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As filed with Securities and Exchange Commission on April 25, 2023

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 20-F

☐ **REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES EXCHANGE ACT OF 1934**

OR

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended December 31, 2022

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

OR

☐ **SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
Date of event requiring this shell company report _____________
For the transition period from __________ to __________

Commission file number 001-15264

中国铝业股份有限公司
(Exact name of Registrant as specified in its charter)

ALUMINUM CORPORATION OF CHINA LIMITED
(Translation of Registrant's name into English)

People's Republic of China
(Jurisdiction of incorporation or organization)

No. 62 North Xizhimen Street, Haidian District, Beijing
People's Republic of China (100082)
(Address of principal executive offices)

Zhu Runzhou
No. 62 North Xizhimen Street, Haidian District, Beijing
People's Republic of China (100082)
(86) 10 8229 8322
ir@chalco.com.cn
(Name, Telephone, Email and/or Facsimile number and Address of Company Contact Person)

Securities registered or to be registered pursuant to Section 12(b) of the Act.

Title of each class	Trading Symbol	Name of each exchange on which registered
None	None	None

Securities registered or to be registered pursuant to Section 12(g) of the Act.

Class H Ordinary Shares
(Title of Class)

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act.

None
(Title of Class)

Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the annual report.

As of December 31, 2022:

Domestic shares, par value RMB1.00 per share	13,217,625,583
H Shares, par value RMB1.00 per share	3,943,965,968

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes ☐ No ☑

Note – Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of "large accelerated filer," "accelerated filer," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Emerging growth company ☐

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards† provided pursuant to Section 13(a) of the Exchange Act. ☐

† The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☑ No ☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP ☐
International Financial Reporting Standards as issued by the International Accounting Standards Board ☑
Other ☐

If "Other" has been checked in response to the previous question, indicate by check mark which financial statement item the registrant has elected to follow.

Item 17 ☐ Item 18 ☐

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes ☐ No ☑

(APPLICABLE ONLY TO ISSUERS INVOLVED IN BANKRUPTCY PROCEEDINGS DURING THE PAST FIVE YEARS)

Indicate by check mark whether the registrant has filed all documents and reports required to be filed by Sections 12, 13 or 15(d) of the Securities Exchange Act of 1934 subsequent to the distribution of securities under a plan confirmed by a court.

Yes ☐ No ☐

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Forward-Looking Statements

Certain information contained in this annual report, which does not relate to historical information, may be deemed to constitute forward-looking statements. The words or phrases “will likely result,” “are expected to,” “will continue,” “is anticipated,” “estimate,” “project,” “believe” or similar expressions are intended to identify “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Such statements are subject to certain risks and uncertainties that could cause actual results to differ materially from historical results and those presently anticipated or projected. You should not place undue reliance on any such forward-looking statements, which speak only as of the date made. These forward-looking statements include, without limitation, statements relating to:

- future general economic conditions;
- future conditions in the international and China capital markets;
- future conditions in the financial and credit markets;
- future prices and demand for our products;
- future PRC tariff levels for alumina and primary aluminum;
- sales of our products;
- the extent and nature of, and potential for, future developments;
- production, consumption and demand forecasts of bauxite, coal, alumina and primary aluminum;
- expansion, consolidation or other trends in the primary aluminum industry;
- estimates of proven and probable reserves and measured, indicated and inferred resources with respect to our bauxite and coal mines;
- the effectiveness of our cost-saving measures;
- future expansion, investment and acquisition plans and capital expenditures;
- competition;
- changes in legislation, regulations and policies;
- any catastrophe, including outbreaks of health pandemics and other extraordinary events;
- the impact of the Holding Foreign Companies Accountable Act and any rules or regulations adopted by U.S. regulators to implement such legislation, including but not limited to the Final Rule with respect to the Holding Foreign Companies Accountable Act adopted by the SEC;
- the impact of the ongoing Russia-Ukraine conflict and the economic sanctions imposed on Russia, and their impact on the global economy;
- our research and development plans; and
- our dividend policy.

These statements are based on assumptions and analyses made by us in light of our experience and our perception of historical trends, current conditions and future developments, as well as other factors we believe are appropriate in particular circumstances. However, whether actual results and developments will meet our expectations and predictions depends on a number of risks and uncertainties, which could cause actual results to differ materially from our expectations. These risks are more fully described in the section headed "Item 3. Key Information - D. Risk Factors."

Consequently, all of the forward-looking statements made in this annual report are qualified by these cautionary statements. We cannot assure you that the actual results or developments anticipated by us will be realized or, even if substantially realized, that they will have the expected effect on us or our business or operations.

Certain Terms and Conventions

"**Chalco**," "**the Company**," "**the Group**," "**our Company**," "**our Group**," "**we**," "**our**" and "**us**" refer to Aluminum Corporation of China Limited and its subsidiaries and, where appropriate, to its predecessors;

"**A Share(s)**" and "**domestic share(s)**" refer to our domestic ordinary share(s), with a par value of RMB1.00 each, which are listed on the Shanghai Stock Exchange;

"**ADR(s)**" refers to the American Depositary Receipt(s);

"**ADS(s)**" refers to the American Depositary Share(s);

"**alumina-to-silica ratio**" refers to the ratio of alumina to silica in bauxite by weight;

"**aluminum fabrication**" refers to the process of converting primary aluminum or recycled aluminum materials into plates, strips, bars, tubes and other fabricated products;

"**Baotou Aluminum**" refers to Baotou Aluminum Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**bauxite**" refers to a mineral ore that is principally composed of aluminum;

"**Bayer process**" refers to a refining process that employs a strong solution of caustic soda at an elevated temperature to extract alumina from ground bauxite;

"**Bayer-sintering combined process**" and "**Bayer-sintering series process**" refer to the two methods of refining process developed in China which involve the combined application of the Bayer process and the sintering process to extract alumina from bauxite;

"**Board**" refers to our board of directors;

"**Boffa Project**" refers to the project to develop and operate a bauxite mine located in Boffa, Guinea, in accordance with a mining convention entered into by Chalco Hong Kong, Chalco Guinea Company S.A. and the Guinean government on June 8, 2018;

"**CBEX**" refers to China Beijing Equity Exchange, an approved equity exchange for the transfer of state-owned assets;

"**Chinalco Assets**" refers to Chinalco Assets Operation and Management Co., Ltd., a wholly-owned subsidiary of Chinalco;

"**Chalco Carbon**" refers to Chalco (Shanghai) Carbon Co., Ltd., our wholly-owned subsidiary;

"**Chalco Energy**" refers to Chalco Energy Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**Chalco Hong Kong**" refers to Chalco Hong Kong Ltd., our wholly-owned subsidiary established under Hong Kong Law;

"**Chalco Logistics**" refers to Chalco Aluminum Logistics Corporation Group Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**Chalco Materials**" refers to Chalco Materials Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**Chalco Mining**" refers to Chalco Mining Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**Chalco Ruimin**" refers to Chalco Ruimin Company Limited, our subsidiary until June 2013 when we disposed of 93.30% of its equity interest to Chinalco;

"**Chalco Shandong**" refers to Chalco Shandong Co., Ltd., our indirect wholly-owned subsidiary;

"**Chalco Shanghai**" refers to Chalco Shanghai Company Limited, our wholly-owned subsidiary established under the PRC law;

"**Chalco Southwest Aluminum**" refers to Chalco Southwest Aluminum Company Limited, our subsidiary until June 2013 when we disposed of 60% of its equity interest to Chinalco;

"**Chalco Southwest Aluminum Cold Rolling**" refers to Chalco Southwest Aluminum Cold Rolling Company Limited, our wholly-owned subsidiary until June 2013 when we disposed of its entire equity interest to Chinalco;

"**Chalco Trading**" refers to China Aluminum International Trading Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**Chalco Trading Group**" refers to China Aluminum International Trading Group Co., Ltd., our wholly-owned subsidiary established under the PRC law;

"**Chalco Xing County Alumina Project**" refers to the Bayer process production system and ancillary facilities at Xing County, Lvliang City of Shanxi Province with production capacity of 800,000 tonnes of metallurgical grade alumina per year;

"**China**" and the "**PRC"** refer to the People's Republic of China, excluding, for purposes of this annual report only, Hong Kong Special Administrative Region, Macao Special Administrative Region and Taiwan;

"**China Copper**" refers to China Copper Co., Ltd., a subsidiary of Chinalco;

"**China United Assets Appraisal**" refers to China United Assets Appraisal Group Co., Ltd., a PRC qualified valuer;

"**Chinalco**" refers to our controlling shareholder, Aluminum Corporation of China and its subsidiaries (other than Chalco and its subsidiaries) and, where appropriate, to its predecessors;

"**Chinalco Finance**" refers to Chinalco Finance Co., Ltd.;

"**CSRC**" refers to China Securities Regulatory Commission;

"**cut-off grade**" refers to the grade (i.e., the concentration of metal or mineral in rock) that determines the destination of the material during mining. For purposes of establishing "prospects of economic extraction," the cut-off grade is the grade that distinguishes material deemed to have no economic value (it will not be mined in underground mining or if mined in surface mining, its destination will be the waste dump) from material deemed to have economic value (its ultimate destination during mining will be a processing facility).

"**Exchange Act**" refers to the U.S. Securities Exchange Act of 1934, as amended;

"**Euro**" refers to the lawful currency of the Eurozone;

"**Fushun Aluminum**" refers to Fushun Aluminum Company Limited, our indirect wholly-owned subsidiary established under the PRC law;

"**Gansu Hualu**" refers to Gansu Hualu Aluminum Company Limited, 51% of the equity interest of which is owned by us;

"**Gansu Huayang**" refers to Gansu Huayang Mining Development Company Limited, 70% of the equity interest of which is owned by us;

"**GNF**" refers to Guinea franc, the lawful currency of the Republic of Guinea;

"**Guangxi Investment**" refers to Guangxi Investment (Group) Co., Ltd., formerly known as Guangxi Development and Investment Co., Ltd., a PRC state-owned enterprise;

"**Guizhou Development**" refers to Guizhou Provincial Materials Development and Investment Corporation, a PRC state-owned enterprise and one of our promoters and shareholders;

"**Guizhou Huajin**" refers to Guizhou Huajin Aluminum Co., Ltd., 60% of the equity interest of which is owned by us;

"**Guizhou Huaren**" refers to Guizhou Huaren New Material Co., Ltd., 40% of the equity interest of which is owned by us;

"**Guangxi Huasheng**" refers to Guangxi Huasheng New Material Co., Ltd., 51% of the equity interest of which is owned by us;

"**H Share(s)**" refers to overseas listed foreign share(s) with a par value of RMB1.00 each, which are listed on the Hong Kong Stock Exchange;

"**Henan Aluminum**" refers to Chalco Henan Aluminum Company Limited, our subsidiary until June 2013 when we disposed of 90.03% of its equity interest to Chinalco;

"**HK$**" and "**HK dollars**" refer to Hong Kong dollars, the lawful currency of the Hong Kong Special Administrative Region of the PRC;

"**Hong Kong Stock Exchange**" refers to The Stock Exchange of Hong Kong Limited;

"**Huaxi Aluminum**" refers to Huaxi Aluminum Company Limited, our subsidiary until June 2013 when we disposed of 56.86% of its equity interest to Chinalco;

"**Inner Mongolia Huayun**" refers to Inner Mongolia Huayun New Materials Co., Ltd., 50% of the equity interest of which is owned by Baotou Aluminum;

"**IRS**" refers to Internal Revenue Service of the United States federal government;

"**Japanese Yen**" refers to the lawful currency of Japan;

"**Jiaozuo Wanfang**" refers to Jiaozuo Wanfang Aluminum Manufacturing Co., Ltd.;

"**Ka**" refers to kiloamperes, a unit for measuring the strength of an electric current, with one kiloampere equaling 1,000 amperes;

"**kWh**" refers to kilowatt-hours, a unit of electrical power, meaning one kilowatt of power for one hour;

"**Lanzhou Aluminum**" refers to Lanzhou Aluminum Co., Ltd., our wholly-owned subsidiary since January 2019, which was previously our wholly-owned branch, Lanzhou branch;

"**Listed Company**" refers to Aluminum Corporation of China Limited, the holding company of our Group that has been listed on the New York Stock Exchange since December 2001.

"**Listing Rules**" and "**Hong Kong Listing Rules**" refer to the Rules Governing the Listing of Securities on the Hong Kong Stock Exchange, as amended;

"**LME**" refers to the London Metal Exchange Limited;

"**Logistics Zhongzhou**" refers to China Aluminum Logistics Group Zhongzhou Co., Ltd., our indirect subsidiary;

"**MIIT**" refers to Ministry of Industry and Information Technology of the PRC;

"**MOF**" refers to Ministry of Finance of the PRC;

"**MW**" refers to megawatt, a unit of electrical power;

"**Nanchu**" refers to ENanchu (http://www.enanchu.com/), a nonferrous metal-related portal site in PRC;

"**NDRC**" refers to China National Development and Reform Commission;

"**Ningxia Energy**" refers to China Aluminum Ningxia Energy Group Co., Ltd., formerly known as Ningxia Electric Power Group Co., Ltd., before we acquired 70.82% of its equity interest in January 2013;

"**Northwest Aluminum**" refers to Northwest Aluminum Fabrication Branch, our wholly-owned branch until June 2013 when we disposed of all its assets to a subsidiary of Chinalco;

"**NYSE**" and **"New York Stock Exchange**" refer to the New York Stock Exchange Inc.;

"**ore-dressing Bayer process**" refers to a refining process we developed to increase the alumina-to-silica ratio of bauxite;

"**PBOC**" refers to People's Bank of China;

"**Pingguo Aluminum**" refers to Pingguo Aluminum Co., Ltd., our wholly-owned subsidiary established under the PRC law.

"**Qingdao Light Metal**" refers to Chalco Qingdao Light Metal Company Limited, our wholly-owned subsidiary until June 2013 when we disposed of its entire equity interest to Chinalco. In December 2017, we acquired 100% of the equity interest in Qingdao Light Metal through Chalco Shandong at a consideration of RMB300.4 million to further our prospective strategic layout on secondary aluminum;

"**qualified person**" refers to an individual who is a mineral industry professional with at least five years of relevant experience in the type of mineralization and type of deposit under consideration and in the specific type of activity that person is undertaking on behalf of the registrant; and an eligible member or licensee in good standing of a recognized professional organization at the time the technical report is prepared.

"**refining**" refers to the chemical process used to produce alumina from bauxite;

"**RMB**" and "**Renminbi"** refer to the lawful currency of the PRC;

"**SAT**" refers to State Administration of Taxation of the PRC;

"**SAFE**" refers to State Administration of Foreign Exchange of the PRC;

"**SASAC**" refers to State-owned Assets Supervision and Administration Commission of the State Council of China;

"**SEC**" refers to the U.S. Securities and Exchange Commission;

"**Securities Act**" refers to the U.S. Securities Act of 1933, as amended;

"**Shandong Huayu**" refers to Shandong Huayu Alloy Material Co., Ltd., 55% of the equity interest of which is owned by us;

"**Shanxi Huasheng**" refers to Shanxi Huasheng Aluminum Company Limited, 51% of the equity interest of which is owned by us;

"**Shanxi Huaxing**" refers to Shanxi Huaxing Aluminum Co., Ltd., a wholly-owned subsidiary established under the PRC law.

"**Shanxi Huayu**" refers to Shanxi Huayu Energy Investment Co., Ltd., our indirect wholly-owned subsidiary established under the PRC law.

"**Shanxi New Material**" or "**Shanxi Huaze**" refers to Chalco Shanxi New Material Co., Ltd., formerly known as Shanxi Huaze Aluminum and Power Co., Limited, 85.98% of the equity interest of which is owned by us;

"**Shanxi Other Mines**" refers to the nine mines to which we entrusted another party to conduct mining activities, including Changjialing mine, Guxian mine, Loufan mine, Nanpo mine, Xishan mine, Yangjiashan mine, Niucaogou mine, Xiwupu mine and Jiaokou Xisongzhuang mine in Shanxi Province;

"**Shanxi Zhongrun**" refers to Shanxi China Huarun Co., Ltd., 40% of the equity interest of which is owned by us;

"**SHFE**" refers to the Shanghai Futures Exchange;

"**sintering process**" refers to a refining process employed to extract alumina from bauxite by mixing ground bauxite with supplemental materials and burning the mixture in a coal-fired kiln;

"**smelting**" refers to the electrolytic process used to produce molten aluminum from alumina;

"**tonne**" refers to the metric ton, a unit of weight, that is equivalent to 1,000 kilograms or 2,204.6 pounds;

"**US$**," "**dollars**" and "**U.S. dollars**" refer to the lawful currency of the United States;

"**Xinghua Technology**" refers to Chinalco Shanxi Jiaokou Xinghua Technology Ltd., 66% of the equity interest of which is owned by us;

"**Yangtze**" refers to the Shanghai Changjiang Nonferrous Metals Spot Market;

"**Yixin Aluminum**" refers to Heqing Yixin Aluminum Co., Ltd., an indirect subsidiary of Chinalco;

"**Yunnan Aluminum**" refers to Yunnan Aluminum Co., Ltd., our subsidiary, 29.10% of the equity interest of which is owned by us;

"**Yunnan SASAC**" refers to the State-owned Assets Supervision and Administration Commission of Yunnan Provincial People's Government;

"**Jinneng Holding Shanxi Electric Power**" refers to Jinnneng Holding Shanxi Electric Power Co., Ltd., formerly known as Shanxi Zhangze Electric Power Co., Ltd., which owns 14.02% of equity interest in Shanxi New Material;

"**Zhengzhou Institute**" refers to Chalco Zhengzhou Research Institute of Non-ferrous Metal Co., Ltd., our wholly-owned subsidiary, which primarily provides research and development services;

"**Zhongzhou Aluminum**" refers to Chalco Zhongzhou Aluminum Co., Ltd., our indirect wholly-owned subsidiary;

"**Zhongzhou Aluminum Plant**" refers to Henan Zhongzhou Aluminum Plant Co., Ltd., a wholly-owned subsidiary of Chinalco;

"**Zhongzhou Logistics**" refers to Henan Zhongzhou Logistics Co., Ltd., which had been a wholly-owned subsidiary of Chinalco and was dissolved in September 2020;

"**Zunyi Alumina**" refers to Chalco Zunyi Alumina Co., Ltd., which was merged into Zunyi Aluminum in June 2018; and

"**Zunyi Aluminum**" refers to Zunyi Aluminum Co., Ltd., 67.45% of the equity interest of which is owned by us.

Translations of amounts in this annual report from Renminbi to U.S. dollars and vice versa have been made at the rate of RMB6.8972 to US$1.00, the exchange rate as set forth in the H.10 statistical release of the Federal Reserve Board for December 30, 2022. We make no representation that any Renminbi or U.S. dollar amounts could have been, or could be, converted into U.S. dollars or Renminbi, as the case may be, at any particular rate, the rates stated below, or at all.

Any discrepancies in any table between the amounts identified as total amounts and the sum of the amounts listed therein are due to rounding.

PART I

Item 1. Identity of Directors, Senior Management and Advisors

Not applicable.

Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

Significant Risks Associated with Being Based in and Having the Majority of Our Operations in China

We face legal and operational risks associated with being based in and having the majority of our operations in China. Changes in PRC economic, political or social conditions or government policies could materially adversely affect our business and results of operations. The PRC government has the authority to exert significant influence on the ability of a China-based company, including us, to conduct its business, and investors of Chalco and our business face potential uncertainty as a result. For example, we face risks associated with PRC governmental authorities' significant oversight and discretion over our businesses and financing activities, the requirement of regulatory approvals for offerings conducted overseas by and foreign investment in China-based issuers, the enforcement of anti-monopoly regime, which may impact our ability to conduct certain businesses, accept foreign investments. The materialization of these risks may result in a material adverse change to our business operations and financial condition, significantly limit or completely hinder our ability to offer or continue to offer securities to investors, and cause our ADSs and/or other securities to significantly decline in value or become worthless. See "Item 3. Key Information - D. Risk Factors - Our operations are affected by a number of risks relating to conducting business in the PRC. The PRC government has significant authority to intervene or influence the operations of a China-based company, such as us, at any time. The materialization of any such risk may result in a material adverse change to our business, prospects, financial condition and results of operations, and cause your investment in our ADSs to significantly decline in value or become worthless." Moreover, on September 1, 2022, our ADSs were delisted from the NYSE. Our ADSs are now traded on the over-the-counter market (the "OTC Market"), which may adversely affect the market price of our ADSs and make it difficult for our shareholders to resell their ADSs. In light of the delisting, we subsequently delivered a termination letter to the depositary for our ADSs, for the termination of our ADS program on March 30, 2023. Our ADS program is expected to be terminated on June 30, 2023. See "Item 3. Key Information - D. Risk Factors - We voluntarily delisted our ADSs from the NYSE, which could reduce the liquidity and market price of our ADSs and underlying shares."

Pursuant to the Holding Foreign Companies Accountable Act, if the SEC determines that we have filed audit reports issued by a registered public accounting firm that has not been subject to inspections by the PCAOB for two consecutive years, the SEC will prohibit our shares or the ADSs from being traded in the over-the-counter trading market in the United States. On December 16, 2021, the PCAOB issued a report to notify the SEC of its determination that the PCAOB was unable to inspect or investigate completely registered public accounting firms headquartered in mainland China and Hong Kong, including our auditor. In May 2022, the SEC conclusively listed us as a Commission-Identified Issuer under the HFCA Act following the filing of the annual report on Form 20-F for the fiscal year ended December 31, 2021. On December 15, 2022, the PCAOB issued a report that vacated its December 16, 2021 determination and removed mainland China and Hong Kong from the list of jurisdictions where it is unable to inspect or investigate completely registered public accounting firms. For this reason, we do not expect to be identified as a Commission-Identified Issuer under the HFCA Act after we file this annual report on Form 20-F. Each year, the PCAOB will determine whether it can inspect and investigate completely audit firms in mainland China and Hong Kong, among other jurisdictions. If PCAOB determines in the future that it no longer has full access to inspect and investigate completely accounting firms in mainland China and Hong Kong and we continue to use an accounting firm headquartered in one of these jurisdictions to issue an audit report on our financial statements filed with the Securities and Exchange Commission, we would be identified as a Commission-Identified Issuer following the filing of the annual report on Form 20-F for the relevant fiscal year. There can be no assurance that we would not be identified as a Commission-Identified Issuer for any future fiscal year, and if we were so identified for two consecutive years, we would become subject to the prohibition on trading under the HFCA Act. See "Item 3. Key Information - D. Risk Factors - Our ADSs may be prohibited from trading in the United States under the Holding Foreign Companies Accountable Act and the relevant laws and regulations if the PCAOB is unable to inspect or investigate completely auditors located in China."

An investment in our ADSs and/or other securities involves a high degree of risk and should be considered speculative. You should carefully consider all risk factors set out in "Item 3. Key Information - D. Risk Factors" and other information before investing in our ADSs. If any event arising from these risks occurs, our business, prospects, financial condition, results of operations or cash flows could be materially adversely affected, the trading price of our ADSs and/or other securities could decline and all or part of your investment may be lost.

Requisite Permissions and Approvals

We are principally subject to governmental supervision and regulation by five agencies of the PRC government:

- the NDRC, which sets and implements the major policies concerning China's economic and social development, approves investments exceeding certain amounts, coordinates and improves the reform of the economic system;

- the Ministry of Natural Resources of China, which has the authority to grant land use rights and mining right permits;

- the MIIT, which formulates industrial policies and investment guidelines for all industries, including the aluminum industry;

- The Ministry of Ecology and Environment of China, which is responsible for supervision and administration of environmental protection in China; and

- the CSRC, the securities regulatory commission of China.

See "Item 4. Information of the Company - B. Business Overview - Regulatory Overview." As Chalco is incorporated in China, our capital markets financing activities are subject to approval by the CSRC, regardless of whether the funds are raised in or outside China. We must obtain prior approval from the CSRC for issuance of equity securities or equity-linked securities. Our offering of corporate bonds in China is also subject to supervision of the CSRC. The governmental and regulatory interference could significantly limit or completely hinder our ability to offer or continue to offer securities to investors and cause the value of such securities to significantly decline or be worthless.

As an industrial producer of alumina, primary aluminum and other non-ferrous metals, our capital markets financing activities are not subject to approval by the Cyber Administration of China, or the CAC. Furthermore, our ordinary course of business is not subject to permission requirements from the CAC. Accordingly, we believe that our business operations have not been directly affected by the regulations and policies that have been issued by the CAC to date.

As of December 31, 2022 and up to the date of this annual report, we have received all requisite permissions and approvals that are material to our operations, and no permissions or approvals that are material to our operations have been denied. However, if we do not receive or maintain any permissions or approvals that are material to our operations, conclude that such permissions or approvals are not required, or the applicable laws, regulations, or interpretations change and we are required to obtain such permissions or approvals in the future, our business operations and financial condition could be materially adversely affected, and our ADSs could significantly decline in value or become worthless.

Transfers of Cash within Our Group and Dividend Payment

Any determination related to our dividend policy will be made at the discretion of our board of directors after considering its financial condition, results of operations, capital requirements, business prospects and other factors the board of directors deems relevant, and subject to the restrictions contained in any financing instruments. Subject to the PRC Company Law and our Articles of Association, our board of directors may propose to authorize and declare a dividend to shareholders at such time and of such an amount as they think fit if they are satisfied, on reasonable grounds, that immediately following the dividend the value of its assets will exceed its liabilities and we will be able to pay our debts as they become due. See "Item 8. Financial Information - Dividend Policy" for details of our dividend policy.

Chalco's cash dividends, if made, are declared in Renminbi with respect to our H shares on a per share basis and paid in HK dollars. The Bank of New York Mellon, as depositary, converts the HK dollar dividend payments and distributes them to holders of ADSs in U.S. dollars, less expenses of conversion. See "Item 10. Additional Information - E. Taxation" for tax consequences of dividends made to investors of our ADSs.

The Listed Company's payment of dividends is dependent on receipt of funds from its subsidiaries by way of dividend payments. Current PRC regulations permit our PRC subsidiaries to pay dividends to the Listed Company only out of its accumulated after-tax profits, if any, determined in accordance with Chinese accounting standards and regulations. In addition, our PRC subsidiaries are required to set aside at least 10% of its after-tax profits each year, if any, to fund a statutory reserve until such reserve reaches 50% of its registered capital. Our PRC subsidiaries could further set aside a portion of its after-tax profits to fund a discretionary reserve, although the amount to be set aside, if any, is determined at the discretion of their shareholder, i.e. the Listed Company. Although the statutory reserves can be used, among other ways, to increase the registered capital, the reserve funds are not distributable as cash dividends except in the event of liquidation. Under PRC Enterprise Income Tax Law, dividends payment from our subsidiaries to the Listed Company are exempt from taxation.

The PRC government also imposes controls on the conversion of RMB into foreign currencies and the remittance of currencies out of the PRC. See "Item 10. Additional Information - D. Exchange Controls." Although we have not experienced any difficulties in completing the administrative procedures necessary to obtain and remit foreign currency for the payment of dividends in the past, we cannot assure you that we will not experience such difficulties for the payment of dividends in the future.

For the years ended 2020, 2021 and 2022, the Listed Company received dividends of RMB1,797.4 million, RMB4,059.8 million and RMB6,075.8 million from our subsidiaries, primarily including our principal subsidiaries disclosed in "Item 4. Information on the Company - C. Organizational Structure." For the year ended December 31, 2020, we did not make dividend payment because we had accumulated losses as of December 31, 2020. As of December 31, 2021 and December 31, 2022, we had retained earnings of RMB6,810.1 million and RMB10,089.5 million, respectively. As disclosed in our current reports on Form 6-K furnished to the SEC on June 21 and 28, 2022, the final dividends payable for 2021 amount to approximately RMB544,891,195.38 in total, and the final dividends payable on each H share for 2021 is HK$0.0372 (tax inclusive), which was paid on August 19, 2022. As disclosed in our current report on Form 6-K furnished to the SEC on March 21, 2023, the dividends declared for 2022 is RMB0.036 per H share.

A. Selected Financial Data

Reserved.

B. Capitalization and Indebtedness

Not applicable.

C. Reasons for the Offer and Use of Proceeds

Not applicable.

D. Risk Factors

Our business and financial condition and results of operations are subject to various changing business, competitive, economic, political and social conditions in China and worldwide. In addition to the factors discussed elsewhere in this annual report, the following are some of the important factors that could cause our actual results to differ materially from those projected in any forward-looking statements.

We voluntarily delisted our ADSs from the NYSE, which could reduce the liquidity and market price of our ADSs and underlying shares.

Our Board approved the voluntarily withdrawal of our ADSs from listing on the NYSE, primarily due to a number of considerations, including the limited trading volume of the ADSs of the Company as compared to the worldwide trading volume of H shares of the Company, and the considerable administrative burden and costs associated with maintaining the listing of the ADSs on the NYSE and the registration of the ADSs and the underlying H shares with the SEC and complying with the periodic reporting and related obligations under the Exchange Act. We filed a Form 25 with the SEC on August 22, 2022 in order to delist our Shares from the NYSE, which occurred ten days thereafter upon effectiveness of the Form 25. Accordingly, our last day of trading on the NYSE was September 1, 2022. Our ADSs are currently traded on the OTC Market and our ticker symbol was changed from "ACH" to "ACHHY." In light of the delisting, we subsequently delivered a termination letter to the depositary for our ADSs, for the termination of our ADS program on March 30, 2023. Our ADS program is expected to be terminated on June 30, 2023.

The delisting of our shares from the NYSE could negatively impact us because it could: (i) reduce the liquidity and market price of our ADSs, (ii) reduce the number of investors willing to hold or acquire our ADSs, which could negatively impact our ability to raise equity financing, and (iii) impair our ability to raise additional necessary capital through equity or debt financing in the United States if needed in the future.

Trading on the OTC Market may be volatile and sporadic, which could depress the market price of our ADSs. Selling our ADSs on the OTC Market could be more difficult because smaller quantities of ADSs would likely be bought and sold, transactions could be delayed, and security analysts' coverage of us may be reduced. In addition, broker-dealers have certain regulatory burdens imposed upon them, which may discourage broker-dealers from effecting transactions in our ADSs, further limiting the liquidity of our ADSs. As a result, the market price of our ADSs may be depressed, and as a result it may be more difficult to sell our ADSs.

Additionally, we intend to file a Form 15F with the SEC to deregister our ADSs and the underlying ordinary shares under the Exchange Act once we have met the criteria for deregistration. Thereafter, all of our reporting obligations under the Exchange Act will be suspended unless the Form 15F is subsequently withdrawn or denied. Deregistration of ADSs and the underlying ordinary shares and termination of our reporting obligations under the Exchange Act are expected to become effective 90 days after the filing of Form 15F with the SEC.

Once the Form 15F is filed, we will publish the information required under Rule 12g3-2(b) of the Exchange Act on our website, www.chalco.com.cn. We will also continue to comply with our financial reporting and other obligations as a listed issuer on the Hong Kong Stock Exchange.

Our ADSs may be prohibited from trading in the United States under the Holding Foreign Companies Accountable Act and the relevant laws and regulations if the PCAOB is unable to inspect or investigate completely auditors located in China.

As part of continued regulatory focus in the United States on access to audit and other information currently protected by foreign law, in particular the PRC's law, on December 18, 2020, the United States enacted the Holding Foreign Companies Accountable Act, or the HFCA Act. The HFCA Act includes requirements for the SEC to identify issuers whose audit reports are prepared by auditors that the PCAOB is unable to inspect or investigate completely because of a restriction imposed by a non-U.S. authority in the auditor's local jurisdiction. The HFCA Act also requires public companies on this SEC list to certify that they are not owned or controlled by a foreign government and make certain additional disclosure in their SEC filings that cover a "non-inspection" year. In addition, if the auditor of a U.S.-listed company is not subject to PCAOB inspections for two consecutive "non-inspection" years, the SEC is required to prohibit the securities of these issuers from being traded on a U.S. national securities exchange, such as the New York Stock Exchange, on OTC markets in the United States or through any other method within the SEC's jurisdiction to regulate.

On September 22, 2021, the PCAOB adopted a final rule implementing the HFCA Act, which provides a framework for the PCAOB to determine, as contemplated under the HFCA Act, whether the PCAOB is unable to inspect or investigate completely registered public accounting firms located in a foreign jurisdiction because of a position taken by one or more authorities in that jurisdiction. Final rules implementing certain requirements of the HFCA Act, or the Final Rules, were adopted by the SEC on December 2, 2021 and generally became effective on January 10, 2022. On December 16, 2021, the PCAOB issued the HFCA Act Determination Report, according to which our auditor is subject to the determination that the PCAOB is unable to inspect or investigate it completely. Pursuant to the Final Rules, the SEC began to identify Commission-Identified Issuers in March 2022. On May 26, 2022, we were listed on the "conclusive list of issuers identified under the HFCA Act," indicating that we are now Commission-Identified Issuers subject to the delisting provisions if we remain on the list for two consecutive years. A Commission-Identified Issuer is required to comply with the submission and disclosure requirements in the annual report for each year in which it was identified. Since we have been identified as a Commission-Identified Issuer based on this annual report, we are required to comply with the submission or disclosure requirements in our annual report filing covering the fiscal year ending December 31, 2022. Although our ADSs have been delisted from the NYSE since September 1, 2022, under the HFCA Act and the Final Rules, our securities will be prohibited from trading in over-the-counter markets after we are identified as a Commission-Identified Issuer for two consecutive years, and this ultimately would result in our ADSs being prohibited from over-the-counter trading.

On August 26, 2022, the PCAOB signed a statement of protocol agreement with the CSRC and the MOF, or the "Cooperative Agreement." According to the fact sheets published by the PCAOB, the PCAOB has the sole discretion in selecting the subject of its inspections and investigations without input from the Chinese authorities, and that procedures are in place to allow PCAOB inspectors and investigators to review complete audit working papers of accounting firms located in mainland China and Hong Kong.

On December 15, 2022, the PCAOB removed mainland China and Hong Kong from the list of jurisdictions where it is unable to inspect or investigate completely registered public accounting firms. For this reason, we do not expect to be identified as a Commission-Identified Issuer under the HFCA Act after we file this annual report on Form 20-F for the fiscal year ended December 31, 2022.

Each year, the PCAOB will determine whether it can inspect and investigate completely audit firms in mainland China and Hong Kong, among other jurisdictions. If the PCAOB determines in the future that it no longer has full access to inspect and investigate completely accounting firms in mainland China and Hong Kong and we use an accounting firm headquartered in one of these jurisdictions to issue an audit report on our financial statements filed with the Securities and Exchange Commission, we would be identified as a Commission-Identified Issuer following the filing of the annual report on Form 20-F for the relevant fiscal year.

Any lack of access to the PCAOB inspection in China may prevent the PCAOB from fully evaluating audits and quality control procedures of the auditors based in China. As a result, the investors may be deprived of the benefits of such PCAOB inspection. The inability of the PCAOB to conduct inspections of auditors in China makes it more difficult to evaluate the effectiveness of these accounting firms' audit procedures or quality control procedures as compared to auditors outside of China that are subject to the PCAOB inspections, which could cause existing and potential investors to lose confidence in audit procedures and reported financial information and the quality of financial statements of China-based companies.

Our operations are affected by a number of risks relating to conducting business in the PRC. The administrative regulations, departmental rules, and industry regulatory requirements in relation to production safety and environmental protection issued by the Chinese government and relevant government authorities may affect the operations of a China-based company, such as us. The materialization of such risk may result in an adverse change to our business, prospects, financial condition and results of operations, and in extreme cases, may cause your investment in our ADSs to significantly decline in value or become worthless.

As most of our assets and operations are located in the PRC, we are subject to a number of risks relating to conducting business in the PRC, including the following:

- Our business, prospects, financial condition, and results of operations may be influenced by political, economic, and social conditions in China generally. The industry regulatory requirements and other regulations issued by the PRC government may influence operations of some China-based companies, including us.

- The PRC government continues to shape the structure and development of the aluminum industry through industry guidelines for energy conservation, safety, environmental protection and quality. The central and local PRC government will give more support to entities that meet the standards in such industry guidelines. If the PRC government changes its current industry guidelines or the interpretation of those industry guidelines, we may face pressure on profit margins and constraints on our ability to expand our business operations.

- Although the PRC has been one of the world's fastest-growing economies in terms of GDP growth in the past 30 years, the global financial crisis that unfolded in 2008, coupled with the ongoing structural adjustment of the PRC economy in the past few years, has led to a marked slowdown in the economic growth of the PRC. For example, the GDP growth rate of the PRC decreased from 11.4% in 2007 to 6.1% in 2019. Furthermore, the outbreak and global spread of the COVID-19 in 2020, 2021 and 2022 has adversely affected global and China's economy and financial market in general. As a result, the compound annual GDP growth rate of China was 4.4% from 2019 to 2022. A slowdown or decline in the PRC economy could reduce business activities and demand for our products. In addition, the PRC government exercises macro-control over China's economic through the control of payments of obligations denominated in foreign currencies, monetary and tax policies. Some of these measures benefit the overall economy of China, but may have an adverse impact on us.

- We are subject to reviews and inspections by various governmental authorities and regulatory agencies. These reviews and inspections could cover many aspects in relation to our business and operations, including financial reporting, tax reporting, internal control and compliance with applicable laws, rules and regulations. We cannot predict the impact of any findings of these reviews and inspections to be carried out by governmental authorities and regulatory agencies in the future, and we cannot assure you that the outcome of any such reviews and inspections would not have a material adverse effect on our business, financial condition, results of operations and prospects.

- In 2005, China adopted a managed floating exchange rate system to allow the value of the Renminbi to fluctuate within a regulated band based on supply and demand with reference to a basket of currencies. In April 2012, the PRC government took a milestone step in turning the Renminbi into a global currency by doubling the size of its trading band against the U.S. dollar to 1%, pushing through a crucial reform that further liberalizes its financial markets. The PBOC further allows the Renminbi trading band against the U.S. dollar to rise or fall 2% from a mid-point every day, effective on March 17, 2014, compared with its previous 1% limit. In August 2015, the PBOC announced that the daily central parity quotes the market-makers reported to the China Foreign Exchange Trade System operated by the PBOC before the market opens should be based on the closing rate of the inter-bank foreign exchange rate market on the previous day, supply and demand in the market, and price movement of major currencies, effective on August 11, 2015. In recent years, the Renminbi has fluctuated against the U.S. dollar, at times significantly. It is difficult to predict how market forces or PRC or U.S. government policy may impact the exchange rate between the Renminbi and the U.S. dollar in the future. Any appreciation or depreciation of the Renminbi will affect the value of our U.S. dollar-denominated borrowings and overseas investments, the prices of our export sales denominated in foreign currencies and the Renminbi equivalent value of our trade and notes receivable denominated in foreign currencies, which may affect our financial condition and results of operations. Our financial condition and operating performance may also be affected by changes in the value of currencies other than Renminbi in which our earnings and obligations are denominated.

- The Chinese legal system is a civil law system based on written statutes. Unlike common law systems, it is a system in which decided legal cases may be cited for reference but have limited precedential value. Over the past decades, the PRC government has promulgated a comprehensive system of laws, rules and regulations governing economic matters. However, because these laws, rules and regulations are relatively new, and because of the relatively limited volume of published cases and their non-binding nature, uncertainties regarding the interpretation and enforcement of these laws, rules and regulations may adversely affect our operations.

We are subject to, and incur costs to comply with, environmental laws and regulations.

As we produce air emissions, discharge waste water, and handle hazardous substances at our bauxite mines, alumina refineries and primary aluminum smelters, we are subject to, and incur costs to comply with, environmental laws and regulations.

Given the magnitude, complexity and continuous amendments to these laws and regulations, compliance therewith may be onerous or may involve substantial financial and other resources to establish efficient compliance and monitoring systems. The liabilities, costs, obligations and requirements associated with these laws and regulations may therefore be substantial and may delay the commencement of, or cause interruptions to, our operations. Non-compliance with the relevant laws and regulations applicable to our operations may even result in substantial penalties or fines, suspension or revocation of our relevant licenses or permits, termination of government contracts or suspension of our operations. As the environmental protection standards and requirements may be further enhanced, we cannot assure you that non-compliance incidents would not occur in the future. If such incidents were to occur, they could impact our operating results, financial condition and reputation, all of which could adversely affect our profitability and ability to retain existing customers and to attract new customers.

In addition, the environmental laws and regulations in the PRC and other jurisdictions in which we operate continue to evolve. As a result, we may incur significant additional costs if relevant laws and regulations change or enforcement of existing laws and regulations becomes more rigorous. For instance, in April 2020, the Law on Prevention and Control of Environmental Pollution Caused by Solid Waste was amended to impose stricter liabilities on enterprises that produce solid waste. The National Catalogue of Hazardous Wastes was also amended and the new version became effective on January 1, 2021, which detailed and reclassified some hazardous wastes. As we generate solid waste during our production process, we may incur higher costs to comply with the requirements under the amended law. The Administrative Measures for the List of Key Entities Subject to Environmental Supervision became effective on January 1, 2023, which required the provincial and municipal government to formulate a list of key entities in accordance with the standards provided in this administrative regulation and such key entities shall be subject to strict environmental supervision. As we generate solid waste during our production process, some of our subsidiaries may be identified on such list of key entities. Further, our overseas expansion projects are subject to foreign environmental laws and regulations. Failure to comply with environmental laws and regulations may trigger a variety of administrative, civil and criminal enforcement measures, including the assessment of monetary penalties, the imposition of remedial requirements and the issuance of orders enjoining future operations, all of which may materially and adversely affect our business operations.

We are subject to administrative policies and orders relating to China's energy-saving and emission reduction requirements that could adversely affect our production.

We are subject to administrative energy-saving and emission reduction policies and orders carried out by the central and provincial governments. For example, the MIIT issued the Standard Conditions for Aluminum Industry on July 18, 2013 and updated it on February 28, 2020, which set forth various standards for existing enterprises, including but not limited to standards for environmental protection, energy consumption, and utilization of resources. We cannot assure you that the relevant government authorities will not issue more stringent standards or rules, which may require us to incur additional costs or expenses to comply with these standards or rules, and our existing production may be delayed for facility upgrading or suspended before full compliance with these standards or rules. The occurrence of any of the foregoing could have an adverse effect on our business, results of operations and financial condition.

You may experience difficulties in effecting service of legal process and enforcing judgments against us and our management, and the ability of U.S. authorities to bring actions in the PRC may also be limited.

Most of our assets and our subsidiaries are located in the PRC; most of our directors and officers reside within the PRC, and most of the assets of our directors and officers are located within the PRC. As a result, it may not be possible to effect service of process within the United States or elsewhere outside the PRC upon most of our directors or officers, including with respect to matters arising under applicable laws and regulations. Moreover, the PRC does not have treaties providing for the reciprocal recognition and enforcement of judgments of courts with the United States, the United Kingdom or most other Western countries, and Hong Kong has no arrangement for the reciprocal enforcement of judgments with the United States.

As a result, recognition and enforcement in the PRC or Hong Kong of judgments of a court in the United States and any of the other jurisdictions mentioned above in relation to any matter not subject to a binding arbitration provision may be difficult or impossible. Even if you sue successfully in a U.S. court or any of the other jurisdictions mentioned above, you may not be able to collect on such judgment against us or our directors and officers. In addition, the SEC, the U.S. Department of Justice and other U.S. authorities may also have difficulties in bringing and enforcing actions against us or our directors or officers in the PRC. Furthermore, class action lawsuits, which are available in the United States for investors to seek remedies, are generally uncommon in the PRC.

Our business is vulnerable to downturns in the general economy and industries in which we operate or which we serve. A significant reduction in demand could materially and adversely affect our business, financial condition and results of operations.

Demand for our products depends on the general economy and level of activity and growth in the industries where we operate or serve. Adverse development in economic and market conditions, such as a significant economic downturn or a downturn in the commodity sector or the financial markets, could have a material adverse effect on our business, financial condition, results of operations and the price of our ordinary shares or ADSs. Development of the relevant industries is subject to various factors, including but not limited to market fluctuations of prices of commodities, general political or economic conditions, technology development, government regulations and investment plans and changes in domestic and global production capacity, many of which are beyond our control.

We are unable to predict cycles of the global and domestic economies. Concerns over inflation, energy costs, geopolitical issues, trade tensions, the availability and cost of credit, unemployment, consumer confidence, declining asset values, capital market volatility and liquidity issues have created difficult operating conditions for us in the past and may continue to do so in the future. For example, since 2018, there were continuing trade tensions between the U.S. and China, resulting in increased tariffs and escalating tensions between the two countries. On January 15, 2020, the two parties signed the China-U.S. phase-one economic and trade agreement. Since then, the PRC government and the U.S. government have granted tariff exemptions on certain goods. However, it is still unclear when future phase negotiations between the two countries will begin and whether there will be further trade agreements following such negotiations. It is also unclear if future disputes will occur or the two countries will be able to negotiate the issues to restore a mutually beneficial economic and trade cooperation. Future actions or escalations by either the U.S. government or the PRC government could have a material adverse effect on the business environment in general, global, Chinese and/or U.S. economic conditions and the stability of global, Chinese and/or U.S. financial markets, which in turn, may adversely affect our business, financial condition and results of operations. In addition, on November 12, 2020, the President of the United States signed Executive Order 13959 (as subsequently amended on January 13, 2021 and June 3, 2021, the "Executive Order"), which prohibits certain transactions in securities of certain entities listed in the annex to the Executive Order (each, a "Restricted Entity"). Currently, neither we nor Chinalco are on the list of Restricted Entities. However, if the Executive Order is further amended, or the Office of Foreign Assets Control of the U.S. Department of Treasury exercised its power pursuant to the Executive Order, to include us or Chinalco as a Restricted Entity in the future, U.S. persons as defined under the Executive Order may be prohibited from purchasing our securities. As a result, the value and liquidity of our ADSs may be materially and adversely affected, which may lead to significant volatility in our ADS trading price on the OTC Market. Furthermore, the PRC government has, from time to time, adjusted its monetary, fiscal and other policies and measures to manage the rate of growth of the economy or the overheating and overcapacity in certain industries or markets.

As a result of the recovery of demand for aluminum globally and the short supply of aluminum caused by the energy crisis in Europe due to the ongoing Russia-Ukraine conflict, the average spot price of alumina on the Australian FOB increased by 9.7% to US$363 per tonne and the average international cash price for primary aluminum on the LME increased by 9.0% to US$2,703 per tonne in 2022. During the same period, the average spot price of alumina in the domestic market increased to RMB2,945 per tonne, representing an increase of 5.3% compared to 2021. Although the overall trend of the industries we are in was upward in 2022, there is no assurance that there will not be any further and significant fluctuations, which may materially and adversely affect our business, financial condition and results of operations. The Russia-Ukraine military conflict has caused, and continues to intensify, significant geopolitical tensions in Europe and across the world. The resulting economic sanctions imposed by the United States, the European Union, the UK and other countries may continue to significantly impact supply chains, lead to market disruptions including significant volatility in commodities' prices, and bring heightened near-term uncertainty to the global financial system. Escalation of the Russia-Ukraine conflict could lead to other additional impacts which may adversely affect our business, such as disruption of international trade flows, extreme market pricing volatility, with particular impact on the energy sector, industrial supply chains, shipping, and regulatory and contractual uncertainty, and increased geopolitical tensions around the world. These factors could disrupt the global markets in ways that are difficult to predict and estimate in advance as to their potential impact on our business, financial position, or operational results.

As a result of the foregoing, the global and domestic economic conditions or any particular industry in which we operate or which we serve may grow at a lower-than-expected rate or even experience a downturn. Uncertainty about future economic conditions makes it challenging for us to forecast our results of operations, make business decisions and identify risks that may affect our business. If we are not able to timely and appropriately adapt to changes resulting from the difficult macroeconomic environment, our business, financial condition and results of operations may be materially and adversely affected.

Volatility in the prices of alumina, primary aluminum, other non-ferrous metal and other commodities may adversely affect our business, financial condition and results of operations.

The prices of the products we produce and trade, including alumina, primary aluminum, other non-ferrous metal and coal products, have experienced significant fluctuation historically and are expected to continually fluctuate in response to general economic conditions, supply and demand, the level of inventories, interruption caused by unforeseen international or domestic events such as global outbreak of COVID-19, uncertainty of or changes in domestic or foreign laws or policies and many other factors, which are beyond our control.

