion. During the three-hour panel discussion, participants cherished the opportunity and actively proposed ideas. They talked freely about their impressions of the 2017 cost-cutting and efficiency drives. Although their words varied, their affection and deep love for the Company was evident in each of their sentences. Employees are closely linked to the Company and share the same destiny with the Company.

6. Safety • Talents (Continued)

Care for Employees

Employee-care concerns employees as well as the Company. We hope our employees can find a sense of satisfaction through appropriate remuneration and welfare as well as a broad stage to develop their career, and hence work with the Company for its sustainable development. The Company provides employees with various welfare policies to meet their needs. In addition, every year, the Company holds abundant recreational activities to enrich their lives and ease their pressure, including movie-watching, fellowship activities for single employees, and training courses in basketball, football, Ping-Pong, and fitness room exercises. The Company also adds equipment and hires coaches according to the needs of employees, making every effort to make employees feel the warmth of the Chalco “Big Family”.

<p>Shanxi New Materials Took Part in the Serious Illness Medical Mutual Aid of Yuncheng City</p>

<p>Chalco Shanxi New Materials took part in Yuncheng city’s 8th Serious Illness Medical Mutual Aid event. This was another project of the company for the benefit of employees, aiming at increasing employees’ medical insurance and easing the economic burdens of employees when they suffer from serious illnesses.</p>

<p>According to the requirement, the company paid mutual aid fees for a total of 1,651 employees, taking part in the fundraising project. This helped build a mutual aid platform for employees to “get help when needed and help those in need”, which added to the happiness of employees significantly and at the same time promoted the establishment and improvement of the medical insurance system for employees.</p>
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6. Safety • Talents (Continued)

Shanxi Branch Put into Use the “Heart-warming Canteen”

In 2017, Shanxi branch introduced a “Heart-warming Canteen”, which provided employees with delicious food and gained approval from them, solving a long-term dinning problem that bordered employees.

To ensure high quality and high standards of the “Heart-warming Canteen”, leaders of the company frequently held themed meetings to seek opinions from different perspectives, focusing on providing meals for employees who do shift work. They also visited similar canteens and investigated and discussed the proper operation and organization of canteens. Meanwhile, based the actual situation in the company, strict and detailed management plans were developed for canteens, including measures such as “Meals Delivered to Posts”.

Operating a “Heart-warming Canteen” is a concrete step for the company to care for its employees. In the next period, the company will further strengthen its supervision and management of canteens, and organize irregular tests of employees’ satisfaction with the service, food safety, eating environment and other aspects of canteens. It will also collect reasonable comments and suggestions to guarantee satisfying meals for employees.

Respect Female Employees

Chalco enacted the *Labor Protection Measure for Female Employees and Child-Bearing Period Compensation Regulation*, established female employee protection registers for all grades of staff, and monitored the implementation progress of these protections. At the same time, the trade union organized women employees to sign the *Special Collective Contract for Female Employees’ Special Rights and Interests Protection*. The contract-signing rate for primary-level female employees was 100%.

In addition to providing regular annul body examination for all employees, Chalco also provided one more special body examination for female employees, better safeguarding their health.

6. Safety • Talents (Continued)

Shanxi Enterprise Opened up Re-employment Channel for Retired Female Employees

The city trade union of Yuncheng held the opening ceremony of the first housekeeping and infant-care training in Shanxi Aluminum. Led by the city trade union, the training involved Shanxi Aluminum and Chalco Shanxi Branch. Shanxi Yingzi Steward Housekeeping Service Co., Ltd. provided free training to help retired female employees (both early retirement and normal retirement) of Shanxi Aluminum and Chalco Shanxi Branch to gain re-employment skills and enlarge their re-employment possibilities.

During the three-day training, trainers helped participants learn scientific infant-care theories and knowledge through explanation and interactive teaching, and helped them master infant-care skills through practical activities, thus creating opportunities for them to find jobs after retirement.

Help Employees in Need

The Company highly values the rights and interests of disabled employees. Based on age, disability, expertise and other circumstances, subsidiaries of the Company make appropriate arrangements for disabled employees. The Company offers special allowance annually to disabled employees who have disability certificates, provides reasonable facilities for disabled employees in the workplace and ensures the convenience of their work and life. We try our best to solve employees' problems. Through pair arrangements to help low-income families and financial aid for education, Chalco strives to alleviate the living pressure for employees in need.

Party Branch of Chalco's Corporate Management Department Raised Donation for Employee's Sick Child

After learning that the son of a former employee of Qinghai Branch, He Jiantao, was suffering from serious diseases but could not get proper treatment due to financial difficulties, the Party branch of Chalco's Corporate Management Department appealed to all members of the Party branch to donate for him. Within one day, 25 members all expressed their concern and raised a total of RMB4,800. On April 17, the Party branch transferred the donation to He Jiantao with the help of the Party committee of Qinghai Branch.