We price our alumina and primary aluminum products by reference to international and domestic market prices, and domestic supply and demand, each of which may fluctuate beyond our control. We may not be able to effectively respond to a sudden fluctuation in alumina or primary aluminum prices. In 2022, the average external selling prices for our self-produced alumina and primary aluminum, regardless whether the sales were recognized in our trading segment, were RMB3,025 per tonne and RMB19,639 per tonne, respectively, representing an increase by 7.1% and 2.8%, respectively, as compared to the prices in 2021. Nevertheless, the prices of alumina and primary aluminum may decline due to, among other things, decrease in market demand of those products and any slowdown of economic growth in China. Because our prices are affected by a variety of factors, most of which are beyond our control, we may not be able to respond promptly to the fluctuation in alumina or primary aluminum prices in international market or domestic market. There is no assurance that there will not be any further and significant fluctuations in prices of our key products, including alumina and primary aluminum, which may materially and adversely affect our business, financial condition and results of operations. In addition, since our profit margin for trading non-ferrous metal products and coal products is based on price fluctuations in the short term, we need to make the correct prediction of the price fluctuations of these commodities on the markets to maintain our profit margin. If market price fluctuations on the market do not match our prediction, we may incur substantial losses.

In addition, as we generate profit from the differences between the purchase and sales prices of the non-ferrous metal products and the coal products we deal in, significant fluctuations in these prices may cause the value of the outsourced products in transit or in inventory to decline, and if the carrying value of our existing inventories exceeds the market price in the future periods, we may need to make additional provisions for our inventories' value, which may have a material and adverse effect on our profit level and other financial performance. See Note 13 to our audited consolidated financial statements for information about our inventories. As a result, any significant fluctuation in market prices for these commodities could materially and adversely affect our business, financial condition and results of operations.

Our business requires substantial capital expenditures that we may not always be able to obtain at reasonable costs and on acceptable terms.

Our plans to upgrade and expand our production capacity will require substantial capital expenditures. For the years ended December 31, 2020, 2021 and 2022, our total capital expenditures were approximately RMB9.9 billion, RMB6.4 billion and RMB4.8 billion, respectively. We expect our estimated capital expenditures in 2023 to be a total of approximately RMB14.4 billion. See "Item 4. Information on the Company – D. Property, Plants and Equipment – Our Expansion" and "Item 5. Operating and Financial Review and Prospects – B. Liquidity and Capital Resources – Capital Expenditures and Capital Commitments" for details of our expansion and capital expenditures. We may also need additional funding for debt servicing, working capital, other investments, potential acquisitions and joint ventures and other corporate requirements.

We may need to seek external financing, such as bank and other loans as well as bond offerings, to satisfy our capital needs if cash generated from our operations is insufficient to fund our capital expenditures or if our actual capital expenditures and investments exceed our plans. Our ability to obtain external financing at reasonable costs and on acceptable terms is subject to a variety of factors, such as our credit ratings, financial market conditions and our past or projected financial performance. Although we have been profitable in recent years, we cannot guarantee that we will not incur losses in the future, in which case the rating agencies may downgrade our credit ratings. In addition, if financial markets experience significant volatility and disruption, it may result in a decrease in the availability of liquidity and credit for borrowers and increase in interest rate or other financing cost. Failure to obtain sufficient funding at reasonable costs and on acceptable terms for our development plans could delay, reduce the scope of, or eliminate future activities or growth initiatives and adversely affect our business and prospects.

Our operations consume substantial amounts of electricity, and our profitability may decline if electricity costs rise or if our electricity supplies are interrupted.

Our operations consume substantial amounts of electricity. Although we generally expect to meet the electricity consumption requirements for our alumina refineries and primary aluminum smelters from a combination of internal and external sources, our results of operations may be materially and adversely affected by any significant increase in electricity costs or interruptions in electricity supply.

Cost of electricity is the principal production cost in our primary aluminum operations. Our average electricity cost per kWh (including tax) of our primary aluminum smelters increased by 16% from 2021 to 2022, primarily due to the increase of coal price and the cancellation of preferential policies. There is no assurance that the electricity costs will not further increase in the future. See "Item 4. Information on the Company – B. Business Overview – Regulatory Overview – Electricity Supply and Price" for further details. If we are unable to pass on increases in energy costs to our customers, our operating margin, financial condition and results of operations could be materially and adversely affected.

With the implementation of the policy of "carbon dioxide peaking and carbon neutrality," a series of policies have been introduced to control both the total amount and intensity of energy consumption and restrict the energy-intensive and high-emission industries, resulting in drastic market fluctuations and a sharp increase in production costs. A supply shortage of coal and the drought in 2022 resulted in production reduction in certain areas, which led to a shortage of supply of electricity in the second half of 2022. The instability of supply of electricity and water aggravated the uncertainty of new or resumed production capacity in the near future. We cannot assure you that our production capacity will not be further affected by such policies, the occurrence of which could have a material adverse impact on our business, financial condition and results of operations.

In addition, interruptions in the supply of electricity can result in costly production shutdowns, increased costs associated with restarting production and the waste of production in progress. A sudden loss of electricity, if prolonged, can cause damage to or the destruction of production equipment and facilities. In such an event, we may need to expend significant capital and resources to repair or replace the affected production equipment to restore our production capacity. In the past, various regions across China experienced shortages and disruptions in electricity supply, especially during peak demand summer season or under severe weather conditions. We cannot assure you that our operations will not suffer from shortages or disruptions in electricity supply, the occurrence of which could have a material adverse impact on our business, financial condition and results of operations.

Our operations consume substantial amounts of coal, and our operations may be adversely affected if we are not able to procure sufficient coal or if coal prices rise significantly.

We rely heavily on coal as our energy and fuel source in our operations. As we increase our alumina refining capacity, our consumption of coal will increase accordingly. If we are not able to obtain the amount of coal needed for our production due to a shortage of coal, constraints on coal transportation or any other reason, we may be forced to reduce our production output or suspend our alumina refining operations, which could materially and adversely affect our financial condition and results of operations. Although we have acquired equity interest in a number of coal mines, we expect to continue to rely substantially on third-party coal suppliers for the supply of coal. Our average purchase price per unit tonne of thermal coal increased by approximately 13.9% in 2022 from the level in 2021. See "Item 5. Operating and Financial Review and Prospects – A. Operating Results – Overview – Factors Affecting Our Results of Operations – Manufacturing Costs." However, there is no assurance that the coal prices will not increase or fluctuate. If we are unable to pass on increases or otherwise significant fluctuations in coal prices to our customers or offset price increases through productivity improvements, our operating margin, financial condition and results of operations could be adversely affected.

Our business and industry may be affected by the development of alternative energy sources and climate change.

Our operations consume substantial amounts of coal, the combustion of which generates significant greenhouse gas and other pollutants, and negatively contributes to climate change. A number of governments or governmental bodies have introduced or are contemplating legislative and regulatory changes in response to the potential impacts of climate change. These regulatory mechanisms may impact our operations directly or indirectly through our customers or supply chain. For example, the deepening of supply-side structural reform and the policy of "carbon dioxide peaking and carbon neutrality" have urged the industry in which we operate to optimize the energy consumption structure, reduce energy consumption, and develop deep-processing products with high added values. We may have to increase our capital expenditures in order to comply with such revised or new legislation or regulations, which may lead to higher costs of our products. Changes to our profit or loss may occur due to increased or decreased demand for our products and indirectly due to changes in costs of goods sold, which may adversely affect our results of operations and financial condition.

In addition, we have invested in coal mining operations. Although revenues attributable to our energy segment accounted for only approximately 3.1% of our total revenues in 2022 (after elimination of inter-segment sales), we might still be affected by any change on the PRC thermal power industry, which have relied on coal as main source of fuel. The PRC thermal power industry may be affected by the development of alternative energy sources, climate change and global environmental factors. In particular, pursuant to the environmental protection goal set in China's 14th Five-Year Plan, the PRC government plans to continue to encourage the development of new energy sources from 2021 to 2025. As one of the PRC government's measures for encouraging utilizing new energy, on August 15, 2022, the NDRC, the National Bureau of Statistics, and the National Energy Administration issued the Notice on Further Improving the Relevant Work Concerning New Renewable Energy Consumption Not Included in the Total Energy Consumption Control, which provides that renewable energy sources, such as wind power, solar power, hydropower, are not included in the total energy consumption of the enterprises. As such, alternative energy industries may rapidly develop and gradually gain mainstream acceptance in the PRC and the rest of the world. If alternative energy technologies continue to develop and prove suitable for wide commercial application in the PRC and overseas, demand for conventional energy sources, such as coal, could be reduced. Such reduction in demand for coal could have a material adverse effect on the coal mining industry and, consequently, negatively affect our business, results of operations and financial condition.

We may not be able to continue competing successfully in the markets in which we operate.

In 2022, we supplied approximately 70% of our total production of alumina to our own smelters and sold substantially all of the remaining self-produced alumina and all of our self-produced primary aluminum to our domestic customers. Our alumina (excluding chemical alumina products) and primary aluminum production represented approximately 22% and 17%, respectively, of total domestic production in China in 2022. We face competition from both domestic and international alumina and primary aluminum producers. Our principal competitors are major domestic refineries and smelters. These producers compete with our alumina and primary aluminum operations on the basis of product cost, quality and pricing. In addition, we face increasing competition from international alumina and primary aluminum suppliers as a result of the elimination of tariffs on imports of primary aluminum and alumina into China. See “Item 4. Information on the Company – B. Business Overview – Competition” for further details.

Increasing competition in our product markets may reduce our selling prices or sales volumes, which will have a material adverse effect on our financial condition and results of operations. If we are unable to price our products competitively, maintain or increase our current share of China’s alumina and primary aluminum markets or otherwise maintain our competitiveness, our financial condition, results of operations and profitability could be materially and adversely affected.

Our overseas expansion exposes us to political and economic risks, commercial instability and events beyond our control in the countries in which we plan to operate.

We have overseas projects from time to time. For example, in 2020, we completed the construction of the Boffa Project, a project for the construction and development of a bauxite mine located in Boffa, Guinea. Although the Boffa Project has been completed and put into production, due to uncertainties involved in the overseas projects, we cannot assure you that all of our overseas expansion or investments will be successful or that we will not suffer foreign exchange losses in connection with our overseas investment.

In addition, operations in the overseas markets may also expose us to a number of risks including expropriation and nationalization of our assets in foreign countries, civil unrest, acts of terrorism, war, or other armed conflict; shortages of construction equipment and materials; severe weather conditions; social security, public health and safety, labors and construction safety and similar issues; epidemic diseases and infectious diseases; natural disasters; inflation; currency fluctuations, devaluations and conversion restrictions; confiscatory taxation or other adverse tax policies, governmental activities that limit or disrupt markets, restrict payments or limit the movement of funds, governmental activities that may result in the deprivation of contractual rights; lack of a well-developed legal system that makes it difficult to enforce our contractual rights; uncertainties in laws and policies; and governmental activities that may result in the inability to obtain or retain licenses required for operations. For example, in September 2021, President of Guinea was captured by the country’s armed forces in a coup. While our Boffa Project has not been materially impacted as of the date of this annual report, we cannot assure you that it will not be adversely affected given the fluid situation in Guinea.

Our profitability and operations could be adversely affected if we are unable to obtain a steady supply of raw materials at competitive prices.

Historically, the price for bauxite, our most important raw material for alumina production, has been volatile. We obtain bauxite for our operations from our mines and external suppliers. See “Item 4. Information on the Company – B. Business Overview – Raw Materials – Alumina – Supply.” The extents to which we procure bauxite from each of these sources affect the security of our supply or cost of bauxite. The supply of bauxite could be affected by various factors, including geographic conditions of bauxite mines, government policies, market prices and competition, many of which are beyond our control. We rely on overseas suppliers to obtain a portion of bauxite we use for production. Indonesia used to be a major source of our imported bauxite. As a result of the ban imposed by the Indonesia Government on the exportation of unprocessed bauxite and nickel, since January 2014, we have not been able to import bauxite from Indonesia for the use of our alumina refineries in China, and our operation of bauxite mining in Indonesia has been suspended since September 2014. See “Item 4. Information on the Company – B. Business Overview – Our Mines” for more details of our bauxite mines in Indonesia. If we exhaust our stockpiles or our procurement of bauxite from external suppliers is interrupted for any reasons, and cannot find an alternative source of bauxite at competitive prices, our financial condition, results of operations and profitability could be adversely affected.

In addition, our results of operations can be affected by increases in the cost of other raw materials and other key inputs such as energy. If we cannot obtain a steady supply of key raw materials at competitive prices, our financial condition and results of operations could be materially and adversely affected.

Any transportation interruption or any material increase in our transportation costs could have a material adverse effect on our business, financial condition and results of operations.

Our operations require the reliable transportation of raw materials and supplies to our refining and smelting sites and finished products to our customers. Our alumina and primary aluminum products are mainly transported by rail and trucks. There is no assurance that we can always enjoy sufficient transportation capacity or we will not experience transportation interruption in the future. Furthermore, natural disasters, severe weather conditions and outbreak of epidemic diseases and infectious diseases may cause interruption to the transportation system, which could in turn affect the transportation of our products. In addition, any changes in fuel prices or fuel supply may be unpredictable and beyond our control. There is no assurance that shortage of fuel will not occur in the future. Any surge in fuel prices or shortage of fuel supply may lead to increases in our operation and transportation costs. If we are unable to make timely deliveries due to logistical and transportation disruptions, or transfer the increased costs to our customers, our production, reputation and results of operations may be adversely affected.

Estimates of mineral reserves and mineral resources are uncertain and the volume and grade of minerals actually extracted may vary from our estimates.

Our estimates of mineral reserves and mineral resources have been prepared in accordance with the disclosure requirements of Subpart 1300 of U.S. Securities and Exchange Commission Regulation S-K ("Regulation S-K 1300"). Compliance with Regulation S-K 1300 may be subject to varying interpretations in some cases due to their lack of specificity, which could result in continuing uncertainty regarding compliance matters and substantial costs associated with compliance.

There are numerous uncertainties inherent in mineral estimates. Such estimates are, to a large extent, based on assumed prices for the commodities we produce, primarily bauxite and coal, and interpretations of geologic data obtained from drill holes and other exploration techniques, which may not necessarily be indicative of future results. Our mineral estimates are based on the latest available geological and geotechnical studies. We conduct ongoing studies of our mining properties to optimize economic values and to manage risk. Valid estimates made at a given time may significantly change when new information becomes available.

Estimates of mineral reserves, or the cost at which we anticipate the mineral reserves will be recovered, are based on assumptions, such as prices of alumina, aluminum and coal and other economic inputs. Changes to such assumptions may require revisions to reserve estimates which could affect our asset carrying values and may also negatively impact our future financial condition and results. We revise our mine plans and estimates of recoverable proven and probable mineral reserves as required in accordance with the latest available studies. Until mineral reserves are actually mined and processed, the quantity of minerals and grades must be considered as an estimate only.

Additionally, the term "mineral resources" does not indicate recoverable proven and probable mineral reserves as defined by Regulation S-K 1300. Estimates of mineral resources are subject to further exploration and evaluation of development and operating costs, grades, recoveries and other material factors, and, therefore, are subject to considerable uncertainty. Certain mineral resources may not meet the threshold for mineral reserve modifying factors, such as engineering, legal and/or economic feasibility, that would allow for the conversion to mineral reserves. Accordingly, no assurance can be given that the estimated mineral resources not included in mineral reserves will become recoverable proven and probable mineral reserves.

The estimation of mineral resources and reserves is a subjective process that is partially dependent upon the judgment of the qualified person preparing such estimates. The process relies on the quantity and quality of available data and is based on knowledge, mining experience, statistical analysis of drilling results and industry practices. If the market prices for the commodities we produce decline from assumed levels, if production costs increase or recovery rates decrease, or if applicable laws and regulations are adversely changed, we can offer no assurance that the mineral reserves can be mined or processed profitably. If we determine that certain of our estimated recoverable proven and probable mineral reserves have become uneconomic, this may ultimately lead to a reduction in our aggregate reported mineral reserves, which could have a material adverse effect on our business, financial condition and results of operations.

Our previous adjustments of our business segments and historical results may not be indicative of our future prospects.

In 2013, we entered into a new business segment, the energy segment, through acquisition of Ningxia Energy. In the past few years, we have streamlined our existing business to focus on the productions of alumina and primary aluminum. For instance, in December 2018, we acquired 50% equity interests in Shanxi Huaxing through the Shanghai United Assets and Equity Exchange at a price of approximately RMB2,665.2 million from Baotou Transportation Investment Group Co., Ltd. Upon completion of the acquisition, Shanxi Huaxing became a wholly-owned subsidiary of the Company. The acquisition is conducted for purposes of enhancing our profitability and is in line with our strategic layout of alumina and aluminum business, as the increase of our shareholding in Shanxi Huaxing, an alumina plant, is expected to enhance the synergy with our primary aluminum production in Shanxi, where we have newly added production capacity of primary aluminum.

There is no assurance that we will enter into a new business segment or continue to streamline our existing business as we have done so in the past. Moreover, we cannot assure you that the benefit of entering into a new business segment or streamlining our existing business will be fully realized as expected or at all.

Our revenue decreased by 2.64% from RMB298,885.4 million in 2021 to RMB290,987.9 million in 2022, primarily due to the decrease in revenue of trading business. The financial performance was driven by a wide range of factors, many of which are out of our control or may not be sustainable or indicative of future growth or performance, such as the prices of our products and raw materials. As a result, our historical results may not be indicative of our future prospects and results of operations.

Our failure to successfully manage our business expansion, including our expansion into new areas of business, would have a material adverse effect on our results of operations and prospects.

We have made investments in business expansion in line with our development strategy through organic growth, acquisitions and joint ventures. In addition, we may, from time to time and when we deem appropriate, expand into new industries which we believe have synergies with our existing operations.

Our expansion has created, and will continue to place, substantial demand on our resources. Managing our growth and integrating the acquired businesses will require us to, among other things:

- comply with the laws, regulations and policies applicable to the acquired businesses, including obtaining timely approval for the construction or expansion of production and mining facilities as required under the relevant laws of PRC and foreign jurisdictions;
- maintain adequate control on our business expansion to prevent, among other things, project delays or cost overruns;
- accumulate expertise and experience in managing the new businesses;
- gain market acceptance for new products and services and establish relationships with new customers and suppliers;
- achieve sufficient utilization of new production facilities to recover costs;
- manage relationships with employees, customers and business partners during the course of our business expansion and integration of new businesses;
- attract, train and motivate members of our management and qualified workforce to support successful business expansion;
- access debt, equity or other capital resources to fund our business expansion, which may divert financial resources otherwise available for other purposes;
- divert significant management attention and resources from our other businesses; and
- strengthen our operational, financial and management controls, particularly those of our newly acquired subsidiaries, to maintain the reliability of our reporting processes.

Any significant difficulty in meeting the foregoing or similar requirements could delay or otherwise constrain our ability to implement our expansion plans, or result in failure to achieve the expected benefits of the combination or acquisition or write-offs of acquired assets or investments, which in turn would limit our ability to increase operational efficiency, reduce marginal manufacturing costs or otherwise strengthen our market position. Failure to obtain the intended economic benefits from the business expansion could adversely affect our business, financial condition, results of operations and prospects. In addition, we may also experience mixed results from our expansion plans in the short term.

Furthermore, there is no assurance that we will be able to identify attractive acquisition targets, obtain favorable deal terms in any acquisition, secure applicable governmental approvals for any proposed investments, accurately estimate the mineral resources and reserves of these acquisition targets or obtain the necessary funding to complete such acquisitions on commercially acceptable terms or at all. Acquisitions may result in the incurrence and inheritance of debts and other liabilities, assumption of potential legal liabilities in respect of the acquired businesses, and incurrence of impairment charges related to goodwill and other intangible assets, any of which could harm our business, financial condition and results of operations. In particular, if any of the acquired businesses fail to perform as we expect, we may be required to recognize a significant impairment charge, which may materially and adversely affect our business, financial condition and results of operations. As a result, there can be no assurance that we will be able to achieve the strategic purpose of any acquisition, the desired level of operational integration or our investment return target.

Our joint ventures and strategic investments may not be successful.

We may from time to time enter into joint ventures or make strategic investments to grow our business and operations. For example, we have participated in joint ventures and strategic investments in coal mining, in line with our development strategy to diversify and optimize our product offering and partially offset our future energy costs. In addition, we have acted as joint venture partner or strategic investor in certain projects which engage in primary aluminum and aluminum alloy manufacturing to diversify our product offering, strategically position ourselves along the industrial chain and facilitate our enterprise transformation and upgrade. If our joint ventures, strategic investments or other investments experience fluctuation in performance or incur losses, our business, financial condition and results of operations may be adversely affected. For further details of certain of our joint ventures and strategic investments, please see “Item 4. Information on the Company – A. History and Development of the Company” and “Item 4. Information on the Company – D. Property, Plants and Equipment – Our Expansion.”

In addition, our joint ventures and subsidiaries which operate coal mines have been facing increasing uncertainties. The coal price remained at a high level due to the tight supply of coal during 2022. However, if coal price decreases in the future, the business, financial condition and results of operations of these joint ventures which operate coal mines may be adversely affected.

Failure to maintain optimal utilization of our production facilities will adversely affect our gross and operating margins.

During the past few years, we expanded the production capacity by completing our construction, upgrading or remolding of some of our alumina and primary aluminum production facilities. If we are able to maintain satisfactory facility utilization rates and increase our production output, this increase in our production output would enable us to reduce our unit costs through economies of scale, as fixed costs will be spread over a higher volume of output units. Conversely, underutilization of our existing and newly acquired or constructed production facilities may increase our marginal production costs and prevent us from realizing the intended economic benefits of our expansion.

Since 2013, we have implemented flexible production arrangements from time to time for certain alumina and primary aluminum production facilities in response to prevailing market conditions and government policies. For example, as affected by the market environment, Zhongzhou Aluminum and Xinghua Technology started to implement flexible production arrangements for alumina production in the fourth quarter of 2022. We may also capitalize on fluctuating market prices to increase trading of alumina and primary aluminum and to enhance resource planning to achieve cost savings in our production. The increase in our external purchases will reduce our utilization of certain production facilities, but may not result in a proportionate decrease in fixed costs such as leases and depreciation of plant, property and equipment.

If we fail to maintain optimal utilization rates and spread fixed costs over a high volume of output units, our gross and operating margins may be adversely affected.

We may be required to record impairment charges in the future.

If business conditions deteriorate, long-lived assets need to be reviewed for possible impairment. Impairment loss needs to be recognized to the extent that the carrying amount exceeds the recoverable amount. In 2020, 2021 and 2022, we recorded impairment loss of property, plant and equipment of RMB681.3 million, RMB4,064.7 million and RMB3,795.4 million, respectively. In addition, we made net credit impairment of receivables of RMB967.9 million, RMB1,390.8 million and RMB414.1 million in 2020, 2021 and 2022. We cannot guarantee that we will not incur any impairment loss or our impairment loss will not increase in the future due to various reasons including, but not limited to, strategic decisions made in response to changes in economic and competitive conditions, the impact of the economic environment on our customer base and material adverse changes in our relationship with significant customers. If we record significant impairment charges, our results of operations may be materially and adversely affected.

Our mining operations have limited mine lives and eventual closure of these operations will entail costs and risks regarding ongoing monitoring, rehabilitation and compliance with environmental standards.

Our existing mining operations in the PRC and overseas have limited mine lives and will eventually be depleted. We need to perform certain procedures to remedy and rehabilitate the environmental and social impact that our mining operations have had on local communities and the environment. Remediation, rehabilitation, closure and removal of our facilities will incur various costs and are subject to various risks. The key costs and risks for mine closures include, among others, (i) long-term management of permanent engineered structures and acid rock drainage; (ii) closure in accordance with local or international environmental standards; (iii) orderly retrenchment of employees and third-party contractors; and (iv) orderly transfer of the site, its associated permanent structures and community development infrastructure and programs to new owners. There is no assurance that such closure of mines will be successful and without delays or additional costs, in which case we may be subject to increased costs, penalties or other legal or administrative actions, damages to reputation, or even suspension and cancellation of mining permits, the occurrence of which would cause a material adverse effect on our business, financial condition and results of operations.

Failure to discover new reserves or resources, maintain or enhance existing reserves or resources, develop new mining operations or expand our current mining operations could negatively affect our business, financial condition and results of operations.

Mining exploration is unpredictable in nature. The success of any mining exploration program depends on various factors, many of which are beyond our control. Due to the unpredictable and speculative nature of the mining industry, there is no assurance that any exploration program that we are currently undertaking or may undertake in the future will result in the discovery of valuable reserves or resources. There is no assurance that reported resources can be converted into reserves. Furthermore, actual results upon production may differ from those anticipated at the time of discovery. To access additional reserves in explored areas, we will need to successfully complete development projects, including but not limited to extending existing mines and developing new mines. There are a number of uncertainties inherent in the development and construction of any new mine or an extension of an existing mine, including but not limited to (i) the availability and timing of necessary governmental approvals; (ii) the timing and cost necessary to construct mining and processing facilities; (iii) the availability and cost of labor, utilities, auxiliary materials and other supplies and the accessibility of transportation and other infrastructure; and (iv) the availability of funds to finance construction and production activities. There is no assurance that any future exploration activities or development projects will extend the life of our existing mining operations or result in any new economic mining operations and such failure may have a material adverse effect on our business, financial condition and results of operations.

Our indebtedness could adversely affect our business, financial condition and results of operations.

We have relied, and expect to continue to rely, on both short-term and long-term borrowings to fund a significant portion of our capital requirements. As of December 31, 2022, we had approximately RMB27,859.4 million in outstanding short-term bonds and short-term bank borrowings (including the current portion of long-term bank and other borrowings) and RMB58,596.8 million in outstanding long- and medium-term bonds and long-term bank and other borrowings (excluding the current portion of these borrowings). On March 21, 2023, subject to approval at our 2022 annual general meeting that is expected to be held in 2023, our Board approved to authorize the issuance of debt financing instruments and bonds in the PRC (including various issued domestic bonds) and overseas bonds with an aggregate outstanding balance of all bonds not exceeding RMB30 billion, the term of which authorizations will commence on the date of approval at our 2022 annual general meeting and close upon the conclusion of our 2023 annual general meeting. Although we have been managing our debt and assets with the goal of maintaining our debt at an appropriate level, there is no assurance that such efforts would be successful or the level of our debt will be further decreased. Please see Note 21 to our audited consolidated financial statements for more detailed information about our borrowings. This level of debt could have significant consequences on our operations, including:

- making it more difficult for us to fulfill payment and other obligations under our outstanding debt, including repayment of our debt and credit facilities should we be unable to obtain extensions for any such debt or credit facilities before they mature. Please see "Item 5 – Operating and Financial Review and Prospects – B. Liquidity and Capital Resources" for maturities of our outstanding long-term borrowings;

- reducing the availability of cash flows to fund working capital, capital expenditures, acquisitions and other general corporate purposes;

- exposing us to interest rates fluctuations on our borrowings and the risk of being unable to rollover, extend or refinance our borrowings as necessary;

- potentially increasing the cost of additional financing and making it more difficult for us to conduct equity financings in the capital markets or obtain government approvals to seek additional financing; and

- putting pressure on our ADS price due to concerns of our ability to repay our debt.

Our ability to meet our payment and other obligations under our outstanding debt depends on our ability to generate cash flows in the future or to refinance such debt. In 2022, we carried out capital preservation and appreciation businesses by using daily reserve fund for investments such as structural deposits. However, we cannot assure you that such capital preservation and appreciation businesses will be successful or profitable, or we will generate sufficient cash flows from operations, to satisfy our obligations under our outstanding debt and to fund other liquidity needs. If we are not able to generate sufficient cash flows to meet such obligations, we may need to refinance or restructure our debt, reduce or delay capital investments, or seek additional equity or debt financing. The increase in equity securities could result in dilution to our ADS holders. A shortage of financing could in turn impose limitations on our ability to plan for, or react effectively to, changing market conditions or to expand through organic and acquisitive growth, thereby reducing our competitiveness. We cannot assure you that future financing will be available in amounts or on terms acceptable to us, if at all.

The instruments governing our senior debt contain covenants that restrict our ability to take certain corporate actions and pay dividends.

We issue perpetual securities from time to time to meet our capital expenditure and working capital requirements. Please refer to "Item 4. Information on the Company – A. History and Development of the Company – Senior Perpetual Capital Securities Offering" for further details.

In August 2022 and September 2022, we issued RMB1,000 million perpetual medium-term notes with an initial distribution rate at 2.87% (the "2022 Third Perpetual Medium-term Notes") and RMB1,000 million perpetual medium-term notes with an initial distribution rate at 2.68% (the "2022 Fourth Perpetual Medium-term Notes"), respectively, in China. Pursuant to the terms of the 2022 Third Perpetual Medium-term Notes and the 2022 Fourth Perpetual Medium-term Notes, while any coupon distribution payments are unpaid or deferred, our Company cannot declare or pay dividends to shareholders or decrease the share capital, or make material fixed asset investments. Therefore, our ability to pay dividends in respect of our ordinary shares and the ADSs may be limited under certain circumstances.

In addition, if these perpetual securities are categorized as debt due to changes of accounting standard or other reasons, or if we choose to redeem these perpetual securities, our total equity may be reduced, which may be adverse to our financial condition or the price of our ordinary shares or ADSs.

The interests of our controlling shareholder who exerts significant influence over us may conflict with ours.

As of December 31, 2022, our largest shareholder, Chinalco, directly owned 29.43% of our issued share capital and indirectly owned an additional 2.47% of our issued share capital through its controlled entities. The interests of Chinalco may conflict or even compete with our interests and those of our public shareholders. Chinalco may take actions that are in the interest of its subsidiaries, associates and other related entities to our detriment. For example, Chinalco may seek to influence our decision as to the amount of dividends we declare and distribute. Any increase in our dividend payout would reduce funds otherwise available for reinvestment in our businesses and thus may adversely affect our future prospects and financial condition.

In addition, we enter into transactions with related parties, including Chinalco and its subsidiaries and associates, which provide a range of services to us, including engineering and construction services, social services, land and property leasing as well as the supply of raw and supplemental materials. See "Item 7. Major Shareholders and Related Party Transactions – B. Related Party Transactions" for detailed information. It would be difficult to find an alternative source for some services that we receive from Chinalco. Our cost of operations may increase if Chinalco, its subsidiaries and associates are unable to continue providing such services to us.

In January 2019, Yunnan SASAC transferred its 51% equity interest in Yunnan Metallurgical Group Co., Ltd. to China Copper, a wholly-owned subsidiary of Chinalco, with no consideration. As Yunnan Aluminum, an affiliated company of Yunnan Metallurgical Group Co., Ltd., competes with us in the business segments of alumina and primary aluminum, Chinalco, as the indirect controlling shareholder of Yunnan Aluminum and our direct controlling shareholder, issued a letter of undertakings on non-competition to us, according to which Chinalco undertook to start in 2019 planning the integration of the businesses in which Yunnan Aluminum and we compete with each other, and address such business competition within five years. In July 2022, we entered into a shares transfer agreement and agreed to acquire shares representing approximately 19% of the total issued share capital of Yunnan Aluminum. The shares transfer was completed in November 2022 and we currently hold 29.10% of the total issued share capital of Yunnan Aluminum. The financial results of Yunnan Aluminum have been consolidated into the financial statements of our Company. The aforesaid transaction has resolved the competition between Chinalco and our Group. However, the competition between our Group and Yunnan Aluminum has not been fully resolved. In light of this, our Company issued a letter of undertakings on non-competition to Yunnan Aluminum, according to which our Company undertook to appropriately resolve the issue of horizontal competition with Yunnan Aluminum within five years from 2019. For further details, please see "Item 4. Information on the Company – A. History and Development of the Company." While we intend to closely monitor Chinalco's planning and implementation of such business integration and make timely public disclosure about significant progress made, due to the uncertainties involved in such business integration, however, we cannot assure you that business competition between Yunnan Aluminum and us would be addressed without undue delays or at all, or the plan of such business integration or the implementation thereof would be viewed by you or other investors as most favorable to us or our shareholders.

Changes in facts and circumstances may adversely affect our ability to exercise control over Yunnan Aluminum.

Although we own shares representing 29.10% of total issued share capital at Yunnan Aluminum, we concluded that we exercise "de facto control" based on the following facts: (i) the percentage and concentration of our voting rights, (ii) the record of attendance to Shareholders' Meetings and the record of votes cast by the other shareholders; and (iii) the effective control exercised by us to direct Yunnan Aluminum's relevant activities.

As some of these facts are out of our control, a change in the fact pattern that we assessed might derive in a loss of control over Yunnan Aluminum, leading to deconsolidation from an accounting perspective.

Any catastrophe, including outbreaks of health pandemics, accidents, natural disasters or other extraordinary events, could disrupt our business operations and have a materially adverse impact on our business and results of operations.

In recent years, there have been outbreaks of health epidemics in China and globally, including the outbreak of COVID-19 pandemic. The COVID-19 pandemic, as well as efforts to contain it, has caused significant economic and financial disruptions around the world, including disruption on manufacturing operations, logistics and global supply chains and significant volatility and disruption of financial markets. Our business could continue to be adversely affected by the effects of health pandemics or epidemics, including the effects of the COVID-19 pandemic, and other recent outbreaks of diseases, such influenza A, avian influenza, and severe acute respiratory syndrome, which may, among other things, exacerbate turbulence in commodity market, discourage or disrupt investment and production, increase total inventories of primary aluminum or other products in the industry, bring more uncertainty to the consumption of aluminum-made products and the prices of primary aluminum and alumina, and cause other adverse impacts on the industry we are in.

We may also experience accidents and natural disasters in the course of our operations, which may cause significant property damage and personal injuries. Significant accidents and natural disasters may cause interruptions to our operations or result in property or environmental damage, increase in operating expenses or loss of revenues. The occurrence of accidents, natural disasters and the resulting consequences may not be covered adequately, or at all, by the insurance policies we carry. Losses or payments incurred by us as a result of major accidents or natural disasters may have a material adverse effect on our results of operations.

We have not obtained valid titles or land use rights to certain properties or land parcels that we occupy.

We have not obtained valid ownership certificates to certain properties that we occupy. These properties are used primarily for production plants and daily operations management. As of December 31, 2022, the book value of our properties with defective titles is RMB4,995.4 million, which represents approximately 2.4% of our total asset value. In addition, we had not obtained land use rights to certain land parcels, which we use primarily for our production plants. As of December 31, 2022, the book value of these land parcels is RMB86.7 million, representing approximately 0.04% of our total asset value. We have applied to the appropriate authorities to obtain the relevant ownership certificates. We cannot give any assurance that ownership dispute will not occur or that third parties will not assert any claims against us for compensation in respect of any use of these properties or land parcels.

Our business involves inherent risks and occupational hazards, which could damage our reputation, subject us to liability claims and cause substantial costs to us.

Our business involves inherent risks and occupational hazards. Under our mining operations, we engage or may engage in certain inherently risky and hazardous activities, including, among others, operations at height or on dangerous terrains, underground excavation and construction, use of heavy machinery, mining and handling of flammable and explosive materials, and we are therefore subject to risks associated with these activities, including, among others, geological catastrophes, toxic gas and liquid leakages, equipment failures, industrial accidents, fire, explosions and underground water leakages. Although we conduct geological assessments on mining conditions and adapt our mining plans to the mining conditions at each mine, we cannot assure you that adverse mining conditions will not endanger our workforce, increase our production costs, reduce our bauxite or coal output or temporarily suspend our operations. The occurrence of any of the foregoing events or conditions could have a material adverse impact on our business and results of operations. Additionally, we are exposed to operational risks associated with industrial or engineering activities, such as maintenance problems or equipment failures. These risks and hazards may result in personal injury and fatal casualties, damage to or destruction of properties or production facilities, and pollution and other environmental damage. Any of these consequences, to the extent they are significant, could result in business interruption, possible legal liability and damage to our business reputation and corporate image.

Our mines and operating facilities may be damaged by water, gas, fire or cave-ins due to unstable geological structures. Any significant accident, business disruption or safety incident could result in substantial uninsured costs and the diversion of our resources, which could materially and adversely affect our business operations and financial condition.

We may be subject to product liability claims.

Some of the products we sell or manufacture may expose us to product liability claims relating to property damage or personal injury. The successful assertion of product liability claims against us could result in significant damage payments and harm to our reputation, which in turn could have a material adverse effect on our business, financial condition and results of operations.

We are subject to litigation risks.

In the ordinary course of business, claims involving project owners, customers, suppliers and subcontractors may be brought against us and by us in connection with our operations. If we were found to be liable on any of the claims, we would have to incur a charge against earnings to the extent a reserve had not been established for the matter in our accounts, or to the extent the claims were not sufficiently covered by our insurance coverage. Both claims brought against us and by us, if not resolved through negotiations, are often subject to lengthy and expensive litigation or arbitration proceedings, and claims against us may also result in freeze of or restrictions on our bank deposits or other assets during such lengthy legal proceedings. Charges associated with claims brought against us and write-downs associated with claims brought by us could have a material adverse impact on our business, financial condition, results of operations and cash flow. Moreover, legal proceedings resulting in judgments or findings against us may harm our reputation and damage our prospects for future contract or business awards.

We face counterparty risks.

While we generally sell goods and provide services to reputable customers and evaluate the customers' credit in accordance with our internal risk management criteria, such as their credit history and likelihood of default, we have limited access to information about our customers, and we may encounter difficulties in the collection of receivables in certain countries that we have less experience in our dealings. Therefore, we cannot guarantee that all of our customers will fully perform their obligations under their respective contracts with us, and the deterioration of any customers' credit or payment conditions may result in those customers defaulting on their contractual obligations, which could materially and adversely affect our business, financial condition and results of operations. In addition, disputes with governmental entities and other public organizations could potentially lead to contract termination if these remain unresolved or it may take a considerably longer period of time to resolve the disputes with counterparties in the private sector, and payments from these entities and organizations may be delayed as a result.

We face risks related to our derivative instruments.

From time to time, we may utilize derivative instruments to minimize our exposure to fluctuations in the price of primary aluminum and other products. We primarily use futures contracts and option contracts traded on the SHFE and LME to hedge against fluctuations in the price of primary aluminum. All of our future contracts and option contracts are held for hedging purpose. As of December 31, 2022, the fair value of the outstanding futures and option contracts recognized in financial assets and financial liabilities amounted to nil and RMB9 million, respectively. In the process of hedging with futures and options, we cannot assure you that we will not incur any loss, which may have an adverse effect on our financial condition and results of operations.

We may face challenges to our intellectual property rights which could adversely affect our reputation, business and financial position.

We own important intellectual property, including patents and trademarks. Our intellectual property plays an important role in maintaining our competitive position in a number of the markets that we serve. Our competitors may develop technologies that are similar or superior to our proprietary technologies or design around the patents we own or license. Developments or assertions by or against us relating to intellectual property rights, and any inability to protect or enforce these rights, could adversely affect our business and competitive position.

We may be exposed to claims in relation to the unsatisfactory performance of third-party service providers, and disputes with business partners may also adversely affect our business.

We rely on third-party service providers for certain services, including but not limited to mining infrastructure construction, logistics services or warehouse management. Therefore, we are exposed to the risk that our third-party service providers may fail to perform their obligations, which may adversely affect our business operations. In addition, from time to time, we cooperate with business partners to develop our business, including acquiring strategic mining resources or businesses that complement our own business line. Furthermore, we operate certain projects through joint venture arrangements and may enter into further joint ventures in the future along with the expansion of our operations. We may have disputes with these business partners or joint venture partners over various aspects, such as performance of each party's obligations, scope of each party's responsibilities, product quality and logistics services. If such disputes cannot be settled in a timely manner, our financial condition and business may be adversely affected.

Failure to hire and retain management executives and other qualified personnel could adversely affect our business and prospects.

The growth of our business operations depends on the continued services of our senior management team. The industry experience, expertise and contributions of our executives and other members of our senior management are essential to our continued success. We will require an increasing number of experienced and competent executives in the future to implement our growth plans. If we were to lose the services of any of our key management members and were unable to recruit and retain personnel with equivalent qualifications at any time, the management and growth of our business could be adversely affected.

Competition for qualified personnel in general is intense in the PRC and other markets where we operate. We cannot guarantee that we will be able to maintain an adequately skilled labor force necessary for us to execute our projects or to perform other corporate activities, nor can we guarantee that staff costs will not increase as a result of a shortage in the supply of skilled personnel. If we fail to attract and retain personnel with suitable managerial, technical or marketing expertise or maintain an adequate labor force on a continuous basis, our business operations could be adversely affected and our future growth and expansions may be inhibited.

We may not be able to detect and prevent fraud or other misconduct committed by our employees, representatives, agents, customers, affiliates or other third parties.

We may be exposed to fraud or other misconduct committed by our employees, representatives, agents, customers, affiliates or other third parties that could subject us to litigation, financial losses and sanctions imposed by governmental authorities, as well as adversely affect our reputation, business, financial condition, results of operations and ADS trading price on the OTC Market. Such misconduct may include, among others:

- hiding unauthorized or unsuccessful activities, resulting in unknown and unmanaged risks or losses;
- intentionally concealing material facts, or failing to adequately perform necessary due diligence or risk analysis procedures designed to identify potential risks;
- improperly using or disclosing confidential information;
- engaging in improper activities or activities that might be subject to penalties, fines or sanctions;
- misappropriation of funds;
- conducting transactions that exceed authorized limits;
- engaging in misrepresentation or fraudulent, deceptive or otherwise improper or illegal activities;
- engaging in unauthorized or excessive transactions to the detriment of our customers; or
- otherwise not complying with applicable laws or our internal policies and procedures.

Our internal control procedures are designed to monitor our operations and ensure overall compliance. However, such internal control procedures may be unable to identify, detect or prevent all incidents of non-compliance or suspicious transactions in a timely manner, if at all. In addition, we do not have control over the activities conducted on their own by those of our customers, affiliates or other third parties.

There is no assurance that fraud or other misconduct by our employees, representatives, agents, customers, affiliates or other third parties will not occur in the future. If such fraud or other misconduct does occur and to the extent that our employees, representatives, agents, customers, affiliates or other third parties are penalized for any of their non-compliance activities or are otherwise subject to any sanctions laws of foreign jurisdictions, it may cause negative publicity of us as a result, and could have a material adverse effect on our business, financial condition, results of operations and ADS trading price on the OTC Market.

Cyber attacks and security breaches may threaten the integrity of our intellectual property and other sensitive information and disrupt our business operations, which could adversely affect our reputation, business and financial position.

We face global cybersecurity threats, which may range from uncoordinated individual attempts to sophisticated and targeted measures directed at us. Cyber attacks and security breaches may include, but are not limited to, attempts to access information, computer viruses, denial of service and other electronic security breaches. Cyber attacks and security breaches may cause equipment failures, loss of information and limited access to systems. For manufacturing companies, cyber attacks and security breaches may result in the theft of sensitive data, including valuable technical and marketing information, disruptions to operations and breakdown of industrial control system. The economic costs to us to eliminate or alleviate cyber attacks and security breaches could be expensive and may be difficult to estimate or calculate because the loss may differ based on the identity and motive of the programmer or hacker, which are often difficult to identify. Further, the perpetrators of cyber attacks and security breaches are not restricted to specific groups or persons. These attacks may be committed by company employees or external actors operating in any geography, including jurisdictions where law enforcement measures to address such attacks are unavailable or ineffective, and may even be launched by or at the behest of nation states. In addition, new and amended PRC regulatory requirements regarding network security and information protection have been adopted in recent years to further strengthen the regulation in those areas. In 2021, both Data Security Law and Personal Information Protection Law were promulgated and became effective. On September 1, 2022, the Measures for Data Export Security Assessment becomes effective. We may be required to devote significant resources to establishing and maintaining our compliance with such new or amended legislation or regulations.

Although we have not experienced any material cybersecurity incidents in the past, we cannot assure you that we will not experience them in the future. Due to the evolving nature of cybersecurity threats, the scope and impact of any future incident cannot be predicted. While we devote significant resources to security measures to safeguard our systems and mitigate potential risks, such as deploying network protection devices and performing regular security assessment, there is no assurance that such actions will be sufficient to prevent cyber attacks or security breaches that manipulate or improperly use our systems or networks, compromise confidential or otherwise protected information, destroy or corrupt data, or otherwise disrupt our operations. The occurrence of such events could negatively impact our reputation and our competitive position and could result in litigation with third parties, regulatory action, loss of business, potential liability and increased remediation costs, any of which could have an adverse effect on our financial condition and results of operations.

We are subject to risks normally associated with cross-border transactions, and our export products may become subject to anti-dumping or countervailing duty proceedings.

During the past few years, we generated marginal revenue from exports of certain chemical alumina products and aluminum fabrication products and also from time to time from exports of certain non-ferrous metals and minerals products to foreign jurisdictions. In 2022, we only engaged in the export of certain refined alumina to foreign countries including, among others, South Korea, Japan and countries in Southeast Asia and revenue generated from such export accounted for approximately 0.3% of our total revenues in 2022. Such foreign jurisdictions and other countries may take restrictive measures, including, among others, imposition of tariffs, anti-dumping duties and other non-tariff barriers, to protect their own markets. The sales of our product in overseas markets may be adversely affected by increases in or new impositions of anti-dumping duties, countervailing duties, quotas or tariffs imposed on our exports. Further increases in or new imposition of anti-dumping duties, countervailing duties, quotas or tariffs on our sales in these markets could adversely affect the exports to these regions in the future. For example, since 2018, the U.S. government has imposed tariffs and other trade barriers on products imported from China, which elicited retaliatory tariff increases by the PRC government on the U.S. products. Since October 1, 2018, the U.S. government had imposed a 10% tariff on various aluminum products imported from China, including chemical alumina products. Starting from May 2019, this tariff rate was increased to 25%. In 2022, we exported approximately 20,000 tonnes of aluminum hydroxide filler to the United States, the revenue generated from which represented approximately 0.02% of our total revenues in 2022. Other than exports of aluminum hydroxide filler, we did not have any other exports to the United States in 2022. There is no assurance that such export volume of chemical alumina products will not further decrease in the future. In addition, such trade frictions and tariffs involved may decrease China's aluminum export to the United States and other countries and reduce global aluminum consumption, which could in turn have a material adverse effect on the demand of our products as well as our business, financial condition and results of operations. On January 15, 2020, the PRC government and the U.S. government entered into the U.S.-China Phase One trade deal agreement. Since then, the PRC government and the U.S. government have granted tariff exemptions on certain goods. However, it is not yet clear what further actions the U.S. government and the PRC government may take. There is no assurance that a broader trade agreement would be successfully negotiated between the U.S. and China, or no additional tariffs or other trade barriers would be imposed. If there is any escalation in trade frictions, we cannot assure you whether such development would not have a material adverse effect on the business environment in general, global economic conditions and the stability of global financial markets. Any of these factors affected by the developments in trade barriers could in turn have a material adverse effect on our business, financial condition and results of operations.

By virtue of our transactions with parties outside the PRC, we will be subject to the risks normally associated with cross-border business transactions and activities. We will also be exposed to the risk of changes in social, legal, political and economic conditions in the foreign jurisdictions. In particular, unexpected changes in regulatory requirements, tariffs and other trade barriers and price or exchange controls could limit our operations and make the repatriation of profits difficult.

Item 4. Information on the Company

A. History and Development of the Company

We were incorporated as a joint stock limited company under the Company Law of the PRC on September 10, 2001 under the corporate name Aluminum Corporation of China Limited. Our principal executive and registered office is located in the People's Republic of China at No. 62 North Xizhimen Street, Haidian District, Beijing, China 100082, and our telephone number is (86) 10 8229 8322. Our website address is www.chalco.com.cn. The information on our website does not constitute a part of this annual report. Our U.S. public filings are available at the website maintained by the SEC at www.sec.gov, which contains reports, proxies and information statements, and other information regarding issuers that file electronically with the SEC.

Pursuant to a reorganization agreement entered into among Chinalco, Guangxi Investment and Guizhou Development in 2001, substantially all of Chinalco's alumina and primary aluminum production operations, as well as a research institute and other related assets and liabilities, were transferred to us upon our formation. We acquired our bauxite mining operations and associated mining rights from Chinalco in a separate mining rights agreement.