7. Poverty-Alleviation • Care

Dedicated to business development, Chalco has also been making contributions to social progress and fulfilling the Company's social responsibilities by hiring local people, paying tax in compliance with laws and regulations and supporting public welfare programs. As a state-owned enterprise, Chalco has shown unwavering support for the national policy of targeted poverty alleviation and made efforts to lift people out of poverty and to tackle hard issues. Leveraging advantages particular to the Company, Chalco formulates appropriate aid programs that fully involve all departments and staff, to ensure the effective advance of poverty alleviation. Chalco has also established volunteer teams that constantly promote projects and activities to contribute to community welfare, local development and to improve local livelihoods.

7.1 DIVERSIFY POVERTY ALLEVIATION TO CATER TO LOCAL NEEDS

In accordance with the Company's policy *Management Methods for Charitable Donations*, Chalco adopted diverse approaches to poverty alleviation through programs targeting particular places, industries, E-commerce and road construction. These programs exemplify the model role of Chalco as a "Demonstration Base of Poverty Alleviation".

Chalco has donated RMB 2.62 million in total this year, and allocated RMB7.50 million to poverty alleviation programs.

7. Poverty-Alleviation • Care (Continued)

Focusing on Targeted Poverty Alleviation by Assisting Tibet in its Development.



“The home of Laogan” in Chaya Cainty donated by Chalco



Cadres sent to support Tibet from Chalco

Chalco assisted Tibet in its poverty alleviation measures during the Twelfth Five Year Plan by investing RMB53.8 million in programs based in the area of Changdu. These targeted alleviation programs focused on building two new Chalco villages in the Karub Region and Chaya County to improve the livelihoods of local people. Chalco also carried out paired-poverty alleviation programs, through which senior executives and employees of the Group and its primary subsidiaries were paired with the poor of Changdu to lift them out of poverty. In addition, Chalco committed itself to supporting the marketing of agricultural products with the local characteristics of Changdu, and to attracting investment to the region to develop local industry.

In terms of talents support, Chalco selected cadres and technical personnel to assist in Tibet's development, and these talents now become the constructors and developers for Changdu Region; the annual number of jobs created by the Group for graduates from Tibet and local nomads is no fewer than 20.

7. Poverty-Alleviation • Care (Continued)

Focusing on Industrial Poverty Alleviation by Funding Chicken Farms in Yangxin County



Chalco spent RMB50,000 in supporting Yangxin County to build chicken farms. With the good use of idle vegetable farms, wasteland and forestry resources, chickens for both consumption and egg production are raised in these farms, stimulating the local breeding industry and the local economy more generally. The number of chickens topped 30,000 in 2017, generating net incomes of RMB600,000 for local chicken farms. In addition, the information regarding 15 impoverished households was documented. That 5 of these households no longer fit the definition of poverty demonstrates the effectiveness of this method.

7. Poverty-Alleviation • Care (Continued)

Establishing Chalco Agricultural School for Innovative and Intellectual Poverty Alleviation



"It's better to teach a man fishing than to give him fish." Chalco brought the innovative spirit into poverty alleviation and created the intellectual training mode. In May 2017, in cooperation with the Science Association and the Agricultural Bureau of Xinyang County, Hubei Province, we conducted a training program in Wufu Ecological Park to disseminate the technology for planting contamination-free strawberries, achieving practical field teaching.

During the program Dr. Xiang Fayun, deputy researcher of Hubei Academy of Agricultural Science, was invited to instruct local trainees to help them better understand how to identify, control and prevent plant diseases and pests. Dr. Xiang also pointed out the issues in production and management for trainees and shared the cutting-edge technology and management approaches to planting strawberries. As a result, we hoped to improve local farmers' knowledge and skills in strawberry planting, so as to help them alleviate poverty by themselves and rewrite their destiny.

7. Poverty-Alleviation • Care (Continued)

7.2 SUPPORT COMMUNITY AND BENEFIT LOCAL NEIGHBORHOODS

Deeming friendly community development to be an important part of our mission, Chalco encourages its employees to join volunteer organizations, to take part in activities providing care and support to the community. A good example of one such organization is the “Guo Mingyi Volunteer Team”, which has contributed to public welfare through community volunteering, blood donation drives, environmental protection activities and by visiting old people. We call for a loving and caring world and provide the best support for employees in their volunteering activities. The volunteers of Chalco spent 850 hours on public welfare activities in 2017.

“Modeling Leifeng in Action”– voluntary blood donation



The Company always encourages employees to be involved in voluntary blood donation. On March 2, 2017, responding the appeal of the Health and Family Planning Commission in Beijing, subsidiaries of the Company organized employees for voluntary blood donation. Over 30 employees were involved.

7. Poverty-Alleviation • Care (Continued)

“Voluntary Service to Villages and Families” Series Activities



Zunyi Alumina unregularly organized “Voluntary Service to Villages and Families” series activities. Employees delivered services concerning everyday lives of villagers in Daba Village, including home appliances repairing, computer maintenance, and health examination. All these services had received positive comments from local residents, which were very effective in promoting a harmonious relationship between the company and the community, building a positive company image.