Our A Shares have been listed on the Shanghai Stock Exchange since April 2007. Our H Shares have been listed on the Hong Kong Stock Exchange since December 2001. Our ADSs were listed on the New York Stock Exchange under the symbol "ACH" with each ADS representing 25 H Shares from December 2001 until being delisted from the NYSE on September 1, 2022. Our ADSs are now traded on the OTC Market with ticker symbol changed from "ACH" to "ACHHY." In light of the delisting, we subsequently delivered a termination letter to the depositary for our ADSs, for the termination of our ADS program on March 30, 2023. Our ADS program is expected to be terminated on June 30, 2023.

We are a vertically integrated aluminum producer with operations in bauxite and coal mining, alumina refining and primary aluminum smelting. We also produce ancillary products and services derived from or related to our aluminum operations. In addition, we are engaged in trading and logistics of alumina, primary aluminum, other non-ferrous metal products, coal products and raw and ancillary materials in bulk domestically and internationally. Since 2013, we have expanded our operations into power generation. See "– B. Business Overview" for more details.

We have substantially increased the size and scope of our operations through organic growth as well as selective acquisitions and joint ventures. Our key operating assets currently include six subsidiaries mainly engaged in bauxite mining; three integrated alumina and primary aluminum production plants; nine stand-alone alumina refineries; seven stand-alone primary aluminum smelters; one stand-alone secondary aluminum producer; four stand-alone carbon production plants; one integrated power generation company with coal mining operations and one institute providing research and development services. All of our principal alumina, primary aluminum and carbon production facilities are operated in accordance with ISO14001 standards.

For the details of our principal capital expenditures for the previous three years ended December 31, 2022 and those planned for 2023, see "Item 5. Operating and Financial Review and Prospects – B. Liquidity and Capital Resources – Capital Expenditures and Capital Commitments." We currently do not have any significant divestiture in progress.

Private Placement of A Shares

On March 8, 2012, our Board resolved to issue up to 1.25 billion A Shares in the PRC. The A Share issue plans previously proposed by our Board on June 30, 2009 and January 30, 2011 and approved by our shareholders at the extraordinary general meeting, A Share class meeting and H Share class meeting held on August 24, 2009 and on April 14, 2011, respectively, ceased. Pursuant to the new issue plan approved by our Board on March 8, 2012, we planned to issue up to 1.25 billion A Shares, with a nominal value of RMB1.00 each, by way of private placement for expected proceeds not exceeding RMB8 billion. We intended to issue the A Shares to no more than ten specific target subscribers within six months of obtaining the approval of the CSRC. The issue price of A Shares to be offered shall be not less than 90% of the average trading price of our A Shares in 20 trading days immediately preceding the pricing determination date. We intended to apply proceeds from this private placement to finance Chalco Xing County Alumina Project, Zhongzhou branch Ore-dressing Bayer Process expansion construction project and to supplement working capital. The issue plan was approved by the SASAC on April 5, 2012 and by our shareholders at the extraordinary general meeting, A Share class meeting and H Share class meeting held on May 4, 2012. On August 24, 2012, our Board resolved to adjust the issue plan by proposing, among others, to increase the number of A Shares to be issued to up to 1.45 billion A Shares. The adjusted issue plan was approved by the SASAC and our shareholders at an extraordinary general meeting, A Share class meeting and the H Share class meeting on October 12, 2012 and by the CSRC on December 7, 2012. On March 14, 2013, we obtained the approval from the CSRC on our proposed private placement of A Shares under such adjusted issue plan, with effective period of six months after the approval date. However, the CSRC temporarily retrieved its approval in July 2013 due to its ongoing investigation of the sponsor of our proposed private placement of A Shares. The period of authorization to the Board relating to the adjusted issue plan was extended by our shareholders at the 2013 annual general meeting, A Share class meeting held on June 27, 2014 and H Share class meeting held on June 27, 2014, with an effective period of 12 months after the approval date. On January 4, 2015, we submitted the "Report regarding the resumption of the approval of non-public offering of shares of Aluminum Corporation of China Limited" to the CSRC. On April 24, 2015, we received the Approval in Relation to the Non-public Issuance of Shares by Aluminum Corporation of China Limited issued by the CSRC, pursuant to which we were approved to issue no more than 1,450,000,000 new shares. We completed the non-public issuance of A Shares on June 15, 2015 and issued an additional 1,379,310,344 A Shares pursuant to the specific mandate as approved at the annual general meeting of the Company on June 27, 2014. Upon completion, the total number of A Shares of the Company was increased from 13,524,487,892 to 14,903,798,236. Please refer to "– Subscription of Equity Interest of Certain Subsidiaries and Subsequent Issuance of Additional A Shares" and "Item 6. Directors, Senior Management and Employees - E. Share Ownership" for further changes of our issuance of A Shares.

Disposal of Aluminum Fabrication Business

We disposed of substantially all of our aluminum fabrication operations to Chinalco pursuant to the approval of shareholders at the 2012 annual general meeting on June 27, 2013.

On May 13, 2013, we submitted the tender notice to CBEX to dispose of the equity interest we held in eight aluminum fabrication enterprises, including Henan Aluminum, Chalco Southwest Aluminum, Chalco Southwest Aluminum Cold Rolling, Huaxi Aluminum, Qingdao Light Metal, Chalco Ruimin, Chalco Sapa Aluminum Products (Chongqing) Co., Ltd. and Guizhou Chalco Aluminum Co., Ltd. (collectively, "Aluminum Fabrication Interests") through open tender. Chinalco participated in and won the bid for the Aluminum Fabrication Interests on June 7, 2013. We entered into an agreement (the "Aluminum Fabrication Interests Transfer Agreement") with Chinalco on June 9, 2013 for the disposal of Aluminum Fabrication Interests for a consideration of RMB3,242.2 million. Such consideration was the initial bidding price, which was determined with reference to the appraised value of the Aluminum Fabrication Interests. Pursuant to the Aluminum Fabrication Interests Transfer Agreement, Chinalco agreed to pay the consideration in cash in two installments, namely, 30% of the consideration to be paid within five business days after the effective date of the agreement and 70% of the consideration to be paid by June 30, 2014. Chinalco must pay interest for the second installment for the period starting from the date immediately after the effective date until the payment date at the one-year lending rate set by the PBOC. The disposal was approved at the 2012 annual general meeting held on June 27, 2013 and we completed the disposal on June 27, 2013. Chinalco paid the consideration in full by June 2014.

As a condition of the disposal of the Aluminum Fabrication Interests, on June 9, 2013, we entered into an agreement with Chinalco to transfer the outstanding entrusted loans we provided to Henan Aluminum and Qingdao Light Metal as of December 31, 2012 to Chinalco for a consideration of RMB1,756.0 million. Such consideration was determined based on negotiations between the parties, with reference to the appraised total value of the loans. Pursuant to the agreement, Chinalco agreed to pay the consideration in cash in five equal installments of RMB351.2 million, with the last installment, together with the relevant interests at the one-year lending rate set by the PBOC, to be paid by June 30, 2017. The transfer was approved at the 2012 annual general meeting held on June 27, 2013 and we completed the transfer on June 27, 2013. The payment was fully settled by Chinalco in accordance with the agreement.

In addition, we entered into an agreement with Northwest Aluminum Fabrication Plant, a subsidiary of Chinalco, on June 6, 2013 to dispose of all the assets of Northwest Aluminum for RMB1,659.6 million. Such consideration was determined based on negotiations between the parties, with reference to the appraised net asset value of Northwest Aluminum. Pursuant to the agreement, Northwest Aluminum Fabrication Plant agreed to pay the consideration in cash in five equal installments of RMB331.9 million, with the last installment, together with the relevant interests at the one-year lending rate set by the PBOC, to be paid by June 30, 2017. The disposal was approved at the 2012 annual general meeting held on June 27, 2013 and we completed the disposal on June 27, 2013. The payment was fully settled by Northwest Aluminum Fabrication Plant in accordance with the agreement.

Disposal of Assets of Alumina Production Line of Guizhou Branch

On June 6, 2013, we entered into an agreement with Guizhou Aluminum Plant, a subsidiary of Chinalco, to dispose of the assets of the alumina production line of our Guizhou branch for a consideration of RMB4,429.0 million. Such consideration was determined based on negotiations between the parties, with reference to the appraised net asset value of such alumina assets of our Guizhou branch. Pursuant to the agreement, Guizhou Aluminum Plant agreed to pay the consideration in cash in five equal installments of RMB885.8 million, with the last installment, together with the relevant interests at the one-year lending rate set by the PBOC, to be paid by June 30, 2017. The disposal was approved at the 2012 annual general meeting held on June 27, 2013 and we completed the disposal on June 27, 2013. The payment was fully settled by Guizhou Aluminum Plant in accordance with the agreement.

We decided to dispose of the assets of the alumina production line of Guizhou branch because the district in which they were located had been changed from an industrial district to a commercial district based on the local urban plan, which would significantly increase Guizhou branch's environmental compliance costs. We built a new alumina refinery, Guizhou Huajin, in an area relatively close to major bauxite and coal mines in Guizhou Province, which commenced production with an annual capacity of 1.6 million tonnes of alumina in 2015.

Senior Perpetual Capital Securities Offering

In October 2013, we completed the issuance of US$350 million in aggregate principal amount of 6.625% senior perpetual capital securities (the "2013 Senior Perpetual Securities") through Chalco Hong Kong Investment Company Limited (the "Bond Issuer"), our wholly-owned subsidiary, which was exempted from, and not subject to, registration under the Securities Act. The 2013 Senior Perpetual Securities are guaranteed by Chalco Hong Kong and its certain subsidiaries. The 2013 Senior Perpetual Securities also have the benefit of a keepwell deed dated October 29, 2013 entered into by the Issuer, the Company, Chalco Hong Kong and the trustee and a deed of equity interest purchase undertaking dated on October 29, 2013 entered into by the Company and the trustee, both deeds being executed in favor of the trustee. The 2013 Senior Perpetual Securities were listed on the Hong Kong Stock Exchange on October 30, 2013. The net proceeds from the issue of the 2013 Senior Perpetual Securities after deduction of issuance costs are RMB2,122.6 million and have been on-lent to the Company or any of its subsidiaries for general corporate use. Coupon payments of 6.625% per annum on the 2013 Senior Perpetual Securities are paid semi-annually in arrears from October 29, 2013, and may be deferred at our discretion unless, during the six-month period ending on the day before the relevant scheduled coupon payment date, we have, or the Bond Issuer or Chalco Hong Kong has, declared or paid a discretionary dividend, distribution or other discretionary payment on or in respect of, or have/has at its discretion repurchased, redeemed or otherwise acquired, any securities of lower or equal rank, subject to certain exceptions. The 2013 Senior Perpetual Securities have no fixed maturity and are callable only at our option on or after October 29, 2018, at their principal amounts together with any accrued, unpaid or deferred coupon interest payments. We redeemed the 2013 Senior Perpetual Securities in October 2018.

On October 27, 2015, our Company issued RMB2,000 million perpetual medium-term notes at an initial distribution rate of 5.50% (the "2015 Perpetual Medium-term Notes"). The proceeds from the issuance were RMB2,000 million and were used for repayments of interest-bearing loans and borrowings. Coupon payments of 5.50% per annum on the 2015 Perpetual Medium-term Notes are paid annually in arrears from October 29, 2015 and may be deferred at the discretion of our Company. The 2015 Perpetual Medium-term Notes have no fixed maturity and are callable only at our option on October 29, 2020 or any coupon distribution date after October 29, 2020 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. We repaid the principal amounts together with any accrued, unpaid or deferred coupon distribution payments of the 2015 Perpetual Medium-term Notes on October 29, 2020.

On October 31, 2016, the Bond Issuer issued US$500 million senior perpetual securities (the "2016 Senior Perpetual Securities") at a rate of 4.25%. The 2016 Senior Perpetual Securities are guaranteed by one of our subsidiaries, Chalco Hong Kong. The 2016 Senior Perpetual Securities also have the benefit of a keepwell deed entered into by the Bond Issuer, the Company, Chalco Hong Kong and the trustee. The 2016 Senior Perpetual Securities were listed on the Hong Kong Stock Exchange on November 7, 2016. The net proceeds from the issue of the 2016 Senior Perpetual Securities were approximately RMB3,374 million and were on-lent to the Company or any of its subsidiaries for general corporate use. Coupon payments of 4.25% per annum on the 2016 Senior Perpetual Securities have been made semi-annually on April 29 and October 29 in arrears from November 7, 2016 and may be deferred at our discretion. The first coupon payment date was April 29, 2017. The 2016 Senior Perpetual Securities have no fixed maturity date and are callable only at our option on or after November 7, 2021 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. We repaid the principal amounts together with any accrued, unpaid or deferred coupon distribution payments of the 2016 Senior Perpetual Securities on November 7, 2021.

On October 19, 2018, we issued RMB2,000 million perpetual medium-term notes with an initial distribution rate at 5.10% (the "2018 Perpetual Medium-term Notes"). The proceeds from the issuance were RMB2,000 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 5.10% per annum on the 2018 Perpetual Medium-term Notes are made annually in arrears from October 19, 2018 and may be deferred at our discretion. The 2018 Perpetual Medium-term Notes have no fixed maturity date and are callable only at our option on October 23, 2021 or any coupon distribution date after October 23, 2021 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. We repaid the principal amounts together with any accrued, unpaid or deferred coupon distribution payments of the 2018 Perpetual Medium-term Notes on October 23, 2021.

On November 19, 2019, we issued RMB1,500 million perpetual medium-term notes with an initial distribution rate at 4.20% (the "2019 Perpetual Medium-term Notes"). The proceeds from the issuance were RMB1,499 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 4.20% per annum on the 2019 Perpetual Medium-term Notes have been made annually in arrears from November 19, 2019 and may be deferred at our discretion. The 2019 Perpetual Medium-term Notes have no fixed maturity date and are callable only at our option on November 20, 2022 or any coupon distribution date after November 20, 2022 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. The coupon distribution rate will be reset to a percentage per annum equal to the sum of (a) the initial spread of 1.31 per cent, (b) the China Treasury Rate, and (c) a margin of maximum 300 Bps every five years after November 20, 2022. While any coupon distribution payments are unpaid or deferred, the Company cannot declare or pay dividends to shareholders or decrease the share capital, or make material fixed asset investments. The 2019 Perpetual Medium-term Notes matured on November 20, 2022, and no breach of contract occurred.

On December 2, 2020, the Company issued RMB1,000 million perpetual medium-term notes with an initial distribution rate at 4.45% (the "2020 Perpetual Medium-term Notes"). The proceeds from the issuance of the 2020 Perpetual Medium-term Notes were RMB1,000 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 4.45% per annum on the 2020 Perpetual Medium-term Notes have been made annually in arrears from December 2, 2020 and may be deferred at the discretion of the Company. The 2020 Perpetual Medium-term Notes have no fixed maturity date and are callable only at our option on December 3, 2022 or any coupon distribution date after December 3, 2022 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. The coupon distribution rate will be reset to a percentage per annum equal to the sum of (a) the initial spread of 1.42 percent, (b) the China Treasury Rate, and (c) a margin of maximum 300 Bps every two years after December 3, 2022. While any coupon distribution payments are unpaid or deferred, the Company cannot declare or pay dividends to shareholders or decrease the share capital, or make material fixed asset investments. The 2020 Perpetual Medium-term Notes matured on December 4, 2022, and no breach of contract occurred.

On August 17, 2022, the Company issued RMB1,000 million perpetual medium-term notes with an initial distribution rate at 2.87% (the "2022 Third Medium-term Notes"). The proceeds from the issuance of the 2022 Third Medium-term Notes were RMB1,000 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 2.87% per annum on the 2022 Third Medium-term Notes have been made annually in arrears from August 17, 2022 and may be deferred at the discretion of the Company. The 2022 Third Medium-term Notes have no fixed maturity date and are callable only at the Group's option on August 19, 2025 or any coupon distribution date after August 19, 2025 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. The coupon distribution rate will be reset to a percentage per annum equal to the sum of (a) the initial spread of 0.57 percent, (b) the China Treasury Rate, and (c) a margin of maximum 300 Bps every three years since August 19, 2025. While any coupon distribution payments are unpaid or deferred, the Company cannot declare or pay dividends to shareholders or decrease the share capital, or make material fixed asset investments. As of December 31, 2022, no coupon distribution payments are unpaid or deferred.

On September 20, 2022, the Company issued RMB1,000 million perpetual medium-term notes with an initial distribution rate at 2.68% (the "2022 Fourth Medium-term Notes"). The proceeds from the issuance of the 2022 Fourth Medium-term Notes were RMB1,000 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 2.68% per annum on the 2022 Fourth Medium-term Notes have been made annually in arrears from September 20, 2022 and may be deferred at the discretion of the Company. The 2022 Fourth Medium-term Notes have no fixed maturity date and are callable only at the Group's option on September 22, 2024 or any coupon distribution date after September 22, 2024 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. The coupon distribution rate will be reset to a percentage per annum equal to the sum of (a) the initial spread of 0.59 percent, (b) the China Treasury Rate, and (c) a margin of maximum 300 Bps every two years since September 22, 2024. While any coupon distribution payments are unpaid or deferred, the Company cannot declare or pay dividends to shareholders or decrease the share capital, or make material fixed asset investments. As of December 31, 2022, no coupon distribution payments are unpaid or deferred.

Transfer of Equity Interest in Shanxi Huaxing

The Chalco Xing County Alumina Project, which was carried out by Shanxi Huaxing, commenced construction in May 2011 and undertook full operation in 2014. After completion of private placement of A Shares in June 2015, the Board resolved to replace the funds which have been invested by us in advance with the proceeds raised from the private placement of A Shares. In light of our strategic blueprint for the development of Shanxi aluminum recycle industrial park, we planned to introduce strategic investors for joint investment and cooperation to develop a new model of integrated coal, electricity and aluminum operations. In December 2015, we entered into an equity transfer agreement with Shenzhen CR Yuanta Asset Management Co., Ltd., a state-owned entity, to transfer 50% equity interests in Shanxi Huaxing, a wholly-owned subsidiary, through the Shanghai United Assets and Equity Exchange at a price of RMB2,351 million (the "2015 Equity Transfer Agreement"). The price was determined based on the appraisal value provided by an independent qualified appraisal company. According to the 2015 Equity Transfer Agreement, 30% of the consideration amounting to RMB705 million has been received by us in December 2015. In December 2016, Shenzhen CR Yuanta Asset Management Co., Ltd. transferred the 50% of equity interest in Shanxi Huaxing to Baotou Transportation Investment Group Co., Ltd. As agreed among Shenzhen CR Yuanta Asset Management Co., Ltd., Baotou Transportation Investment Group Co., Ltd. and the Company, Baotou Transportation Investment Group Co., Ltd., shall assume the payment obligation on the outstanding consideration of RMB1,646,035,160 payable by Shenzhen CR Yuanta Asset Management Co., Ltd. to the Company under the 2015 Equity Transfer Agreement and settle the outstanding consideration in full together with interest accrued thereon from January 1, 2017 to the date of payment before March 31, 2017. The payment was fully settled by Baotou Transportation Investment Group Co., Ltd. in March 2017.

In December 2018, we entered into an equity transfer agreement with Baotou Transportation Investment Group Co., Ltd., pursuant to which we agreed to acquire 50% equity interest in Shanxi Huaxing through the Shanghai United Assets and Equity Exchange at a price of approximately RMB2,665.2 million, which we paid in full in December 2018. Upon completion of the acquisition, Shanxi Huaxing became a wholly-owned subsidiary of the Company. The acquisition is conducted for the purpose of enhancing our profitability and is in line with our strategic layout of alumina and aluminum business, as the increase of our shareholding in Shanxi Huaxing, an alumina plant, is expected to enhance the synergy with our primary aluminum production in Shanxi, where we have newly added production capacity of primary aluminum.

Transfer of Shares of Jiaozuo Wanfang

On January 22, 2015 and January 23, 2015, we decreased our shareholding in Jiaozuo Wanfang by 4,758,858 shares through the securities exchange system of the Shenzhen Stock Exchange. In March 2015, we transferred 100,000,000 shares of Jiaozuo Wanfang to Geo-Jade Petroleum Corporation by way of agreement after the public solicitation for potential transferees. On June 25, 2015, we further transferred 42,550,900 shares of Jiaozuo Wanfang by way of block trading through the securities exchange system of the Shenzhen Stock Exchange. On December 18, 21 and 22, 2015, we reduced our shareholding in Jiaozuo Wanfang by 16,695,100 shares through the centralized bidding trading system of the Shenzhen Stock Exchange. From December 23 to 25, 2015, we reduced our shareholding in Jiaozuo Wanfang by 13,865,000 shares through the centralized bidding trading system of the Shenzhen Stock Exchange and block trading. As a result, we held 29,582,057 shares of Jiaozuo Wanfang as of December 31, 2015, representing 2.46% of the total share capital of Jiaozuo Wanfang. During the period from July 8, 2016 to September 27, 2016, we reduced our shareholding of Jiaozuo Wanfang by an aggregate of 16,628,098 shares via the Shanghai Stock Exchange centralized bidding trading system, representing approximately 1.39% of the total share capital of Jiaozuo Wanfang. The average price of reduction was approximately RMB8.73 per share. After the reduction, the Company remained holding 12,953,959 shares of Jiaozuo Wanfang, representing approximately 1.09% of its total share capital. During the period from September 29, 2016 to January 26, 2017, we reduced our shareholding of Jiaozuo Wanfang by an aggregate of 12,953,959 shares via the Shanghai Stock Exchange centralized bidding trading system, representing approximately 1.09% of the total share capital of Jiaozuo Wanfang. The average price of reduction was approximately RMB10.19 per share. After such reduction in our shareholding, we no longer hold any shares of Jiaozuo Wanfang.

Disposal of Certain Assets of Guizhou Branch

Guizhou branch entered into a land reserve acquisition cooperation agreement with the People's Government of the Baiyun District of Guiyang, Guiyang Land Reserve Center, and Guizhou Aluminum Plant on November 13, 2015. As the land of Guizhou Aluminum Plant occupied by the primary aluminum plant of Guizhou branch shall be transferred to the respective land resources and reserve authorities, Guizhou branch sold the relevant assets, including buildings and structures located on the land occupied by the primary aluminum plant of Guizhou branch, to the Guiyang Land Reserve Center for a total consideration of RMB1.95 billion. The consideration was determined based on the asset appraisal conducted by an independent asset appraisal firm.

Disposal of the Environmental Protection Business

On May 30, 2016, the Board approved the transfer of the environmental protection assets in relation to the desulfurization, denitration and dedusting of the coal-fired generating units of five entities, namely Lanzhou branch, Baotou Aluminum, Shandong Huayu, Maliantai Power Station and Liupanshan Power Station of Ningxia Energy, by way of public bidding. On June 29, 2016, the assets transfer agreement in relation to disposal of the above environmental protection assets were entered into between Beijing Aluminum SPC Environment Protection Tech Co., Ltd., which had won the bid for the acquisition of the assets, and us. Pursuant to the asset transfer agreement, the aggregate consideration for the above environmental protection assets disposal was RMB1,754 million which was paid in two installments in June 2016 and December 2016, respectively.

We decided to dispose the environmental protection assets to reduce our capital investments and generate cash flows. We have been complying with the relevant standards of environmental protection through professional services rendered by specialized environmental protection companies.

Development of Gold Leasing Financing

On May 30, 2016, the Board resolved to develop gold leasing business to financing working capital. From 2016 to 2019, we have entered into several agreements with Bank of Communications Co., Ltd., China Everbright Bank and Agriculture Bank of China to finance working capital via gold leasing. We repaid the remaining gold leasing financing and did not enter into any new gold leasing agreement in 2021 and 2022.

Establishment of Industry Investment Fund

On May 23, 2017, the Company, Bank of Communications International Trust Co., Ltd. ("BOCOMMTRUST") and Chinalco Jianxin Investment Fund Management (Beijing) Company Limited ("Chinalco Jianxin") entered into a partnership agreement in relation to the establishment of Beijing Chalco Bocom Size Industry Investment Fund Management Partnership (Limited Partnership) (the "Industry Fund"). On September 27, 2017, the Company, BOCOMMTRUST, Chinalco Jianxin and Bocommtrust Asset Management Co., Ltd. ("Bocommtrust Asset") entered into certain agreements with respect to Chinalco Jianxin's withdrawal from and Bocommtrust Asset's participation in the Industry Fund. On the same day, the Company, BOCOMMTRUST and Bocommtrust Asset entered into a capital contribution agreement and a new partnership agreement in relation to the Industry Fund. Pursuant to these agreements, the general partner of the Industry Fund changed from Chinalco Jianxin to Bocommtrust Asset while Chinalco Jianxin remained as the manager of the Industry Fund.

The Industry Fund provided funding for the construction of our major projects, replenish our working capital and support our structural adjustment, transformation and upgrade. In 2021, the Industry Fund had exited all its investment and thereafter had been closed down and liquidated.

Merger and Reorganization of Shanxi Branch and Shanxi Huaze

On August 8, 2017, we entered into a reorganization agreement with Jinneng Holding Shanxi Electric Power, pursuant to which we contributed certain assets related to alumina production of our Shanxi branch, with an appraised net value of RMB3,425.7 million equaling the appraised net value of the assets and liabilities of Shanxi branch, to Shanxi Huaze. The assets injected into Shanxi Huaze included, among others, inventories, buildings, structures, machinery and equipment. Upon completion of our asset contribution in 2017, our shareholding in Shanxi Huaze increased from 60% to 85.98% and Shanxi Huaze was renamed to Shanxi New Material.

Subscription of Equity Interest of Certain Subsidiaries and Subsequent Issuance of Additional A Shares ("Asset Restructuring")

On December 4, 2017, we entered into certain investment and debt conversion agreements (the "Initial Agreements") with Huarong Ruitong Equity Investment Management Co., Ltd. ("Huarong Ruitong"), China Life Insurance Company Limited ("China Life"), Shenzhen Zhaoping Chalco Investment Center LLP ("Zhaoping Investment"), China Pacific Life Insurance Co., Ltd. ("CPIC Life"), China Cinda Asset Management Co., Ltd. ("China Cinda"), BOC Financial Asset Investment Co., Ltd. ("BOC Financial"), ICBC Financial Asset Investment Co., Ltd. ("ICBC Financial") and ABC Financial Asset Investment Company Limited ("ABC Financial") (collectively, the "Restructuring Investors"). Pursuant to the Initial Agreements, Huarong Ruitong, China Life, Zhaoping Investment, CPIC Life, BOC Financial, ICBC Financial and ABC Financial have agreed to make cash contributions to our wholly-owned subsidiaries, Chalco Shandong, Zhongzhou Aluminum, Baotou Aluminum and Chalco Mining (collectively, the "Target Subsidiaries"), while the principal of loans owed by Chalco Mining to Huarong Ruitong, Zhaoping Investment, China Cinda and BOC Financial prior to signing of the Initial Agreements would be treated as capital contribution to Chalco Mining and converted into equity interest in Chalco Mining held by Huarong Ruitong, Zhaoping Investment, China Cinda and BOC Financial. The Restructuring Investors have agreed to acquire 30.80%, 36.90%, 25.67% and 81.14% of equity interest of Chalco Shandong, Zhongzhou Aluminum, Baotou Aluminum and Chalco Mining, respectively, with an aggregate capital contribution of approximately RMB12.6 billion. Under the Initial Agreements, we have also agreed to acquire equity interest held by the Restructuring Investors in the Target Subsidiaries with consideration in the form of our A Shares to be issued to the Restructuring Investors. On December 20, 2017, the Initial Agreements and the transactions contemplated thereunder were approved at our 2017 second extraordinary general meeting. In December 2017, the capital contribution to the Target Subsidiaries by the Restructuring Investors was completed in accordance with the terms of the Initial Agreements.

Subsequently, on January 31, 2018, we entered into equity acquisition agreements (the "Further Agreements") with the Restructuring Investors. Pursuant to the Further Agreements, we have agreed to acquire all the equity interest held by the Restructuring Investors in the Target Subsidiaries with consideration in the form of A Shares of the Company to be issued to the Restructuring Investors (the "Proposed Issuance"). The number of A Shares in issue pursuant to the Proposed Issuance would equal the appraised value of equity interest held by Restructuring Investors in Target Subsidiaries as of December 31, 2017 determined by China United Assets Appraisal divided by the issue price. The issue price has been set at RMB6.00 per A Share with reference to 90% of the average trading price of our A Shares during the last 60 trading days prior to January 31, 2018 (i.e., the last 60 trading days prior to the suspension of trading of our A Shares) in accordance with rules and regulations of the PRC applicable to transaction of this kind. The appraised value, subject to further adjustment, was RMB12.7 billion and therefore we issued to the Restructuring Investors approximately 2.1 billion A Shares in aggregate, representing approximately 14.2% of the total issued share capital of the Company as of January 31, 2018 and approximately 12.4% of the enlarged total issued share capital of the Company upon completion of the Proposed Issuance. On July 30, 2018, we entered supplemental equity acquisition agreements with the Restructuring Investors, amending, among others, the final consideration of the proposed acquisition and the number of the consideration shares to be issued from approximately RMB12,703.7 million and approximately 2,117,280,800 to approximately RMB12,713.2 million and 2,118,874,715, respectively. The Proposed Issuance was approved by our shareholders, the SASAC and the CSRC in 2018. In February 2019, all equity interests of Target Subsidiaries held by the Restructuring Investors were transferred to us, which resulted in us holding 100% equity interests of all Target Subsidiaries. On February 25, 2019, we issued an aggregate of 2,118,874,715 A Shares to the Restructuring Investors and our total share capital increased from 14,903,798,236 shares to 17,022,672,951 shares. The shares issued to the Restructuring Investors could be traded on the Shanghai Stock Exchange since February 26, 2020 after the expiry of the 12-month lock-up period.

Cash contributions received from the Restructuring Investors have been used by us for the repayment of loans. The Asset Restructuring has helped to reduce the gearing ratios of these subsidiaries and us as a whole.

Boffa Project

On June 8, 2018, Chalco Hong Kong and Chalco Guinea Company S.A., a wholly-owned subsidiary of Chalco Hong Kong, entered into a mining convention (the "Mining Convention") with the Guinean government, pursuant to which Chalco Hong Kong agreed to provide investment funds while the Guinean government agreed to provide mining licenses and rights to transport mining products for the development and operation of the Boffa Project, a project for the construction and development of a bauxite mine located in Boffa, Guinea.

Based on our preliminary research and analysis and after taking into account various factors, including but not limited to (i) the bauxite reserve and the minable quantity in the mining area of the Boffa Project; (ii) the advancement and effectiveness of the existing development technologies; (iii) labor costs, transportation expenses and other development costs and other factors, the total investment of the Boffa Project is estimated to be approximately US$706 million, subject to adjustment pursuant to the actual needs, which will be mainly allocated in the construction of mines, ports and lightering system and is expected to be funded through capital investment together with shareholders' loans or bank loans. The Boffa Project was completed and put into operation in April 2020. As of December 31, 2022, an aggregate of RMB2.9 billion of capital expenditure had been incurred for the Boffa Project.

In accordance with the Mining Convention, a mining company (the "Mining Company") and a port company (the "Port Company") are established to act as the main operating bodies for mines construction and ports construction, respectively. In accordance with the Mining Convention, we own 85% and 95% equity interests in the Mining Company and the Port Company, respectively, while the Guinean government and its wholly-owned companies collectively own 15% and 5% equity interests in the Mining Company and the Port Company, respectively. Pursuant to the Mining Convention, Chalco Hong Kong shall grant the Guinean government and/or its wholly-owned companies an option to obtain additional equity interests in the Mining Company and grant Societe Guineenne de Patrimoine Minier, a company wholly-owned by the Guinean government, an option to obtain additional equity interests in the Port Company (together, the "Options"). If the Options are exercised in full, our equity interests in the Mining Company and Ports Company will reduce to 65% and 90%, respectively. As of December 31, 2022, the Options had not been exercised.

With a large reserve of resources, we believe the Boffa Project would provide sustainable bauxite resources for our alumina production and its high ore grades would help reduce alkali and energy consumption in our alumina production. In addition, as the mines are close to port, we are able to consolidate inland waterway transportation and maritime transportation, which benefits long-term development of the project and effectively controls investment risks at the early stage.

The Boffa Project commenced construction in September 2018. The project was completed and put into operation in April 2020. From then through the end of 2022, we extracted approximately 33.9 million tonnes of bauxite from the Boffa mine. The annual bauxite output capacity is expected to remain stable at 13.6 million tonnes in 2023.

Merger and Reorganization of Zunyi Alumina and Zunyi Aluminum

On June 21, 2018, in order to streamline our production chains, enhance synergistic effects and control operating costs, we entered into a contribution agreement with other shareholders of Zunyi Aluminum, pursuant to which we contributed all assets in Zunyi Alumina to Zunyi Aluminum. The appraised net value of Zunyi Alumina, equaling the appraised net value of its assets and liabilities, was RMB2,311 million. Upon completion of the merger, our shareholding in Zunyi Aluminum increased from 62.1% to 67.45%.

Controlling Shareholder's Shareholding Increase in the Company

On June 24, 2018, Chinalco notified us of its plan to increase its shareholding in us via the trading system of the Shanghai Stock Exchange in an amount of not less than RMB400 million and not more than RMB1 billion in 12 months. Chinalco would, based on its reasonable judgment on our share price as well as the fluctuations of our share prices and the overall trend in the capital market, gradually implement the plan on increase in shareholding to the extent not exceeding 2% of our total share capital. The purpose of such increases in shareholding is to boost confidence of investors, protect the interests of minority shareholders and stabilize the capital market based on Chinalco's confidence in the future development of the company and the recognition of our value.

For the period from June 25, 2018 to June 24, 2019, as the result of the aforesaid plan, Chinalco increased its shareholding in us by 160,512,964 A shares (representing approximately 0.94% of our total issued share capital as of June 24, 2019) in the amount of RMB608 million on a cumulative basis via the trading system of the Shanghai Stock Exchange. In addition, during the same period of time, Chinalco also, through its subsidiaries, had increased its shareholding in us by 115,276,000 H shares (representing approximately 0.68% of our total issued share capital as of June 24, 2019) in the amount of HK$365 million on a cumulative basis via the trading system of the Hong Kong Stock Exchange.

Acquisition of Carbon Assets and Equity Interests

On August 30, 2018, our Group and the affiliates of Chinalco Assets entered into a series of assets transfer agreements and equity transfer agreements for the acquisition of certain carbon assets and equity interests from the affiliates of Chinalco Assets, including: (i) the assets of the carbon plant under Shandong Aluminum Industry Co., Ltd; (ii) the assets of the carbon plant under Pingguo Aluminum Company Limited; (iii) 49% equity interests of Baotou Sendu Carbon Company Limited; and (iv) 57.69% and 19.96% equity interests of Chibi Great Wall Carbon Products Company Limited from two separate shareholders. Upon completion of the acquisition, we expect this acquisition would help us consummate our industrial chain, ensure our steady production, and improve our competitiveness and anti-risk capabilities, as carbon products are one of major raw materials for production of primary aluminum. As of December 2018, we had paid the total consideration of RMB735.6 million in full and the acquisition had been completed.

Transfer Between China Copper and Yunnan SASAC

On November 13, 2018, China Copper, a wholly-owned subsidiary of our controlling shareholder, entered into a transfer agreement with Yunnan SASAC, pursuant to which Yunnan SASAC shall transfer its 51% equity interest in Yunnan Metallurgical Group Co., Ltd. to China Copper with no consideration. The transfer was approved by the SASAC on December 19, 2018, by the State Administration for Market Regulation on December 20, 2018 and by the CSRC on December 29, 2018. Chinalco completed the transfer on January 8, 2019. As Yunnan Aluminum, an affiliated company of Yunnan Metallurgical Group Co., Ltd., competes with us in the business segments of alumina and primary aluminum, on January 2, 2019, Chinalco, as the indirect controlling shareholder of Yunnan Aluminum and our direct controlling shareholder, issued a letter of undertakings on non-competition to us in order to address business competition and safeguard the legitimate interests of the Company and our minority shareholders. According to the letter of undertakings, Chinalco undertook to start in 2019 planning the integration of the businesses in which Yunnan Aluminum and we compete with each other, and address business competition between Yunnan Aluminum and us within five years. In July 2022, we entered into a shares transfer agreement and agreed to acquire shares representing approximately 19% of the total issued share capital of Yunnan Aluminum. The shares transfer was completed in November 2022 and we currently hold 29.10% of the total issued share capital of Yunnan Aluminum. The financial results of Yunnan Aluminum have been consolidated into the financial statements of our Company. The aforesaid transaction has resolved the competition between Chinalco and our Group. However, the competition between our Group and Yunnan Aluminum has not been fully resolved. In light of this, our Company issued a letter of undertakings on non-competition to Yunnan Aluminum, according to which our Company undertook to appropriately resolve the issue of horizontal competition with Yunnan Aluminum within five years from 2019.

Transfer of Primary Aluminum Capacity Quota of Shanxi Huasheng

On May 28, 2019, Shanxi Huasheng and Yixin Aluminum entered into a transfer agreement, pursuant to which Shanxi Huasheng agreed to sell to Yixin Aluminum the primary aluminum capacity quota of 190,000 tonnes at a total transfer consideration of RMB950 million and a transfer price of RMB5,000 per tonne. With the adjusted number of annual capacity quota finally determined by relevant PRC authority, we completed the transfer of the primary aluminum capacity quota of 170,000 tonnes to Yixin Aluminum with the total transfer consideration of RMB850 million in June 2019. We expect this transfer would help to reverse Shanxi Huasheng’s losses, achieve its transformation and upgrading, and optimize our industrial layout and asset structure.

Proposed Issuance of H Shares

On June 21, 2022, our shareholders at the 2021 annual general meeting passed a special resolution, which will remain valid until the earliest of (i) the conclusion of our next annual general meeting, (ii) the expiration of 12 months following the date of passing the resolution, or (iii) the date on which the authority set out in this resolution is revoked or varied by a special resolution at a general meeting. The resolution authorizes us to issue additional H Shares up to 20% of the number of H Shares in issue as of the resolution date. Our Board has been authorized to determine the use of the proceeds. The proposed issuance is subject to all the necessary approval by the CSRC and/or other relevant PRC government authorities.

Our Gallium Assets

On August 27, 2019, we entered into a capital contribution agreement with China Rare Metals and Rare Earths Company Ltd., a subsidiary of Chinalco, pursuant to which we agreed to make a capital contribution of RMB352,848,100 to China Rare Metals and Rare Earths Company Ltd. with our gallium assets. Upon completion of the transaction in August 2019, the shareholding proportion we held in China Rare Metals and Rare Earths Company Ltd. increased from 14.62% to 23.94%. In September 2021, we repurchased the gallium assets from three branches of China Rare Metals and Rare Earths Company Ltd for a cash consideration of RMB395,624,218.12.

Capital Contribution to Yixin Aluminum

On December 10, 2019, we entered into a capital contribution agreement with Yixin Aluminum and its shareholders, pursuant to which we agreed to make a capital contribution of RMB850 million in cash to Yixin Aluminum, which we paid in full in December 2019. Upon completion of the transaction, we held 38.90% equity interests of Yixin Aluminum. We expect this capital contribution to facilitate us in participating in the green development layout on the integration of hydropower and aluminum in Yunnan Province and obtaining competitive assets for our principal business.

Subscription for A Shares of Yunnan Aluminum

On December 19, 2019, we entered into a shares subscription agreement with Yunnan Aluminum, pursuant to which we agreed to subscribe through non-public offering for 314,050,688 A shares of Yunnan Aluminum at a price of RMB4.10 per share with the total subscription amount of RMB1,287,607,820.80. The subscription price of RMB4.10 per A share was determined through bidding and based on the minimum issuance price of the non-public offering by Yunnan Aluminum, which represented 90% of the average trading price of the shares in the 20 trading days prior to the first day of the issuance period, namely December 13, 2019. We paid the consideration in full and 314,050,688 A shares of Yunnan Aluminum were registered under our name in December 2019, representing approximately 10.04% of the total share capital of Yunnan Aluminum. Pursuant to the shares subscription agreement, we shall not transfer the subscribed A shares thereto within 36 months from the listing date. We expect our subscription for A shares of Yunnan Aluminum will help resolve business competitions between Yunnan Aluminum and us and is in line with our development strategies and in our interests as a whole.

On December 23, 2020 and March 16, 2021, we entered into a conditional shares subscription agreement and a supplemental agreement with Yunnan Aluminum, respectively, pursuant to which we agreed to subscribe for A shares of Yunnan Aluminum to be issued through non-public offering with the total subscription amount ranging from RMB200 million to RMB320 million. On December 2, 2021, we entered into a supplemental agreement with Yunnan Aluminum, pursuant to which we agreed to subscribe for 36,240,090 A shares of Yunnan Aluminum at a price of RMB8.83 per share with a total subscription amount of RMB319,999,994.70 and the subscription price per share is finally determined based on the results of enquiry. Upon completion of this subscription in December 2021, Yunnan Aluminum did not become a subsidiary of the Company.

On July 24, 2022, we entered into a shares transfer agreement with Yunnan Metallurgical Group Co., Ltd., pursuant to which, we agreed to acquire and Yunnan Metallurgical Group Co., Ltd. agreed to dispose of 658,911,907 shares in Yunnan Aluminum, representing approximately 19% of the total issued share capital of Yunnan Aluminum. The aforesaid shares transfer was completed in November 2022. The Company currently holds 1,009,202,685 shares in Yunnan Aluminum, representing approximately 29.10% of the total issued share capital of Yunnan Aluminum. The financial results of Yunnan Aluminum have been consolidated into the financial statements of our Company, and Yunnan Aluminum has become a subsidiary of the Company.

B. Business Overview

Our Principal Products

We are a leading enterprise in the non-ferrous metal industry in China. In terms of comprehensive scale, we ranked among the top enterprises in the global aluminum industry. We have benefited from the development of the PRC aluminum market, the world's largest aluminum market. We refine bauxite into alumina, which is then smelted into primary aluminum. In addition to alumina and primary aluminum, we also produce and sell chemical alumina products (alumina hydrate and alumina-based industrial chemical products) and carbon products (carbon anodes and cathodes). We are also engaged in the trading and logistics of alumina, primary aluminum, other non-ferrous metal products, coal products and raw and ancillary materials in bulk manufactured by us or sourced from external suppliers domestically and abroad. In addition, we are engaged in coal mining and power generation. The remainder of our revenues was derived from research and development activities and other products and services. Accordingly, we organize and manage our operations in five business segments: alumina segment, primary aluminum segment, trading segment, energy segment and corporate and other operating segment. After elimination of inter-segment sales, revenues attributable to our alumina segment, primary aluminum segment, trading segment, energy segment, and corporate and other operating segment accounted for approximately 5.6%, 29.7%, 61.4%, 3.1% and 0.2%, respectively, of our total revenues in 2022.

Our alumina segment includes the mining and purchasing of bauxite and other raw materials, and production and sale of alumina as well as chemical alumina. Alumina accounted for approximately 89.1% of our total production volume of alumina and chemical alumina products for this segment in 2022. Chemical alumina products are used in the production of chemical, pharmaceutical, ceramic and construction materials. In the process of refining bauxite into alumina, we produce gallium as a by-product, which is a rare, high value metal with applications in the electronics and telecommunication industries.

Our primary aluminum segment includes the procurement of alumina, other raw materials, supplemental materials and electrical power, the production and sale of primary aluminum and aluminum-related products, such as carbon products, aluminum alloy products, renewable aluminum and other aluminum products. Our principal primary aluminum products are ingots, molten aluminum and aluminum alloys, which accounted for approximately 26.5%, 41.5% and 32.0%, respectively, of our total production volume of primary aluminum in 2022. Our standard 20 kilogram remelt ingots are used for general aluminum fabrication in the construction, electricity, electronics, transportation, packaging, machinery and durable goods industries. We internally produce substantially all the carbon products used at our smelters and sell our remaining carbon products to external customers.

Our trading segment is mainly engaged in the trading of alumina, primary aluminum, aluminum fabrication products, other non-ferrous metal products, and crude fuels such as coal products, as well as supplemental materials and logistics and transport services to our internal manufacturing plants and external customers. We established our trading business under Chalco Trading as a separate segment in July 2010 as a result of our operational structural adjustment. Since 2014, we have established Chalco Materials, Chalco Logistics and Chalco Trading Group to continuously promote and deepen development of our trading business, jointly constituting our trading segment. Established in 2018, Chalco Trading Group has undertaken the businesses that used to be operated by Chalco Trading.

Our energy segment includes the research and development, production and operation of energy products, including coal mining and conventional coal-fire power generation as well as renewable energy generation such as wind power and solar power. In January 2013, to partially offset our future energy costs, we established our energy segment after our acquisition of Ningxia Energy in line with our development strategy. In 2022, we supplied a portion of the electricity we generated for our own production use, supplied a portion of the coal output to our own electric power plant and sold the remaining portion to external customers. Ningxia Energy supplied the electricity it generated mainly to the state grid in China.

Our corporate and other operating segment mainly includes corporate and other aluminum-related research, development, and our other activities.

Our Production Capacity

As of December 31, 2022, our annual alumina production capacity and primary aluminum production capacity was approximately 22.26 million tonnes and 7.35 million tonnes, respectively. The following table sets forth the production capacity of each of our principal plants by business segment as of the indicated date:

Plant	As of December 31, 2022	
	Alumina	Primary Aluminum
	(in thousand tonnes)[1]	
Guangxi branch	2,210	—
Zhongzhou Aluminum	3,050	—
Qinghai branch	—	400
Guangxi Huasheng	2,000	—
Chalco Mining	2,410	—
Chalco Shandong	2,270	—
Shanxi New Material	2,600	420
Chongqing branch	800	—
Lanzhou Aluminum	—	420
Zunyi Aluminum	1,000	360
Baotou Aluminum[2]	—	1,290
Zhengzhou Institute	20	—
Liancheng branch	—	523
Guizhou Huajin	1,600	—
Xinghua Technology	900	—
Shanxi Huaxing	2,000	—
Guizhou Huaren	—	400
Shanxi Zhongrun	—	497
Yunnan Aluminum	1,400	3,040
Total	22,260	7,350

(1) Production capacity is calculated based on designed capacity, which takes into account various assumptions including downtime for ordinary maintenance and repairs, the ore grade of bauxite feedstock and subsequent capacity modifications.

(2) Including the primary aluminum production capacity of Inner Mongolia Huayun, a subsidiary of Baotou Aluminum.

(3) Shandong Huayu transferred its primary aluminum capacity quota of 65,000 tonnes to Shanxi Zhongrun. Shandong Huayu had no production capacity in 2022.

In 2022, we produced approximately 17.64 million tonnes of alumina (excluding chemical alumina products), 4.29 million tonnes of chemical alumina products and 6.88 million tonnes of primary aluminum. Our production of alumina (excluding chemical alumina products) and primary aluminum represented approximately 22% and 17%, respectively, of the total output of alumina and primary aluminum in China in 2022.

The following table sets forth a breakdown of our production volume by product segment for the periods indicated:

Production Volume by Product	Year Ended December 31, 2020	2021	2022
	(in thousand tonnes)		
Alumina segment			
Alumina	14,526	16,229	17,642
Chemical alumina products	3,942	4,123	4,285
Gallium(1)	95	137	146
Primary aluminum segment			
Primary aluminum(2)	3,695	3,863	6,879
Carbon	1,840	2,055	2,877

(1) As we repurchased our gallium assets in 2021 after disposal in 2019, we present the production volume as if we never disposed of our gallium assets. See "– A. History and Development of the Company – Our Gallium Assets" for details.

(2) Including ingots, molten aluminum and aluminum alloys.

Production Process

Alumina

Alumina is refined from bauxite, an aluminum-bearing ore, through a chemical refining process. The refining process applied is determined by the mineral composition of the bauxite used in production. Our refineries may employ the Bayer process, the Bayer-sintering series process, the Bayer-sintering combined process or the ore-dressing Bayer process. Most of the bauxite reserves in China contain diasporic bauxite, which contains high alumina content but relatively high silica content, resulting in bauxite reserves with low alumina-to-silica ratio. The Bayer process cannot efficiently refine diasporic bauxite that has not undergone processing to increase its alumina-to-silica ratio. The Bayer-sintering process and the Bayer-sintering combined process are suitable for refining low alumina-to-silica ratio bauxite. We have developed and improved these processes to increase our refining yield. In addition, we also produce some chemical alumina products (alumina hydrate and alumina-based industrial chemical products).

Primary Aluminum

We smelt alumina into primary aluminum through electrolytic reduction. The electrolytic process takes place in a reduction cell, or pot, a steel shell lined with carbon cathodes and refractory materials. Powerful electric currents are passed through the pot to produce molten aluminum. The molten aluminum is transferred to holding furnaces and then poured directly into molds to produce foundry ingots, or further refined to form fabricating ingots, which may be used directly in the aluminum fabrication process. The primary aluminum we produce is in the form of ingots, molten aluminum and aluminum alloys.

All of our primary aluminum smelters use pre-bake anode reduction pot-lines. In the pre-bake reduction process, the anodes are pre-formed in a separate facility where pollutants can be contained. The cells themselves are enclosed with removable panels so that the waste gas produced during the process can be collected using large exhaust fans. Our waste gas is treated and purified to reduce dust and fluoride emissions to standards set by state environmental protection agencies.

Production Facilities

Alumina

We currently operate 12 alumina refineries and one research institute with a total designed annual production capacity of approximately 22.26 million tonnes as of December 31, 2022. Two of our refineries are integrated with primary aluminum smelters. In 2022, we produced approximately 17.64 million tonnes of alumina and approximately 4.29 million tonnes of chemical alumina products. The overall utilization rate for our refineries was 79% as of December 31, 2022.

The following table sets forth the annual production capacity, output of alumina and chemical alumina products, utilization rate and production process applied in each of our alumina refineries and our Zhengzhou Institute:

	As of December 31, 2022		For the Year Ended December 31, 2022		
	Annual Production Capacity(1)	Utilization Rate(2)	Alumina Production Output	Chemical Alumina Products Output	Production Process
	(in thousand tonnes, except percentages)				
Shanxi New Material	2,600	55 %	1,391	194	Bayer-sintering
Chalco Mining	2,410	74 %	1,358	65	Bayer-sintering
Chalco Shandong	2,270	100 %	1,550	2,596	Sintering and Bayer
Zhongzhou Aluminum	3,050	76 %	1,776	1,159	Sintering and Bayer
Guangxi branch	2,210	100 %	2,357	187	Bayer
Zunyi Aluminum	1,000	100 %	1,096	9	Bayer
Chongqing branch(3)	800	0 %	—	—	Bayer-sintering
Zhengzhou Institute(4)	20	0 %	—	—	Bayer
Guizhou Huajin	1,600	100 %	1,631	—	Bayer
Xinghua Technology	900	38 %	830	12	Bayer
Shanxi Huaxing	2,000	100 %	2,089	—	Bayer
Guangxi Huasheng	2,000	100 %	2,168	6	Bayer
Yunnan Aluminum	1,400	100 %	1,396	—	Bayer
Total	22,260	79 %	17,642	4,285	

(1) Production capacity is calculated based on designed capacity, which takes into account various assumptions including downtime for ordinary maintenance and repairs, the ore grade of bauxite feedstock and subsequent capacity modifications.
(2) Capacity utilization rate is calculated by dividing our utilized production capacity as of the date indicated by our total designed annual production capacity.
(3) Since 2018, we have leased the alumina production facilities of our Chongqing branch to a third party. We terminated such lease in December 2022.
(4) The production line of our Zhengzhou Institute is a pilot production line and has been halted in 2022.

Primary Aluminum

We operate nine primary aluminum smelters in China. Our smelters had an aggregate annual production capacity of approximately 7.35 million tonnes as of December 31, 2022.

In 2022, we produced approximately 6.88 million tonnes of primary aluminum and the average utilization rate for our smelters was 78% as of December 31, 2022. The following table sets forth the annual production capacity, aluminum output, utilization rate and smelting equipment used in each of our aluminum smelters:

	As of December 31, 2022		For the Year Ended December 31, 2022	
Plant	Annual Production Capacity(1)	Utilization Rate(2)	Aluminum Output(3)	Smelting Equipment
	(in thousand tonnes, except percentages)			
Baotou Aluminum(4)	1,290	100	1,325	200Ka, 240Ka, 400Ka and 500Ka pre-bake
Lanzhou Aluminum	420	100	429	200Ka and 350Ka pre-bake
Qinghai branch	400	100	402	180Ka and 210Ka pre-bake
Shanxi New Material	420	100	428	300Ka pre-bake
Zunyi Aluminum	360	55	415	200Ka and 400Ka pre-bake
Liancheng branch	523	100	292	200Ka and 500Ka pre-bake
Guizhou Huaren	400	43	401	500Ka
Shanxi Zhongrun	497	100	487	500Ka
Yunnan Aluminum	3,040	71	2,700	240Ka, 300Ka, 400Ka and 500Ka pre-bake
Total	7,350	78	6,879	

(1) Production capacity takes into account designed capacity, downtime for ordinary maintenance and repairs and subsequent capacity modifications.

(2) Capacity utilization rate is calculated by dividing our utilized production capacity as of the date indicated by our total designed annual production capacity.
(3) Includes ingots, molten aluminum and aluminum alloys.
(4) Including the primary aluminum production facilities at Inner Mongolia Huayun, a subsidiary of Baotou Aluminum.

Raw Materials

Alumina

Bauxite is the principal raw material in alumina production. Most of the bauxite in China is monohydrate, consisting mainly of aluminosilicate compounds. Bauxite deposits have been discovered across a broad area of central China and are especially abundant in the southern and northern parts of central China. The largest bauxite deposit in China lies in the Shanxi Province.

Rock Formation and Mineralization. Except for our Guangxi Pingguo mine which is an accumulation deposit due to original erosion, the bauxite deposits of our mines in China usually have similar stratigraphic sequences. Primary bauxite deposit, as a type of sedimentary boehmite ($Al_2O_3.H_2O$) of the Carboniferous or Permian age, is contained in clay rock, limestone or coal seams. A zonary red shale is usually located at the bottom of the bauxite and the red seam distributes over the irregular “karst-type” erosion face on the top of Ordovician limestone. Aluminum deposits in northern China are usually covered with a very thick Quaternary weathering.

The thickness and quality of deposits vary with our mine locations. Quality is usually consistent in smooth sections but changes sharply in karst “billabong” terrain. The level of hardness of minerals also varies. A sequence that includes a seam of hard bauxite of fine quality in the middle and soft bauxite of inferior quality on the bottom and top seams is common in deposits.

Generally, deposits are horizontal or with an obliquity of 0 to 8 degrees, but there are also steep deposits at an angle of 75 degrees, such as in our Guizhou mine. Most of the original mineralization is not influenced by folds and faults, and some fractures of a low obliquity and folds emerge in certain deposits, which is evident in the Guizhou mine area. In most of the Guizhou mine area, the underground mining method must be used due to the obliquity of its bauxite body reaching 70 degrees with the influence of folds and several meters of dislocation arising from partial faults.

Economic Significance. Our bauxite deposits in China are divided into three groups. They are primarily distinguished by drill hole spacing and the composition of the deposit, which can encompass rock formations such as intercalated clays, bauxite, footwall iron clay or Ordovician limestone. Bauxite deposit groups vary in the thickness and mineral quality of its reserves.

We use the Chinese bauxite deposit estimation method, which is calculated using cut-off grades and thickness to outline continuous areas within the limits defined by samples of marginal grade. We utilize actual limiting sample points that are joined to create a polygonal outline, and grades are then calculated using a length weighted arithmetic average. We believe that the Chinese bauxite deposit estimation method of test boring, inspection pit, trial trench, density, tonnage analysis and calculation applied to the geological work of bauxite in China is an appropriate method to analyze these types of deposits.

Supply. To support the growth of our alumina production, we continuously seek opportunities to streamline and optimize our bauxite procurement. Except for Chalco Shandong, all of our refineries are located in the four provinces where over 90% of China’s potentially mineable bauxite has been found. We generally source our domestic bauxite from mines close to our refineries to control transportation costs. Historically, we have procured our bauxite supply principally from three sources:

- our own bauxite mining operations, which include the mining operations of the Boffa mine in Guinea since 2020;
- jointly-operated mines; and
- other suppliers, which principally include small independent mines in China and international suppliers.

On average, our refineries consumed approximately 2.4 tonnes of bauxite to produce one tonne of alumina in 2022. Our mines supplied approximately 29.6 million tonnes of bauxite to our refineries in 2022. We purchase bauxite from a number of suppliers and do not depend on any supplier for our bauxite requirements.

The following table sets forth the volumes and percentages of bauxite supplied by our own mines and other suppliers for the periods indicated:

	Year Ended December 31,					
	2020		2021		2022	
	Bauxite Supply	Percentage of Bauxite Supply	Bauxite Supply	Percentage of Bauxite Supply	Bauxite Supply	Percentage of Bauxite Supply
		%		%		%
	(in thousand tonnes, except percentages)					
Own mines[(1)]	20,498.3	46.4	28,140.0	63.5	29,640.0	65.4
Other suppliers	23,723.2	53.6	16,204.3	36.5	15,690.0	34.6
Total	44,221.5	100.0	44,344.3	100.0	45,330.0	100.0

(1) Including the bauxite supplied by the Boffa mine in Guinea since 2020.

Own Mines. As of December 31, 2022, we owned and operated 14 mines in China that had approximately 147.40 million tonnes of aggregate bauxite reserves. In addition, we own Boffa mine in Guinea, which had approximately 98.08 million tonnes of total bauxite reserves as of December 31, 2022. In 2020, 2021 and 2022, we extracted approximately 17.2 million tonnes, 16.0 million tonnes, and 14.6 million tonnes respectively, of bauxite from our domestic mines. In addition, in 2021 and 2022, we extracted approximately 12.3 million tonnes and 13.6 million tonnes of bauxite from the Boffa mine, respectively. We continue to explore new bauxite reserves to replenish our reserves. Please refer to "– Our Mines" for further details of our own bauxite mines.

Other Suppliers. In addition to our mines, we also source bauxite from other suppliers. The majority of other domestic suppliers are small independent mines. Small independent mines are not affiliated with us and generally have annual bauxite production capacities not exceeding 200,000 tonnes. These mines have been one of the sources of bauxite for our operations. We purchase bauxite directly from small independent mines or through local distributors that procure bauxite from these mines. In addition, we also secure a portion of bauxite overseas. In 2022, bauxite secured from other suppliers accounted for approximately 34.6% of our total bauxite supply, primarily because our demand for bauxite exceeded the production of our mines.

Bauxite Procurement. The production and quality management department at our headquarters is responsible for the oversight and coordination of our supply of bauxite in general. The sales and marketing department is responsible for management and coordination of procurement of imported bauxite. To determine how our bauxite requirement will be allocated among our principal sources each year, we first estimate our total bauxite needs for the year. Based on market conditions, production costs and other factors, we determine the amount of bauxite that we wish to source from our mines, and the remaining requirements from other suppliers.

Alumina-to-Silica Ratio. The production method for alumina refining is determined by the mineral composition of the bauxite, in particular, its alumina-to-silica ratio. Most of the bauxite reserves in China are diasporic with low alumina-to-silica ratios. Based on our current technology and economic considerations, an efficient application of the Bayer process requires bauxite with an alumina-to-silica ratio of 4.5:1 or higher, while the Bayer-sintering process can refine bauxite with an alumina-to-silica ratio as low as 4:1. In 2022, the average alumina-to-silica ratio of the proven and probable reserves of our mines ranges from approximately 4.62:1 to 41.14:1.

Prices. There is neither governmental regulation on bauxite prices nor an official trading market for bauxite in China. We negotiate bauxite prices with our suppliers based on ore quality, mining costs, market conditions, transportation costs and various governmental taxes or levies, including a resource tax imposed by local governments. Our total bauxite cost is currently influenced by the following factors:

- the cost of mining;
- the market conditions relating to purchases from small independent mines; and
- the market conditions relating to purchases from overseas.

The average purchase price of bauxite per tonne from our other suppliers in 2022 increased by approximately 4.8% to RMB405.31 compared to 2021, primarily because of the shortage of bauxite resources in certain areas in China, which led to a higher price. The average cost of bauxite per tonne from our own mines is mainly related to the cost of our bauxite mining operations and transportation costs. In 2022, the average cost of bauxite per tonne from our own mines was RMB287.04, which remained stable compared to that of 2021.

We purchase a substantial amount of bauxite to satisfy our alumina production needs. Additionally, to fully utilize the bauxite from our mines, we refine all bauxite that meets the minimum technical requirements for our production of alumina. We also purchase higher-grade ore from other suppliers and blend the ore of various grades to meet the technical requirements for our alumina production. This practice allows for flexibility and the inclusion of lower-grade bauxite to optimize the use of bauxite deposits available to us.

Primary Aluminum

An average of approximately 1.90 tonnes of alumina and 13,376 kWh of electricity was required to produce one tonne of primary aluminum ingots in 2022.

Alumina and electricity, the two principal components of costs in the smelting process, accounted for approximately 35% and 37%, respectively, of our unit primary aluminum production costs in 2022. Apart from alumina and electricity, we also require carbon anodes, carbon cathodes, fluoride salt and cryolite for our smelting operations.

Alumina is the main raw material used in the production of primary aluminum. Our primary aluminum plants that do not have integrated alumina refining operations onsite obtain alumina internally from our alumina plants located elsewhere or externally on the market.

Our Mines

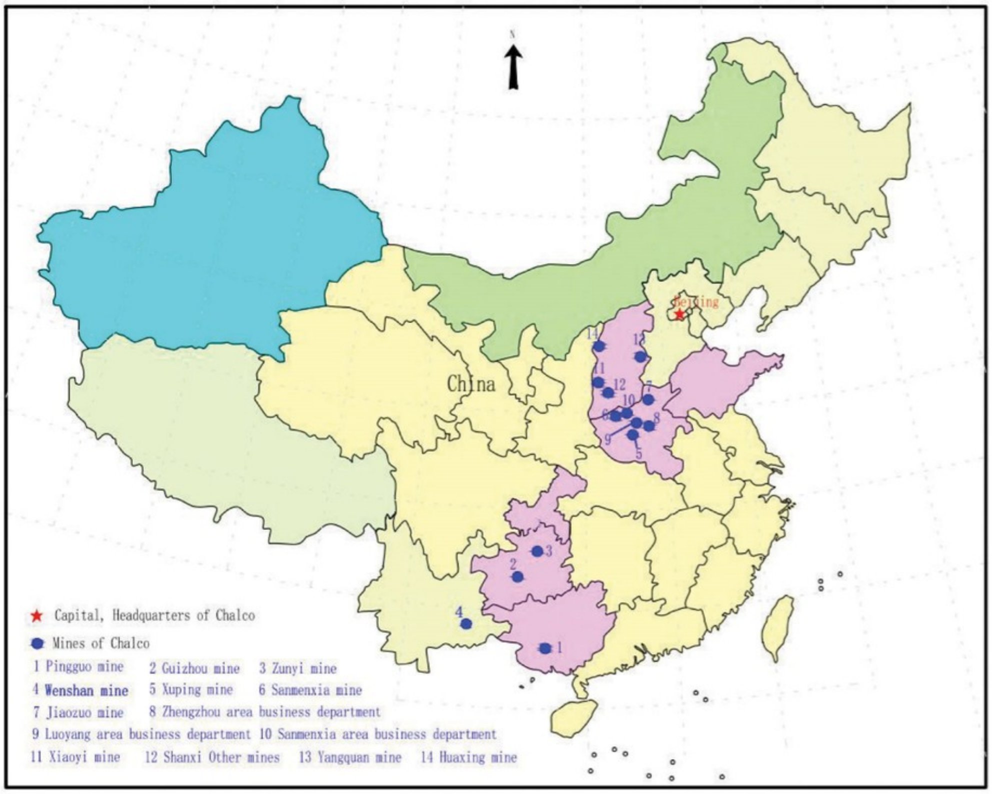
Overview of Our Mining Properties and Operations

As of December 31, 2022 and up to the date of this annual report, our mining operations are primarily related to bauxite mines and also cover certain coal mines.

Bauxite Mines

As of December 31, 2022, we owned and operated 14 bauxite mines in China and one bauxite mine in Guinea. In accordance with the requirements of Regulation S-K 1300, we consider our Boffa mine in Guinea as the sole mining property that is material to our business. Please refer to "– D. Property, Plants and Equipment – Boffa Mine" for more details of Boffa mine and refer to Exhibit 96.1 for the technical report summary that has been prepared for Boffa mine in accordance with Regulation S-K 1300 and Item 601(b)(96) of Regulation S-K, or the Technical Report Summary, in our amended annual report on Form 20-F/A for the year ended December 31, 2021 filed with the SEC on August 31, 2022.

The following map shows the locations of our 14 bauxite mines in China.



Bauxite Mines in China

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The following table sets forth information for our bauxite mines as of December 31, 2022 and the annual production for the three years ended December 31, 2022:

Mine	Location	Amount of ownership intersests and Operator	Mining method	Mining Permit[1]		Exploration Permit[1]		Stage	Bauxite Production (in Thousand tonnes)			Processing plants and facilities [2]
				Mining permit renewal	Area (km²)	Exploration permit renewal	Area (km²)		2020	2021	2022	
Pingguo mine	Guangxi Zhuang Autonomous Region, China	100% owned and operated by Chalco (Guangxi branch)	Open pit	March 2024 – April 2036	232.38	November 2026 –January 2027	73.64	Partially production and partially exploration	5,806	5,531	5,517	Washing and crushing system
Guizhou mine[4]	Guizhou Province, China	100% owned and operated by Chalco (Guizhou branch)	Open pit/underground	October 2024 – December 2038	32.97	N/A	N/A	Partially production	2,000	1,962	1,850	Crushing system
Zunyi mine	Guizhou Province, China	Owned and operated by Zunyi Aluminum, a 67.45% subsidiary of Chalco	Open pit/underground	July 2026 – May 2032	18.28	January 2023 – June 2027	4.05	Partially production and partially exploration	1,003	1,004	1,098	Crushing system
Xuping mine	Henan Province, China	100% owned and operated by Chalco (Zhongzhou Aluminum)	Open pit/underground	May 2019 – September 2031	34.63	N/A	N/A	Production	277	168	65	Crushing system
Sanmenxia mine	Henan Province, China	100% owned and operated by Chalco (Zhongzhou Aluminum)	Underground	May 2025 – February 2035	13.03	N/A	N/A	Production	507	170	287	Crushing system
Jiaozuo mine	Henan Province, China	100% owned and operated by Chalco (Zhongzhou Aluminum)	Open pit/underground	October 2014 – October 2024	9.3	N/A	N/A	Production	388	335	166	Crushing system
Zhengzhou branch[5]	Henan Province, China	100% owned and operated by Chalco (Chalco Mining)	Open pit/underground	June 2021– June 2032	56.39	N/A	N/A	Production	853	922	623	Crushing system
Luoyang branch[5]	Henan Province, China	100% owned and operated by Chalco (Chalco Mining)	Open pit/underground	December 2024 – October 2031	7.30	July 2017 – March 2027	29.59	Partially production and partially exploration	753	741	329	Crushing system
Sanmenxia branch[5]	Henan Province, China	100% owned and operated by Chalco (Chalco Mining)	Open pit/underground	December 2020 – October 2031	14.53	February 2021 – February 2026	5.51	Partially production and partially exploration	400	337	447	Crushing system
Xiaoyi mine	Shanxi Province, China	100% owned and operated by Chalco (Shanxi New Material[6])	Open pit	May 2023 – September 2031	24.67	N/A	N/A	Production	499	999	597	Crushing system
Shanxi Other Mines	Shanxi Province, China	100% owned and operated by Chalco (Shanxi New Material[6])	Open pit/underground	September 2017 – July 2035	44.76	July 2013- August 2027	17.95	Partially production and partially exploration	1,523	1,135	1,585	Crushing system
Yangquan mine	Shanxi Province, China	100% owned and operated by Chalco (Chalco Shandong)	Open pit	September 2031 – May 2036	5.78	N/A	N/A	Production	426	429	79	Crushing system
Huaxing mine	Shanxi Province, China	100% owned and operated by Chalco (Shanxi Huaxing)	Underground	September 2020[3] – August 2022	17.44	November 2021 – December 2027	13.49	Partially production and partially exploration	2,768	2,278	1,769	Crushing system
Boffa mine[7]	Boffa, Guinea	Owned and operated by Chalco Guinea Company S.A., an 85% subsidiary of Chalco	Open pit	July 2018 – July 2033	1,248.16	N/A	N/A	Production	8,062	12,303	13,550	Various facilities [7]
Wenshan mine	Yunnan Province, China	Owned and operated by Yunnan Wenshan Aluminum Co., Ltd., an 29.10% subsidiary of Chalco	Open pit	September 2021 – March 2028	18.64	September 2010 – March 2028	353.02	Partially production and partially exploration	162	144	166	Crushing system
Total					**1,778.26**		**497.25**		**25,427**	**28,458**	**28,128**	

(1) All conditions to retain our properties or leases have been fulfilled as of December 31, 2022. Each mine may be covered by one or more mining permits and/or exploration permits and the range of permit renewal dates is set forth above.

(2) We have modern facilities at our bauxite mines in China, which were designed by professional PRC mine design institutes and adhere to international standards. Our bauxite mines are either open pit or underground. Our bauxite mines generally have mining offices and transportation facilities that have access to local roads and highways. In addition, we utilize advanced heavy equipment such as bulldozers and scrapers. All of our mining facilities in China are connected to the local or regional electric power grids. Our mining facilities are also connected to reliable water sources, all of which were sufficient for the requirements of each individual mine. For details of the processing plants and other available facilities for these mines, see "– Principal Facilities."

(3) We are in the process of renewing these permits.

(4) Including both Guizhou No. 1 mine and Guizhou No. 2 mine throughout this annual report.

(5) To enhance our mine management system and improve management efficiency and coordination, in 2022, Sanmenxia area business department was renamed as Sanmenxia branch; Luoyang area business department was renamed as Luoyang branch; Zhengzhou area business department was renamed as Zhengzhou branch. These new names are used throughout this annual report.

(6) As disclosed in "– C. Organizational Structure," Chalco does not own 100% ownership interests of Shanxi New Material. Nevertheless, Chalco holds the permits for 100% interests of Xiaoyi mine and Shanxi Other Mines while Shanxi New Material is the operator of these mines.

(7) The mining right of Nanchuan mine was voluntarily cancelled by us in December 2022 after government approval due to economic considerations.

(8) For details of our sole individually material mining property, Boffa mine, please refer to "– D. Property, Plants and Equipment – Boffa Mine."

For the years ended December 31, 2020, 2021 and 2022, we extracted approximately 17.2 million tonnes, 16.0 million tonnes and 14.6 million tonnes, respectively, of bauxite from our domestic mines. In addition, in 2021 and 2022, we extracted approximately 12.3 million tonnes and 13.6 million tonnes of bauxite from the Boffa mine, respectively. The decrease in the volume of bauxite extracted from our domestic mines in 2022 was primarily because of the depletion of some mine resources. The increase in the volume of bauxite extracted from Boffa mine in 2022 was primarily because Boffa mine further increased its production capacity in 2022.

We hold the requisite mining permit for three bauxite mines (i.e. PT ALUSENTOSA, PT KALMIN and PT VISITAMA) in West Kalimantan, Indonesia through our 96.28% owned subsidiary, PT Nusapati Prima. Our bauxite deposits in Indonesia are lateritic gibbsite and were formed by weathering and leaching of aluminum-rich silicate rock in tropical climates. We have suspended our bauxite mining in Indonesia since September 2014 due to restraints on export of bauxite imposed by the Indonesian government. Since 2017, the Indonesian government has issued, and amended from time to time, relevant rules pursuant to which export of bauxite may be allowed upon satisfaction of certain requirements. We have been actively exploring the possibility of meeting these requirements. However, Indonesia plans to stop the exports of bauxite in June 2023. We do not expect to engage in exploration, development or production of bauxite on PT ALUSENTOSA, PT KALMIN or PT VISITAMA mines in the near future.

We are required to obtain mining rights permits to conduct mining activities. Under PRC laws and regulations, a mining enterprise must prepare and submit exploration reports for a mine to the local government to obtain a mining rights permit for a mine. A mining right owner is also permitted to lease the mining right through a lease arrangement. The mining rights permit is subject to renewal on a regular basis.

Furthermore, the mining right owner is required to obtain land use rights on the land in order to operate the mines. We lease the land use rights relating to our mines in China from Chinalco pursuant to a land use rights lease agreement that became effective upon our formation. Chinalco's land use rights relating to over 90% of our mining properties in China are for 50-year terms beginning on July 1, 2001. The remaining land use rights relating to other mines in China are for shorter terms, some as short as one year. All of our land use rights lease agreements end on the expiry date of the mining rights or the end of the working life of the mine, whichever is earlier. Both the land use rights and land use rights lease agreements are renewable.

The following table sets forth our capital expenditures for our bauxite mines for the periods indicated:

	Year Ended December 31,		
	2020	2021	2022
		(RMB in thousands)	
Capital Expenditures			
Infrastructure construction	831,375.0	279,536.0	961,253.0 (1)
Facility upgrade	—	—	—
Total	831,375.0	279,536.0	961,253.0

(1) The increase in capital expenditures on infrastructure construction in 2022 were primarily attributable to payment for two completed projects (Boffa project and Guangxi Jiaomei mine project).

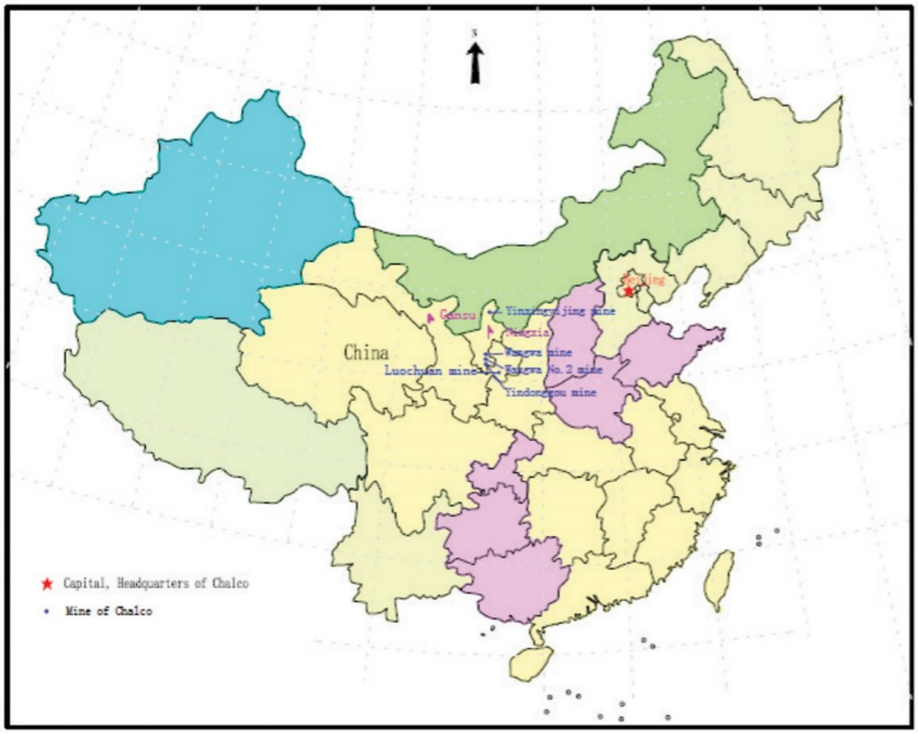
Coal Mines

As of December 31, 2022, our non-wholly owned subsidiaries owned and operated five coal mines in China.

We completed the acquisition of 70.82% of the equity interest in Ningxia Energy in January 2013, which holds mining rights or exploration rights for certain coal deposits in Ningxia Autonomous Region. The coal mines directly owned and operated by Ningxia Energy include Wangwa mine, Wangwa No.2 mine and Yindonggou mine. In addition, Ningxia Energy holds 50% of interest in Ningxia Yinxing Coal Industry Co., Ltd., which owns and operates Yinxingyijing mine. As the other 50% owner of in Yinxingyijing mine does not participate in its operation, Ningxia Energy is able to control its operation and consolidate its financial statements. Each of Wangwa mine, Wangwa No.2 mine, Yindonggou mine and Yinxingyijing mine is an underground thermal coal mine in extraction stage. The operations at these coal mines are powered by electricity from local power grids and are accessible by public roads. For the year ended December 31, 2022, Ningxia Energy incurred capital expenditures of approximately RMB624 million on infrastructure construction.

We acquired 70% of the equity interest in Gansu Huayang in March 2011, which holds exploration rights for a portion of Luochuan mine in Gansu Province. We renewed the exploration permit in 2020, which will expire in October 2025. We are in the process of applying for the exploration permit for the rest of Luochuan mine. Luochuan mine is an underground mine. We have completed the exploration but have not commenced development of Luochuan mine.

The following map shows the locations of five coal mines of our subsidiaries in China.



Coal Mines in China

The following table sets forth information for five coal mines owned and operated by our subsidiaries as of December 31, 2022 and the annual production for the three years ended December 31, 2022:

Mine	Location	Amount of ownership and Operator	Mining method	Mining Permit/ Exploration Permit	Area (km²)	Coal Production (in thousand tonnes)				Processing plants and facilities
						Stage	2020	2021	2022	
Wangwa mine	Ningxia Autonomous Region, China	Owned and operated by Ningxia Energy, a 70.82% subsidiary of Chalco	Underground	October 2021 – November 2046	23.97	Production	3,953.2	1,792.8	4,307.4	Coal preparation plant with capacity of 12 million tonnes/year
Wangwa No.2 mine	Ningxia Autonomous Region, China	Owned and operated by Ningxia Energy, a 70.82% subsidiary of Chalco	Underground	October 2021 – June 2031	8.72	Production	2,913.6	2,977.2	3,408.4	Coal preparation plant with capacity of 12 million tonnes/year
Yindonggou mine	Ningxia Autonomous Region, China	Owned and operated by Ningxia Energy, a 70.82% subsidiary of Chalco	Underground	July 2016 – July 2036	2.79	Production	2,254.6	1,580.8	1,250.2	Coal preparation plant with capacity of 12 million tonnes/year
Yinxingyijing mine	Ningxia Autonomous Region, China	Owned and operated by Ningxia Yinxing Coal Industry Co., Ltd., 50% subsidiary of Ningxia Energy	Underground	February 2018 – February 2048	60.42	Production	2,081.0	1,890.5	4,046.2	Coal preparation plant with capacity of four million tonnes/year
Luochuan mine	Gansu Province, China	Owned and operated by Gansu Huayang, a 70% subsidiary of Chalco	Underground	October 2020 – October 2025	260.13	Exploration	—	—	—	N/A
Total					**356.03**		**11,202.4**	**8,241.3**	**13,012.2**	

In addition to the coal mines above, as of December 31, 2022, we held minority interests in certain other coal mines owned or operated by our joint ventures and associates, including Xuehugou Coal Industry Co., Ltd., Huasheng Wanjie Coal Co., Ltd., Guizhou Yuneng Mining Co., Ltd., Shanxi Jiexiu Xinyugou Coal Industry Co., Ltd., Qinghai Province Energy Development (Group) Co., Ltd., Shaanxi Chengcheng Dongdong Coal Co., Ltd., Guizhou Chalco Hengtaihe Mining Co., Ltd. (formerly known as Chalco Liupanshui Hengtaihe Mining Co., Ltd.) and Huozhou Coal Group Xingshengyuan Coal Co., Ltd. The coal mines owned or operated by these joint ventures and associates are individually and collectively immaterial to our business operations and financial condition. The mineral resources and mineral reserves of these coal mines are not available.

Our Mineral Resources and Reserves

Our estimates of mineral resources and mineral reserves have been prepared in accordance with the disclosure requirements of Regulation S-K 1300.

With respect to our bauxite mines, we, through CINF Engineering Co., Ltd., engaged Mr. Shengfa Tu, a fellow of Australasian Institute of Mining and Metallurgy, as the qualified person as defined under Regulation S-K 1300. Mr. Tu is not our employee. He is an external consultant of CINF Engineering Co., Ltd., a wholly-owned subsidiary of China Aluminum International Engineering Corporation Limited, in which our controlling shareholder Chinalco owns 73.56% interests. The scientific and technical information concerning our mineral resources and mineral reserves of bauxite mines in this annual report has been reviewed and approved by Mr. Tu. In addition, with respect to Boffa mine, our sole individually material mining property, Mr. Tu has prepared the Technical Report Summary in accordance with Regulation S-K 1300 and Item 601(b)(96) of Regulation S-K, filed as Exhibit 96.1 to our amended annual report on Form 20-F/A for the year ended December 31, 2021 filed with the SEC on August 31, 2022.

With respect to our coal mines, we engaged Mr. Wen Chen, a member of Geological Society of China, as the qualified person as defined under Regulation S-K 1300. Mr. Chen is not our employee. He is employed by Ningxia Coal Mine Geological Bureau, which is a non-profitable organization not affiliated with us. The scientific and technical information concerning our mineral resources and mineral reserves of coal mines in this annual report has been reviewed and approved by Mr. Chen.

For discussion of risks associated with our estimates of mineral resources and mineral reserves, please refer to "Item 3. Key Information – D. Risk Factors – Estimates of mineral reserves and mineral resources are uncertain and the volume and grade of minerals actually extracted may vary from our estimates."

As used in this annual report, the terms "mineral resource," "measured mineral resource," "indicated mineral resource," "inferred mineral resource," "mineral reserve," "proven mineral reserve" and "probable mineral reserve" are defined and used in accordance with Regulation S-K 1300. In addition, all disclosure of mineral resources and reserves in this annual report is only for the portion of the resources or reserves attributable to Chalco's interest in the mining properties.

Summary of Mineral Resources

A "mineral resource" is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade, or quality and quantity that there are reasonable prospects for eventual economic extraction. A mineral resource is a reasonable estimate of mineralization, taking into account relevant factors such as cut-off grade, likely mining dimensions, location or continuity, that, with the assumed adjustifiable technical and economic conditions, is likely to, in whole or in part, become economically extractable. It is not merely an inventory of all mineralization drilled or sampled. A "measured mineral resource" is a resource for which the quantity and grade are estimated from detailed, closely spaced sampling, and geologic characterization that defines the size, shape, depth and mineral content to a high degree of confidence. An "indicated mineral resource" is a resource for which quantity and grade are estimated from information similar to that used for measured mineral resources where the samples are farther apart, and the geological characterization is adequate. An "inferred mineral resource" is a resource for which quantity and grade are estimated from information similar to that used for measured and indicated mineral resources, but with limited geological evidence and sampling. Inferred mineral resource grade and mineralization continuity have a lower degree of confidence. Accordingly, no assurance can be given that the estimated mineral resources not included in mineral reserves will become proven and probable mineral reserves. The measured, indicated, and inferred resource figures presented herein are estimates based on information available at the time of calculation and are exclusive of reserves.

The following table sets forth certain estimated details of the measured, indicated and inferred resources, exclusive of mineral reserves, for our bauxite mines as of December 31, 2022:

	Measured Resources				Indicated Resources				Measured and Indicated Resources				Inferred Resources			
Mine	**Tonnage** ***(in million tonnes)***	**Al_2O_3** ***(%)***	**SiO_2** ***(%)***	**A/S(1)**	**Tonnage** ***(in million tonnes)***	**Al_2O_3** ***(%)***	**SiO_2** ***(%)***	**A/S(12)**	**Tonnage** ***(in million tonnes)***	**Al_2O_3** ***(%)***	**SiO_2** ***(%)***	**A/S(12)**	**Tonnage** ***(in million tonnes)***	**Al_2O_3** ***(%)***	**SiO_2** ***(%)***	**A/S(1)**
Pingguo mine	1.86	52.28	4.11	12.72	2.43	49.79	3.77	13.21	4.29	50.87	3.92	12.99	3.01	50.70	4.27	11.87
Guizhou mine	/	/	/	/	0.00	60.82	9.24	6.58	0.00	60.82	9.24	6.58	68.59	65.81	7.71	8.53
Zunyi mine	0.07	63.55	13.41	4.74	0.68	6.52	0.96	6.76	0.75	11.68	2.09	5.59	10.01	57.97	9.12	6.35
Wenshan mine	3.76	49.97	7.63	6.55	3.73	48.14	9.18	5.24	7.49	49.06	8.40	5.84	9.54	49.89	9.31	5.36
Xuping mine	0.13	68.71	11.85	5.80	3.25	64.51	12.78	5.05	3.38	64.67	12.75	5.07	8.54	63.06	12.25	5.15
Sanmenxia mine	0.73	66.34	10.04	6.61	5.11	65.48	11.28	5.81	5.84	65.58	11.12	5.90	9.46	67.12	10.01	6.71
Jiaozuo mine	/	/	/	/	/	/	/	/	/	/	/	/	0.41	63.83	12.51	5.10
Zhengzhou branch	/	/	/	/	1.87	66.44	9.97	6.66	1.87	66.44	9.97	6.66	11.22	64.25	12.16	5.28
Luoyang branch	3.46	63.27	12.42	5.09	9.17	63.38	13.00	4.88	12.63	63.35	12.84	4.93	9.57	63.16	13.25	4.77
Sanmenxia branch	2.39	63.25	11.93	5.30	6.40	64.12	12.50	5.13	8.79	63.88	12.34	5.17	11.02	64.11	12.46	5.15
Xiaoyi mine	/	/	/	/	0.33	65.41	11.30	5.79	0.33	65.41	11.30	5.79	5.64	64.89	12.33	5.26
Shanxi Other Mines	1.22	64.80	12.60	5.14	3.26	64.05	12.63	5.07	4.48	64.26	12.62	5.09	26.03	65.08	12.49	5.21
Yangquan mine	/	/	/	/	0.02	61.35	13.28	4.62	0.02	61.35	13.28	4.62	1.64	59.57	12.35	4.82
Huaxing mine	7.81	61.40	7.45	8.24	30.07	61.03	6.87	8.88	37.88	61.11	6.99	8.74	21.59	61.62	7.06	8.73
Boffa mine(2)	44.51	39.34	1.02	38.41	66.22	39.07	0.90	43.22	110.73	39.18	0.95	41.14	1,535.77	39.02	1.09	35.93
Total	**65.94**				**132.54**				**198.48**				**1,732.04**			

(1) Refers to the ratio of average grade of Al_2O_3 to the average grade of SiO_2 of the reserves.

(2) Alumina for the Boffa mine is stated as available alumina (AAl_2O_3) and Silica is stated as reactive silica ($RSiO_2$). For details of Boffa mine, please refer to "– D. Property, Plants and Equipment – Boffa Mine."

(3) Estimation of mineral resources of our bauxite mines other than Boffa mine is based on the following per tonne price, which is the five-year average sales price of bauxite from the respective mines between 2018 and 2022: RMB300-320 for Pingguo mine, RMB300-350 for Guizhou mine and Zunyi mine, RMB350-450 for Wenshan mine, RMB400-450 for Yangquan mine, RMB450-500 for Xuping mine, Sanmenxia mine, Jiaozuo mine, Sanmenxia branch and Luoyang branch, RMB500-550 for Zhengzhou branch, Xiaoyi mine, Shanxi Other Mines and Huaxing mine. Since each of these mines may contain multiple mining areas for which the qualified person used slightly different prices when estimating the mineral resources of different areas, the prices above are stated as a range. The point of reference selected by the qualified person is the point where bauxite is delivered to ore storage yard and available for use by alumina refineries.

(4) The mining right of Nanchuan mine was voluntarily cancelled by us in December 2022 after government approval due to economic considerations.

The following table sets forth certain estimated details of the measured, indicated and inferred resources, exclusive of mineral reserves, for our four coal mines as of December 31, 2022:

	Measured Resources			Indicated Resources			Measured and Indicated Resources			Inferred Resources		
Mine[1]	Tonnage	Heat Value (MJ/kg)	Coal ash (%)	Tonnage	Heat Value *(MJ/kg)*	Coal ash *(%)*	Tonnage	Heat Value *(MJ/kg)*	Coal ash *(%)*	Tonnage	Heat Value *(MJ/kg)*	Coal ash (%)
	(in ten thousand tonnes)			*(in ten thousand tonnes)*			*(in ten thousand tonnes)*			*(in ten thousand tonnes)*		
Wangwa mine	1,791.40	24.85	16.10 %	921.57	24.85	16.10 %	2,712.97	24.85	16.10 %	7,001.05	24.85	16.10 %
Wangwa No.2 mine	2,376.28	26.11	12.98 %	414.65	26.11	12.98 %	2,790.93	26.11	12.98 %	2,620.26	26.11	12.98 %
Yindonggou mine	121.68	24.5	18.52 %	21.19	24.5	18.52 %	142.87	24.5	18.52 %	1,190.38	24.5	18.52 %
Yinxingyijing mine	780.03	25.04	10.95 %	729.80	25.04	10.95 %	1,509.82	25.04	10.95 %	26,041.27	25.04	10.95 %
Total	**5,069.39**			**2,087.21**			**7,156.60**			**36,852.95**		

(1) Measured, indicated and inferred resources for Luochuan mine are not available because it is still in exploration stage.

(2) Estimation of mineral resources in this table is based on RMB460, RMB465, RMB483 and RMB517 per tonne of coal for Wangwa mine, Wangwa No.2 mine, Yindonggou mine and Yinxingyijing mine, respectively. Such prices are the respective average selling price of coal extracted from these mines during 2022. The point of reference selected by the qualified person is the point where raw coal mined from the coal mines can be saleable product after being washed by the supporting coal preparation plant.

Summary of Mineral Reserves

A "mineral reserve" is an estimate of tonnage and grade or quality of indicated and measured mineral resources that, in the opinion of the qualified person, can be the basis of an economically viable project. More specifically, it is the economically mineable part of a measured or indicated mineral resource, which includes diluting materials and allowances for losses that may occur when the material is mined or extracted. The term "economically viable," as used in the definition of reserve, means that the qualified person has analytically determined that extraction of the mineral reserve is economically viable under reasonable investment and market assumptions.

The term "proven reserves" means the economically mineable part of a measured mineral resource and can only result from conversion of a measured mineral resource. The term "probable reserves" means reserves for which quantity and grade are computed from information similar to that used for proven reserves, but the sites for sampling are farther apart or are otherwise less closely spaced. The degree of assurance, although lower than that for proven reserves, is high enough to assume continuity between points of observation. Our proven and probable reserves include bauxite or coal attributable to our ownership or economic interest.

Proven and probable mineral reserves were determined from the application of relevant modifying factors to geological data, in order to establish an operational, economically viable mine plan. The proven and probable reserve figures presented herein are estimates based on information available at the time of calculation. No assurance can be given that the indicated levels of recovery of bauxite or coal will be realized. Reserve estimates may require revision based on actual production. Market fluctuations in the price of aluminum and coal, as well as increased production costs or reduced metallurgical recovery rates, could render certain proven and probable reserves containing higher cost uneconomic to exploit and might result in a reduction of reserves.

The following table sets forth details of proven and probable reserves for our bauxite mines as of December31, 2022:

Mine	Proven Mineral Reserves				Probable Mineral Reserves				Total Mineral Reserves			
	Tonnage (in million tonnes)	Al_2O_3 (%)	SiO_2 (%)	A/S[(1)]	Tonnage (in million tonnes)	Al_2O_3 (%)	SiO_2 (%)	A/S[(1)]	Tonnage (in million tonnes)	Al_2O_3 (%)	SiO_2 (%)	A/S[(1)]
Pingguo mine	14.53	51.85	5.19	9.98	26.61	52.04	5.27	9.87	41.14	51.98	5.24	9.91
Guizhou mine	5.77	63.03	9.54	6.61	26.61	66.73	7.90	8.45	32.38	66.07	8.19	8.07
Zunyi mine	1.73	58.82	10.69	5.50	3.73	62.06	9.84	6.31	5.46	61.04	10.11	6.04
Wenshan mine	0.46	46.72	10.11	4.62	1.06	50.84	9.65	5.27	1.52	49.60	9.79	5.07
Xuping mine	/	/	/	/	0.96	62.89	11.84	5.31	0.96	62.89	11.84	5.31
Sanmenxia mine	20.09	62.13	13.12	4.73	3.52	61.35	15.27	4.02	23.61	62.01	13.44	4.61
Jiaozuo mine	0.19	63.56	12.17	5.22	0.06	60.49	13.00	4.65	0.25	62.84	12.36	5.08
Zhengzhou branch	4.83	64.19	13.83	4.64	6.09	63.92	12.56	5.09	10.92	64.04	13.12	4.88
Luoyang branch	1.75	63.41	13.61	4.66	0.66	63.19	14.27	4.43	2.41	63.35	13.79	4.59
Sanmenxia branch	0.08	63.54	13.88	4.58	4.07	61.86	15.28	4.05	4.15	61.89	15.25	4.06
Xiaoyi mine	0.21	65.94	11.62	5.68	6.45	65.00	12.90	5.04	6.66	65.03	12.86	5.06
Shanxi Other Mines	3.93	64.93	13.25	4.90	11.43	62.76	13.73	4.57	15.36	63.32	13.61	4.65
Yangquan mine	/	/	/	/	1.00	58.34	13.96	4.18	1.00	58.34	13.96	4.18
Huaxing mine	0.38	58.47	10.49	5.57	1.20	58.92	10.38	5.68	1.58	58.81	10.40	5.65
Boffa mine[(2)]	35.85	38.95	1.09	35.82	62.24	38.68	0.96	40.48	98.08	38.78	1.00	38.64
Total	**89.79**				**155.69**				**245.49**			

(1) Refers to the ratio of average grade of Al_2O_3 to the average grade of SiO_2 of the reserves.

(2) Alumina for the Boffa mine is stated as available alumina (AAl_2O_3) and Silica is stated as reactive silica ($RSiO_2$). For details of Boffa mine, please refer to "– D. Property, Plants and Equipment – Boffa Mine."

(3) Estimation of mineral resources of our bauxite mines other than Boffa mine is based on the following per tonne price, which is the five-year average sales price of bauxite from the respective mines between 2018 and 2022: RMB300-320 for Pingguo mine, RMB300-350 for Guizhou mine and Zunyi mine, RMB350-450 for Wenshan mine, RMB400-450 for Yangquan mine, RMB450-500 for Xuping mine, Sanmenxia mine, Jiaozuo mine, Sanmenxia branch and Luoyang branch, RMB500-550 for Zhengzhou branch, Xiaoyi mine, Shanxi Other Mines and Huaxing mine. Since each of these mines may contain multiple mining areas for which the qualified person used slightly different prices when estimating the mineral resources of different areas, the prices above are stated as a range. The point of reference selected by the qualified person is the point where bauxite is delivered to ore storage yard and available for use by alumina refineries.

(4) The mining right of Nanchuan mine was voluntarily cancelled by us in December 2022 after government approval due to economic considerations.

The following table sets forth details of proven and probable reserves for our four coal mines as of December 31, 2022:

Mine[(1)]	Proven Mineral Reserves			Probable Mineral Reserves			Total Mineral Reserves		
	Tonnage	Heat Value (MJ/kg)	Coal ash (%)	Tonnage	Heat Value (MJ/kg)	Coal ash (%)	Tonnage	Heat Value (MJ/kg)	Coal ash (%)
	(in ten thousand tonnes)			(in ten thousand tonnes)			(in ten thousand tonnes)		
Wangwa mine	10,326.10	24.85	16.10 %	6,381.03	24.85	16.10 %	16,707.13	24.85	16.10 %
Wangwa No.2 mine	7,050.52	26.11	12.98 %	1,454.54	26.11	12.98 %	8,505.06	26.11	12.98 %
Yindonggou mine	2,920.23	24.5	18.52 %	508.49	24.5	18.52 %	3,428.73	24.5	18.52 %
Yinxingyijing mine	3,120.10	25.04	10.95 %	2,919.19	25.04	10.95 %	6,039.29	25.04	10.95 %
Total	**23,416.95**			**11,263.26**			**34,680.21**		

(1) Proven and probable reserves for Luochuan mine are not available because it is still in the exploration stage.

(2) Estimation of mineral reserves in this table is based on RMB460, RMB465, RMB483 and RMB517 per tonne of coal for Wangwa mine, Wangwa No.2 mine, Yindonggou mine and Yinxingyijing mine, respectively. Such prices are the respective average selling price of coal extracted from these mines during 2022. The point of reference selected by the qualified person is the point where raw coal mined from the coal mines can be a saleable product after being washed by the supporting coal preparation plant.

Internal Controls over the Mineral Reserves and Mineral Resources Estimation Process

We have internal controls over the mineral reserves and mineral resources estimation processes that are able to reach reasonable and reliable estimates aligned with industry practice and reporting regulations, which includes (i) a quality control and quality assurance plan, and (ii) verification of analytical procedures.