7. Poverty-Alleviation • Care (Continued)

“Building harmonious Communities and Civilized Cities”–Voluntary Bike-cleaning



Chalco always pays attention to building civilized cities and harmonious communities. Through various voluntary activities, we maintained bright appearance of the city, purified community environment and built harmonious community with local residents. In order to brighten the city image and promote green transportation, subsidiaries of the Company organized employees to clean public bikes, which not only was a promotion in protecting public equipment, but also raised employees' awareness of green transportation.

8. Outlook of 2018

“The new era calls for new acts, and the new journey encourages new responsibilities.” The year 2018 is the beginning to implement the spirit raised in the 19 CPC National Congress, and is also a “striving year” for Chalco. As a leading company in China’s aluminum industry, Chalco will closely center high-quality development to fulfill the yearly target. We will uphold the guidance of CPC committee and the baseline thinking, progress steadily and stick to reform and innovation, so as to build a low-cost, high-competition company, forging the leading advantage. In addition, we will continue to tackle issues concerning safety, environmental protection and quality, in order to achieve a comprehensive development featuring “horizontal and longitudinal, internal and external” (“horizontal” means to expand the range of our products; “longitudinal” refers to expand the whole industry; “internal” indicates a connotative development path; “external” means an overseas development path.) Striving for strength and excellence through endeavor and innovation, we seek to build a world-class company with global competitiveness.

Lu Dongliang

Secretary of party committee and chairman
Chalco

Index	Description	Reporting Chapter
A. Environmental		
Emissions		
General Disclosure	Information on: the policies; and 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.	
A1.1	The types of emissions and respective emissions data.	P.27
A1.2	Greenhouse gas emissions in total (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P.30
A1.3	Total hazardous waste produced (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P.36
A1.4	Total non-hazardous waste produced (in tons) and, where appropriate, intensity (e.g. per unit of production volume, per facility).	P.28
A1.5	Description of measures to mitigate emissions and results achieved.	P.27–28
A1.6	Description of how hazardous and non-hazardous wastes are handled, reduction initiatives and results achieved.	P.35

ESG Index

Index	Description	Reporting Chapter
Use of Resources		
General Disclosure	Policies on the efficient use of resources, including energy, water and other raw materials.	
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).	P.30
A2.2	Water consumption in total and intensity (e.g. per unit of production volume, per facility).	P.30
A2.3	Description of energy use efficiency initiatives and results achieved.	P.28–29
A2.4	Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and results achieved.	P.27
A2.5	Total packaging material used for finished products (in tons) and, if applicable, with reference to per unit produced.	P.32
The Environment and Natural Resources		
General Disclosure	Policies on minimizing the issuer's significant impact on the environment and natural resources.	
A3.1	Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them.	P.34
B. Social		
Employment and Labor Practices		
General Disclosure	Information on the policies; and 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.	
B1.1	Total workforce by gender, employment type, age group and geographical region.	P.64–65
B1.2	Employee turnover rate by gender, age group and geographical region.	P.70

Index	Description	Reporting Chapter
Health and Safety		
General Disclosure	Information on the policies; and 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.	
B2.1	Number and rate of work-related fatalities.	/
B2.2	Lost days due to work injury.	/
B2.3	Description of occupational health and safety measures adopted, how they are implemented and monitored.	P.56–62
Development and Training		
General Disclosure	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities.	
B3.1	The percentage of employees trained by gender and employee category (e.g. senior management, middle management).	P.64–65
B3.2	The average training hours completed per employee by gender and employee category.	P.64–65
Labor		
Standards		
General Disclosure	Information on the policies; and compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labor.	
B4.1	Description of measures to review employment practices to avoid child and forced labor.	P.63
B4.2	Description of steps taken to eliminate such practices when discovered.	

ESG Index

Index	Description	Reporting Chapter
Supply Chain Management		
General Disclosure	Policies on managing environmental and social risks of the supply chain.	
B5.1	Number of suppliers by geographical region.	P.52
B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored.	P.52
Product Responsibility		
General Disclosure	Information on the policies; and compliance with relevant laws and regulations that have a significant impact on the issuer relating to health and safety, advertising, labelling and privacy matters relating to products and services provided and methods of redress.	
B6.1	Percentage of total products sold or shipped subject to recalls for safety and health reasons.	P.45
B6.2	Number of products and service related complaints received and how they are dealt with.	P.50
B6.3	Description of practices relating to observing and protecting intellectual property rights.	P.37
B6.4	Description of quality assurance process and recall procedures.	P.45
B6.5	Description of consumer data protection and privacy policies, how they are implemented and monitored.	NA

Index	Description	Reporting Chapter
Anticorruption		
General Disclosure	Information on the policies; and compliance with relevant laws and regulations that have a significant impact on the issuer relating to bribery, extortion, fraud and money laundering.	
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.	/
B7.2	Description of preventive measures and whistle-blowing procedures, how they are implemented and monitored.	P.19
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.	
B8.1	Focus areas of contribution (e.g. education, environmental concerns, labor needs, health, culture, sport).	P.75
B8.2	Resources contributed (e.g. money or time) to the focus area.	P.75

9. Your Feedback



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