With respect to quality control and quality assurance, we engage third-party professional technical firms to conduct the mineral exploration and mineral resources estimation, the results of which are evaluated by internal and external experts. The conversion of mineral resources into mineral reserves is determined by third-party professional consulting firms based on feasibility studies or pre-feasibility studies, or supported by mine production data. The estimates of mineral resources and mineral reserves by third-party professional firms will first be reviewed by Chalco’s internal experts, and then reviewed and confirmed by the qualified person to ensure the reliability of mineral reserves and mineral resources estimation results. The annual report and results of mineral reserve and resources estimation of coal mines are also filed with the Department of Natural Resources of the local government.

The verification of analytical procedures is entrusted to third-party qualified firms. The fundamental analysis of the samples is carried out by a certified laboratory. During the analysis, standard samples were used for quality control. At the same time, duplicate samples were taken according to the ratio of 7% to 10% by such laboratory. In each batch of analysis samples, 3% to 5% of the samples are taken and sent to another certified laboratory for external inspection and analysis, and standard samples are also used for quality control during external inspection and analysis.

These controls and other measures help to validate the reasonableness of the estimates of our mineral resources and mineral reserves. However, estimates could change due to a number of factors, including future changes in permitting requirements, geological conditions, ongoing mine planning, macroeconomic and industry conditions, and regulatory disclosure requirements. The industry risks to which estimates are subject include risks related to metal prices, metallurgical performance and geological modeling. Please refer to “Item 3. Key Information – D. Risk Factors – Estimates of mineral reserves and mineral resources are uncertain and the volume and grade of minerals actually extracted may vary from our estimates” for a discussion of risks inherent in our estimates of mineral resources and mineral reserves.

Mine Safety Disclosure

We have been in compliance with the PRC National Mining Safety Law and related rules and regulations in China. We closely supervise and routinely inspect mining conditions with continual implementation of safety measures and procedures at our own bauxite mines and safety trainings for our mining personnel. For our Boffa mine, we strictly abide by the mining convention with the Guinean government and Guinean laws and regulations relating to mining. We continuously screen, identify and control safety hazards and regularly organize safety trainings for our personnel. In 2022, we extracted approximately 14.6 million tonnes of bauxite from our domestic mines and approximately 13.6 million tonnes of bauxite from the Boffa mine. We did not experience any mining operation-related accidents that involved serious work injuries or death.

Supplemental Materials, Electricity and Fuel

The sales and marketing department at our headquarters coordinates and manages our supply chain for all our major raw materials in conjunction with the procurement center at each production facility, which manages the logistics and inventory of raw materials locally. We are able to purchase diesel, the main fuel used by our mining and manufacturing equipment, from the public markets, and we source our water from local rivers, lakes or underground sources.

Alumina

Electricity, coal, alkali (caustic soda or soda ash) and natural gas are the principal materials and energy used in our alumina production. Electricity is one of the principal cost components in our refining process. We generate electricity at a number of alumina refineries and meet our remaining electric power requirements through purchasing from regional power grids at government-mandated rates or directly from power generation enterprises. Most of our power supply agreements have a term of one year and are renewed by mutual agreement. Power prices in China can vary, sometimes substantially, from one region to another, based on demand and power production costs in the region. Power costs for our various alumina refineries vary accordingly.

Large quantities of coal are used as a reducing agent and fuel to produce steam and gas in the alumina refining process. See "– B. Business Overview – Our Mines" for details of coal mines of which we own majority or minority interests. By investing in coal mining enterprises and acquiring mining rights for coal deposits, we plan to partially offset our future energy costs.

Alkali is used as a supplemental material in alumina refining. The Bayer-sintering process and the Bayer-sintering combined process require soda ash while caustic soda is used in the Bayer process. Our alumina refineries use natural gas and coal gas as fuel to refine alumina. There is no governmental regulation of the prices of coal, alkali or fuel. We purchase these raw materials from external suppliers under negotiated supply contracts, which we believe are competitively priced. We have not experienced difficulty in obtaining these materials in sufficient quantity and at acceptable prices.

Primary Aluminum

Electricity, carbon anodes and cathodes are the principal materials and energy used in our smelting process. Smelting primary aluminum requires a substantial and continuous supply of electricity. The availability and price of electricity are key factors in our primary aluminum production. See "Item 5. Operating and Financial Review and Prospects - A. Operating Results - Overview - Factors Affecting Our Results of Operations - Manufacturing Costs."

We generate electricity at four of our smelters to supply a portion of the electricity consumed by these smelters. We meet our remaining electric power requirements through purchasing directly from power generation enterprises. As of December 31, 2022, ten of our smelters had direct purchase arrangements with power generation enterprises and the rest of our smelters were in the negotiation process for the renewal of direct purchase arrangements. In 2022, direct purchase transactions were organized by the local government. Starting from January 1, 2022, direct purchase transactions have been carried out based on the relevant rules and regulations in different regions. Because power prices in China vary from one region to another, power costs for our various smelters could vary substantially. The average electricity cost (including tax) of our smelters increased by 16% from 2021 to 2022.

Carbon anodes and cathodes are key raw materials in the smelting process. We are generally able to manufacture carbon anodes necessary for the operations of our smelters. In addition, our Qinghai branch possesses production capacity of carbon cathodes and is able to manufacture carbon cathodes products.

Sales and Marketing

We coordinate substantially all of our marketing activities for our self-produced alumina products and some of our self-produced primary aluminum products through Chalco Trading Group. Our subsidiaries and branches sell some of our self-produced primary aluminum products directly to external customers. For domestic sales, our alumina refineries sell our self-produced chemical alumina products through Chalco Trading Group for external trading. For international sales, our self-produced chemical alumina products are sold to Chalco Trading Group through Chinalco New Materials Co., Ltd. and Chalco Trading Group is responsible for subsequent external trading. For all of our self-produced products that are sold either through Chalco Trading Group for subsequent external sale or directly to external customers, our subsidiaries and branches play an important role in providing after-sale services and strengthening our presence in the marketplace. Since late 2009, we have also been engaged substantially in the trading of non-ferrous metal products including alumina, primary aluminum, copper, zinc and lead, as well as coal products that we source from third-party suppliers through Chalco Trading Group, or previously Chalco Trading.

Alumina

We sell our self-produced alumina to external customers primarily through Chalco Trading Group, giving priority to customers with whom we have long-standing relationships and who have established a strong credit history, after reserving sufficient alumina for our forecasted primary aluminum production. In 2022, we supplied approximately 12.4 million tonnes of alumina produced at our alumina refineries to our smelters, which represented approximately 70.4% of our total alumina production, and sold the remainder to our customers. In addition, we also procure and sell outsourced alumina under long-term agreements or on the spot market through Chalco Trading Group. We sold approximately 0.28 million tonnes of outsourced alumina in 2022.

The sales prices of alumina that our alumina refineries sell internally to Chalco Trading Group are determined based on our budgeted sale prices, spot market prices and the prices of primary aluminum on SHFE. Chalco Trading Group coordinates the external negotiation and execution of sales contracts of our alumina products. Chalco Trading Group sells our self-produced alumina and alumina sourced from third-party suppliers to customers throughout China. Most of our major customers in the past three years have been domestic smelters. We primarily sourced alumina from third-party suppliers on the spot market, and we are normally required to pay the full price of the outsourced alumina before each delivery.

Chalco Trading Group sells our self-produced alumina and outsourced alumina under spot sales agreements and long-term sales agreements with terms ranging from one year to three years. Our long-term sales agreement for alumina normally sets forth the quantity of alumina to be sold by us in each month and each year, the price determination mechanism, payment method, place of delivery and delivery method. Places of delivery under our sales agreements are arranged to be where we could efficiently manage the transportation of alumina and help reduce logistics cost. Our customers are normally required to pay for their procurement before each delivery. As a result, the spot price of alumina and fluctuations of primary aluminum prices on the SHFE affect the alumina prices at which we sell.

Chalco Trading Group sets the price for the external sales of alumina products after taking into account the following factors:

- international and domestic supply-demand situation;
- CIF Chinese ports prices for alumina imports into China and other relevant import expenses;
- international and domestic alumina transportation costs;
- effects of the PRC government’s policies on raw materials required by our alumina refineries; and
- our short-term and mid-term projections for alumina prices.

Primary Aluminum

We sell all of our self-produced and outsourced primary aluminum to domestic customers. We expect China to remain our key market for primary aluminum for the foreseeable future. Customers of our primary aluminum products principally consist of aluminum fabricators and distributors that resell our primary aluminum products to aluminum fabricators or other purchasers.

To improve the efficiency of our distribution, we divide our China market into the following regions: southern China (including Guangdong and Fujian Provinces); eastern China (including Jiangsu and Zhejiang Provinces and Shanghai Municipality); southwestern China (including Sichuan Province and Chongqing Municipality); the Beijing-Tianjin-Tanggu area; and central China. In general, we purchase products from our nearest smelter to minimize transportation costs.

Our primary aluminum smelting subsidiaries and branches sell a portion of our primary aluminum output directly to external customers. Each of our smelters is normally responsible for the sale of products to the customers from neighboring markets, negotiating the pricing and delivery terms based on market conditions.

Our primary aluminum smelting subsidiaries and branches also sell a portion of our primary aluminum output internally to Chalco Trading Group at prices based on the spot prices of primary aluminum on Yangtze or Nanchu. We establish pricing guidelines for Chalco Trading Group to conduct external domestic sales of our self-produced primary aluminum products, taking into account four main factors: the primary aluminum spot prices and futures price on the SHFE; spot prices in the regions of eastern China and southern China; our production costs and expected profit margins; and supply and demand. Chalco Trading Group then coordinates the external sales of primary aluminum. Chalco Trading Group sells our self-produced primary aluminum products to external customers through the following three channels:

- Contract sales. Most of our primary aluminum sales are made pursuant to contracts entered into directly with our long-standing customers. The terms for our sales contracts for primary aluminum are typically one year. We price our primary aluminum products based on the SHFE prices and spot market prices for primary aluminum.
- Sales on the SHFE. As part of our effort to manage market risk, we sell a portion of our primary aluminum products on the SHFE through futures contracts with terms ranging from one month to 12 months to hedge against declines in primary aluminum prices.
- Sales on the spot market. We also sell our primary aluminum products on the spot market at prices with reference to various factors, such as market spot prices and transportation costs.

In addition, we also procure and sell outsourced primary aluminum on the spot market or through short-term futures and options transactions. We determine our sales prices of the outsourced primary aluminum through negotiations with our customers, taking into consideration factors including our procurement prices and prevailing market conditions. We sold approximately 4.24 million tonnes of outsourced primary aluminum in 2022.

Chemical Alumina Products and Gallium

Chemical alumina products are derived from our alumina production. We adjust our production of these products based on market demand. Our alumina refineries sell our chemical alumina products directly to external customers or indirectly to external customers through Chalco Trading Group for subsequent external trading. We sell most of our chemical alumina products in China. Prices for our chemical alumina products are determined through negotiations with our customers, taking into consideration the market conditions.

In addition, in the process of refining bauxite into alumina, we produce gallium as a by-product. We adjusted our production of gallium based on market demand. Prices for our gallium were determined through negotiations with our customers, taking into consideration the market conditions.

Coal

Ningxia Energy sells a portion of its self-produced coal directly to external customers through short-term contracts at prices determined through negotiations with our customers, taking into consideration factors including our procurement prices and prevailing market conditions. Ningxia Energy consumes the rest of its self-produced coal at its own electric power plant.

In addition, we also procure and sell outsourced coal under long-term agreements or on the spot market through Chalco Trading Group. We sold approximately 2.07 million tonnes of outsourced coal in 2022.

Trading of Outsourced Non-ferrous Metal Products and Other Materials

Since late 2009, we have been actively engaged in the trading of alumina and primary aluminum sourced from third-party suppliers. Please see "– Alumina" and "– Primary Aluminum" for more details. Through Chalco Trading Group, we also sell other non-ferrous metal products such as copper, zinc and lead as well as coal products that we procure from our third-party suppliers to external customers on the spot market or under long-term sales agreements. Please see "– Coal." In 2022, we sold approximately 0.2 million tonnes of outsourced electrolytic copper, copper concentrate and zinc. In addition, we also sell outsourced raw and ancillary materials such as iron ore, charred coal and cathode copper in bulk to customers such as steel manufacturers and copper processing companies on the spot market.

Chalco Trading Group has a team with trading expertise to conduct research on the markets of non-ferrous metal products and other materials. From time to time, we may enter into futures and options transactions to hedge against price fluctuations in the non-ferrous metal product market.

Delivery

We rely on rail shipping and trucks for the delivery of products within China.

Our alumina is transported by rail or trucks, and transportation costs are generally borne by our customers and excluded from our sales prices. For long-distance deliveries, we maintain spur lines connecting our plants to the national railway routes.

Our molten aluminum is delivered to our customers primarily by trucks. Other primary aluminum products are primarily transported by rail or trucks. Our coal products are transported both by trucks or rail.

Rail shipping on the PRC national railway system is subject to government mandated pricing.

Principal Facilities

Our principal facilities include 23 principal production plants and our Zhengzhou Institute. Set forth below is a description of our principal production plants.

Guangxi Branch

Our Guangxi branch commenced operations in 1994 and is located in Guangxi Zhuang Autonomous Region in southwestern China, an area rich in bauxite reserves. Our Guangxi branch obtains bauxite delivered via highway from our Pingguo mine, one of our wholly-owned mines, located less than 17 kilometers from our Guangxi branch.

Our Pingguo mine contains large, easily exploitable bauxite reserves with high alumina-to-silica ratios. Our Guangxi branch is our only principal refinery that exclusively uses the Bayer process. With technology and production equipment imported from Europe, the Guangxi refinery features a relatively high level of automation and energy efficiency. Since its inception, we have continually increased the designed production capacity at this branch by overcoming production bottlenecks and capacity expansions. Guangxi branch had an annual alumina production capacity of approximately 2,210,000 tonnes as of December 31, 2022. In 2022, our Guangxi branch produced approximately 2,357,059 tonnes of alumina, along with approximately 186,726 tonnes of chemical alumina products.

Guizhou Branch

Our Guizhou branch commenced its smelting operations in 1966 and was subsequently expanded to include alumina refining operations in 1978. Our Guizhou branch used 160Ka and 230Ka pre-bake reduction pot-lines in its primary aluminum production. The smelter in our Guizhou branch has undergone technological innovations and overhauls since its inception. Since November 2017, we have been engaged in the gradual closing down of the 160Ka pre-bake reduction pot-lines and, subsequently, the closing down of the 230Ka pre-bake reduction pot-lines. As of January 2018, the production in our Guizhou branch had been fully shut down. In 2019, we disposed of the primary aluminum production facilities in our Guizhou branch. Our Guizhou branch did not have any annual primary aluminum production capacity as of December 31, 2022 and did not produce any primary aluminum in 2022. It was mainly engaged in bauxite mining and production of aluminum alloys in 2022. As of December 31, 2022, our Guizhou branch had an annual aluminum alloy production capacity of approximately 348,000 tonnes. In 2022, our Guizhou branch produced approximately 244,901 tonnes of aluminum alloy products.

Chalco Mining

Chalco Mining was incorporated as one of our subsidiaries in the PRC in 2007 and is currently our wholly-owned subsidiary. To optimize the allocation of our resources and further consolidate our operations, we transferred all of the assets and liabilities of our Henan branch to Chalco Mining in August 2017. Our Henan branch commenced its alumina refining operation in 1966 and primary aluminum smelting operation in 1967 (the latter of which was ceased in 2013) in Henan Province, a province rich in bauxite reserves. It was the first refinery in China to develop the Bayer-sintering combined process. Bauxite is delivered to Chalco Mining via railway and highway from our following mines: Zhengzhou branch located in Zhengzhou, Luoyang branch in Luoyang and Sanmenxia branch in Mianchi. The alumina production line that we put into operation at Chalco Mining uses the ore-dressing Bayer process, which we developed to refine low alumina-to-silica ratio bauxite. Chalco Mining's production facilities have been substantially upgraded with equipment imported from Germany and Denmark. The refinery has also benefited from its access to high alumina-to-silica ratio bauxite from certain of our mines and through purchases on the market. Chalco Mining had an annual alumina production capacity of approximately 2,410,000 tonnes as of December 31, 2022. In 2022, Chalco Mining produced approximately 1,358,109 tonnes of alumina and 65,179 tonnes of chemical alumina products.

Chalco Shandong

Chalco Shandong was incorporated as one of our subsidiaries in the PRC in 2015 and is currently our wholly-owned subsidiary. The predecessor of Chalco Shandong was our Shandong branch, which commenced operations in 1954. Chalco Shandong produces alumina and chemical alumina products. Its alumina refinery was China's first production facility for alumina. It produces its alumina through the Bayer-sintering process and the Bayer process. Through technology renovation, Chalco Shandong has the capacity to produce high-quality alumina products used for the production of refined aluminum and high-purity aluminum. Chalco Shandong obtains bauxite supplies primarily from extractions of our Boffa mine in 2022. Chalco Shandong had an annual alumina production capacity of approximately 2,270,000 tonnes as of December 31, 2022. It produced approximately 1,549,551 tonnes of alumina in 2022.

In addition, Chalco Shandong produces a substantial amount of chemical alumina products. In 2022, it produced approximately 2,596,428 tonnes of chemical alumina products. It is the largest and most technologically advanced production facility for chemical alumina products in China with the ability to produce a wide variety of chemical alumina products.

Qinghai Branch

Located in Qinghai Province, our Qinghai branch is a stand-alone primary aluminum production facility. This branch commenced operations in 1987 and was one of the most technologically advanced primary aluminum smelters in China. It operates 180Ka and 210Ka automated pre-bake anode reduction pot-lines that were developed domestically. In addition, our Qinghai branch also possesses production capacity of carbon cathodes and is able to manufacture carbon cathodes products. Our Qinghai branch benefits from relatively low electricity costs in Qinghai Province due to the hydroelectric power stations in the region. The Qinghai branch sources alumina from Shanxi New Material, Chalco Shandong, Chalco Mining and Zhongzhou Aluminum and incurs higher transportation costs for both raw materials and its primary aluminum products than our other branches.

Our Qinghai branch had an annual primary aluminum production capacity of approximately 400,000 tonnes as of December 31, 2022. It produced approximately 402,080 tonnes of primary aluminum in 2022.

Guizhou Huaren

Established in May 2017 and located in Qingzhen, Guizhou Province, Guizhou Huaren is a stand-alone primary aluminum production facility that commenced full operation in September 2018. Guizhou Huaren had an annual primary aluminum production capacity of approximately 400,000 tonnes as of December 31, 2022. It produced approximately 401,362 tonnes of primary aluminum products in 2022.

Shanxi Zhongrun

Established in November 2015 and located in Lvliang, Shanxi Province, Shanxi Zhongrun specializes in producing primary aluminum products. The first batch of electrolytic cells of Shanxi Zhongrun was put into operation in May 2018, and Shanxi Zhongrun was fully put into operation in December 2020. Shanxi Zhongrun had an annual primary aluminum production capacity of approximately 497,000 tonnes as of December 31, 2022. It produced approximately 487,042 tonnes of primary aluminum products in 2022.

Zhongzhou Aluminum

Located in Henan Province, Zhongzhou Aluminum is a stand-alone alumina plant, located near abundant bauxite, coal and water supplies. Zhongzhou Aluminum was incorporated as one of our subsidiaries in the PRC in 2015 and is currently our wholly-owned subsidiary. The predecessor of Zhongzhou Aluminum was our Zhongzhou branch. Zhongzhou Aluminum commenced operations in 1993 and is equipped with imported and self-developed technology and has undergone various improvements and upgrades, in particular to its Bayer-sintering process and Bayer process. Zhongzhou Aluminum obtains bauxite supplies partly from extractions of our mines, including Boffa mine, and partly from external suppliers in Henan Province and overseas.

Zhongzhou Aluminum started implementing a flexible production arrangement since November 11, 2022 due to the decrease in the price of alumina products and the increase in the price of raw materials. Zhongzhou Aluminum had an annual alumina production capacity of approximately 3,050,000 tonnes as of December 31, 2022. Zhongzhou Aluminum produced approximately 1,776,299 tonnes of alumina and approximately 1,159,351 tonnes of chemical alumina products in 2022.

Chongqing Branch

Our Chongqing branch is located in Chongqing. Our Chongqing branch completed the construction of alumina production facilities in 2010 and its annual alumina production capacity was approximately 800,000 tonnes as of December 31, 2022. We have suspended production in our Chongqing branch since July 2014 due to the relatively significant decrease in the price of alumina as compared with the price of alumina during the construction period, large negative variation of mineral resources and the high costs of natural gas and other energy. In 2018, we entered into agreements with a third party to lease the alumina production facilities of Chongqing branch and to cooperate on mine operations, respectively. We no longer lease alumina production facilities to such third party since December 2022.

Guangxi Huasheng

Established in June 2017 and located in Fangchenggang, Guangxi Province, Guangxi Huasheng is mainly engaged in producing alumina products and was put into production in the third quarter of 2020. Guangxi Huasheng had an annual alumina production capacity of approximately 2,000,000 tonnes as of December 31, 2022. Guangxi Huasheng produced approximately 2,167,859 tonnes of alumina in 2022.

Guizhou Huajin

Established in July 2014 and located in Qingzhen, Guizhou Province, Guizhou Huajin specializes in producing alumina products. Guizhou Huajin had an annual alumina production capacity of approximately 1,600,000 tonnes as of December 31, 2022. Guizhou Huajin produced approximately 1,631,095 tonnes of alumina in 2022.

Shanxi Huaxing

Located in Shanxi Province, Shanxi Huaxing is a stand-alone alumina plant which commenced trial production in October 2013. Shanxi Huaxing obtains bauxite supplies from our own mines delivered primarily via highway.

In December 2015, we transferred out 50% of our equity interests in Shanxi Huaxing, a then wholly-owned subsidiary of our Company, through the Shanghai United Assets and Equity Exchange. In December 2018, we acquired the 50% equity interests in Shanxi Huaxing through the Shanghai United Assets and Equity Exchange from Baotou Transportation Investment Group Co., Ltd. Upon completion of the acquisition, Shanxi Huaxing became our wholly-owned subsidiary. Please see "- A. History and Development of the Company - Transfer of Equity Interest in Shanxi Huaxing" for more details about the transfer of equity interest.

Shanxi Huaxing had an annual alumina production capacity of approximately 2,000,000 tonnes as of December 31, 2022. Shanxi Huaxing produced approximately 2,089,209 tonnes of alumina products in 2022.

Lanzhou Aluminum

Located in Lanzhou city in Gansu Province, Lanzhou Aluminum is a stand-alone primary aluminum plant. In April 2007, we acquired a primary aluminum plant in Lanzhou, which was divided into two parts in July 2007: our Lanzhou branch and Northwest Aluminum. In January 2019, we turned the Lanzhou branch into our wholly-owned subsidiary, Lanzhou Aluminum, in order to promote its business vitality. Lanzhou Aluminum's designed annual primary aluminum production capacity was approximately 420,000 tonnes as of December 31, 2022. It produced approximately 428,489 tonnes of primary aluminum in 2022.

Shanxi New Material

Shanxi New Material is situated in Shanxi Province. In March 2003, we established the joint venture company, Shanxi Huaze, with Jinneng Holding Shanxi Power to commence the construction of a primary aluminum production facility. In 2017, we contributed certain assets related to alumina production of our Shanxi branch to Shanxi Huaze. Upon completion of our asset contribution, our shareholding in Shanxi Huaze increased from 60% to 85.98% and Shanxi Huaze was renamed to Shanxi New Material. Shanxi New Material had an annual alumina production capacity of approximately 2,600,000 tonnes as of December 31, 2022. Shanxi New Material suspended its alumina production capacity of approximately 105 million tonnes since July 2022 due to the decrease in the price of alumina products and the increase in the price of raw materials. Shanxi New Material produced approximately 1,391,095 tonnes of alumina and 194,412 tonnes of chemical alumina products in 2022. Its designed annual production capacity of primary aluminum was approximately 420,000 tonnes as of December 31, 2022 and it produced approximately 428,232 tonnes of primary aluminum in 2022. Please see "– A. History and Development of the Company – Merger and Reorganization of Shanxi Branch and Shanxi Huaze" for more details about the reorganization.

Zunyi Aluminum

Zunyi Aluminum is situated in Guizhou Province. In 2018, we merged Zunyi Alumina into Zunyi Aluminum. Upon the completion of the merger, our shareholding in Zunyi Aluminum increased from 62.1% to 67.45%. After the merger, Zunyi Aluminum had an annual alumina production capacity of approximately 1,000,000 tonnes as of December 31, 2022 and the aggregate production of Zunyi Aluminum was approximately 1,095,434 tonnes of alumina and 8,574 tonnes of chemical alumina products in 2022. Its post-merger designed annual production capacity of primary aluminum was approximately 360,000 tonnes as of December 31, 2022 and it produced approximately 414,478 tonnes of primary aluminum in 2022. Please see "– A. History and Development of the Company – Merger and Reorganization of Zunyi Alumina and Zunyi Aluminum" for more details about the merger.

Fushun Aluminum

Fushun Aluminum is situated in Liaoning Province and was a stand-alone primary aluminum plant. In March 2006, we entered into a share transfer agreement with Liaoning Fushun Aluminum Plant to acquire 100% of the equity interests in Fushun Aluminum for a consideration of RMB500 million. Fushun Aluminum's primary business was the production of primary aluminum and carbon products. We stopped production of primary aluminum in Fushun Aluminum in October 2015 due to the relatively significant decrease in the price of primary aluminum and high costs of electricity at that time. In 2018, we disposed of the primary aluminum production facilities in Fushun Aluminum. Fushun Aluminum did not have any annual primary aluminum production capacity as of December 31, 2022 and did not produce any primary aluminum in 2022.

Fushun Aluminum had an annual anode carbon production capacity of approximately 530,000 tonnes as of December 31, 2022 and it produced approximately 335,000 tonnes of baked carbon anodes in 2022.

Shandong Huayu

Shandong Huayu is situated in Shandong Province and is a stand-alone primary aluminum plant. We currently hold 55% equity interest in Shandong Huayu. Since November 2018, we have gradually suspended production of aluminum at Shandong Huayu due to market environment and production restriction for environmental protection. In 2019, we halted its primary aluminum production and before that Shandong Huayu produced approximately 8,500 tonnes of primary aluminum in 2019. In October 2020, Shandong Huayu agreed to transfer its primary aluminum capacity quota of 135,000 tonnes to Yunnan Aluminum through judicial auction at a consideration of RMB538.66 million. Shandong Huayu also transferred its primary aluminum capacity quota of 65,000 tonnes to Shanxi Zhongrun. Shandong Huayu ceased its primary aluminum production in 2019 and Shandong Huayu had no production capacity for primary aluminum in 2022. The supporting facilities and coal-fired generators of Shandong Huayu are being disposed of.

Gansu Hualu

Gansu Hualu is situated in Gansu Province and was a stand-alone primary aluminum plant. In August 2006, we entered into a share transfer agreement with Baiyin Nonferrous Metal (Group) Co., Ltd. ("Baiyin Nonferrous") and Baiyin Ibis Aluminum Co., Ltd. ("Baiyin Ibis"). Baiyin Nonferrous contributed 127,000 tonnes of primary aluminum smelting and supporting facilities owned by Baiyin Ibis as capital contribution and holds a 49% equity interest in Gansu Hualu. We hold a 51% equity interest in Gansu Hualu. Since November 2015, the production of primary aluminum has been suspended. In 2019, most of the primary aluminum production facilities in Gansu Hualu were disposed and the rest were disposed in 2020. Gansu Hualu had no annual primary aluminum production capacity as of December 31, 2022 and did not produce any primary aluminum in 2022.

In addition, Gansu Hualu also possesses production capacity of carbon products. Its designed annual production capacity of anode carbon products was approximately 150,000 tonnes as of December 31, 2022 and it produced approximately 100,000 tonnes of anode carbon products in 2022.

Baotou Aluminum

Baotou Aluminum is located in the Inner Mongolia Autonomous Region and is a stand-alone primary aluminum plant. On December 28, 2007, through A Shares issuance and exchange for Baotou Aluminum shares, we acquired 100% of the equity interest of Baotou Aluminum. Baotou Aluminum is currently our wholly-owned subsidiary. In April 2015, Baotou Aluminum and Baotou Transportation Investment Group Co., Ltd. established Inner Mongolia Huayun. Inner Mongolia Huayun commenced operations in 2017. Together with the primary aluminum production facilities at Inner Mongolia Huayun, Baotou Aluminum had a consolidated annual primary aluminum production capacity of approximately 1,290,000 tonnes as of December 31, 2022 and a consolidated output of approximately 1,324,996 tonnes of primary aluminum in 2022.

Liancheng Branch

Our Liancheng branch is located in Gansu Province. In late May 2008, we acquired 100% of the equity interest in Liancheng Longxing Aluminum Company Limited from Chinalco on the China Beijing Equity Exchange and subsequently turned it into our Liancheng branch which specializes in producing primary aluminum. We have implemented a flexible production arrangement for certain primary aluminum production facilities in our Liancheng branch since November 2018 as a result of high electricity costs. In March 2022, the original electrolyzer of Liancheng Branch was renovated for energy saving purpose, and after completion of the renovation in September 2022, all the production technical indicators were greatly improved. Our Liancheng branch had an annual primary aluminum production capacity of approximately 523,000 tonnes as of December 31, 2022. It produced approximately 292,380 tonnes of primary aluminum in 2022.

Ningxia Energy

Ningxia Energy is an integrated power generation company with coal mines located in Ningxia Autonomous Region. Its principal business includes conventional coal-fire power generation and renewable energy generation. Ningxia Energy was established in June 2003. In January 2013, we acquired an aggregate of 70.82% of the equity interest in Ningxia Energy. Ningxia Energy had a total installed capacity of 4459 MW as of December 31, 2022. It also operates coal mines located in the Ningxia Autonomous Region. Please see "– B. Business Overview – Our Mines." In 2022, Ningxia Energy produced approximately 13.0 million tonnes of coal and approximately 16.7 billion kWh of electricity.

Zhengzhou Institute

The Zhengzhou Institute, located in Zhengzhou, Henan Province, was incorporated as our subsidiaries in 2015. Its predecessor was established in August 1965 and has served as the center for our research and development efforts. The Zhengzhou Institute specializes in the research and development of technologies for primary aluminum smelting, alumina refining and the development of new products of chemical alumina. Zhengzhou Institute is the only professional research institute in China dedicated to the research and development of aluminum smelting technologies and has played a key role in bringing about technological innovations in China's aluminum industry. The Zhengzhou Institute was approved by the Ministry of Science and Technology of the PRC in 2003 to establish the National Research Center of Aluminum Refinery Technologies and Engineering. As of December 31, 2022, the Zhengzhou Institute had no production.

Xinghua Technology

We acquired a 66% equity interest in Xinghua Technology in December 2016. Located in Shanxi Province, Xinghua Technology is an alumina plant with an annual alumina production capacity of approximately 900,000 tonnes as of December 31, 2022. Xinghua Technology started implementing a flexible production arrangement since October 27, 2022 due to the decrease in the price of alumina products and the increase in the price of raw materials. It produced approximately 830,047 tonnes of alumina and approximately 11,892 tonnes of chemical alumina in 2022.

Yunnan Aluminum

We acquired a 10.04% equity interest in Yunnan Aluminum in December 2019. In July 2022, we entered into a shares transfer agreement and agreed to acquire shares representing approximately 19% of the total issued share capital of Yunnan Aluminum. The aforesaid shares transfer was completed in November 2022. The Company currently holds 29.10% equity interest in Yunnan Aluminum. Yunnan Aluminum's principal business is bauxite mining, alumina production, aluminum smelting, aluminum processing and aluminum anode carbon production and sales. Its main products include alumina, carbon and carbon products, primary aluminum, aluminum ingots for remelting, and aluminum products. It produced approximately 1,395,816 tonnes of alumina, 824,042 tonnes of carbon products, 2,700,391 tonnes of primary aluminum, 1,098,763 tonnes of aluminum ingots for remelting and 1,395,519 tonnes of aluminum products in 2022.

Competition

Competition from Domestic Competitors

Alumina

In 2022, we supplied approximately 71% of our total production of alumina to our own smelters and sold substantially all of the remaining self-produced alumina to our domestic customers. Our competitors mainly include other domestic and international alumina producers that conduct sales in China. In 2022, our alumina production (excluding chemical alumina products) represented approximately 22% of total domestic production in China.

We are a leading enterprise in the non-ferrous metal industry in China. As of December 31, 2022, 43 alumina producers in China (including Chalco) each had annual production capacity of 500,000 tonnes or above, which collectively represented approximately 98% of the total alumina production capacity in China, among which 35 alumina producers (including Chalco) each had annual production capacity of one million tonnes or above, which collectively represented approximately 92% of the total alumina production capacity in China. In order to improve the efficiency and competitiveness of the Chinese alumina industry as well as to protect the environment, MIIT published the Standard Conditions for Aluminum Industry in July 2013 and issued a new version in March 2020, which provides stringent standards for the existing alumina enterprises. Although we face competition from other domestic and international refineries, we have several advantages over such competitors, including:

- we have access to a substantial and stable supply of bauxite;
- we are experienced in alumina production and our production technologies are specifically adapted to the particular chemical composition of bauxite found in China;
- we have strong capabilities in technology research and hold certain proprietary technologies and patents; and
- we have a substantial workforce that has extensive experience in production and management.

Primary Aluminum

We derived all of our primary aluminum revenues from domestic sales in 2022. Our competitors include other domestic and international primary aluminum producers that conduct sales in China. In 2022, our primary aluminum production represented approximately 17% of total domestic production in China.

We are a leading enterprise in the non-ferrous metal industry in China. As of December 31, 2022, 35 primary aluminum producers in China (including Chalco) each had annual production capacity of 500,000 tonnes or above, which collectively represented approximately 63% of the total primary aluminum production capacity in China, among which eight primary aluminum producers (including Chalco) each had annual production capacity of one million tonnes or above, which collectively represented approximately 23% of the total primary aluminum production capacity in China. The PRC government encourages consolidation in the Chinese primary aluminum industry to create larger, more efficient producers that are better positioned to implement measures to reduce emissions. Moreover, according to the current Standard Conditions for Aluminum Industry and other administrative regulations, aluminum smelting enterprises must ensure the availability of resources, energy and water resources, and are encouraged to merge with hydropower, coal power and other power enterprises through reorganization. Alumina and electrolytic aluminum enterprises are required to comply with environmental laws, regulations and policies, and establish, implement and maintain an environmental management system.

Although we face competition from other domestic and international smelters, we have several advantages over such competitors, including:

- Scale of production. With nine primary aluminum smelters, we can achieve significant economies of scale. In addition, our scale of production enables us to achieve high production volumes to fill large customer orders and maintain a large customer base. Through our national distribution network, we are able to make timely deliveries to customers from our local warehouses.

- Technology. We believe we have a more sophisticated technological innovation system and stronger innovation capability than most of our domestic competitors. In terms of technological support and research and development capabilities, we are equipped with the advanced and integrated research and development institute within the aluminum industry in China and enjoy advantages over other domestic smelters in technology advancement.

- Vertical integration. As a leading integrated alumina and primary aluminum producer in China, we are able to supply alumina internally to our primary aluminum plants. As a result, we save on transportation, warehousing and related costs. In addition, because we operate our own alumina refineries, we are able to assure a stable supply of alumina for our primary aluminum smelting operations.

- Quality. We have maintained and will continue to improve on the high quality standards for our primary aluminum, which has satisfied national and industrial standards and customers' need.

The primary aluminum produced by most of our smelters satisfies the quality standards of the LME.

Competition from International Competitors

The tariff rate for alumina and primary aluminum imports remained zero in 2022. In 2022, China had a net import of approximately 0.98 million tonnes of alumina (with chemical alumina products included), a decrease from a net import of 3.21 million tonnes in 2021, primarily attributable to the substantial increase in the export of alumina resulting from difference between domestic and international prices of alumina. China had a net import of approximately 0.47 million tonnes of primary aluminum in 2022, compared to a net import of approximately 1.57 million tonnes of primary aluminum in 2021, primarily because of the year-on-year decrease in the import of primary aluminum resulting from difference between domestic and international prices of primary aluminum. We expect to continue to face competition from international large suppliers of alumina and primary aluminum which are large international companies.

Research and Development

Our research and development efforts over the years have facilitated the expansion of our production capacity and reduced our unit costs. We have successfully commercialized our previous research and development results in various technologies. In 2022, we completed 42 technological projects, including 26 special key science and technology projects and 16 science and technology application projects. In addition, we filed a total of 422 patent applications in 2022.

As of December 31, 2022, we owned 3,465 patents, which were primarily related to technologies and processes, equipment and new products. Once granted, a patent in China for an invention is valid for 20 years and for a utility model or a design 10 years from the date of the patent application. As of December 31, 2022, we owned 25 trademarks, each of which had a term of 10 years.

We do not regard any single patent, license, or trademark to be material to our sales and operations as a whole. We are not involved in any material intellectual property disputes.

Environmental Protection

Our operations are subject to PRC national and local environmental laws and regulations, including laws and regulations governing pollutant emissions, waste generation, treatment and disposal of hazardous materials, land reclamation and environmental issues associated with mining.

The pollutants discharged from our alumina refining process include red mud, waste water and gas emissions and particulates. Our primary aluminum production process generates fluorides, sulphur dioxide and particulates. It is illegal to release these pollutants untreated. The discharge of these pollutants after treatment must comply with national and local discharge standards.

Each of our alumina refineries, primary aluminum smelters and other production plants has its own waste treatment facilities onsite or has developed other methods to dispose of industrial waste in compliance with applicable environmental laws and regulations. Each of our production plants has established its environmental management system. All of our alumina refineries, primary aluminum smelters and carbon production plants passed the ISO14001 accreditations.

We have increased our energy efficiency by implementing new production techniques and technologies, upgrading our production facilities, optimizing our production process and enhancing our logistics and operations management. In 2022, we saved energy equivalent to 880,000 tonnes of standard coal as a result of implementing new production techniques and technologies, upgrading our production facilities, optimizing our production process and enhancing our logistics and operations management. We have established the industrial waste water recycling system. All of our aluminum smelting plants have achieved "zero discharge" of industrial waste water and 100% of the industrial waste water is reused for production after treatment.

In addition, we have focused on sustainable development of mine sites and achieved significant progress in mine reclamation. We reclaimed approximately 4.75 square kilometer of land throughout the year 2022, representing a cumulative reclamation rate of over 100% as of December 31, 2022.

Our total expenditures for maintaining compliance with environmental laws and regulations were RMB2,151 million, RMB1,583 million and RMB1,434 million for 2020, 2021 and 2022, respectively. In 2022, we did not have any major environmental pollution incidents.

Insurance

We maintain insurance coverage for our fixed assets such as plant, machinery, equipment, office facilities and transportation vehicles against accidents or natural disasters such as typhoons, hurricanes, floods, landslides and lightning strikes. However, there are certain types of losses, such as losses from war, acts of terrorism and nuclear radiation, for which we cannot obtain insurance at a reasonable cost or at all.

We are covered under the work-related injury insurance required by the relevant local government labor departments, and we have procured additional business accidental insurance for our employees. More extensive insurance is either unavailable in China or would impose a cost on our operations that would reduce our competitiveness.

Our insurance premiums were RMB38.6 million, RMB45.6 million and RMB49.6 million in 2020, 2021 and 2022, respectively.

Seasonality

Our business in general is not subject to seasonality. Separately, our bauxite output in the Boffa mine may be subject to seasonal fluctuations due to the rainy season in Guinea.

Cybersecurity

With respect to our internal internet policies on cybersecurity, we have established an information safety management system and issued internal regulations on cybersecurity, internal hardware and data safety systems and we are gradually implementing measures relating to the office environment information safety management, information system access control, protection from any malicious software, and internal review of information safety risks, in order to prevent loss of information due to cybersecurity incidents, network outages, etc. In 2022, we did not experience any material cybersecurity incidents or related losses.

Regulatory Overview

Producers of alumina and primary aluminum are subject to national industrial policies and relevant laws and regulations in areas of environmental protection, import and export, land use, foreign investment regulation and taxation. We are also subject to regulations relating to activities such as mining.

We are principally subject to governmental supervision and regulation by five agencies of the PRC government:

- the NDRC, which sets and implements the major policies concerning China's economic and social development, approves investments exceeding certain amounts, coordinates and improves the reform of the economic system;

- the Ministry of Natural Resources of China, which has the authority to grant land use rights and mining right permits;

- the MIIT, which formulates industrial policies and investment guidelines for all industries, including the aluminum industry;

- The Ministry of Ecology and Environment of China, which is responsible for supervision and administration of environmental protection in China; and

- the CSRC, the securities regulatory commission of China.

The following is a brief summary of the principal laws, regulations, policies and administrative directives to which we are subject.

Requirements for Capital Investments

Before March 31, 2023, any capital markets financing activities by an enterprise or company incorporated in the PRC such as those to finance capital projects, are subject to approval by the CSRC and/or other relevant authorities in China, regardless of whether the funds are raised in China or on the international capital markets. An issuer incorporated in the PRC must obtain prior approval from the CSRC for issuance of equity securities or equity-linked securities. On March 31, 2023, the Trial Administrative Measures of Overseas Securities Offering and Listing by Domestic Companies issued by the CSRC became effective, which allowed PRC domestic companies that seek listing in overseas markets to make a filing with the CSRC within 3 working days after its overseas issuance and listing application is submitted and such issuance and listing is completed, respectively.

Offering of corporate bonds in the PRC is also subject to supervision of the CSRC. A PRC-incorporated company that offers bonds outside the PRC shall file certain prescribed documents with the NDRC and obtain a registration certificate from the NDRC. For all overseas financing activities by an enterprise or company incorporated in the PRC, the issuer must register with and obtain prior approval from the administrative authorities of foreign exchange. Foreign investment in the exploring and mining of alumina and primary aluminum is permitted by the PRC government.

Standard Conditions for Aluminum Industry

The Standard Conditions for Aluminum Industry was issued by MIIT on July 18, 2013 and a new version was issued on February 28, 2020 to replace the 2013 version, which became effective on March 30, 2020. The new Standard Conditions for Aluminum Industry only applies to existing bauxite mining, alumina and primary aluminum enterprises and indicates that such standards do not constitute administrative approval or mandatory requirement. It provides that bauxite mining, alumina and primary aluminum production must comply with the state and local industry policies and overall plans on the mining resources and development of aluminum industry, as well as laws, regulations and policies related to the environmental protection, energy conservation, mining and production safety. According to the new Standard Conditions for Aluminum Industry, aluminum smelting enterprises must ensure the availability of resources, energy and water resources, and are encouraged to merge with hydropower, coal power and other power enterprises through reorganization. It further encourages that alumina enterprises use intelligent systems and equipment in their operations to achieve energy-conserving and environment-protective purposes. The new Standard Conditions for Aluminum Industry further set out guidelines and standards for enterprises in the aluminum industry regarding product quality, facilities, energy consumption, resources consumption, environmental protection, production safety and occupational disease prevention.

Under the Standard Conditions for Aluminum Industry, the MIIT shall, in accordance with the applicable regulatory standards, review the applicants and disclose the names of applicants that meet the regulatory conditions. The MIIT promulgated on April 4, 2014, January 4, 2015 and February 14, 2016, respectively, the first, the second and the third lists of enterprises that meet the Standard Conditions for Aluminum Industry of 2013. Most of our production branches and subsidiaries have met the Standard Conditions for Aluminum Industry of 2013 version and are included on these lists. According to the current Standard Conditions for Aluminum Industry, enterprises that would like to be named in the list under this new Standard Conditions for Aluminum Industry need to resubmit application for the MIIT’s review. The MIIT promulgated the first list of enterprises that meet the Standard Conditions for Aluminum Industry of 2020 version on January 5, 2021, which includes three of our production branches and subsidiaries. We are actively taking rectification measures to comply with the new Standard Conditions for Aluminum Industry and will participate in the subsequent applications.

Pricing

The PRC government does not impose any limitations with respect to the pricing of alumina, primary aluminum and related products. Thus, alumina and primary aluminum producers are free to set prices for their products. All the raw materials, supplemental materials and other supplies that we purchase are based on market prices. Freight transportation on the national railway system is subject to government mandated pricing.

Electricity Supply and Price

The National Energy Administration is responsible for the supervision and administration of the power industry in China. The NDRC and local governments regulate electricity pricing.

The Electric Power Law of China and related rules and regulations govern construction, generation, supply and consumption of electric power. Currently, China's state-owned power companies, through their respective local subsidiaries, operate all the regional power grids in China from which we obtain a part of our electricity requirements. In October 2007, the PRC government issued "Notice on Further Solutions of the Difference in Electricity Rates," according to which the preferential electricity prices originally enjoyed by Chinese primary aluminum enterprises have been gradually abolished. In December 2007, the PRC government issued "Notice of Eliminating Preferential Electricity Rate for High Energy Consuming Enterprises and Related Matters," which further eliminated the preferential electricity price arrangement enjoyed by Chinese primary aluminum enterprises. In December 2013, the NDRC and MIIT issued the "Circular on the Policies for Tiered Pricing of Electricity Used by Electrolytic Aluminum Enterprises", which became effective on January 1, 2014, to impose tiers of electricity prices on primary aluminum smelters. In March 2015, new policies and reforms relating to electricity generation, retail, usage, and other related sectors were introduced. Under "Several Opinions of the CPC Central Committee and the State Council on Further Deepening the Reform of the Electric Power System," a series of reforms relating to electricity pricing, distribution and retail segments, electricity trading, distributed generation, and other aspects has been put forward. In November 2015, NDRC and the National Energy Administration of the PRC jointly issued further supplemental measures, including "Implementation Opinions on Promoting Transmission-Distribution Price Reform," "Implementation Opinions on Promoting Power Market Construction," "Implementation Opinions on Establishing Power Trading Institutions and Their Normative Operation," "Implementation Opinions on Orderly Releasing Plans of Power Generation and Power Utilization," "Implementation Opinions on Promoting Power-Sales Side Reform," and "Guidance Opinions on Reinforcing and Regulating Supervision and Management of Coal-Fired Self-Generation Power Plants," which set out further requirements and implementation steps in relation to the reform of electric power systems. Towards the end of 2016, NDRC promulgated "Measures of Electricity Pricing for Transmission-Distribution Grid at the Provincial Level," which established a regulatory framework of electricity transmission and distribution pricing.

On August 26, 2021, NDRC further issued "Circular for Improvement of the Policies for Tiered Pricing of Electricity Used by Electrolytic Aluminum Enterprises," which came into effect on January 1, 2022. It provides that if the comprehensive alternating current consumption of molten aluminum is not higher than 13,650 kWh per ton, the electricity price will not be increased. If power consumption exceeds 13,650 kWh per ton, the electricity price will be increased by RMB0.01 per kWh for every additional 20 kWh. The grading standard will be lowered to 13,450 kWh in 2023 and further to 13,300 kWh in 2025, in each case excluding power consumed in the desulfurization process. In addition, it prohibits implementation of any preferential electricity price policies in the electrolytic aluminum industry.

On October 11, 2021, NDRC issued "Notice on Further Deepening the Market Reform of the Feed-in Tariff for Coal-fired Power Generation, which requires the orderly liberalization of the feed-in tariff for all coal-fired power generation and the expansion of the fluctuation range of the market trading tariff, resulting in a significant increase in our cost of electricity. In order to reduce the impact of electricity price increase, we have been actively participating in market trading with power generation enterprises with cost advantages, while carrying out energy saving and consumption reduction at the same time.

Regulations Concerning Imports and Exports of Alumina and Primary Aluminum

The MFN import duty on alumina and primary aluminum is 5.0% and MFN interim import duty is 0.0%. The export tariff on certain primary aluminum products has been 15% since August 1, 2007.

Environmental Protection Laws and Regulations

The Ministry of Ecology and Environment of China is responsible for supervision and administration of environmental protection in China. It formulates national environmental quality and discharge standards and monitors China's environmental system. Bureau of Ecology and Environment at the municipal level or above is responsible for environmental protection within its jurisdiction.

The Law on Environment Impact Assessment and relevant regulations require each enterprise to file an environmental impact report with the relevant Bureau of Ecology and Environment for approval before undertaking the construction of a new production facility or any major expansion or renovation of an existing production facility. New facilities built pursuant to this approval are not permitted to operate until the relevant environmental bureau has performed an inspection and concluded that the facilities are in compliance with environmental standards.

The Environmental Protection Law requires any facility that produces pollutants or other hazards to incorporate environmental protection measures in its operations and establish an environmental protection responsibility system. Such system includes adoption of effective measures to control and properly dispose of waste gases, waste water, waste residue, dust or other waste materials. Any entity that discharges pollution must register with the relevant environmental protection authority. Regulations on the Administration of Pollutant Discharge Permits became effective on March 1, 2021, pursuant to which enterprises that discharge pollutants need to obtain permits from relevant environmental authorities in accordance with the regulations.

Penalties for breaches of the Environmental Protection Law include warning, payment of damages and imposition of fines. Any entity undertaking a construction project that fails to install pollution prevention and control facilities in compliance with environmental standards for a construction project may be ordered to suspend production or operations or to cease operations and may be fined. Criminal liability may be imposed for a material violation of environmental laws and regulations that causes any significant loss of property or personal injuries or death.

On December 25, 2016, the PRC government promulgated the Environmental Protection Tax Law, which became effective from January 1, 2018 and was amended on October 26, 2018. The Environmental Protection Tax Law imposes environmental protection tax to enterprises, entities, producers or operators that discharge taxable pollutants into air, water or lands. Taxable pollutants include air pollutants, water pollutants, solid wastes and noises. The environmental protection tax is collected by the tax authority and levied in accordance with a table attached to the Environmental Protection Tax Law. However, emission of taxable pollutants into the centralized sewage and domestic waste treatment facilities, or storage or disposal of solid wastes in facilities or places that meet the national or local environmental protection standard, by enterprises, entities, producers or operators, is not deemed as direct emission of pollutants into the environment and is exempted from the environmental protection tax for such pollutants.

In April 2020, the PRC government promulgated the amended Law on Prevention and Control of Environmental Pollution Caused by Solid Waste. Effective on September 1, 2020, the amended law imposes stricter responsibilities on the entities that generate industrial solid waste for environmental pollution caused by industrial solid waste. For example, under the revised version, if an entity that generates industrial solid waste engages a third-party contractor to deliver, use or dispose such industrial solid waste, it shall verify the qualification of such third-party contractor and enter into an agreement with such third party on requirements for the environment pollution prevention, failing which the entity will be jointly liable for any damages to the environment caused by the third-party contractor in relation to such arrangement. In conjunction with the amendment of the Law on Prevention and Control of Environmental Pollution Caused by Solid Waste, the National Catalogue of Hazardous Wastes was revised in November 2020, which amended and reclassified some hazardous wastes.

On November 28, 2022, the Ministry of Ecology and Environment of China issued the Administrative Measures for the List of Key Entities Subject to Environmental Supervision, which became effective on January 1, 2023 and required the provincial and municipal government to formulate a list of key entities in accordance with the standards provided in this administrative regulation. Such key entities shall be subject to strict environmental supervision.

Mineral Resources Laws and Regulations

All mineral resources in China are owned by the state under the current Mineral Resources Law. Exploration, exploitation and mining operations must comply with the relevant provisions of the Mineral Resources Law and are under the supervision of the Ministry of Natural Resources. Exploration and exploitation of mineral resources are also subject to examination and approval by the Ministry of Natural Resources or relevant local authorities. Upon approval, the relevant administrative authorities, which are responsible for supervision and inspection of mining exploitation in their jurisdiction, will issue an exploration permit or mining permit. The holders of mining rights are required to file with the relevant administrative authorities annually.

The PRC government permits mine operators of collectively owned mines to exploit mineral resources in designated areas and individuals to mine scattered mineral resources. Such mine operators and individuals are subject to government regulation. Mining activities by individuals are restricted. Individuals are not permitted to exploit mineral reserves allocated for exploitation by a mining enterprise or company, or specified minerals prescribed by the state for protective mining. Indiscriminate mining that damages mineral resources is prohibited.

If mining activities result in damage to arable land, grassland or afforested area, the mining operator must take measures to return the land to an arable state within the prescribed time frame. Any entity or individual which fails to fulfil its remediation obligations may be fined and denied application for land use rights for new land by the relevant land and natural resources authorities.

It is unlawful for an entity or individual to conduct mining operations in areas designated for other legal mining operators. A mining operator whose exploitation causes harm to others in terms of production or in terms of living standards is liable for compensation and is required to take necessary remedial measures. When a mine is closed, a mine closure report and information concerning the mining facilities, hidden dangers, remediation and environmental protection must be submitted for examination and approval in accordance with the relevant PRC law and regulations.

Mineral products that have been illegally extracted and the related income derived from such activities may be confiscated and may result in fines, revocation of the mining permit and, in serious circumstances, criminal liability.

Energy Conservation Law

The amended Energy Conservation Law came into effect on October 26, 2018. It sets out the general principles for reducing energy waste and improving efficiency of energy consumption. It urges the adjustment of industry structure and replacement of high energy consumption projects with new energy or renewable energy resources. It provides that an energy conservation assessment and review system shall apply to new investment projects and where a project does not meet the mandatory energy conservation standards, the project cannot be constructed. If a project that does not meet the mandatory energy conservation standards has been completed, it cannot be put into use.

In March 2014, the MIIT issued a regulation, the "Opinion on Implementing Supervision of Industrial Energy Conservation," which lists the primary aluminum smelting as one of the high energy consumption operations that will be strictly monitored. In December 2014, the MIIT issued the Guidance for National Industrial Efficiency, which sets forth industrial efficiency standards for producers of major products in industries that involve high energy consumption, which included primary aluminum and alumina products.

The State Council issued the Working Guidance for Carbon Dioxide Peaking and Carbon Neutrality in Full and Faithful Implementation of the New Development Philosophy on September 22, 2021. It sets China's main objective for energy consumption per unit of GDP and carbon dioxide (CO_2) emissions per unit of GDP for 2025, 2030 and 2060. It predicts that by 2060, China will reach carbon neutrality.

In February 2022, the NDRC, the MIIT, the Ministry of Ecology and Environment of China and the National Energy Administration jointly issued the Implementation Guidance for Energy Saving and Carbon Reducing Transformation and Upgrading in Key Areas for High Energy Consuming Industries (2022 Edition). Among other industries, it provides working directions and goals related to energy saving and carbon reducing for non-ferrous metal smelting industry. It sets the goal that by 2025, the energy efficiency level of key products such as copper, aluminum, lead, and zinc will be further improved through the implementation of energy-saving and carbon-reduction technological transformation. The proportion of production capacity above the energy efficiency benchmark level of electrolytic aluminum shall reach 30% and the production capacity below the benchmark level of energy efficiency in the four industries shall be basically cleared.

Regulations Concerning Electrolytic Aluminum Industry

In June 2016, the General Office of the State Council promulgated "Guiding Opinions on Creating a Favorable Market Environment and Promoting the Non-Ferrous Metals Industry to Adjust Structure, Advance Transformation and Increase Efficiency," under which the construction of new electrolytic aluminum projects and the reconstruction or expansion of existing electrolytic aluminum projects would be approved only if such construction, reconstruction or expansion would introduce new electrolytic aluminum production capacity in an amount equal to or smaller than the amount of existing electrolytic aluminum production capacity to be replaced by such construction, reconstruction or expansion.

In April 2017, NDRC, MIIT, the Ministry of Land and Resources (now known as the Ministry of Natural Resources) and the Ministry of Environmental Protection (now known as the Ministry of Ecology and Environment) jointly issued the "Notice Regarding the Plan on Special Action for Clean-up and Rectification of Projects in Violation of Laws and Regulations in the Electrolytic Aluminum Industry," which sets forth a comprehensive plan to inspect electrolytic aluminum projects and rectify violations of applicable laws or regulations revealed in the inspection.

On January 1, 2018, MITT issued the "Notice Regarding Electrolytic Aluminum Enterprises to Realize Capacity Replacement by Acquisition, Merger and Restructure," which requires electrolytic aluminum enterprises to achieve capacity replacement by acquisition, merger or capacity transferring and exchange of capacity quotas with its group companies.

Tax Laws and Regulation

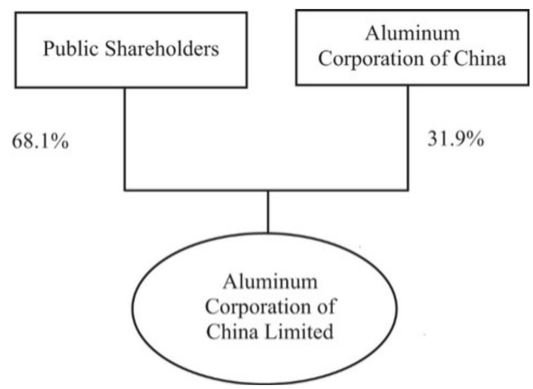
In March 2007, the PRC government promulgated the Enterprise Income Tax Law which became effective from January 1, 2008 and was revised in 2018. The Enterprise Income Tax Law imposes a single income tax rate of 25% on both domestic and foreign invested enterprises. Pursuant to the Enterprise Income Tax Law, important high- and new-tech enterprises that are necessary to be supported by the state are subject to a reduced enterprise income tax rate of 15%. Certain branches and subsidiaries of us were granted tax concessions including preferential tax rates of 15%. On December 6, 2007, the PRC government promulgated the Enterprise Income Tax Law Implementation Rules which also became effective on January 1, 2008 and was later revised in 2019.

In March 2016, the MOF and the SAT jointly promulgated "Circular on Comprehensively Promoting the Pilot Program of the Collection of Value-added Tax in Lieu of Business Tax," pursuant to which we are allowed to deduct input tax from output tax according to the amount set forth in the special value-added tax invoices obtained from our purchases of services, intangible assets or real estate. On April 4, 2018, the MOF and the SAT issued the Circular on Adjusting Value-added Tax Rates, which became effective on May 1, 2018. Pursuant to this circular, for sale or import of goods, the previous applicable value-added tax rates of 17% and 11% were adjusted to 16% and 10%, respectively.

On March 20, 2019, the MOF, the SAT and the General Administration of Customs jointly issued the Announcement on Policies for Deepening Reform of Value-added Tax, which became effective on April 1, 2019. Pursuant to this announcement, for sales or import of goods by a general taxpayer that were previously subject to value added tax at the rate of 16%, the applicable tax rate has been adjusted to 13%, and for those previously subject to value added tax at the rate of 10%, the applicable tax rate has been adjusted to 9%.

C. Organizational Structure

Set out below is a chart illustrating our corporate structure as of March 31, 2023:



The following table sets forth further information of our principal subsidiaries as of December 31, 2022:

Company[(1)]	Percentage of ownership interest attributable to the Company		Principal activities
Baotou Aluminum Co., Ltd.	100.00	%	Manufacture and distribution of primary aluminum, aluminum alloy and related fabricated products and carbon products
Chalco Hong Kong Ltd.	100.00	%	Overseas investments and alumina import and export activities, and mining and distribution of bauxite
China Aluminum International Trading Co., Ltd.	100.00	%	Import and export activities
Chalco Mining Co., Ltd.	100.00	%	Manufacture, acquisition and distribution of bauxite mines, limestone ore and alumina
Chinalco Shanxi Jiaokou Xinghua Technology Ltd.[(2)]	66.00	%	Manufacture and distribution of primary aluminum
Chinalco Shanghai Company Limited	100.00	%	Trading and engineering project management and leasing
Chalco Shanxi New Material Co., Ltd.	85.98	%	Manufacture and distribution of alumina, primary aluminum and anode carbon products and electricity generation and supply
Zunyi Aluminum Co., Ltd.	67.45	%	Manufacture and distribution of primary aluminum and alumina
Chalco Energy Co., Ltd.	100.00	%	Thermoelectric supply and investment management
China Aluminum Ningxia Energy Group Co., Ltd.	70.82	%	Thermal power, wind power and solar power generation, coal mining, and power-related equipment manufacturing
Guizhou Huajin Aluminum Co., Ltd.	60.00	%	Manufacture and distribution of alumina
Chalco Zhengzhou Research Institute of Non-ferrous Metal Co., Ltd.	100.00	%	Research and development services
Chalco Aluminum Logistics Group Corporation Co., Ltd.	100.00	%	Logistics and transportation
Shanxi Huaxing Aluminum Co., Ltd.[(3)]	100.00	%	Manufacture and distribution of alumina
Shanxi Chinalco Resources Co., Ltd.	40.00	%	Manufacture and distribution of primary aluminum
Guizhou Huaren New Material Co., Ltd.	40.00	%	Manufacture and distribution of primary aluminum
China Aluminum International Trading Group Co., Ltd.	100.00	%	Import and export activities
Chinalco Materials Co., Ltd.	100.00	%	Import and export activities and trading
Chinalco New Materials Co., Ltd	100.00	%	Manufacture and distribution of alumina, aluminium hydroxide and trading
Yunnan Aluminum Co., Ltd.	29.10	%	Manufacture and distribution of primary aluminum and alumina
Chalco (Shanghai) Carbon Co., Ltd.	100.00	%	Manufacture and distribution of anode and cathode carbon
Lanzhou Aluminum Co., Ltd.	100.00	%	Manufacture and distribution of primary aluminum

(1) Chalco Hong Kong Ltd. is incorporated in Hong Kong. All other principal subsidiaries are incorporated in the PRC.
(2) We directly hold 33% shares and indirectly hold 33% shares, through Chalco Shandong Co., Ltd.
(3) We directly hold 60% shares and indirectly hold 40% shares, through Chalco Hong Kong Ltd.

D. Property, Plants and Equipment

Bauxite Mines and Coal Mines

For summary disclosure of our bauxite mines and coal mines, please refer to "– B. Business Overview – Our Mines."

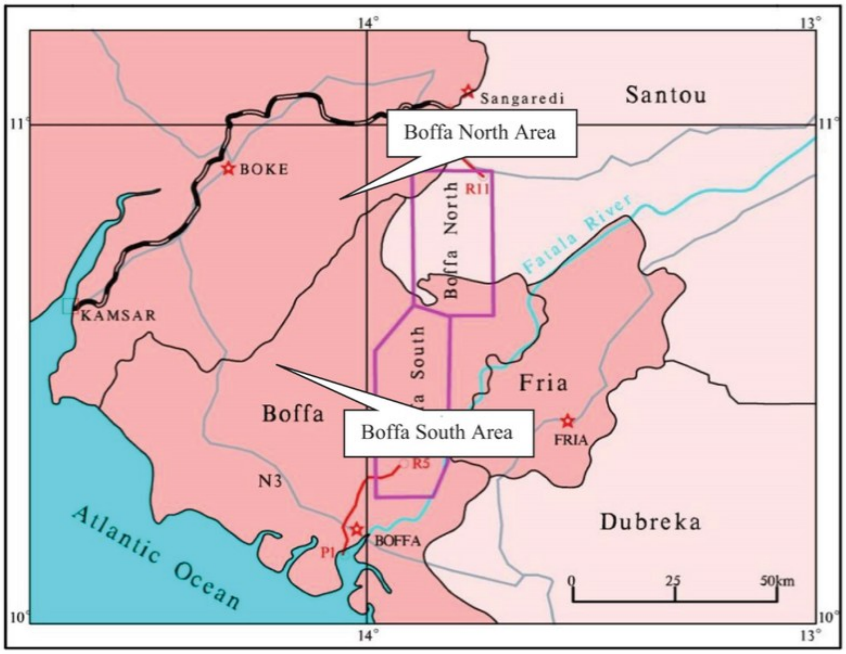
Boffa Mine

In accordance with the requirements of Regulation S-K 1300, we consider our Boffa mine in Guinea as the sole mining property that is material to our business. We have engaged Mr. Shengfa Tu as the qualified person for our bauxite mines. Mr. Tu has prepared the Technical Report Summary for our Boffa mine in compliance with Regulation S-K 1300 and Item 601(b)(96) of Regulation S-K, filed as Exhibit 96.1 to our amended annual report on Form 20-F/A for the year ended December 31, 2021 filed with the SEC on August 31, 2022.

The information that follows relating to our Boffa mine is derived, for the most part, from the Technical Report Summary. Portions of the following information are based on assumptions, qualifications, and procedures that are not fully described herein. Reference should be made to the full text of the Technical Report Summary.

Location, Infrastructure and Facilities

The following map sets forth details of the area surrounding our Boffa mine in Guinea:



The Boffa mine is located eight kilometers north east of Boffa, the capital of Boffa Prefecture in Guinea. The linear distance between Boffa mine and Conakry, the capital of Guinea, is approximately 86 kilometers and the linear distance between the southwest corner of Boffa mine and the Atlantic Ocean is 25 kilometers. Conakry is connected to the city Boffa by the N3 road, which is a tarmac road with a distance of approximately 150 kilometers and a width of approximately six meters. The southern part of the Boffa mine is connected to the N3 road by a hasty road with a distance of approximately five kilometers. The Boffa mine consists of Boffa north area and Boffa south area, which covers an area of 653.55 km^2 and 594.61 km^2, respectively.

There are two main railways in Guinea. One railway links Conakry and the Fria smelter east of Boffa. The other railway runs from the CBG mine near Sangaredi to the port of Kamsar and has a larger transport capacity.

Guinea has two major ports. The first is the port of Conakry, adjacent to Conakry. The port handles container shipments and exportation of alumina and bauxite. The second port is Kamsar CBG, which is primarily used to export bauxite and has two smaller terminals for other bulk cargoes.

The Boffa mine is open pit, equipped with 2500SM open pit mining machines. We have facilities such as mining industrial sites, raw ore storage yards, low-grade ore storage yards, open-pit mining machines, belt conveyor systems, bridges, inland terminals, electric power stations and a temporary dump site. It has transportation facilities that have access to local roads and a belt conveyor system. Our mining facilities in the Boffa mine are connected to the electric power stations, which are powered by heavy oil fuel. Most of the facilities started to operate since Boffa mine was put into operation in April 2020. The quality of groundwater in the Boffa mine area meets the requirements for drinking, and the production and domestic water in the mine area is extracted groundwater. We believe all of our equipment in the Boffa mine is in good physical condition and suitable for our operations. The total book value of Boffa mine's fixed assets is RMB1.7 billion as of December 31, 2022.

History, Mining Rights and Operations

From August 2005 to May 2006, 10 exploration leases were granted to BHP Billiton in Guinea, which cover Boffa. In 2008 and 2011, BHP Billiton applied to the Guinea Government to reduce the size of the mine covered by the leases. In 2012, BHP Billiton submitted "Boffa Santou Houda Project Close Out Report" to the Guinea Government and handed the exploration leases back to the Guinea Government.

On October 31, 2016, Chalco signed cooperation framework agreements with the Guinea Government and Guinean State Mining Company for the development of the Boffa mine. On June 8, 2018, Chalco Hong Kong and Chalco Guinea Company S.A., a wholly-owned subsidiary of Chalco Hong Kong, entered into a mining convention with the Guinean government, pursuant to which Chalco Hong Kong agreed to provide investment funds while the Guinean government agreed to provide mining licenses and rights to transport mining products for the development and operation of the Boffa Project. On July 9, 2018, the president of Guinea signed a decree to grant both Boffa north area and Boffa south area a mining permit, effective from July 2018 to July 2033. For more details of the history of Boffa mine, please refer to "Item 4. Information on the Company – A. History and Development of the Company – Boffa Project."

Upon expiration of the current 15-year period, our mining permit for the Boffa mine is renewable for additional periods, each of which would also be 15 years except that the last renewal period would be subject to the depletion timing of the Boffa mine. We will not need to pay additional consideration for each renewal of the mining permit. The Boffa Project commenced construction in September 2018 and was completed and put into operation in April 2020. We must pay a royalty of US$0.208 per tonne based on the volume of bauxite extracted from the Boffa mine.

Chalco Guinea Company S.A. has 864 employees. From then through the end of 2022, we extracted approximately 33.9 million tonnes of bauxite from the Boffa mine. The annual bauxite output capacity is expected to remain stable at 13.6 million tonnes in 2023.

As of the date of this annual report, we have not been found any violation or subject to any fine for our mining operations at the Boffa mine.

Mineral Resources and Mineral Reserves

The following table sets forth the summary of mineral resources, exclusive of mineral reserves, for the Boffa mine as of December 31, 2022:

	Amount *(in million tonnes)*	**AAl_2O_3** *(%)*	**$RSiO_2$** *(%)*	**A/S**	**Cut-off grades**		**Metallurgical recovery**[(1)]
Measured mineral resources	44.51	39.34	1.02	38.41	AAl_2O_3	35%	
Indicated mineral resources	66.22	39.07	0.90	43.22	AAl_2O_3	35%	85%
Measured + Indicated mineral resources	110.72	39.18	0.95	41.14	AAl_2O_3	35%	
Inferred mineral resources	1,535.77	39.02	1.09	35.93	AAl_2O_3	35%	

(1) The metallurgical recovery of bauxite refers to dissolution rate.

(2) AAl_2O_3 means available aluminum and $RSiO_2$ means reactive silica.

(3) The resources include stockpiled ore or ore to be stockpiled in the local area.

(4) Estimation of mineral resources in this table is based on US$22.02 per wet tonne of bauxite, which is the loading price in Guinea, calculated based on the FOB price of US$32.5 per wet tonne and deduction of cost of wharf, inland waterway and platform transship. The corresponding CIF price of bauxite arriving in China is $57.8 per dry tonne. This price is close to the five-year average CIF price of Guinea bauxite imported by China from 2018 to 2022. Mineral resources are estimated at $AAl_2O_3 \geq 35\%$ cut off grade and at a minimum mining thickness of 1 meter. The point of reference selected by the qualified person is the point where bauxite is delivered to wharf yard and available for use by alumina refineries. For further information on assumptions used in preparing the estimates, please refer to Chapter 11 of the Technical Report Summary.

The following table sets forth the summary of mineral reserves for the Boffa mine as of December 31, 2022:

	Amount *(in million tonnes)*	**AAl_2O_3** *(%)*	**$RSiO_2$** *(%)*	**A/S**	**Cut-off grades**	**Metallurgical recovery[1]**
Proven mineral reserves	35.85	38.95	1.09	35.82	AAl_2O_3 39 %	
Probable mineral reserves	62.24	38.68	0.96	40.48	AAl_2O_3 39 %	85%
Total mineral reserves	98.08	38.78	1.00	38.64	AAl_2O_3 39 %	

(1) The metallurgical recovery of bauxite refers to dissolution rate.

(2) AAl_2O_3 means available aluminum and $RSiO_2$ means reactive silica.

(3) Estimation of mineral resources in this table is based on US$22.02 per wet tonne of bauxite, which is the loading price in Guinea, calculated based on the FOB price of US$32.5 per wet tonne and deduction of cost of wharf, inland waterway and platform transship. The corresponding CIF price of bauxite arriving in China is $57.8 per dry tonne. This price is close to the five-year average CIF price of Guinea bauxite imported by China from 2018 to 2022. Mineral reserves are estimated at $AAl_2O_3 \geq 39\%$ cut off grade and at a minimum mining thickness of 1 meter. The point of reference selected by the qualified person is the point where bauxite is delivered to wharf yard and available for use by alumina refineries. For further information on assumptions used in preparing the estimates, please refer to Chapter 12 of the Technical Report Summary.

For comparative purposes, the measured and indicated mineral resources for the Boffa mine were 110.72 million tonnes and 125.89 million tonnes for the years ended 2022 and 2021, respectively. The inferred mineral resources remained unchanged since 2021. The proven mineral reserves were 35.85 million tonnes and 49.45 million tonnes for the years ended 2022 and 2021, respectively. The probable mineral resources remained unchanged since 2021. The decreases in the measured and indicated mineral resources and proven mineral reserves are primarily due to extraction of 13.6 million tonnes of bauxite from the Boffa mine in 2022.

Land

Chinalco leases to us 377 pieces or parcels of land, located in 10 provinces, covering an aggregate area of approximately 43.61 million square meters for any purpose related to our operations and businesses. Currently, all leases for our properties are valid and have not expired. The leased land mainly consists of:

- 41 pieces of allocated land with an area of approximately 5.5 million square meters. Chinalco has obtained authorization from the relevant administrative authorities to manage and lease the land use rights for such land; and
- 336 pieces of land with an area of approximately 38.1 million square meters. Chinalco has paid the land premiums and obtained land use rights certificates.

The land is leased for the following terms:

- allocated land: 50 years commencing from July 1, 2001 (except for land use rights of mines operated by us, whose leased terms shall end on the expiration date of the mining rights or at the end of the actual mine life, whichever is earlier);
- granted land: until expiration of the relevant land use right permits; and
- for both allocated or granted land: normal commercial terms that stipulate, among other conditions, the terms of use, monthly or annual rental amounts payable in Renminbi and a six-month notification provision for termination of any lease agreement.

Buildings

Our principal executive offices, which we lease from Chinalco, are located at No. 62 North Xizhimen Street, Haidian District, Beijing, People's Republic of China, 100082.

Pursuant to the reorganization in connection with our initial public offering in 2001, Chinalco transferred to us, among other operating assets, ownership of the buildings and properties for the operation of our core businesses. Chinalco retained its remaining buildings and properties for its operations. The buildings transferred to us comprise 4,631 buildings with an aggregate gross area of approximately 4.2 million square meters. These buildings may be sold or transferred only with the consent of Chinalco and in accordance with applicable land transfer procedures. Chinalco has undertaken to provide its consent and the necessary assistance to affect land grant procedures to ensure that our buildings can be legally transferred or sold.

We and Chinalco also lease to each other a number of other buildings and properties for ancillary uses, which comprise mainly buildings for offices, dormitory, canteen and storage purposes. As of the date of this annual report, we leased to Chinalco buildings with an aggregate gross area of approximately 272,071 square meters, while Chinalco leased to us buildings with an aggregate gross area of approximately 173,353 square meters. In December 2021, we and China Aluminum Investment and Development Co., Ltd., a wholly-owned subsidiary of Chinalco, renewed a tenancy agreement pursuant to which we would lease from Chinalco the office premises at certain floors of No. 62 North Xizhimen Street, Haidian District, Beijing, PRC, with an aggregate gross floor area of 22,303 square meters. This agreement will expire on December 31, 2024.

Our Expansion

Our expansion projects in 2022 primarily include:

- The 2,000,000 tonne bauxite project of Guangxi branch: The project was completed and put into operation on June 25, 2022. We have invested a total amount of approximately RMB545 million in this project.

Item 4A. Unresolved Staff Comments

None.

Item 5. Operating and Financial Review and Prospects

The following discussion and analysis should be read in conjunction with our audited consolidated financial statements and selected historical financial data, in each case together with the accompanying notes included elsewhere in this annual report.

This section contains certain "forward-looking statements" within the meaning of the United States Private Securities Litigation Reform Act of 1995. Forward-looking statements are not guarantees of our future performance or results and our actual results could materially differ from those disclosed in the forward-looking statements. In evaluating our business, you should carefully consider the information provided in "Item 3. Key Information – D. Risk Factors."

As the business combinations under common control incurred in the years ended December 31, 2020, 2021 and 2022, the comparative financial data for the years ended December 31, 2020, 2021 and 2022 are revised to reflect the business combinations under common control. Unless otherwise indicated in this section, our financial data for the years ended December 31, 2021 and 2022 are presented based on those revised amounts. Please see Note 41 to our audited consolidated financial statements.

A. Operating Results

Overview

We are a leading enterprise in the non-ferrous metal industry in China. We are engaged principally in alumina refining, primary aluminum smelting, and trading of non-ferrous metal products, coal products and other products. In addition, we are engaged in coal mining and power generation. The remainder of our revenues was derived from research and development activities and other products and services. We organize and manage our operations according to the following key segments:

- Our alumina segment, which consists of the mining and purchasing of bauxite and other raw materials, and production and sale of alumina as well as chemical alumina. Alumina accounted for approximately 89.1% of the total production volume of alumina and chemical alumina products for this segment in 2022. Chemical alumina products are used in the production of chemical, pharmaceutical, ceramic and construction materials. In the process of refining bauxite into alumina, we produce gallium as a by-product, which is a rare, high-value metal with applications in the electronics and telecommunication industries.

- Our primary aluminum segment, which consists of the procurement of alumina, other raw materials, supplemental materials and electrical power, the production and sale of primary aluminum and aluminum-related products, such as carbon products, aluminum alloy products and other aluminum products. Our principal primary aluminum products are ingots, molten aluminum and aluminum alloys, which accounted for approximately 26.5%, 41.5% and 32.0%, respectively, of our total production volume of primary aluminum in 2022. Our standard 20 kilogram remelt ingots are used for general aluminum fabrication in the construction, electricity, electronics, transportation, packaging, machinery and durable goods industries. We internally produce substantially all the carbon products used at our smelters and sell our remaining carbon products to external customers.

- Our trading segment, which mainly consists of the trading of alumina, primary aluminum, aluminum fabrication products, other non-ferrous metal products, and crude fuels such as coal products, as well as supplemental materials and logistics and transport services to our internal manufacturing plants and external customers. We established our trading business under Chalco Trading as a separate segment in July 2010 as a result of our operational structural adjustment. Since 2014, we have established Chalco Materials, Chalco Logistics and Chalco Trading Group to continuously promote and deepen development of our trading business, jointly constituting our trading segment. Established in 2018, Chalco Trading Group has undertaken the businesses that used to be operated by Chalco Trading.

- Our energy segment, which consists of the research and development, production and operation of energy products, including coal mining and conventional coal-fire power generation as well as renewable energy generation such as wind power and solar power. In January 2013, to partially offset our future energy costs, we established our energy segment after our acquisition of Ningxia Energy in line with our development strategy. In 2022, we supplied a portion of the electricity we generated for our own production use, supplied a portion of the coal output to our own electric power plant and sold the remaining portion to external customers. Ningxia Energy supplied the electricity it generated mainly to the state grid in China.

- Our corporate and other operating segment, which consists of corporate and other aluminum-related research, development, and our other activities.

Our consolidated revenue decreased by 2.6% from RMB298,885.4 million for the year ended December 31, 2021 to RMB290,987.9 million for the year ended December 31, 2022, primarily due to the decrease in revenue of trading business. Our net profit decreased from RMB11,316.9 million for the year ended December 31, 2021 to RMB10,843.3 million for the year ended December 31, 2022, primarily because of the increase in prices of raw materials, such as a year-on-year increase of 19.8% in electricity cost, a year-on-year increase of 49.5% in the cost of anode carbon, and a year-on-year increase of 14.9% in the bauxite cost.

Factors Affecting Our Results of Operations

We believe that the following factors, which impact our various revenue and expense items (as described below), have had, and will continue to have, a significant effect on the development of our business, financial position and results of operation.

Economic Condition of China and the World

As the major aluminum product market is globalized, the demand for and prices of our products are highly correlated with the general economic condition of China and the world and the performance of the major aluminum and related product markets. In recent years, China's economy continued to experience growth despite the negative effects of the global financial crisis beginning in the second half of 2008 and economic recession in 2009, as well as general market volatility and changing macroeconomic conditions. However, as China is in the process of transforming its development model, optimizing its economic structure and changing its growth drivers, the growth of China's economy has slowed down since 2014, with GDP growth from 2014 through 2019 ranging from 6.1% to 6.9%. Furthermore, the outbreak and global spread of the COVID-19 in 2020, 2021 and 2022 has adversely affected the global economy and China's economy and financial market in general. As a result, the compound annual GDP growth rate of China was 4.3% over the last three years. The global output of alumina (with chemical alumina products included) in 2022 decreased by approximately 1.2% from 2021 to approximately 137.02 million tonnes. The global alumina consumption (with chemical alumina products included) in 2022 decreased approximately by 0.5% from 2021 to approximately 136.87 million tonnes. In 2022, the domestic output of alumina (with chemical alumina products included) increased approximately by 6.1% from 2021 to approximately 79.76 million tonnes and the domestic consumption for alumina (with chemical alumina products included) increased by approximately 3.7% from 2021 to approximately 80.91 million tonnes.

The global output of primary aluminum in 2022 increased by approximately 2.3% from 2021 to approximately 69.28 million tonnes. The global consumption of primary aluminum in 2022 increased by approximately 1.0% from 2021 to approximately 70.05 million tonnes. In 2022, the domestic output of primary aluminum increased by approximately 3.9% from 2021 to approximately 40.43 million tonnes and the domestic consumption of primary aluminum increased by approximately 1.4% from 2021 to approximately 41.10 million tonnes.

Mix and Pricing of Our Products

We are engaged principally in alumina refining, primary aluminum smelting and sales of these products and trading of non-ferrous metal products and other products. In addition, we are engaged in coal mining and power generation. We coordinate substantially all of our sales and marketing activities for our self-produced alumina products and some of our sales and marketing activities for our self-produced primary aluminum products through Chalco Trading Group, taking into account the spot market prices and SHFE prices. In 2022, revenues generated from alumina, primary aluminum, trading and energy segments (after elimination of inter-segment sales) accounted for 5.6%, 29.7%, 61.4% and 3.1%, respectively, of our consolidated total revenues after elimination of inter-segment sales. We apply different policies to price different products. For information on our pricing of different products, please see the section headed "Item 4. Information of the Company – B. Business Overview – Sales and Marketing."

The sales prices of alumina that our alumina refineries sell internally to Chalco Trading Group are determined based on our budgeted sale prices, spot market prices and the prices of primary aluminum on SHFE. Chalco Trading Group coordinates the external negotiation and execution of sales contracts of our alumina products. The alumina prices in both the domestic and international markets increased in 2022 when compared to that of 2021. The increase in the alumina price in the international market was attributable to the gradual recovery of the demand of alumina after the COVID-19 outbreak in 2020 and the energy crisis in Europe due to the ongoing Russia-Ukraine conflict. In 2022, the spot price of alumina in the international market reached a high of approximately US$533 per tonne and bottomed out at approximately US$310 per tonne. The average spot price of alumina in the international market was approximately US$363 per tonne, representing an increase of 10% from 2021. The spot price of alumina in the domestic market reached a high of RMB3,305 per tonne and bottomed out at RMB2,739 per tonne. The average spot price of alumina in the domestic market was approximately RMB2,945 per tonne, representing an increase of 5.2% from 2021. The increase of the alumina price in the domestic market was primarily attributable to the inadequate supply of alumina resulting from the limited production due to the Winter Olympics in the first quarter of 2022 and the large-scale reduction of production in the northern region and the restrictions on production due to heavily polluted air at the end of year 2022. Our average selling price of alumina increased by 7.1% from RMB2,825 per tonne in 2021 to RMB3,025 per tonne in 2022.

Like most primary aluminum producers in China, we price our primary aluminum products by reference to the primary aluminum spot prices and futures price on the SHFE. In 2022, the primary aluminum prices in the international market generally increased due to the ease of global liquidity and the gradual recovery of the demand of alumina after the COVID-19 outbreak in 2020. The change of primary aluminum prices in the domestic market in 2022 was attributable to large-scale capacity reduction and shutdown of electrolytic aluminum plants in the region in the second half of 2022, resulting from the lack of power supply in many southern provinces, the increase of operating pressure, and the limited production in the heating season, as well as the global macroeconomic pessimism improvement. In 2022, three-month aluminum futures prices reached a high of US$4,074 per tonne and a low of US$2,081 per tonne on LME; and a high of RMB24,240 per tonne and a low of RMB16,990 per tonne on SHFE. In 2022, the average price of spot aluminum and three-month aluminum futures at LME were approximately US$2,703 per tonne and US$2,713 per tonne, respectively, representing an increase of 9.0% and 9.2% from that of 2021, respectively. The average three-month aluminum futures prices at SHFE increased by 5.0% from RMB18,898 per tonne in 2021 to RMB19,837 per tonne in 2022 while the average spot prices of primary aluminum at SHFE increased by 5.3% from RMB18,953 per tonne in 2021 to RMB19,950 per tonne in 2022. Our average selling price of primary aluminum increased by 2.8% from RMB19,099 per tonne in 2021 to RMB19,639 per tonne in 2022.

Price Volatility of Non-ferrous Metal and Coal Products

Since late 2009, as a result of the implementation of our operational structural adjustment, we have been engaged substantially in the trading of outsourced non-ferrous metal products to increase our profit. In 2012, we began to engage in the trading of significant amounts of outsourced coal products to diversify our product portfolio. Although the profit margin of sales of outsourced products is typically lower than that of our self-produced products, we generated substantial revenues and profit from the trading of outsourced products during the past few years due to our significant trading volumes. Our revenue generated from external sales of products purchased from external sources in 2022 was approximately RMB129,721.1 million, representing approximately 72.6% of total revenue from external sales in our trading segment. From time to time, we may enter into futures and option transactions in addition to the simple buy-low-sell-high trading model to hedge against price fluctuations in the non-ferrous metal and coal products market. However, short-term price volatility of these products remains a key factor affecting our operating results, as we need to make the correct prediction concerning the price trends of these products on the markets to ensure substantial revenues through large trading volume. If the market price trend does not match our prediction, we may be forced to sell trading products at low prices or to purchase trading products at high prices, which may adversely affect gross margins and profitability.

Manufacturing Costs

Our cost of revenues consists primarily of the costs of raw materials, overhead cost and electric power cost. Our principal raw material is bauxite. For the years ended December 31, 2020, 2021 and 2022, bauxite supplied by our mines accounted for 46.3%, 62.7% and 61.9%, respectively, of our total bauxite used in the production of alumina. The unit cost of bauxite produced by us is generally lower than the unit cost of bauxite procured from external suppliers. In 2022, the unit cost of bauxite supplied by our mines was 19.4% lower than the unit cost of bauxite procured from external suppliers. The comprehensive cost for bauxite in 2022 increased by approximately 12.4% compared to 2021. In addition, our average purchase price per unit tonne of thermal coal in 2022 increased by approximately 13.9% compared to 2021. As a result, our average cost of alumina per tonne in 2022 increased by approximately 15.7% from that in 2021.

Primary aluminum is one of our major aluminum products and is produced by smelting operations. Smelting operations require a substantial and continuous supply of electricity. Electricity cost is the most significant component of our primary aluminum production cost and accounted for approximately 37% of our unit production cost for primary aluminum in 2022. The availability and price of electricity are key considerations in our primary aluminum operations. Interruptions of electricity supply can result in lengthy production shutdowns, increased costs associated with restarting production and waste of production in progress, and prolonged interruptions can cause damage to, or the destruction of, production equipment and facilities. Our average annual electricity price per kWh (including tax) increased by 16.0% from 2021 to 2022.

Given our high proportion of fixed costs, we must generate sufficient sales to absorb our fixed costs to maintain or increase our operating margins. Our acquisitions and production expansion in recent years have significantly increased our costs that are relatively fixed in nature, such as leases and depreciation of property, plant and equipment and employee benefit expenses. If we are able to maintain satisfactory facility utilization rates and productivity, our production capacity expansion will enable us to reduce our unit costs through economies of scale and recover associated increased costs through higher output. In 2022, we continued to focus on lowering production costs and increasing production efficiency through reducing raw material consumption by improving technology and internal management.

Availability and Costs of Financing

We require a significant amount of capital to fund our operations. For example, we need substantial amounts of funds for expanding our operations, purchasing and maintaining equipment and procuring commodities. We have in the past funded our capital expenditures primarily with bank loans and the issuance of medium-term notes and bonds and long-term bonds. The availability of financing is subject to various factors, including our credit history and the prevailing credit policy adopted by the PRC government. Over the years, we have maintained good relationships with the commercial banks in China, which enables us to access bank financing at relatively low costs. Any change of lending policies adopted by the PRC government in the future may, among other things, affect our ability to obtain financing and may in turn adversely affect our operating results.

Our finance costs decreased by 14.1% from 2021 to 2022, primarily attributable to the year-on-year decrease resulting from reducing the scale of interest-bearing debt and optimizing financing costs. If we are unable to secure sufficient external funding when required, we may not be able to fund our working capital requirements and necessary capital expenditures, which could adversely affect our business, financial performance and prospects.

In addition, our borrowing costs and access to debt financing depend significantly on our credit ratings. These ratings, including long-term corporate credit ratings and financing bond credit ratings, are assigned by rating agencies, which may lower or withdraw their ratings. Any change in our credit ratings or average interest rate could have negative implications, which may increase our finance costs and affect our financial results.

Regulatory Environment

The PRC government continues to shape the structure and development of the aluminum industry through industry guidelines for energy conservation, safety, environmental and quality. The central and local PRC government will give more support to entities that meet the standards in such industry guidelines. If the PRC government changes its current industry guidelines or the interpretation of those industry guidelines, we may face pressure on profit margins and constraints on our ability to expand our business operations.

Selected Statement of Operation Items

Revenue

Our revenue is primarily generated from sales of alumina, primary aluminum, other non-ferrous metal products and coal products. In addition, we are engaged in coal mining and power generation. The remainder of our revenues was derived from research and development activities and other products and services.

Cost of Sales

Our cost of sales consists primarily of the purchase of inventories in relation to trading activities, cost of raw materials, consumables and electric power used in manufacturing, certain fixed cost and employee benefit expenses. For the years ended December 31, 2020, 2021 and 2022, our cost of sales was RMB188,520.2 million, RMB264,168.8 million and RMB259,704.1 million, respectively, and accounted for 92.4%, 88.4% and 89.2%, respectively, of the total consolidated revenues for those periods.

Operating Expenses

Selling and Distribution Expenses. Our selling and distribution expenses consist primarily of transportation and loading expenses which are indirectly related to product sales and employee benefit expenses for employees in selling and distribution department. Selling and distribution expenses accounted for 4.4%, 2.6% and 2.7% of our total operating expenses for the years ended December 31, 2020, 2021 and 2022, respectively.

General and Administrative Expenses. Our general and administrative expenses consist primarily of employee benefit expenses for directors and officers and employees in the administrative department and, to a lesser extent, taxes other than income tax expenses, depreciation of non-production property, plant and equipment, termination benefit expenses, travelling and entertainment, legal and other professional fees, amortization of right-of-use assets, utilities and office supplies, insurance expense, repairs and maintenance expenses, auditors' remuneration, amortization of intangible assets, and others. General and administrative expenses accounted for 59.2%, 43.4% and 38.9% of our total operating expenses for the years ended December 31, 2020, 2021 and 2022, respectively. Employee benefit expenses, including salaries and bonus, housing fund, staff welfare and other expenses, employment expense in relation to early retirement schemes and termination benefit, comprise a significant component of our general and administrative expenses, accounting for 41.7%, 41.4% and 40.5% of our total general and administrative expenses for the years ended December 31, 2020, 2021 and 2022, respectively.

Research and Development Expenses. Our research and development expenses accounted for 17.1%, 16.6% and 31.1% of our total operating expenses for the years ended December 31, 2020, 2021 and 2022, respectively.

Impairment Loss on Property, Plant and Equipment. Our impairment loss on property, plant and equipment accounted for 8.0%, 27.9% and 24.6% of our total operating expenses for the years ended December 31, 2020, 2021 and 2022, respectively. The decrease in impairment loss on property, plant and equipment in 2022 was primarily because of the year-on-year decrease in our Company's provision for losses on long-lived assets.

Impairment Losses on Financial Assets. Our impairment losses on financial assets accounted for 2.7% of our total operating expenses for the year ended December 31, 2022.

Impairment Losses on Investments in Associates. Our impairment losses on financial assets accounted for 0.5% of our total operating expenses for the year ended December 31, 2022.

Other Income

Our other income consists primarily of tax rebates and grants on industrial development support from the government. For the year ended December 31, 2022, our other income was RMB235.8 million and accounted for approximately 0.1% of the total consolidated revenues.

Other Gains, net

Our net other gains consisted primarily of gains on disposal of property, plant and equipment, intangible assets and right-of-use assets, net and others. For the year ended December 31, 2022, our net other gains were RMB315.4 million and accounted for approximately 0.1% of the total consolidated revenues.

Finance Income

Our finance income consists primarily of interest income. For the year ended December 31, 2022, our finance income was RMB477.1 million and accounted for approximately 0.2% of the total consolidated revenues.

Finance Costs

Our financing costs consist primarily of interest expense on our borrowings and bonds, interest on lease liability and amortization of unrecognized finance expenses. Interest rates on loans related to capital expenditures and working capital set by banks generally follow guidelines issued by the PBOC. The PBOC regulates the interest rates for commercial loans charged by state-owned banks from time to time as part of the PRC government's efforts to regulate the PRC economy. In 2022, we incurred finance costs (net of capitalized interest) of RMB3,894.9 million on our borrowings.

Share of Profits and Losses of Joint Ventures

Our share of profits and losses of joint ventures is the profit attributable to us from our joint ventures, based on our equity interests in such joint ventures. A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of an arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control.

Share of Profits and Losses of Associates

Our share of profits and losses of associates is the profit attributable to us from our associates, based on our equity interests in such associates. An associate is an entity over which we have significant influence but not control.

Consolidated Results of Operations

The following table sets forth certain income and expense items as a percentage of our revenues from our consolidated statements of comprehensive income for the periods indicated:

	Year Ended December 31,						
	2020		2021		2022		
	RMB	(%)	RMB	(%)	RMB	US$	(%)
	(in millions, except percentage)						
Revenue	203,993.1	100.0	298,885.4	100.0	290,987.9	42,189.3	100.0
Cost of Sales	(188,520.2)	(92.4)	(264,168.8)	(88.4)	(259,704.1)	(37,653.6)	(89.2)
Gross Profit	15,472.9	7.6	34,716.6	11.6	31,283.8	4,535.7	10.8
Selling and distribution expenses	(372.4)	(0.2)	(383.2)	(0.1)	(418.9)	(60.7)	(0.1)
General and administrative expenses	(5,061.0)	(2.5)	(6,325.5)	(2.1)	(6,008.2)	(871.1)	(2.1)
Research and development expenses	(1,465.3)	(0.7)	(2,417.4)	(0.8)	(4,805.2)	(696.7)	(1.7)
Impairment loss on property, plant and equipment	(681.3)	(0.3)	(4,064.7)	(1.4)	(3,795.4)	(550.3)	(1.3)
Net impairment losses on financial assets	(967.9)	(0.5)	(1,390.8)	(0.5)	(414.1)	(60.0)	(0.1)
Other income	304.4	0.1	173.2	0.1	235.8	34.2	0.1
Other (losses)/gains, net	373.1	0.2	(1,641.1)	(0.5)	315.4	45.7	0.1
Operating profit	7,602.5	3.7	18,667.1	6.2	16,393.2	2,376.8	5.6
Finance Income	266.2	0.1	311.1	0.1	477.1	69.2	0.2
Finance cost	(5,069.7)	(2.5)	(4,532.7)	(1.5)	(3,894.8)	(564.7)	(1.3)
Impairment losses on investments in an associate	—	—	—	—	(76.0)	(11.0)	(<0.1)
Share of net profits of investments accounted for using the equity method							
Joint ventures	180.5	0.1	164.1	0.1	178.9	25.9	0.1
Associates	(93.5)	(0.1)	(423.2)	(0.1)	130.6	18.9	<0.1
Profit before income tax	2,886.0	1.4	14,186.4	4.7	13,209.0	1,915.1	4.5
Income tax expense	(641.3)	(0.3)	(2,869.5)	(1.0)	(2,365.7)	(343.0)	(0.8)
Profit for the year	2,244.7	1.1	11,316.9	3.7	10,843.3	1,572.1	3.7

No customer individually accounted for more than 10% of our total revenue for the year ended December 31, 2022. Sales to Chinalco and its subsidiaries, joint ventures, associates and other related parties accounted for approximately 13.7%, 9.9% and 12.0% of consolidated revenues for the years ended December 31, 2020, 2021 and 2022, respectively. For information on related party transactions, see "Item 7. Major Shareholders and Related Party Transactions – B. Related Party Transactions" and Note 38 to our audited consolidated financial statements.

Year Ended December 31, 2022 Compared with Year Ended December 31, 2021

Revenue

Our revenue decreased by 2.6% from RMB298,885.4 million for the year ended December 31, 2021 to RMB290,987.9 million for the year ended December 31, 2022, primarily due to the decrease in revenue of trading business.

Cost of Sales

Our cost of sales decreased by 1.7% from RMB264,168.8 million for the year ended December 31, 2021 to RMB259,704.1 million for the year ended December 31, 2022, primarily due to lower cost of sales resulting from the decrease in volume of trading business.

Selling and Distribution Expenses

Our selling and distribution expenses were RMB418.9 million for the year ended December 31, 2022, which remained relatively stable compared to RMB383.2 million for the year ended December 31, 2021.

General and Administrative Expenses

Our general and administrative expenses decreased by 5.0% from RMB6,325.5 million for the year ended December 31, 2021 to RMB6,008.2 million for the year ended December 31, 2022, primarily due to the impact of the Company's optimization of internal management, enhancement of labor efficiency and strict control of expenditures.

Research and Development Expenses

Our research and development expenses increased by 98.8% from RMB2,417.4 million for the year ended December 31, 2021 to RMB4,805.2 million for the year ended December 31, 2022, primarily due to the increase in investment in product process optimization, added value of aluminum processed products and development of medium and high-end products.

Other Income

Other income increased by 36.2% from RMB173.2 million for the year ended December 31, 2021 to RMB235.8 million for the year ended December 31, 2022, primarily due to an increase of RMB66.5 million in tax rebates.

Other Gains, Net

Our other gains, net amounted to RMB315.4 million for the year ended December 31, 2022, compared to our net other losses of RMB1,641.0 million for the year ended December 31, 2021, primarily due to the year-on-year increase in profit of settlement of hedging futures and lower frequency of asset retirement.

Finance Income

Our finance income increased by 53.4% from RMB311.1 million for the year ended December 31, 2021 to RMB477.1 million for the year ended December 31, 2022, primarily due to the year-on-year increase in average daily balance of bank deposits.

Finance Costs

Our finance costs decreased by 14.1% from RMB4,532.7 million for the year ended December 31, 2021 to RMB3,894.9 million for the year ended December 31, 2022, primarily due to the year-on-year decrease resulting from reducing the scale of interest-bearing debt and the decrease in relevant interest rates.

Share of Net Profits of Investments Accounted for Using the Equity Method of Joint Ventures

Our net profits of investments accounted for using the equity method of joint ventures amounted to RMB178.9 million for the year ended December 31, 2022, compared to our net profits of investments accounted for using the equity method of joint ventures of RMB164.1 million for the year ended December 31, 2021. This was primarily attributable to increase in the profitability of a joint venture specializing in environmental technology.

Share of Net Profits of Investments Accounted for Using the Equity Method of Associates

Our net profits of investments accounted for using the equity method of associates increased significantly from net losses of RMB423.2 million for the year ended December 31, 2021 to net profits of RMB130.6 million for the year ended December 31, 2022. This was primarily attributable to well-run operations of an energy associate and a mineral resources associate.

Income Tax

Our income tax expense decreased by 17.6% from RMB2,869.6 million for the year ended December 31, 2021 to RMB2,365.6 million for the year ended December 31, 2022.This was mainly due to the decrease in profit before tax and the increase in the proportion of profits subject to preferential tax rates in total profits.

Results of Operations

As a result of the foregoing, our net profit decreased by 4.2% from RMB11,316.9 million for the year ended December 31, 2021 to RMB10,843.3 million for the year ended December 31, 2022.

Year Ended December 31, 2021 Compared with Year Ended December 31, 2020

Revenue

Our revenue increased by 46.5% from RMB203,993.1 million for the year ended December 31, 2020 to RMB298,885.4 million for the year ended December 31, 2021, primarily due to the year-on-year increase in the prices of alumina and primary aluminum.

Cost of Sales

Our cost of sales increased by 40.1% from RMB188,520.2 million for the year ended December 31, 2020 to RMB264,168.8 million for the year ended December 31, 2021, primarily due to the impact of higher prices of raw fuel materials.

Selling and Distribution Expenses

Our selling and distribution expenses were RMB383.2 million for the year ended December 31, 2021, which remained stable compared to RMB372.4 million for the year ended December 31, 2020.

General and Administrative Expenses

Our general and administrative expenses increased by 25.0% from RMB5,061.0 million for the year ended December 31, 2020 to RMB6,325.5 million for the year ended December 31, 2021, primarily due to the increase in staff costs and the increase in expenses as a result of expanded operation of our Boffa mine in Guinea and the ancillary alumina plants of Guangxi Huasheng.

Research and Development Expenses

Our research and development expenses increased by 65.0% from RMB1,465.3 million for the year ended December 31, 2020 to RMB2,417.4 million for the year ended December 31, 2021, primarily due to the increase in investment in optimizing the product process, improving the added value of aluminum processing products and developing the medium and high-end products.

Other Income

Other income decreased by 43.1% from RMB304.4 million for the year ended December 31, 2020 to RMB173.2 million for the year ended December 31, 2021, primarily due to the decrease in tax rebates in 2021.

Other (Losses)/Gains, Net

Our net other losses amounted to RMB1,641.0 million for the year ended December 31, 2021, compared to our net other gains of RMB373.1 million for the year ended December 31, 2020, primarily because of the increased losses on futures business and the higher frequency of asset retirement during 2021.

Finance Income

Our finance income increased by 16.9% from RMB266.2 million for the year ended December 31, 2020 to RMB311.1 million for the year ended December 31, 2021, primarily due to increase in gains from short-term wealth management products.

Finance Costs

Our finance costs decreased by 10.6% from RMB5,069.7 million for the year ended December 31, 2020 to RMB4,532.7 million for the year ended December 31, 2021, primarily because we reduced the scale of our interest-bearing debts and the unit cost of financing decreased in 2021.

Share of Net Profits of Investments Accounted for Using the Equity Method of Joint Ventures

Our net profits of investments accounted for using the equity method of joint ventures decreased by 9.1% from RMB180.5 million for the year ended December 31, 2020 to RMB164.1 million for the year ended December 31, 2021. This was primarily attributable to the decrease in the profitability of a coal joint venture and an electricity generation joint venture.

Share of Net Losses of Investments Accounted for Using the Equity Method of Associates

Our net losses of investments accounted for using the equity method of associates increased significantly from RMB93.5 million for the year ended December 31, 2020 to RMB423.2 million for the year ended December 31, 2021. This was primarily due to decrease in the profitability of a coal associate and an electricity generation associate.

Income Tax

Our income tax expense increased significantly from RMB641.3 million for the year ended December 31, 2020 to RMB2,869.6 million for the year ended December 31, 2021, mainly due to our significant year-on-year increase in pre-tax corporate profits.

Results of Operations

As a result of the foregoing, our net profit increased significantly from RMB2,244.7 million for the year ended December 31, 2020 to RMB11,316.9 million for the year ended December 31, 2021.

Discussion of Segment Operations

We account for our operations on a segmental basis; that is, separately preparing the accounting for our alumina, primary aluminum, trading, energy and corporate and other operating segments. Unless otherwise indicated, also included in these segments are other revenues derived from activities such as supplying electricity, gas, heat and water to our affiliates, selling scrap and other materials and providing services including transportation and research and development to third parties. For additional information relating to our business segments and segment presentation, see Note 5 to our consolidated financial statements.

The following table sets forth a breakdown of our revenues by segment and the contribution of external sales and inter-segment sales for the periods indicated:

	Year Ended December 31,					
	2020	2021	2022	2022	2022	2022
	RMB	*RMB*	*RMB*	*US$*	*%*	*%*
			(in millions, except percentage)			
Revenue						
Alumina:						
External sales	13,088.7	17,579.8	16,411.4	2,379.4	3.5	5.6
Inter-segment sales	31,174.7	36,463.6	39,350.3	5,705.3	8.5	
Total	**44,263.4**	**54,043.4**	**55,761.7**	**8,084.7**	**12.0**	
Primary aluminum:						
External sales	47,336.8	78,613.8	86,503.3	12,541.8	18.6	29.7
Inter-segment sales	34,068.5	39,899.7	51,962.5	7,533.9	11.2	
Total	**81,405.3**	**118,513.5**	**138,465.8**	**20,075.7**	**29.8**	
Trading						
External sales	136,248.7	194,542.3	178,570.7	25,890.3	38.5	61.4
Inter-segment sales	46,261.3	58,162.6	80,283.6	11,640.0	17.3	
Total	**182,510.0**	**252,704.9**	**258,854.3**	**37,530.3**	**55.7**	
Energy						
External sales	6,940.4	7,674.6	9,061.1	1,313.7	2.0	3.1
Inter-segment sales	243.8	240.6	261.5	37.9	<0.1	
Total	**7,184.2**	**7,915.2**	**9,322.6**	**1,351.6**	**2.0**	
Corporate and others						
External sales	378.5	474.9	441.4	64.1	0.1	0.2
Inter-segment sales	748.2	978.3	1,502.5	217.8	0.3	
Total	**1,126.7**	**1,453.2**	**1,943.9**	**281.9**	**0.4**	
Total Revenues before inter-segment eliminations	316,489.6	434,630.2	464,348.3	67,324.2	100.0	
Eliminations of inter-segment sales	(112,496.5)	(135,744.8)	(173,360.4)	(25,134.9)	(37.3)	
Consolidated total revenues	**203,993.1**	**298,885.4**	**290,987.9**	**42,189.3**	**62.7**	**100.0**

The following table sets forth segment results before income tax by segment for the periods indicated:

	Year Ended December 31,			
	2020	2021	2022	2022
	RMB	*RMB*	*RMB*	*US$*
		(in millions)		
Alumina:				
Revenues	44,263.4	54,043.4	55,761.7	8,084.7
Cost and expenses(1)	(43,098.4)	(51,245.3)	(55,421.2)	(8,035.3)
Segment results(2)	**1,165.0**	**2,798.1**	**340.5**	**49.4**
Primary aluminum:				
Revenues	81,405.3	118,513.5	138,465.8	20,075.7
Cost and expenses(1)	(77,542.6)	(105,729.7)	(128,119.5)	(18,575.6)
Segment results(2)	**3,862.7**	**12,783.8**	**10,346.3**	**1,500.1**
Trading:				
Revenues	182,510.0	252,704.9	258,854.3	37,530.3
Cost and expenses(1)	(181,739.9)	(251,368.6)	(256,840.9)	(37,238.4)
Segment results(2)	**770.1**	**1,336.3**	**2,013.4**	**291.9**
Energy:				
Revenues	7,184.2	7,915.2	9,322.6	1,351.6
Cost and expenses(1)	(7,261.4)	(8,150.0)	(7,121.6)	(1,032.5)
Segment results(2)	**(77.2)**	**(234.8)**	**2,201.0**	**319.1**
Corporate and others				
Revenues	1,126.7	1,453.2	1,943.9	281.9
Cost and expenses(1)	(3,318.6)	(3,434.6)	(2,787.0)	(404.2)
Segment results(2)	**(2,191.9)**	**(1,981.4)**	**(843.1)**	**(122.3)**
Elimination(3)	(642.7)	(515.6)	(849.1)	(123.1)
Total profit before income tax	**2,886.0**	**14,186.4**	**13,209.0**	**1,915.1**

(1) Consist of cost of sales, operating expenses, other income, other gains, finance income, finance costs and others attributable to each segment.
(2) Segment results refer to profit before income tax.
(3) Elimination refers to the aggregate inter-segment eliminations of segment results of each segment.

Year Ended December 31, 2022 Compared with Year Ended December 31, 2021

Alumina Segment

Revenues. Total revenue generated by the alumina segment increased by 3.2% from RMB54,043.4 million for the year ended December 31, 2021 to RMB55,761.7 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 4.7% in the sales price of alumina.

Revenue from external sales of the alumina segment decreased by 6.6% from RMB17,579.8 million for the year ended December 31, 2021 to RMB16,411.4 million for the year ended December 31, 2022, primarily due to the year-on-year decrease by 14.4% in the volume of external sales of alumina, partially offset by the year-on-year increase by 4.7% in the price for external sales of alumina compared to that in 2021.

Revenue from inter-segment sales of the alumina segment increased by 7.9% from RMB36,463.6 million for the year ended December 31, 2021 to RMB39,350.3 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 4.7% in the price for internal sales of alumina.

Cost and expenses. The total cost and expenses for our alumina segment increased by 8.1% from RMB51,245.3 for the year ended December 31, 2021 to RMB55,421.2 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 22.8% in the raw material prices and the year-on-year increase in the impairment losses on assets.

Segment results. The segment profit for our alumina segment decreased by 87.8% from RMB2,798.1 million for the year ended December 31, 2021 to RMB340.5 million for the year ended December 31, 2022, primarily due to the impact of the year-on-year decrease in product profit as a result of the increase in raw material prices.

Primary Aluminum Segment

Revenues. Total revenue generated by the primary aluminum segment increased by 16.8% from RMB118,513.5 million for the year ended December 31, 2021 to RMB138,465.8 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 6.7% in the sales price of primary aluminum and the year-on-year increase by 8.9% in the sales volume of primary aluminum.

Revenue from external sales of the primary aluminum segment increased by 10.0% from RMB78,613.8 million for the year ended December 31, 2021 to RMB86,503.3 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 6.7% in the price for external sales of primary aluminum.

Revenue from inter-segment sales of primary aluminum segment increased by 30.2% from RMB39,899.7 million for the year ended December 31, 2021 to RMB51,962.5 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 6.7% in the price for internal sales of primary aluminum and the year-on-year increase by 34.5% in the volume of internal sales of primary aluminum.

Cost and expenses. The total cost and expenses for our primary aluminum segment increased by 21.2% from RMB105,729.7 million for the year ended December 31, 2021 to RMB128,119.5 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 17.2% in raw material prices.

Segment results. We had a segment profit of RMB10,346.3 million for the year ended December 31, 2022, decreasing from a segment profit of RMB12,783.8 million for the year ended December 31, 2021. This was mainly due to the impact of the year-on-year decrease in product profit as a result of the increase in raw material prices.

Trading Segment

Revenues. Total revenue generated by the trading segment increased by 2.4% from RMB252,704.9 million for the year ended December 31, 2021 to RMB258,854.3 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 6.9% in the sales price of alumina and the year-on-year increase by 5.6% in the sales price of primary aluminum, partially offset by the year-on-year decrease by 8.5% in the sales volume of primary aluminum compared to that in 2021.

Revenue from external sales of the trading segment decreased by 8.2% from RMB194,542.3 million for the year ended December 31, 2021 to RMB178,570.7 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 6.9% in the price for external sales of alumina and the year-on-year increase by 5.6% in the price for external sales of primary aluminum, partially offset by the year-on-year decrease by 8.5% in the sales volume of primary aluminum compared to that in 2021.

Revenue from internal sales of the trading segment increased by 38.0% from RMB58,162.6 million for the year ended December 31, 2021 to RMB80,283.6 million for the year ended December 31, 2022, primarily due to the year-on-year increase in the raw materials supplied internally, such as the year-on-year increase by 70.3% in the price of petroleum coke and the year-on-year increase by 57.3% in the price of caustic soda.

Cost and expenses. The total cost and expenses for our trading segment increased by 2.2% from RMB251,368.6 million for the year ended December 31, 2021 to RMB256,840.9 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 6.9% in the purchase price of alumina and the year-on-year increase by 5.6% in purchase price of primary aluminum, partially offset by the year-on-year decrease by 8.5% in the sales volume of primary aluminum compared to that in 2021.

Segment results. Our segment profit increased by 50.7% from RMB1,336.3 million for the year ended December 31, 2021 to RMB2,013.4 million for the year ended December 31, 2022. This was mainly due to the impact of the year-on-year increase in trading profit of imported coking coal.

Energy Segment

Revenues. Total revenue generated by the energy segment increased by 17.8% from RMB7,915.2 million for the year ended December 31, 2021 to RMB9,322.6 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 30.2% in the sales volume of coal.

Revenue from external sales of the energy segment increased by 18.1% from RMB7,674.6 million for the year ended December 31, 2021 to RMB9,061.1 million for the year ended December 31, 2022, primarily due to the year-on-year increase by 30.2% in the sales volume of coal.

Revenue from internal sales of the energy segment was RMB261.5 million for the year ended December 31, 2022, which remained stable compared to RMB240.6 million for the year ended December 31, 2021.

Cost and expenses. The total cost and expenses for our energy segment decreased by 12.6% from RMB8,150.0 million for the year ended December 31, 2021 to RMB7,121.6 million for the year ended December 31, 2022, primarily because of the year-on-year decrease share of net losses of investments accounted for using the equity method of associates and the year-on-year decrease in net impairment losses on financial assets.

Segment results. We recorded a segment profit of RMB2,201.0 million for the year ended December 31, 2022, whereas we had a segment loss of RMB234.8 million for the year ended December 31, 2021. This was primarily due to the year-on-year increase by 30.2% in the sales volume of coal and, the year-on-year decrease in impairment losses on investments in joint ventures and the year-on-year decrease in credit impairment losses.

Corporate and Other Operating Segment

Revenues. Revenue from the corporate and other operating segment increased by 33.8% from RMB1,453.2 million for the year ended December 31, 2021 to RMB1,943.9 million for the year ended December 31, 2022, primarily due to an increase in the revenue for internal maintenance.

Segment results. We recorded a segment loss of RMB843.1 million for the year ended December 31, 2022, representing a decrease of 57.5% from a segment loss of RMB1,981.4 million for the year ended December 31, 2021. This was mainly due to the impact of more provisions for bad debts made on the Company's long-aged receivables in the same period of last year.

Year Ended December 31, 2021 Compared with Year Ended December 31, 2020

Alumina Segment

Revenues. Total revenue generated by the alumina segment increased by 22.1% from RMB44,263.4 million for the year ended December 31, 2020 to RMB54,043.4 million for the year ended December 31, 2021, primarily due to an increase by 11% in production volume as a result of the expanded operation of our Boffa mine in Guinea and the ancillary alumina plants of Guangxi Huasheng in 2021, as well as a year-on-year increase by 18% in the price of alumina.

Revenue from external sales of the alumina segment increased by 34.3% from RMB13,088.7 million for the year ended December 31, 2020 to RMB17,579.8 million for the year ended December 31, 2021, primarily due to an increase by 19% in the average external selling prices for our self-produced alumina and an increase by 18% in the volume of external sales of the alumina in 2021 as compared to that in 2020.

Revenue from inter-segment sales of the alumina segment increased by 17.0% from RMB31,174.7 million for the year ended December 31, 2020 to RMB36,463.6 million for the year ended December 31, 2021, primarily due to an increase by 15% in the internal selling price of our self-produced alumina and an increase by 6% in the volume of internal sales of the alumina.

Cost and expenses. The total cost and expenses for our alumina segment increased by 18.9% from RMB43,098.4 million for the year ended December 31, 2020 to RMB51,245.3 million for the year ended December 31, 2021, primarily due to increase in costs as a result of (i) an increase by 3% in the prices of raw materials, (ii) an increase by 12% in production volume of alumina as a result of operation of Guangxi Huasheng, which is in line with an increase by 64% in production volume of bauxite as a result of expanded operation of our Boffa mine in Guinea, and (iii) a significant increase in loss on disposal of assets and impairment loss in 2021 as compared to that in 2020.

Segment results. The segment profit for our alumina segment increased significantly from RMB1,165.0 million for the year ended December 31, 2020 to RMB2,798.1 million for the year ended December 31, 2021, primarily due to the increase in production volume and gross profit as a result of the expanded operation of our Boffa mine in Guinea and the ancillary alumina plants of Guangxi Huasheng, as well as the year-on-year increase in the gross profit of our alumina products.

Primary Aluminum Segment

Revenues. Total revenue generated by the primary aluminum segment increased by 45.6% from RMB81,405.3 million for the year ended December 31, 2020 to RMB118,513.5 million for the year ended December 31, 2021, primarily due to the year-on-year increase in the price of primary aluminum.

Revenue from external sales of the primary aluminum segment increased by 66.1% from RMB47,336.8 million for the year ended December 31, 2020 to RMB78,613.8 million for the year ended December 31, 2021, primarily due to an increase in the average external selling prices for our self-produced primary aluminum.

Revenue from inter-segment sales of primary aluminum segment increased by 17.1% from RMB34,068.5 million for the year ended December 31, 2020 to RMB39,899.7 million for the year ended December 31, 2021, primarily due to the year-on-year increase in sales price of primary aluminum.

Cost and expenses. The total cost and expenses for our primary aluminum segment increased by 36.4% from RMB77,542.6 million for the year ended December 31, 2020 to RMB105,729.7 million for the year ended December 31, 2021, primarily due to an increase by 21% in the price of alumina, the main raw material of primary aluminum, and an increase by 25% in the price of electricity.

Segment results. We had a segment profit of RMB12,783.8 million for the year ended December 31, 2021, increasing significantly from a segment profit of RMB3,862.7 million for the year ended December 31, 2020. This was mainly due to the year-on-year increase in the gross profit of our primary aluminum products.

Trading Segment

Revenues. Total revenue generated by the trading segment increased by 38.5% from RMB182,510.0 million for the year ended December 31, 2020 to RMB252,704.9 million for the year ended December 31, 2021, primarily due to an increase by 20% and 35% in the average selling prices for alumina and primary aluminum, respectively, an increase by 43% in the average external selling prices for copper and an increase by 49% in the volume of external sales of copper in 2021 as compared to that in 2020.

Revenue from external sales of the trading segment increased by 42.8% from RMB136,248.7 million for the year ended December 31, 2020 to RMB194,542.3 million for the year ended December 31, 2021, primarily due to an increase by 35% and 6% in the average external selling prices and the volume of external sales of primary aluminum, respectively and an increase by 43% and 49% in the average external selling prices and the volume of external sales of copper, respectively, in 2021 as compared to that in 2020.

Revenue from internal sales of the trading segment increased by 25.7% from RMB46,261.3 million for the year ended December 31, 2020 to RMB58,162.6 million for the year ended December 31, 2021, primarily due to an increase by 19% in the internal selling price for our alumina, and an increase by 79% in the revenue of internal sales of raw materials and fuel in 2021 as compared to that in 2020.

Cost and expenses. The total cost and expenses for our trading segment increased by 38.3% from RMB181,739.9 million for the year ended December 31, 2020 to RMB251,368.6 million for the year ended December 31, 2021, primarily due to an increase by 20% and 35% in the average procurement cost of alumina and primary aluminum, respectively, and increased procurement cost corresponding to an increase by 43% and 49% in the average external selling prices and the volume of external sales of copper, respectively, in 2021 as compared to that in 2020.

Segment results. Our segment profit increased significantly from RMB770.1 million for the year ended December 31, 2020 to RMB1,336.3 million for the year ended December 31, 2021. This was mainly due to the year-on-year increase in the gross profit of our alumina and primary aluminum products.

Energy Segment

Revenues. Total revenue generated by the energy segment increased by 10.2% from RMB7,184.2 million for the year ended December 31, 2020 to RMB7,915.2 million for the year ended December 31, 2021, primarily due to the year-on-year increase in coal price.

Revenue from external sales of the energy segment increased by 10.6% from RMB6,940.4 million for the year ended December 31, 2020 to RMB7,674.6 million for the year ended December 31, 2021, primarily due to the year-on-year increase in coal price.

Revenue from internal sales of the energy segment was RMB240.6 million for the year ended December 31, 2021, which remained stable compared to RMB243.8 million for the year ended December 31, 2020.

Cost and expenses. The total cost and expenses for our energy segment increased by 12.2% from RMB7,261.4 million for the year ended December 31, 2020 to RMB8,150.0 million for the year ended December 31, 2021, primarily due to an increase in the procurement costs for certain thermal power companies resulting from increased price of coal.

Segment results. Our segment loss increased significantly from RMB77.2 million for the year ended December 31, 2020 to RMB234.8 million for the year ended December 31, 2021, primarily attributable to the losses of our non-controlling thermal power companies.

Corporate and Other Operating Segment

Revenues. Revenue from the corporate and other operating segment increased by 29.0% from RMB1,126.7 million for the year ended December 31, 2020 to RMB1,453.2 million for the year ended December 31, 2021, primarily due to the expanded business of Zhengzhou Institute in this segment.

Segment results. We recorded a segment loss of RMB1,981.4 million for the year ended December 31, 2021, representing a decrease of 9.6% from a segment loss of RMB2,191.9 million for the year ended December 31, 2020. This was mainly attributable to the loss of RMB307.1 million resulting from hedging business in 2021 compared to that in 2020.

B. Liquidity and Capital Resources

Historically, our primary sources of funding have been cash generated from operating activities, prepayments and deposits from customers, bank and other loans and proceeds from equity or notes and bonds offerings. Our primary uses of funds have been working capital for production, capital expenditures and repayments of short-term, medium-term and long-term borrowings.

As of December 31, 2022, our current assets amounted to RMB54,536.0million, remaining relatively stable compared to RMB54,109.7 million as of December 31, 2021, primarily due to the impact of the appropriate increase in reserves of the Company at the end of the year based on market prices for raw fuel materials and key products. As of December 31, 2022, our restricted cash and cash and cash equivalents balance amounted to RMB19,259.9 million, representing a decrease of 8.7% from RMB21,084.6 million as of December 31, 2021. As of December 31, 2022, our trade and notes receivable amounted to RMB5,874.0 million, representing a decrease of 17.3% from RMB7,106.7million as of December 31, 2021.

As of December 31, 2022, our current liabilities amounted to RMB62,366.8 million, remaining relatively stable compared to RMB61,915.6 million as of December 31, 2021. This is mainly due to the impact of reclassification of more of the Company's debts due within one year to current liabilities during the year.

As of December 31, 2022, our net current liabilities amounted to RMB7,830.9 million, remaining relatively stable compared to RMB7,805.9 million as of December 31, 2021. As of December 31, 2022, our current ratio (current assets/current liabilities) was 0.87, remaining stable compared to 0.87 as of December 31, 2021. Our quick ratio ((current assets – inventories – prepayments)/current liabilities) was 0.44 as of December 31, 2022, compared with 0.51 as of December 31, 2021.

We have considered our available sources of funds as follows:

- Our expected net cash inflows from operating activities in 2023;
- As of December 31, 2022, we had total banking facilities of approximately RMB123,028 million, of which RMB23,839 million had been utilized and unutilized banking facilities amounted to RMB99,189 million as of December 31, 2022, among which, banking facilities of approximately RMB49,380 million will remain unexpired over the 12 months from December 31, 2022. We believe that all banking facilities can be renewed upon their expiration based on our past experience with banks and our good credit standing;
- Bond facilities registered with National Association of Financial Market Institutional Investors but not utilized; and
- Other available sources of financing from banks and other financial institutions based on our good credit history.

We believe that we have adequate resources to continue in operational existence for the foreseeable future not less than 12 months from December 31, 2022. The Board therefore continues to adopt the going concern basis in preparing our financial statements included in this annual report.

Cash Flows and Working Capital

The following table sets forth a condensed summary of our statement of cash flows for the periods indicated:

	Year Ended December 31,			
	2020	2021	2022	2022
	RMB	*RMB*	*RMB*	*US$*
		(in millions)		
Net cash flows generated from operating activities	19,418.5	35,156.2	27,745.2	4,022.7
Net cash flows used in investing activities	(3,307.8)	(1,672.3)	(3,418.3)	(495.6)
Net cash flows used in financing activities	(18,229.8)	(23,413.4)	(27,037.7)	(3,920.1)
Net increase/(decrease) in cash and cash equivalents	(2,119.1)	10,070.5	(2,710.8)	(393.0)

Net Cash Flows Generated from Operating Activities

For the year ended December 31, 2022, we had net cash generated from operating activities of RMB27,745.2 million, which was primarily attributable to our profit before income tax of RMB13,209.0 million, adjusted for non-cash and non-operating items of RMB18,990.8 million, outflows of RMB1,642.0 million for changes in working capital and outflows of income tax of RMB2,812.6 million. The positive adjustment for non-cash and non-operating items primarily consisted of depreciation of property, plant and equipment of 8,943.6 million, finance cost of RMB3,785.3 million and impairment losses on property, plant and equipment of RMB3,795.4 million. The outflows from changes in working capital consisted primarily of (i) an increase in inventories of 4,008.6 million, (ii) an increase in trade and notes receivables of RMB1,328.7 million and (iii) an increase in restricted cash of 1,042.3 million, and partially offset by an increase in trade and notes payables of RMB4,713.1 million.

For the year ended December 31, 2021, we had net cash generated from operating activities of RMB35,156.2 million, which was primarily attributable to our profit before income tax of RMB14,186.4 million, adjusted for non-cash and non-operating items of RMB23,292.9 million, inflows of RMB441.8 million for changes in working capital and outflows of income tax of RMB2,764.9 million. The positive adjustment for non-cash and non-operating items primarily consisted of depreciation of property, plant and equipment of RMB9,158.0 million, finance cost of RMB4,436.0 million and impairment losses on property, plant and equipment of RMB4,064.7 million. The inflows from changes in working capital primarily consisted of (i) an increase in other payables and accrued liabilities of RMB1,712.7 million and (ii) a decrease in inventories of RMB1,324.1 million, and partially offset by a decrease in other payables of RMB2,189.7 million.

For the year ended December 31, 2020, we had net cash generated from operating activities of RMB19,418.5 million, which was primarily attributable to our profit before income tax of RMB2,886.0 million, adjusted for non-cash and non-operating items of RMB17,882.8 million, outflows of RMB493.8 million for changes in working capital and outflows of income tax of RMB856.5 million. The positive adjustment for non-cash and non-operating items primarily consisted of depreciation of property, plant and equipment of RMB8,653.8 million, finance cost of RMB5,068.3 million and impairment loss of inventory of RMB1,411.9 million. The outflows from changes in working capital primarily consisted of (i) an increase in inventories of RMB1,912.7 million and (ii) an increase in trade and notes receivables of RMB4,366.3 million, and partially offset by an increase in trade and notes payables of RMB3,521.8 million.

Net Cash Flows Used in Investing Activities

We recorded net cash flows used in investing activities of RMB3,418.3 million for the year ended December 31, 2022 while we recorded net cash flows used in investing activities of RMB1,672.3 million for the year ended December 31, 2021, primarily due to the impact of the year-on-year increase in capital expenditures during the year.

We recorded net cash flows used in investing activities of RMB3,307.8 million for the year ended December 31, 2020. The decrease in net cash flows used in investing activities in 2021 compared with 2020 were primarily due to the decrease in purchases of property, plant and equipment during 2021.

Net Cash Flows Used in Financing Activities

The net cash flows used in financing activities increased by 15.5% from RMB23,413.4 million for the year ended December 31, 2021 to RMB27,037.7 million for the year ended December 31, 2022, primarily due to the impact of the consideration paid by the Company for the implementation of the business combination under common control of Yunnan Aluminum and Pingguo Aluminum during the year. Our net cash used in financing activities for the year ended December 31, 2022, consisted primarily of repayments of short-term and long-term bank and other loans of RMB30,462.4 million, repayments of short-term bonds and medium-term notes of RMB11,543.2 million and repayments of senior perpetual securities of RMB2,498.4 million, partially offset by drawdown of short-term and long-term banks and other loans of RMB23,110.7 million and proceeds from issuance of short-term bonds and medium-term notes (net of issuance costs) of RMB8,500.0 million.

The net cash flows used in financing activities increased by 28.4% from RMB18,229.8 million for the year ended December 31, 2020 to RMB23,413.4 million for the year ended December 31, 2021, primarily due to the increase in our net debt repayment in 2021. Our net cash used in financing activities for the year ended December 31, 2021, consisted primarily of repayments of short-term and long-term bank and other loans of RMB53,661.1 million, repayments of short-term bonds and medium-term notes of RMB21,537.4 million and repayments of senior perpetual securities of RMB5,386.3 million, partially offset by drawdown of short-term and long-term banks and other loans of RMB35,427.5 million and proceeds from issuance of short-term bonds and medium-term notes (net of issuance costs) of RMB24,845.1 million.

Loans and Borrowings

During the past years, we engaged in debt financing to fund our operations and business expansion. As of December 31, 2021 and 2022, our debt to asset ratio (total debts/total assets as defined in Note 39.3 to our audited consolidated financial statements) was approximately 60.1% and 58.7%, respectively.

	As of December 31,		
	2021	**2022**	**2022**
	RMB	*RMB*	*US$*
		(in millions)	
Short-term loans and borrowings			
Short-term bank and other loans	11,937.2	6,461.1	936.8
Short-term bonds, unsecured	5,440.4	2,623.3	380.3
Current portion of lease liabilities	974.9	890.0	129.0
Current portion of medium-term notes	2,999.6	4,398.6	637.7
Current portion of long-term bank and other loans	6,313.2	13,486.3	1,955.3
Sub-total	27,665.3	27,859.3	4,039.1
Long-term loans and borrowings			
Lease liabilities	11,493.5	10,099.5	1,464.3
Long-term bank and other loans	49,246.7	47,549.6	6,894.0
Medium-term notes and bonds	19,222.6	19,722.6	2,859.5
Less:			
Current portion of lease liabilities	(974.9)	(890.0)	(129.0)
Current portion of medium-term notes and bonds	(2,999.6)	(4,398.6)	(637.7)
Current portion of long-term bank and other loans	(6,313.2)	(13,486.3)	(1,955.3)
Sub-total	69,675.1	58,596.8	8,495.8
Total borrowings	97,340.4	86,456.1	12,534.9
Less: Bank balances and cash	21,084.6	19,259.9	2,792.4
Net	76,255.8	67,196.2	9,742.5

Bank and Other Loans

The weighted average annual interest rate of short-term bank and other loans for the year end December 31, 2022 was 2.76%. Our short-term bank and other loans will mature within one year.

The weighted average annual interest rate of long-term bank and other loans for the years ended December 31, 2022 was 4.10%. The following table sets forth the aggregate maturities of our outstanding long-term bank and other loans as of December 31, 2022. The following table sets forth the amounts of the contractual undiscounted cash flows:

	As of December 31, 2022	
	RMB	*US$*
	(in millions)	
Within 1 year	13,486,345	1,955,336
Between 1 and 2 years	6,604,880	957,618
Between 2 and 5 years	20,579,821	2,983,794
Over 5 years	6,878,511	997,290
Total	47,549,557	6,894,038

As of December 31, 2022, we had secured long-term and short-term loans of RMB7,542.5 million, guaranteed long-term loans of RMB2,008.3 million, and unsecured long-term and short-term loans of RMB44,459.8 million. Among these secured loans, long-term loans and borrowings amounting to RMB7,792 million (current portion of RMB1,402 million and non-current portion of RMB6,390 million) were secured by the contractual right to charge users for electricity generated in the future. In addition, we also pledged various assets primarily including property, plant and equipment to secure our loans.

As of December 31, 2022, we had foreign currency denominated loans with a principal amount of RMB8 million in Japanese Yen and RMB737 million in U.S. dollars.

Notes and Bonds

As of December 31, 2022, we had no outstanding long-term bonds.

The following table sets forth the face value, maturity, effective interest rate and outstanding amount of our outstanding medium-term notes and bonds as of December 31, 2022:

	Face value/maturity	**Effective interest rate**	**December 31, 2022**
	(RMB in thousands, except for the face values of Hong Kong meidum-term bonds)		
2018 Medium-term bonds	RMB900,000/2023	5.06 %	899,865
2018 Medium-term bonds	RMB1,600,000/2023	4.57 %	1,598,947
2019 Medium-term notes	RMB2,000,000/2024	4.31 %	1,993,080
2019 Medium-term bonds	RMB2,000,000/2029	4.57 %	1,997,623
2020 Medium-term bonds	RMB1,000,000/2023	3.07 %	999,962
2020 Medium-term notes	RMB900,000/2023	3.04 %	899,787
2020 Medium-term bonds	RMB500,000/2025	3.31 %	499,900
2021 Medium-term notes	RMB1,000,000/2024	3.21 %	997,969
2022 Medium-term notes	RMB2,000,000/2025	3.08 %	1,996,665
2022 Medium-term notes	RMB400,000/2025	2.73 %	399,557
2022 Medium-term notes	RMB500,000/2024	2.50 %	499,621
2021 Hong Kong Medium-term bonds	USD500,000/2024	1.74 %	3,472,428
2021 Hong Kong Medium-term bonds	USD500,000/2026	2.24 %	3,467,237
Total			**19,722,641**

The following table sets forth face value, maturity, effective interest rate and outstanding amount of our outstanding short-term bonds as of December 31, 2022:

	Face value /maturity	Effective interest rate	December 31, 2022
	(RMB in thousands)		
Short-term bonds	RMB600,000/2022	2.05 %	608,105
Short-term bonds	RMB1,000,000/2022	1.93 %	1,009,288
Short-term bonds	RMB1,000,000/2022	1.59 %	1,005,918
Total			**2,623,311**

Senior Perpetual Capital Securities

Please refer to "Item 4. Information on the Company – A. History and Development of the Company – Senior Perpetual Capital Securities Offering" for further details.

Restriction on Cash Dividends

Our PRC subsidiaries are required to set aside a certain amount of their retained profits each year, if any, to fund certain statutory reserves and these reserves may not be distributed as cash dividends. In addition, when our subsidiaries incur debts on their own behalf, the instruments governing the debt may restrict their ability to pay dividends or make other distributions to us. Our directors are of the view that we will continue to be able to meet our borrowing payment obligations as they fall due from cash generated from our operating activities.

Capital Expenditures and Capital Commitments

The following table sets forth our capital expenditures for the years ended 2020, 2021 and 2022, and the capital expenditures of each segment as a percentage of our total capital expenditures for the periods indicated:

	Year Ended December 31					
	2020		2021		2022	
	RMB	*%*	*RMB*	*%*	*RMB*	*%*
			(in millions, except percentage)			
Alumina	2,653.4	26.8	2,939.8	46.0	2,496.7	52.5
Primary aluminum	5,937.2	59.9	2,084.2	32.6	943.9	19.9
Trading	329.4	3.3	17.6	0.3	1.6	(<0.1)
Energy	881.8	8.9	948.8	14.9	926.6	19.5
Corporate and others	113.4	1.1	392.7	6.2	382.9	8.1
Total	**9,915.2**	**100.0**	**6,383.1**	**100.0**	**4,751.7**	**100.0**

In 2022, we spent approximately RMB4,751.6 million of our capital expenditures (excluding equity interest investments) primarily in investments in construction, energy saving and consumption reduction, environmental governance, resources acquisition and technological research and development. Our total capital expenditures increased slightly from 2021 to 2022.

We expect our estimated capital expenditures in 2023 to be a total of approximately RMB11.8 billion, primarily for technology upgrading of infrastructure and research and development of technology.

As of December 31, 2022, our Group's contractual but not provided capital commitment to fixed assets investment amounted to RMB2,181.8 million.

As of December 31, 2022, our commitments to make capital contribution to our associates and joint ventures and investments measured at fair value amounted to RMB1460.8 million, comprised of the capital contributions of RMB1,019.0 million to China Aluminum Suihe Nonferrous Metals Green Low-carbon Innovation and Development Fund (Beijing) Partnership (Limited Partnership), RMB400.0 million to Chinalco Overseas Development Co., Ltd., RMB8.0 million to Loudi Zhongyu New Materials Co., Ltd., RMB27.8 million to Shanxi Qinlv Taiyue New Materials Co., Ltd. and RMB6.0 million to Chinalco Tendering Company Limited, respectively.

We expect to use primarily operating cash flow in meeting such commitments with the shortfall to be satisfied by proceeds of bank loans, short-term and medium-term bonds and medium-term notes.

Off-Balance-Sheet Arrangements

There are no off-balance sheet arrangements material to investors that have or are reasonably likely to have a current or future effect on our financial condition, our changes in financial condition, revenue or expenses, results of operations, liquidity, capital expenditures or capital resources.

Material Cash Requirements

Our material cash requirements as of December 31, 2022 and any subsequent interim period primarily include our capital expenditures, lease liabilities, loans and interest payables, financial liabilities at fair value through profit or loss, financial liabilities included in other payables, accrued liabilities, accrued interest, financial liabilities included in other non-current liabilities and trade and notes payables.

Our lease liabilities primarily relate to consideration for certain properties leased by us from Chinalco for the period commencing January 1, 2023.

Our loans and interest payables primarily consist of long-term bank and other loans, medium-term notes and bonds, short-term bonds and short-term bank and other loans.

The trade and notes payables are non-interest bearing and are normally settled within one year.

We intend to fund our existing and future material cash requirements with our existing cash and cash equivalents, bank loans, the issuance of medium-term notes and bonds and long-term bonds and other financing alternatives. We will continue to make cash commitments, including capital expenditures, to support the growth of our business.

The following table summarizes our contractual obligations and commercial commitments for the periods indicated as of December 31, 2022:

	Payment due by period				
	Total	**Within 1 year**	**1 to 2 years**	**2 to 5 years**	**Thereafter**
			(RMB in millions)		
Lease liabilities, including current portion	19,999.3	1,651.9	1,314.6	3,092.9	13,939.9
Long-term bank and other loans, including current portion	47,549.5	13,486.3	6,604.9	20,579.8	6,878.5
Medium-term notes and bonds, including current portion	19,223.6	4,400.0	6,712.8	6,110.8	2,000.0
Short-term bonds	2,600.0	2,600.0	—	—	—
Short-term bank and other loans	6,461.1	6,461.1	—	—	—
Interest payables for loans and borrowings	6,290.4	2,285.4	1,490.2	1,468.1	1,046.7
Financial liabilities at fair value through profit or loss	8.8	8.8	—	—	—
Financial liabilities included in other payables and accrued liabilities, excluding accrued interest	6,786.9	6,786.9	—	—	—
Financial liabilities included in other non-current liabilities	1,244.2	203.4	50.2	150.6	840.0
Trade and notes payables	22,536.3	22,536.3	—	—	—
Subtotal	132,700.1	60,420.1	16,172.7	31,402.2	24,705.1
Capital commitments on property, plant and equipment	2,181.8	N/A	N/A	N/A	N/A
Commitments for capital contribution	1,460.8	N/A	N/A	N/A	N/A
Total	136,342.7				

Other than as discussed above, we did not have any significant capital and other commitments, long-term obligations or guarantees as of December 31, 2022.

C. Research and Development

For the years ended December 31, 2020, 2021 and 2022, we have had a department responsible for organizing and coordinating the research and development efforts of the Company, and the Zhengzhou Institute, the only professional research institute in China dedicated to the research and development of aluminum smelting technologies, has been responsible for taking the lead in the research and development of important and key technologies for our operations and providing technology services for our plants. The technology centers at our plants focus on providing solutions for specific issues of each plant and applying our developed technologies. Each of the plants also has opportunities to participate in operational testing and pilot industrialization relating to research and development of important and key technologies. We also collaborate with universities and other research institutions in China on some of our complicated projects.

D. Trend Information

Other than as disclosed elsewhere in this annual report, we are not aware of any trends, uncertainties, demands, commitments or events for the period from January 1, 2022 to December 31, 2022, that are reasonably likely to have a material effect on our revenue, profitability, liquidity or capital resources, or that caused the disclosed financial information to be not necessarily indicative of future operating results or financial conditions.

E. Critical Accounting Policies and Estimates

We prepare our consolidated financial statements in accordance with IFRS as issued by the International Accounting Standards Board, which requires the use of certain critical accounting estimates. It also requires management to exercise its judgment in the process of applying the accounting policies. The areas in our financial reporting involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the consolidated financial statements, are disclosed in Note 4 to our consolidated financial statements. We have established procedures and processes to facilitate the making of such judgments in the preparation of our consolidated financial statements. Management has used the best information available but actual performance may differ from our management's estimates and future changes in key variables could change future reported amounts in our consolidated financial statements.

Property, Plant and Equipment

Property, plant and equipment, other than construction in progress ("CIP"), are stated at cost less accumulated depreciation and any impairment losses. When an item of property, plant and equipment is classified as held for sale or when it is part of a disposal group classified as held for sale, it is not depreciated and is accounted for in accordance with IFRS 5. The cost of an item of property, plant and equipment comprises its purchase price and any directly attributable costs of bringing the asset to its working condition and location for its intended use.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of any component accounted for as a separate asset is derecognized when replaced. All other repairs and maintenance are charged to profit or loss during the reporting period in which they are incurred.

Except for the coal mining structures which depreciation is calculated using the unit-of-production method, depreciation of property, plant and equipment is calculated using the straight-line method to allocate their cost or revalued amounts, net of their residual values, over their estimated useful lives as follows:

Buildings and infrastructure	8-45 years
Machinery	3-30 years
Transportation facilities	6-10 years
Office and other equipment	3-10 years

We reviewed and adjusted the assets' depreciation method, residual values and useful lives, if appropriate, at least at each financial year end.

Construction in progress ("CIP") represents buildings under construction, which is stated at cost less any impairment losses, and is not depreciated. Cost comprises the direct costs of construction and capitalized borrowing costs on related borrowed funds during the period of construction. CIP is reclassified to the appropriate categories of property, plant and equipment when completed and ready for use.

An asset's carrying amount is written down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount.

Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in profit or loss.

Goodwill

Goodwill is measured as described in Note 3.3 to our consolidated financial statements. Goodwill on acquisitions of subsidiaries is included in intangible assets. Goodwill is not amortized but it is tested for impairment annually, or more frequently if events or changes in circumstances indicate that it might be impaired, and is carried at cost less accumulated impairment losses. Gains and losses on the disposal of an entity include the carrying amount of goodwill relating to the entity sold.

Goodwill is allocated to cash-generating units for the purpose of impairment testing. The allocation is made to those cash-generating units or groups of cash-generating units that are expected to benefit from the business combination in which the goodwill arose. The units or groups of units are identified at the lowest level at which goodwill is monitored for internal management purposes, being the operating segments.

Intangible assets - mining rights and mineral exploration rights

Our mineral exploration rights and mining rights relate to coal, bauxite and other mines.

(i) Recognition

Except for mineral exploration rights and mining rights acquired in a business combination, mineral exploration rights and mining rights are initially recorded at the cost which includes the acquisition consideration, qualifying exploration and other direct costs. The mineral exploration rights are stated at cost less any impairment, and the mining rights are stated at cost less any amortization and impairment.

(ii) Reclassification

Mineral exploration rights are converted to mining rights when obtain mining rights certification, or technical feasibility and commercial viability of extracting a mineral resource are demonstrable, and are subject to amortization when commercial production has commenced.

We assess the stage of each mine under construction to determine when a mine moves into the production stage. The criteria used to assess the start date are determined based on the unique nature of each mine construction project. We consider various relevant criteria, such as completion of a reasonable period of testing of the mine and equipment, ability to produce in saleable form (within specifications) and ability to sustain ongoing production to assess when a mine is substantially complete and ready for its intended use.

(iii) Amortization

Mining rights other than coal mining rights are amortized on a straight-line basis over a shorter period of the mining right valid period and expected mining life. Estimated mineable periods of majority of the mining rights range from 3 to 30 years.

Coal mining rights are amortized on a unit-of-production basis over the economically recoverable reserves evaluated based on the reserves estimated in accordance with the standards of the mine concerned.

(iv) Impairment

An impairment review is performed when there are indicators that the carrying amount of the mineral exploration rights and mining rights may exceed their recoverable amounts. To the extent that this occurs, the excess is fully provided as an impairment loss.

Leases

Leases are recognized as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group.

Contracts may contain both lease and non-lease components. We allocate the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices.

Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants other than the security interests in the leased assets that are held by the lessor. Leased assets may not be used as security for borrowing purposes.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- fixed payments (including in-substance fixed payments), less any lease incentives receivable;
- variable lease payments that are based on an index or a rate, initially measured using the index or rate as of the commencement date;
- amounts expected to be payable by us under residual value guarantees;
- the exercise price of a purchase option if we are reasonably certain to exercise that option, and
- payments of penalties for terminating the lease, if the lease term reflects us exercising that option.

Lease payments to be made under reasonably certain extension options are also included in the measurement of the liability.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be readily determined, which is generally the case for leases in the Group, the lessee's incremental borrowing rate is used, being the rate that the individual lessee would have to pay to borrow the funds necessary to obtain an asset of similar value to the right-of-use asset in a similar economic environment with similar terms, security and conditions.

To determine the incremental borrowing rate, we:

- where possible, use recent third-party financing received by the individual lessee as a starting point, adjusted to reflect changes in financing conditions since third party financing was received;
- use a build-up approach that starts with a risk-free interest rate adjusted for credit risk for leases held by the Group, which does not have recent third-party financing, and,
- make adjustments specific to the lease, such as term, country, currency and security.

If a readily observable amortizing loan rate is available to the individual lessee (through recent financing or market data) which has a similar payment profile to the lease, then our entities use that rate as a starting point to determine the incremental borrowing rate.

We are exposed to potential future increases in variable lease payments based on an index or rate, which are not included in the lease liability until they take effect. When adjustments to lease payments based on an index or rate take effect, the lease liability is reassessed and adjusted against the right-of-use asset.

Lease payments are allocated between principal and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period.

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of lease liability;

- any lease payments made at or before the commencement date less any lease incentives received;
- any initial direct costs, and
- restoration costs.

Right-of-use assets are generally depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis as follows:

Buildings	2–20 years
Machinery	2–10 years
Land use rights	10–50 years

If we are reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the underlying asset's useful life.

Payments associated with short-term leases of equipment and vehicles and all leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. We apply the short-term lease recognition exemption to our short-term leases of machinery and equipment (that is those leases that have a lease term of 12 months or less from the commencement date and do not contain a purchase option). We also apply the recognition exemption for leases of low-value assets to leases of office equipment that are considered to be of low value (i.e. below RMB30,000).

Rental income is recognized on a time proportion basis over the lease terms. Variable lease payments that do not depend on an index or a rate are recognized as income in the accounting period in which they are incurred.

Impairment of financial assets

We recognize an allowance for expected credit losses ("ECLs") for all debt instruments not held at fair value through profit or loss. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that we expect to receive, discounted at an approximation of the original effective interest rate.

Impairment of non-financial assets

Goodwill and intangible assets that have an indefinite useful life are not subject to amortization and are tested annually for impairment, or more frequently if events or changes in circumstances indicate that they might be impaired. Other assets are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash inflows which are largely independent of the cash inflows from other assets or groups of assets (cash-generating units). Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at the end of each reporting period.

Inventories

Raw materials and stores, work in progress and finished goods are stated at the lower of cost and net realizable value. Cost comprises direct materials, direct labor and an appropriate proportion of variable and fixed overhead expenditure, the latter being allocated on the basis of normal operating capacity. Costs are assigned to individual items of inventory on the basis of weighted average costs. Costs of purchased inventory are determined after deducting rebates and discounts. Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

Share-based payment

The Group operates a share incentive plan, under which the Company issued restricted shares to certain employees of the Group as the consideration for the services received from such employees. The fair value of the services received in exchange for the grant of the restricted shares is recognized as an expense on the consolidated statement of profit or loss with a corresponding increase in equity. In terms of the restricted shares awarded to employees, the total amount to be expensed is determined by reference to the fair value of equity instruments granted. In addition, the Company has an obligation to re-purchase the restricted shares forfeited due to unsatisfaction of service condition or performance condition. Accordingly, treasury shares and corresponding liability for the consideration of re-purchase of the restricted shares are recognized at the issue date of the shares.

Service and non-marketing performance conditions are included in calculation of the number of restricted shares that are expected to vest. The total amount expensed is recognized over the vesting period, which is the period over which all of the specified vesting conditions are to be satisfied.

At the end of each reporting period, the Group revises its estimates of the number of restricted shares that are expected to vest based on the non-marketing performance and service conditions. It recognizes the impact of the revision to original estimates, if any, in the consolidated income statement, with a corresponding adjustment to equity.

Current and deferred income tax

The income tax expense or credit for the period is the tax payable on the current period's taxable income based on the applicable income tax rate for each jurisdiction adjusted by changes in deferred tax assets and liabilities attributable to temporary differences and to unused tax losses.

Current income tax

The current income tax charge is calculated on the basis of the tax laws enacted or substantively enacted at the end of the reporting period in the countries where we and our subsidiaries and associates operate and generate taxable income. Our management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation and considers whether it is probable that a taxation authority will accept an uncertain tax treatment. We measure our tax balances either based on the most likely amount or the expected value, depending on which method provides a better prediction of the resolution of the uncertainty.

Deferred income tax

Deferred income tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, deferred tax liabilities are not recognized if they arise from the initial recognition of goodwill. Deferred income tax is also not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantively enacted by the end of the reporting period and are expected to apply when the related deferred income tax asset is realized or the deferred income tax liability is settled.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses.

Deferred tax liabilities and assets are not recognized for temporary differences between the carrying amount and tax bases of investments in foreign operations where we are able to control the timing of the reversal of the temporary differences and it is probable that the differences will not reverse in the foreseeable future.

Deferred tax assets and liabilities are offset where there is a legally enforceable right to offset current tax assets and liabilities and where the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset where the entity has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously.

Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

Revenue recognition

Revenue from contracts with customers

Revenue from contracts with customers is recognized when control of goods or services is transferred to the customers at an amount that reflects the consideration to which we expect to be entitled in exchange for those goods or services.

When the consideration in a contract includes a variable amount, the amount of consideration is estimated to which we will be entitled in exchange for transferring the goods or services to the customer. The variable consideration is estimated at contract inception and constrained until it is highly probable that a significant revenue reversal in the amount of cumulative revenue recognized will not occur when the associated uncertainty with the variable consideration is subsequently resolved.

When the contract contains a financing component which provides the customer with a significant benefit of financing the transfer of goods or services to the customer for more than one year, revenue is measured at the present value of the amount receivable, discounted using the discount rate that would be reflected in a separate financing transaction between us and the customer at contract inception. When the contract contains a financing component which provides us a significant financial benefit for more than one year, revenue recognized under the contract includes the interest expense accreted on the contract liability under the effective interest method. For a contract where the period between the payment by the customer and the transfer of the promised goods or services is one year or less, the transaction price is not adjusted for the effects of a significant financing component, using the practical expedient in IFRS 15.

(a) Sale of industrial products

Revenue from the sale of industrial products (including sales of scrap and other materials) is recognized at the point in time when control of the asset is transferred to the customer, generally on acceptance of the industrial products. Revenue from electricity is recognized upon transmission of electricity based on the confirmation from the power grid.

(b) Rendering of services

We provide transportation and other service and the revenue from services is recognized over time, using an input method to measure progress towards complete satisfaction of the service, because the customer simultaneously receives and consumes the benefits provided by the Group.

New IFRS Pronouncements

For a detailed discussion of new accounting pronouncements, please see Notes 3.1.4 and 3.1.5 to our audited consolidated financial statements.

Item 6. Directors, Senior Management and Employees

A. Directors and Senior Management

Directors

The eighth session of our Board currently consists of nine directors, including four executive directors, two non-executive directors and three independent non-executive directors. In accordance with our Articles of Association, our affairs are managed by our Board. The business address of each of our directors is No. 62 North Xizhimen Street, Hai Dian District, Beijing, People's Republic of China, 100082.

We were listed on the NYSE until September 1, 2022. We follow our home country practice in relation to the composition of our Board in reliance on the exemption provided under Section 303A.00 of the NYSE Corporate Governance Rules available to foreign private issuers. Our home country practice does not require a majority of directors of a listed company to be independent directors. As such, majority of our directors are not independent within the meaning of NYSE Corporate Governance Rules.

The table and discussion below set forth information concerning our directors who served on our Board during the year ended December 31, 2022, and up to date of this annual report.

Name	Age	Positions with the Company
Executive Directors(1)		
Liu Jianping(2)	55	Executive Director and Chairman of the Board
Zhu Runzhou(3)	58	Executive Director and President
Ou Xiaowu(3)	58	Executive Director and Secretary of the Discipline Inspection Committee
Jiang Tao(4)	48	Executive Director and Vice President
Non-executive Directors(5)		
Zhang Jilong(6)	59	Non-executive Director
Chen Pengjun(6)	52	Non-executive Director
Wang Jun(7)	57	Non-executive Director (expired)
Independent Non-executive Directors(8)		
Qiu Guanzhou(9)	74	Independent Non-executive Director
Yu Jinsong(9)	69	Independent Non-executive Director
Chan Yuen Sau Kelly(9)	52	Independent Non-executive Director

(1) As of the date of this annual report, we had four executive directors.
(2) On June 21, 2022, Mr. Liu Jianping was elected as executive director of the eighth session of the Board at the 2021 annual general meeting of the Company. On the same day, Mr. Liu Jianping was elected as the chairman of the eighth session of the Board.
(3) On June 21, 2022, Mr. Zhu Runzhou and Mr. Ou Xiaowu were elected as executive directors of the eighth session of the Board at the 2021 annual general meeting of the Company.
(4) On June 21, 2022, Mr. Jiang Tao was elected as executive director of the eighth session of the Board at the 2021 annual general meeting of the Company.
(5) As of the date of this annual report, we had two non-executive directors.
(6) On June 21, 2022, Mr. Zhang Jilong and Mr. Chen Pengjun were elected as non-executive directors of the eighth session of the Board at the 2021 annual general meeting of the Company.
(7) Mr. Wang Jun reached the maximum term for consecutive appointment and no longer served as the non-executive directors upon election of new non-executive directors at the 2021 annual general meeting of the Company.
(8) As of the date of this annual report, we had three independent non-executive directors.
(9) On June 21, 2022, Mr. Qiu Guanzhou, Mr. Yu Jinsong and Ms. Chan Yuen Sau Kelly were elected as independent non-executive directors of the eighth session of the Board at the 2021 annual general meeting of the Company.

Executive Director

Liu Jianping, aged 55, is the chairman and an executive Director of the Company. Mr. Liu also serves as the director and deputy secretary of the Communist Party Committee of Aluminum Corporation of China. Mr. Liu graduated from Renmin University of China with a master's degree in economics majoring in commodity. Mr. Liu has extensive experience in human resource and corporate management, etc. He successively worked in the department of restructuring, laws and regulations of National Food and Strategic Reserve Administration, the department of personnel of National Food and Strategic Reserve Administration, the department of personnel, the organization department of the CPC Central Committee and the First Bureau of Management of Enterprise Leaders of the State-owned Assets Supervision and Administration Commission of China Grain Reserve Group Ltd. Company. He successively served as the deputy head and head of the department of personnel (bureau of retired veteran cadres) of Aluminum Corporation of China, the head of the human resources department (veteran cadre work department) of the Aluminum Corporation of China, the general manager of the human resource department of the Company, the assistant to the general manager of Aluminum Corporation of China, a member of the Communist Party Committee, deputy general manager and general manager of copper business department of Aluminum Corporation of China, the chairman and president of China Copper Co., Ltd., the chairman of Yunnan Copper (Group) Co., Ltd, and the deputy general manager, a member of the Communist Party Committee and the safety director of Chinalco.

Zhu Runzhou, aged 58, is an executive Director and president of the Company. Mr. Zhu graduated from Wuhan University, majoring in software engineering, with a doctor's degree in management. He is a professor-level senior engineer. Mr. Zhu has extensive experience in power generation, electrolytic aluminum, operation and management, and has successively served as the head of the inspection department, the deputy chief engineer and the chairman of the labour union of Gansu Jingyuan Power Plant. He has served as the deputy general manager of Jingyuan First Power Co., Ltd., the chairman of Baiyin Huadian Water Supply Co., Ltd., head of Guodian Guizhou Kaili Power Plant, director of the preparatory office of the technical transformation program of Guodian in Duyun City, deputy general manager of Guodian Guizhou Branch, deputy general manager of Guodian Yunnan Branch and general manager of Guodian Power Xuanwei Power Generation Co., Ltd., general manager of Guodian Guangxi Branch, deputy general manager of the energy management department of the Company and deputy general manager (department manager level) of Chalco Energy, a director, general manager and chairman of Ningxia Energy, the general manager of Chalco Xinjiang Aluminum Power Co., Ltd., an executive Director, vice president and safety director of the Company, and a director and vice president of Chinalco High-end Manufacturing Co., Ltd. ("Chinalco High-end Manufacturing").

Ou Xiaowu, aged 58, serves as executive Director and secretary of the Discipline Inspection Committee of the Company. Mr. Ou graduated from Xiamen University with a bachelor's degree in economics majoring in planning and statistics and is a senior auditor. Mr. Ou has extensive experience in auditing and financial management. He successively served as the deputy head and head of 2nd division and head of 1st division of the audit department in China Nonferrous Metals Industry Corporation, the deputy head of the finance department and audit department of China Copper Lead Zinc Group Corporation, the deputy general manager of Guizhou Branch of Aluminum Corporation of China Limited, the deputy head and head of the finance department (audit department) and chief financial officer of copper business department of Aluminum Corporation of China, a director and chief financial officer of China Copper Co., Ltd., the general manager of the finance department and audit department of the Company, and a deputy chief auditor and general manager of the audit department of Chinalco. Mr. Ou also served as a supervisor of China Copper Co., Ltd., Chinalco High-end Manufacturing, Chalco Energy, China Aluminum International Engineering Corporation Limited and the Company. Currently, Mr. Ou serves as the chairman of the supervisory committee of Qinghai Yellow River Hydropower Renewable Aluminum Co., Ltd.

Jiang Tao, aged 48, is the executive director and the vice president of the Company. Mr. Jiang graduated from Northeastern University with a doctor's degree in engineering majoring in nonferrous metals metallurgy, and is an excellent senior engineer. Mr. Jiang has extensive experience in corporate management and production skills. He successively served as the deputy manager of the department of production and operation, deputy head of Second Alumina Plant, deputy head and head of Alumina Plant, assistant to the general manager and head of Second Alumina Plant of Chalco Shandong Co., Ltd., the standing member of the Party Committee of Shandong Aluminum Co., Ltd. and deputy general manager of Chalco Shandong, the deputy secretary of the Party Committee of Shandong Aluminum Co., Ltd. and director and the general manager of Chalco Shandong, the secretary of the Party Committee and executive director of Chalco Zhongzhou Aluminum Co., Ltd., and the executive director of Henan Zhongzhou Aluminum Plant Co., Ltd.

Non-Executive Directors

Zhang Jilong, aged 59, is a non-executive Director of the Company. Mr. Zhang graduated from Central South University with a doctor's degree in engineering majoring in mining engineering, and is an excellent senior engineer. Mr. Zhang has extensive experience in scientific and technological research and development, and corporate management, etc. He successively served as the deputy head of breakthrough and development division of the science and technology development of China Nonferrous Metals Industry Corporation, the deputy head and head of science and technology division of department of planning and development of the State Bureau of Nonferrous Metal Industry, the head of science and technology division of the department of production skills of Aluminum Corporation of China, the deputy general manager of science and technology research and product development center and the manager of comprehensive department of the Company, the deputy head and head of science and technology department of Aluminum Corporation of China and the deputy manager of science and technology research center and product development center of the Company, the head of the department of science and technology management of Aluminum Corporation of China and the deputy dean of Chinalco Research Institute of Science and Technology, the general manager of science and technology management division of the Company, the general manager, secretary of the Party Committee and chairman of Xinan Aluminum (Group) Co., Ltd., the general manager of aluminum processing department of Aluminum Corporation of China, the director of Chinalco Ruimin Co., Ltd. and the general manager of aluminum processing division of Chinalco.

Chen Pengjun, aged 52, serves as a non-executive Director of the Company. Mr. Chen currently serves as the secretary of the Party Committee and chairman of the board of directors of Huarong Ruitong Equity Investment Management Co., Ltd. and the general manager of the equity business department of China Huarong Asset Management Co., Ltd. ("China Huarong"). Mr. Chen holds a Master of Business Administration (MBA) from Tsinghua University and is a senior economist with extensive experience in equity management and investment financing. Mr. Chen successively served as senior deputy manager of the debt management department and senior deputy manager of the first asset management department of China Huarong, senior manager of the first marketing department of China Huarong Beijing Branch, senior manager of the first restructuring office of China Huarong, member of the Party Committee and assistant general manager of China Huarong Xinjiang Branch, deputy general manager of business development department and deputy general manager of international business department of China Huarong, deputy secretary of the Party Committee and general manager of Huarong International Trust Co., Ltd., deputy secretary of the Party Committee and general manager of China Huarong Financial Leasing Co., Ltd., director of the listing office, general manager of the international business department and general manager of the general management department of China Huarong, and deputy secretary of the Party Committee and general manager of Huarong Securities Co., Ltd.

Independent Non-Executive Directors

Qiu Guanzhou, aged 74, is an independent non-executive Director of the Company. Mr. Qiu is an academician of Chinese Academy of Engineering, currently serving as a professor and tutor of doctoral students in Central South University. Mr. Qiu graduated from Central South University of Technology majoring in mineral processing engineering with a doctoral degree and is a famous mineral engineer. Mr. Qiu previously served as the vice-principal of Central South University of Technology (Central South University). Mr. Qiu has dedicated himself to the research of processing and utilizing low-grade, complex and refractory metallic mineral resources in China for a long time, and has obtained significant achievements in flotation separation of fine and sulphide minerals and direct reduction of iron ore, especially the outstanding contributions made in the aspect of biohydrometallurgy in low-grade sulphide ore. He was awarded as a national science and technology expert with outstanding contributions. Mr. Qiu has published many science papers and treatises, and obtained several national technological inventions and scientific and technological advancement awards. He served as the academic leader of the innovative research group under National Natural Science Foundation of China in 2003. In 2004 and 2009, he consecutively served as the chief scientist for biometallurgy project of the National 973 Project twice. He was the president of the 19th International Biohydrometallurgy Symposium in 2011 and was elected as the vice president of International Biohydrometallurgy Society. Currently, Mr. Qiu also serves as the independent director of LB Group Co., Ltd., the independent director of Guangdong Hongda Holding Group Co., Ltd., and the executive director and manager of Hunan Bio Lab Technology Co., Ltd.

Yu Jinsong, aged 69, is an independent non-executive Director of the Company. Mr. Yu is a doctor of law, a professor and tutor of doctoral students of Renmin University of China, and the head of the Institute of International Law (academic part-time job). Mr. Yu focuses on research in international economic law, particularly international investment law and transnational corporation law. He has published dozens of academic papers in multiple major academic journals and several academic works, and obtained multiple national and provincial awards for achievements in teaching and research. Mr. Yu had successively served as an arbitrator of China International Economic and Trade Arbitration Commission, a mediator and arbitrator (2004-2016) of the International Centre for Settlement of Investment Disputes of the World Bank, a vice chairman of the Chinese Society of International Law, a counselor of the International Law Advisory Committee of Ministry of Foreign Affairs.

Chan Yuen Sau Kelly, aged 52, is a Justice of the Peace and an independent non-executive Director of the Company. Ms. Chan is a fellow of the Association of Chartered Certified Accountants (ACCA), the Hong Kong Institute of Certified Public Accountants (HKICPA), and the Hong Kong Institute of Directors (HKIoD). She is also a Bachelor of Accounting (Honours) of City University of Hong Kong. Ms. Chan has nearly three decades of working experience in finance and accounting and practical experience in fields such as corporate governance, risk management, business process reorganization, auditing, etc. Ms. Chan has successively served as a manager of auditing and management consultancy of Deloitte & Touche, the financial and administrative head in Hong Kong and Macau of Heineken, and the chief financial officer of Moet Hennessy Diageo. Ms. Chan currently serves as the managing director of Peony Consulting Services Company, the Program Director of Asia Chief Financial Officer Council of The Conference Board, the past president of the Association of Women Accountants (Hong Kong) and Association of Chartered Certified Accountants (ACCA Hong Kong), the chairperson of TR at CUHK Ltd. and Employees' Compensation Insurance Levies Management Board, a member of the Air Transport Licensing Authority, a member of the board of The Chinese University of Hong Kong, a member of the council of Hong Kong Repertory Theatre and the board of Rehabaid Society. Currently, Ms. Chan also serves as an independent non-executive director of Morimatsu International Holdings Company Limited.

Supervisors

Our supervisors are elected to represent our employees and shareholders and serve a term of three years or until the election of their respective successors, whichever is earlier. Our supervisors currently comprise Mr. Ye Guohua, Ms. Shan Shulan and Ms. Lin Ni.

The table and discussion below set forth certain information concerning our supervisors who served on our supervisory committee during the year ended December 31, 2022, and up to the date of this annual report.

Name(1)	Age	Positions with the Company
Ye Guohua(2)	54	Chairman of Supervisory Committee
Shan Shulan(2)	51	Supervisor
Lin Ni(2)	49	Supervisor
Yue Xuguang(3)	59	Supervisor
Xu Shuxiang(3)	45	Supervisor

(1) As of the date of this annual report, we had five supervisors.
(2) On June 21, 2022, Mr. Ye Guohua, Ms. Shan Shulan and Ms. Lin Ni were elected as shareholder representative supervisors of the Company at the 2021 annual general meeting of the Company.
(3) On June 21, 2022, Mr. Yue Xuguang and Ms. Xu Shuxiang were elected as employee representative supervisors of the Company of the eighth session of the Supervisory Committee of the Company.

Ye Guohua, aged 54, is the chairman of the Supervisory Committee of the Company and served as the chief accountant and a member of the Communist Party Committee of Chinalco. Mr. Ye graduated from Shanghai University of Finance and Economics, majoring in accounting, with a bachelor degree in economics and is a senior accountant. Mr. Ye has extensive experience in financial management and accounting. He has successively served as the director of accounting department of the refinery of Shanghai Gaoqiao Petrochemical Company, the deputy chief accountant and head of accounting department of Sinopec Shanghai Gaoqiao Branch, the chief financial officer, executive director, a member of the Party Committee, deputy general manager of Sinopec Shanghai Petrochemical Company Limited, the director of accounting department of China Petroleum & Chemical Group Corporation, the chairman of Century Bright International Investment Company, the chairman of Sinopec Insurance Limited, the vice chairman of Taiping & Sinopec Financial Leasing Co., Ltd., a director of Sinopec Finance Co., Ltd., and a director of Sinopec Oilfield Service Corporation. Mr. Ye currently is also the chairman of Chinalco Innovative Development Investment Company Limited.

Shan Shulan, aged 51, is a Supervisor of the Company and serves as the general manager of the Finance Property Department of Chinalco. Ms. Shan graduated from Beijing Institute of Light Industry, majoring in industrial corporate management, with a bachelor degree in engineering. She is a certified public accountant and statistician. Ms. Shan has extensive experience in accounting, finance management and other fields. She has successively served as an economic analyst at the economic research office of Beijing Glass Instruments Plant, the financial manager of Beijing CEMFIL Glass Fiber Co. Ltd. under Saint-Gobain in China, the financial manager for Beijing region of Carrefour (China) Co., Ltd., the financial manager for China region of Baker Hughes Centrilift, the financial manager for China region of Microsoft Research Asia (China), the business director and deputy head of budget division and the head of budget assessment division of the finance department of Aluminum Corporation of China, the deputy general manager of the financial department of Chinalco and the deputy general manager of the Finance Property Department of Chinalco (responsible for daily operation). Ms. Shan also currently serves as the director of Chinalco Capital Holdings Co., Ltd., the director of Chinalco Finance Co., Ltd. and the supervisor of Chinalco Research Institute of Science and Technology Co., Ltd.

Lin Ni, aged 49, is a Supervisor of the Company and also serves as the general manager of the audit department of Chinalco. Ms. Lin graduated from Shandong Economics University with a bachelor degree in economics majoring in international accounting. She is a senior auditor. Ms. Lin has extensive experience in the fields of auditing and accounting. She has successively served as the head of the 2nd division and the 1st division of the audit department of Aluminum Corporation of China, the deputy head of the audit department of Aluminum Corporation of China, the deputy head of the audit department of Chinalco, and the deputy general manager of the audit department of Chinalco. Ms. Lin currently also serves as the supervisor of China Aluminum International Engineering Corporation Limited, Chinalco Materials Application Research Institute Co., Ltd. and Chinalco Asset Operation and Management Co., Ltd.

Yue Xuguang, aged 59, is a Supervisor of the Company. Mr. Yue graduated from Kunming Institute of Technology with a bachelor degree in engineering majoring in mineral census and exploration. He is a senior economist. He has rich experience in human resources management. Mr. Yue has successively served as the deputy head of the coordination division of the labour insurance bureau and the head of the labour management division of the personnel and education department of China Nonferrous Metals Industry Corporation, the deputy head of the general division of the personnel office of State Bureau of Nonferrous Metal Industry (enjoying the head-level treatment), the deputy head of the personnel department of China Aluminum Corporation, the head of the labour division of the personnel department of Aluminum Corporation of China, the manager of the remuneration management division of the human resources department of the Company, the head of the general division of the general office of Aluminum Corporation of China, the manager of the general division of the capital operating department of the Company, the deputy general manager and general manager of the human resources department of the Company, the deputy head (departmental head level) of the human resources department (veteran cadre work department) of the Aluminum Corporation of China, the secretary of the party committee and deputy general manager of Chinalco Asset Operation and Management Co., Ltd and the general manager of the human resources department of the Company.

Xu Shuxiang, aged 45, is a Supervisor of the Company and a senior business manager of the operation optimization division of the production quality department of the Company. Ms. Xu graduated from Northeastern University with a master's degree in engineering majoring in non-ferrous metallurgy and has extensive experience in metal smelting, energy conservation management, safety and environmental protection management, etc. Ms. Xu has successively served as the business head of the assets operation department of Aluminum Corporation of China, the business head of the general division of the enterprise management department (safety and environmental protection department) of Aluminum Corporation of China, the business head of the general division of the safety, environmental protection and health department of Aluminum Corporation of China, the business manager of the general division of the safety, environmental protection and health department of the Company, the senior business manager of the energy conservation management division of the safety, environmental protection and health department of Aluminum Corporation of China, the deputy manager of the safety, environmental protection and health division of the enterprise management department of the Company and the senior business manager of the general division of the enterprise management department of the Company.

Senior Management

The table and discussion below set forth certain information concerning other members of senior management during the year ended December 31, 2022, and up to the date of this annual report.

Name	Age	Positions with the Company
Wu Maosen	59	Vice President
Ge Xiaolei [(1)]	57	Chief Financial Officer and Secretary to the Board
Xu Feng	51	Vice President

(1) On March 22, 2022, the appointment of Mr. Ge Xiaolei as the chief financial officer and the secretary to the Board was approved at the 26th meeting of the seventh session of the Board.

Wu Maosen, aged 59, is a vice president of the Company. Mr. Wu graduated from Dalian Railway College with a bachelor's degree in engineering, majoring in welding technology and equipment. He is a senior engineer with excellent performance. Mr. Wu has extensive experience in corporate management. He has successively served as the deputy head of the alumina branch, the deputy head of the overhauling branch and the director of the transport department of Shanxi Aluminum Plant, the assistant to the general manager of Shanxi Branch of Aluminum Corporation of China Limited, the deputy commander-in-chief of the engineering and construction command department of Chalco Shanxi, a deputy general manager of Shanxi Huaze Aluminum & Power Co., Ltd, the deputy head and head of Shanxi Aluminum Plant, a director, a general manager and the secretary of the Party committee of Qinghai Yellow River Hydropower Renewable Aluminum Co., Ltd., the secretary of the Party committee, an executive director and general manager of Chalco Asset Operation and Management Company and successively served as an executive director of Chalco Shanghai Company Limited, an executive director and the general manager of Chalco Industrial Development Co., Ltd., the chairman of the board of Huaxi Aluminum Company Limited, the chairman of the board and the general manager of Chalco Investment and Development Co., Ltd., the deputy team-leader of the team aiming at making up deficits and shaking off dilemma, transforming and upgrading of Shanxi Branch of Aluminum Corporation of China Limited and Shanxi Aluminum Plant and the chairman and an executive director of the board of Chinalco Research Institute of Science and Technology Co., Ltd. Currently, Mr. Wu also serves as the chairman of Chalco (Shanghai) Carbon.

Ge Xiaolei, aged 57, has served as the chief financial officer and secretary to the Board of the Company (Joint Company Secretary). Mr. Ge graduated from Nanjing University majoring in economic management, and subsequently obtained a master's degree in business administration from the University of Texas in the United States. He is a senior economist. Mr. Ge has extensive experience in financial management and corporate management. He has successively served as the deputy head of the planning division and deputy head of the finance division of Zhongzhou Aluminum Plant, the deputy chief accountant and manager of the finance department of the Company's Zhongzhou Branch, the chief financial officer of Qinghai Yellow River Hydropower Renewable Aluminum Co., Ltd., the deputy general manager of Chinalco Finance Co., Ltd. and the director and general manager of Chinalco Finance Lease Co., Ltd., the general manager of Chinalco Finance Co., Ltd. and a director of Chinalco Finance Lease Co., Ltd., a director of Agricultural Bank Huili Fund Management Co., Ltd., the secretary of the party committee and chairman of Chinalco Capital Holdings Co., Ltd., the chairman of the board of directors of Chinalco Finance Co., Ltd., and a director of Agricultural Bank Huili Fund Management Co., Ltd.

Xu Feng, aged 51, is a vice president of the Company since 21 March 2023. Mr. Xu holds a master of engineering degree in project management from Xi'an Jiaotong University and is a senior engineer. Mr. Xu has extensive experience in the aluminum and the energy industries. He has successively served as the director and deputy chief engineer of the engineering and technical department of Maliantai Power Plant of Ningxia Power Group Co., Ltd., the executive director, general manager and deputy secretary of the party committee of Ningxia Yingyi Power Equipment Inspection and Installation Co., Ltd., the vice general manager of Chinalco Ningxia Energy Group Co., Ltd. and chairman of Ningxia Yinxing Energy Co., Ltd., a general manager and deputy secretary of the party committee of Shanxi Chinalco Resources Co., Ltd., the executive director and secretary of the party committee of Chinalco (Yunnan) Huajiang Aluminum Co., Ltd., a vice chairman and deputy secretary of the party committee of Yunnan Aluminum Co., Ltd. and the chairman and secretary of the party committee of Yunnan Wenshan Aluminum Co., Ltd., as well as an assistant to the president of the Company. Mr. Xu also serves as the chairman of Chalco Steering Intelligence Technology Co., Ltd. currently.

B. Compensation

Executive Compensation

Executive directors are entitled to a director's fee, performance bonuses and welfare benefits provided under the relevant PRC laws and regulations. Non-executive directors are entitled only to a director's fees. In 2022, the aggregate amount of cash compensation paid by us to our directors, supervisors and other members of senior management for services performed in connection with their respective capacities above was approximately RMB3.8 million, RMB1.5 million and RMB1.9 million, respectively. Our executive directors and supervisors who are employees also receive compensation in forms including allowances, subsidies and medical care, maternity, unemployment, occupational injury and other benefits. None of the service contracts of our directors provide benefits to our directors upon their termination.

Details of the emoluments paid to our directors and supervisors during the year ended December 31, 2022 are as follows:

Name of Directors and Supervisors	Fees RMB('000)	Salary RMB('000)	Bonus RMB('000)	Pension RMB('000)	Total RMB('000)
Directors					
Executive Directors					
Liu Jianping(1)	—	—	—	—	—
Zhu Runzhou(2)	—	1,160	—	101	1,261
Ou Xiaowu(2)	—	933	—	101	1,034
Jiang Tao(3)	—	844	—	101	945
Non-Executive Directors					
Zhang Jilong(4)	—	—	—	—	—
Chen Pengjun(4)	—	—	—	—	—
Wang Jun(5)	—	—	—	—	—
Independent Non-Executive Directors					
Qiu Guanzhou(6)	206	—	—	—	206
Yu Jinsong(6)	206	—	—	—	206
Chan Yuen Sau Kelly(6)	206	—	—	—	206
Subtotal	618	2,937	—	303	3,858
Supervisors					
Ye Guohua(7)	—	—	—	—	—
Shan Shulan(7)	—	—	—	—	—
Lin Ni(7)	—	—	—	—	—
Guan Xiaoguang(8)	—	198	—	24	222
Xu Shuxiang(9)	—	319	—	77	396
Yue Xuguang(9)	—	790	—	101	891
Subtotal	—	1,307	—	202	1,509
Total	618	4,244	—	505	5,367

(1) On June 21, 2022, Mr. Liu Jianping was elected as executive director of the eighth session of the Board at the 2021 annual general meeting of the Company. On the same day, Mr. Liu Jianping was elected as the chairman of the seventh session of the Board. Mr. Liu Jianping received emoluments from Chinalco.
(2) On June 21, 2022, Mr. Zhu Runzhou and Mr. Ou Xiaowu were elected as executive directors of the eighth session of the Board at the 2021 annual general meeting of the Company.
(3) On June 21, 2022, Mr. Jiang Tao was elected as executive director of the eighth session of the Board at the 2021 annual general meeting of the Company.
(4) On June 21, 2022, Mr. Zhang Jilong and Mr. Chen Pengjun were elected as non-executive directors of the eighth session of the Board at the 2021 annual general meeting of the Company. Mr. Zhang Jilong received emoluments from Chinalco.
(5) Mr. Wang Jun submitted a voluntary waiver of director's remuneration to the Company, according to which Mr. Wang has voluntarily waived his remuneration for his service as a director of the Company since May 2020. Accordingly, Mr. Wang Jun did not receive remuneration from the Company in 2022.
(6) On June 21, 2022, Mr. Qiu Guanzhou, Mr. Yu Jinsong and Ms. Chan Yuen Sau Kelly were elected as independent non-executive directors of the eighth session of the Board at the 2021 annual general meeting of the Company.
(7) On June 21, 2022, Mr. Ye Guohua, Ms. Shan Shulan and Ms. Lin Ni were elected as shareholder representative supervisors of the Company at the 2021 annual general meeting of the Company.
(8) On March 18, 2022, Mr. Guan Xiaoguang resigned as a supervisor of the Company.
(9) On June 21, 2022, Mr. Yue Xuguang and Ms. Xu Shuxiang were elected as employee representative supervisors of the Company of the eighth session of the Supervisory Committee of the Company.
(10) The amounts of emoluments paid to directors and supervisors disclosed in this table include amounts paid for their services in all capacities to the Company and its subsidiaries.

Senior Management Incentive System

In order to better provide incentives for our senior management and improve our shareholders' value, we adopted a special compensation system for our senior management designed to align our senior management's financial interests with our operating performance. Under this system, the senior management's compensation consists of the following components:

- basic salaries;
- performance bonuses;
- welfare benefits; and
- incentive bonuses.

C. *Board Practices*

Board of Directors

All of our directors and supervisors serve a term of three years or until such later date as their successors are elected or appointed. Directors and supervisors may serve consecutive terms. Each of our directors and supervisors has entered into a service contract with us, none of which can be terminated by us within one year without payment of compensation (other than statutory compensation). There were no arrangements providing for benefits upon termination of directors, supervisors or other senior management personnel. Two of the supervisors are employee representatives appointed by our employees and the rest are appointed by the shareholders. The following table sets forth the number of years our current directors and supervisors have held their positions and the expiration of their current term:

Name	Held Position Since	Expiration of Term
Liu Jianping	June 21, 2022	June 30, 2025
Zhu Runzhou	June 21, 2022	June 30, 2025
Jiang Tao	June 21, 2022	June 30, 2025
Ou Xiaowu	June 21, 2022	June 30, 2025
Zhang Jilong	June 21, 2022	June 30, 2025
Chen Pengjun	June 21, 2022	June 30, 2025
Qiu Guanzhou	June 21, 2022	June 30, 2025
Yu Jinsong	June 21, 2022	June 30, 2025
Chan Yuen Sau Kelly	June 21, 2022	June 30, 2025
Ye Guohua	June 21, 2022	June 30, 2025
Lin Ni	June 21, 2022	June 30, 2025
Shan Shulan	June 21, 2022	June 30, 2025
Yue Xuguang	June 21, 2022	June 30, 2025
Xu Shuxiang	June 21, 2022	June 30, 2025

Audit Committee

As at the date of this annual report, our audit committee consists of three independent non-executive directors, namely, Mr. Qiu Guanzhou, Mr. Yu Jinsong and Ms. Chan Yuen Sau Kelly. Ms. Chan Yuen Sau Kelly is the chairman of the audit committee.

The primary duties of our audit committee as set out in the committee charter include proposing to engage or replace the auditor, supervising our internal audit and its implementation, being responsible for the communication between the internal audit and external audit, auditing our financial information and its disclosure, reviewing the Company's financial control, internal control and risk management systems, studying on our other relevant professional matters, and putting forward suggestions for the decisions of the Board for reference.

Remuneration Committee

As at the date of this annual report, our remuneration committee consists of one non-executive director, namely Mr. Zhang Jilong, and two independent non-executive directors, namely Mr. Qiu Guanzhou and Mr. Yu Jinsong. Mr. Qiu Guanzhou is the chairman of the remuneration committee. The primary duties of our remuneration committee as set out in the committee charter include: preparing the remuneration management scheme and remuneration proposal for directors, employee-representative supervisors and senior management, and providing suggestions to the Board; preparing measures on performance evaluation of senior management, performance assessment procedures and relevant rewards and punishments, and providing suggestions to the Board; monitoring the implementation of the remuneration system of our Company; reviewing senior management's fulfilment of duties and conducting performance assessments; and other functions and authorities delegated by the Board. In 2022, the remuneration committee convened two meetings to consider and approve remuneration standards for 2022 for our directors, supervisors and other senior management members.

We follow our home country practice in relation to the composition of our remuneration committee in reliance on the exemption provided under NYSE Corporate Governance Rule 303A.00 available to foreign private issuers. Our home country practice does not require us to establish a remuneration committee which must be composed entirely of independent directors.

Nomination Committee

As at the date of this annual report, our nomination committee consists of two executive directors, namely Mr. Liu Jianping and Mr. Zhu Runzhou, and three independent non-executive directors, namely Mr. Qiu Guanzhou, Mr. Yu Jinsong and Ms. Chan Yuen Sau Kelly. Mr. Liu Jianping is the chairman of the nomination committee. The primary duties of our nomination committee as set out in the committee charter include: studying the selection standards and procedures for directors, senior management and members of special committees under the Board and providing suggestions to the Board; reviewing the qualification of candidates for directors, senior management and members of special committees under the Board and providing advice on inspection and appointment; assessing the independence of independent non-executive directors; and other functions and authorities delegated by the Board.

We follow our home country practice in relation to the composition of our nomination committee in reliance on the exemption provided under NYSE Corporate Governance Rule 303A.00 available to foreign private issuers. Our home country practice does not require us to establish a nomination committee which must be composed entirely of independent directors.

Development and Planning Committee

As at the date of this annual report, our development and planning committee consists of two executive directors, namely Mr. Liu Jianping and Mr. Zhu Runzhou, one non-executive director, namely Mr. Zhang Jilong, and two independent non-executive directors, namely Mr. Qiu Guanzhou and Mr. Yu Jinsong. Mr. Liu Jianping is the chairman of our development and planning committee. In accordance with the committee charter, the committee reviews and assesses our strategic plans for long-term development, fiscal budgeting, investment, business operations and investments returns.

Occupational Health and Safety and Environmental Committee

As at the date of this annual report, our occupational health and safety and environmental committee consists of three executive directors, namely Mr. Zhu Runzhou, Mr. Ou Xiaowu and Mr. Jiang Tao. Mr. Zhu Runzhou is the chairman of our occupational health and safety and environmental committee. This committee considers our annual planning on health, environmental protection and safety, supervises our implementation of the planning on health, environmental protection and safety initiatives, makes inquiries into serious incidents and inspects and supervises the handling of such incidents and makes recommendations to the Board on major decisions on health, environmental protection and safety.

Supervisory Committee

As at the date of this annual report, our supervisory committee consists of five supervisors, namely Mr. Ye Guohua, Ms. Lin Ni and Ms. Shan Shulan as our shareholder representative supervisors and Mr. Yue Xuguang and Ms. Xu Shuxiang as our employee representative supervisors.

Mr. Ye Guohua is the chairman of our supervisory committee. The term of all members of the supervisory committee will expire upon the election of the ninth session of the supervisory committee at the general meeting and employees' representatives meeting of the Company by the end of June 2025. The primary duties of our supervisory committee include: inspecting implementation of resolutions of the general meetings; inspecting legal compliance of our operations; inspecting our financial activities; inspecting the utilization of proceeds raised by us; inspecting the acquisitions and disposals of our assets; inspecting our connected transactions; and reviewing self-assessment report on internal control.

D. Employees

As of December 31, 2020, 2021 and 2022, we had 63,007, 60,056 and 67,383 employees, respectively. The number of our employees decreased from 2020 to 2021, which was mainly due to retirement of employees and termination of employment contracts through negotiation. The number of our employees increased from 2021 to 2022, primarily because Yunnan Aluminum becomes a subsidiary of our Company, due to our acquisition of 19% total issued share capital of Yunnan Aluminum in 2022. The table below sets forth the number of our employees by function and location as of the periods indicated:

	As of December 31,					
	2020		2021		2022	
Function		(%)		(%)		(%)
Alumina production	24,485	38.86	23,338	38.86	24,368	36.16
Primary aluminum production	22,612	35.89	21,553	35.89	27,085	40.20
Mining operation	4,721	7.49	4,500	7.49	4,635	6.88
Research and development	783	1.24	746	1.24	896	1.33
Sales and marketing	643	1.02	613	1.02	687	1.02
Energy	6,833	10.84	6,513	10.84	6,698	9.94
Management and others(1)	2,930	4.65	2,793	4.65	3,013	4.47
Total	**63,007**	**100.0**	**60,056**	**100.0**	**67,383**	**100.0**

(1) Excluding our management personnel for alumina production, and primary aluminum production.

Location	Employees	% of Total
Shandong	168	0.25
Shandong Huayu	168	0.25
Henan	4,645	6.89
Chalco Mining	4,092	6.07
Zhengzhou Institute	4,645	6.89
Guizhou	5,825	8.65
Guizhou Huajin	793	1.18
Guizhou branch	2,238	3.32
Zunyi Aluminum	1,993	2.96
Guizhou Huaren	801	1.19
Guangxi	3,885	5.77
Guangxi branch	2,120	3.15
Guangxi Huasheng	602	0.89
Pingguo Aluminum	1,163	1.73
Shanxi	8,841	13.12
Shanxi branch	1,356	2.01
Shanxi New Material	770	1.14
Shanxi Zhongrun	1,136	1.69
Shanxi Huaxing	484	0.72
Xinghua Technology	8,841	13.12
Yunnan	9,696	14.39
Yunnan Aluminum	9,696	14.39
Gansu	3,131	4.65
Lanzhou Aluminum	1,913	2.84
Liancheng branch	3,131	4.65
Qinghai	2,152	3.19
Qinghai branch	2,152	3.19
Chongqing	29	0.04
Chongqing branch	29	0.04
Inner Mongolia	4,549	6.75
Baotou Aluminum	4,549	6.75
Ningxia	6,108	9.06
Ningxia Energy	6,108	9.06
Shanghai	6,388	9.48
Chalco Trading Group	236	0.35
Chalco Carbon	6,152	9.13
Beijing	2,958	4.40
Chalco Materials	125	0.19
Chalco Energy	58	0.09
Chalco Logistics	2,775	4.12
Jiangsu	7,935	11.78
Chalco New Material	7,935	11.78
Overseas	864	1.28
Chalco Guinea Company S.A.	864	1.28
Others	19	0.03
Chalco Hong Kong	19	0.03
Headquarters	190	0.28
Total	**67,383**	**100.00**

We have workers' unions at the plant level that protect employees' rights and welfare benefits, organize educational programs, encourage employee participation in management decisions and mediate disputes between individual employees and us. All employees are union members. We have not experienced any strikes or other labor disturbances that have interfered with our operations and we believe that we maintain good relationships with our employees.

The remuneration package of our employees includes salaries, bonuses, subsidies, allowances and medical care, housing subsidies, maternity, unemployment, occupational injury, retirement pension and other benefits.

In accordance with applicable PRC regulations, we participate in pension contribution plans organized by provincial and municipal governments, under which each of our plants is required to contribute an amount equal to a specified percentage of its employees' salaries, bonuses and various allowances. As the relevant PRC authorities adjusted the social insurance rate, the amount of contribution as a percentage of the employees' salary has been adjusted to approximately 16% from approximately 20% since May 1, 2019. We have made all required pension contributions up to December 31, 2022. Retirees who retired prior to the date of the reorganization have their pensions paid out of the pension plans established by the PRC government. We provide to our employees various social welfare benefits through various institutions owned by Chinalco and its other affiliates or through third parties.

E. Share Ownership

As of the date of this annual report, other than as listed in the following table, none of our directors, supervisors or senior management own any interest in shares of our Company.

Name	Position	Share class	Number of shares	% of respective share class
Zhu Runzhou	Executive Director and President	A Share	270,000	<0.1%
Ou Xiaowu	Executive Director	A Share	250,000	<0.1%
Jiang Tao	Executive Director and Vice President	A Share	234,000*	<0.1%
Xu Shuxiang	Supervisor	A Share	4,000	<0.1%

* Among which 4,000 shares were directly held by Ms. Shi Biqiong, Mr. Jiang Tao's spouse.

On December 21, 2021, our Board reviewed and approved the relevant proposals on the Company's restricted share incentive scheme in 2021 (the "2021 Restricted Share Incentive Scheme"), and proposed to grant not more than 141 million restricted A shares to not more than 1,192 employees comprising directors, senior management, middle level management and core technical (business) backbones of the Company, including the grant of restricted A shares to connected persons under the Hong Kong Listing Rules. The aforesaid share incentive scheme has been approved in the 2022 first extraordinary general meeting, 2022 first class meeting of A shareholders and 2022 first class meeting of H shareholders convened by the Company on April 26, 2022. On May 25, 2022, our Board reviewed and approved the relevant proposals on the adjustment to the Company's 2021 Restricted Share Incentive Scheme and the first grant of restricted shares to participants. The registration of the first grant has been completed on June 13, 2022, with a total of 112,270,300 restricted shares granted to 930 participants. Upon completion of the grant, the total share capital of the Company was changed from 17,022,672,951 shares to 17,134,943,251 shares. On November 24, 2022, our Board reviewed and approved the relevant proposal on the grant of reserved restricted shares to participants under the Company's restricted share incentive scheme in 2021. The registration of the reserved grant under the 2021 Restricted Share Incentive Scheme has been completed on 23 December 2022, with a total of 26,648,300 Restricted Shares granted to 276 Participants. Upon completion of the grant, the total share capital of the Company was changed from 17,134,943,251 shares to 17,161,591,551 shares.

Item 7. Major Shareholders and Related Party Transactions

A. *Major Shareholders*

We are a joint stock limited company organized under the laws of the PRC. Our parent company, Chinalco, a state-owned enterprise, beneficially owns 31.9% of our outstanding ordinary Shares directly and indirectly through its controlled entities as of March 31, 2023. Chinalco holds a significant portion of our domestic shares in the form of state legal person shares, which do not have voting rights different from our other shares. Chinalco has substantial influence over our management, policies and corporate actions and can exercise all rights as our controlling shareholder subject to the relevant laws, rules and regulations. As of March 31, 2023, approximately 68.1% of our total outstanding ordinary Shares are held by public shareholders, of which 52.45% and 15.65% are owned by holders of A Shares and H Shares, respectively. The following table sets forth information regarding ownership of our issued and outstanding capital stock as of March 31, 2023. The table includes all persons who are known by us to own, either as beneficial owners or holders of record, 5% or more of any class of shares:

	March 31, 2023(2)		
Holders of A Shares and H Shares(1)	**Number of shares**	**% of respective share class**	**% of issued total share capital**
Chinalco(3)			
A Shares	5,295,895,019 (L) (4)	40.07 (L)	30.86 (L)
H Shares	178,590,000 (L)	4.53 (L)	1.04 (L)
AllianceBernstein L.P.			
H Shares	291,003,304 (L)	7.37 (L)	1.70 (L)
BlackRock, Inc.			
H Shares	204,179,237 (L)	5.18 (L)	1.19 (L)
	6,446,000 (S) (5)	0.16 (P)	0.04 (P)
Brown Brothers Harriman & Co.			
H Shares	197,645,061 (L)	5.01 (L)	1.15 (L)
	197,645,061 (P) (6)	5.01 (P)	1.15 (P)

(1) Information disclosed hereby is based on the information available on the website of the Hong Kong Stock Exchange at www.hkexnews.hk.
(2) As at March 31, 2023, the total number of our A Shares was 13,217,625,583, the total number of our H Shares was 3,943,965,968, and the number of our total issued shares was 17,161,591,551 shares.
(3) Including 5,050,376,970 A Shares directly held by Chinalco, an aggregate interest of 245,518,049 A Shares directly held by various controlled subsidiaries of Chinalco, comprising 238,377,795 A Shares held by Baotou Aluminum (Group) Co., Ltd. and 7,140,254 A Shares held by Chinalco Asset Operation and Management Co., Ltd. and an interest of 178,590,000 H Shares directly held by Aluminum Corporation of China Overseas Holdings Limited, a subsidiary of Chinalco.
(4) The letter “L” denotes a long position.
(5) The letter “S” denotes a short position.
(6) The letter “P” denotes a lending pool.

We are not aware of any arrangement that may on a subsequent date result in a change of control of Chalco. We have completed the Asset Restructuring through capital contributions by several investors to our subsidiaries and subsequent issuance of additional A Shares to these investors to purchase their entire stake in these subsidiaries. On February 25, 2019, we issued to the investors approximately 2.1 billion A Shares in aggregate, representing approximately 12.45% of the enlarged total issued share capital of the Company. See “Item 4. Information on the Company - A. History and Development of the Company - Subscription of Equity Interest of Certain Subsidiaries and Subsequent Issuance of Additional A Shares” for detailed information of the Asset Restructuring. For the period from June 25, 2018 to June 24, 2019, Chinalco increased its shareholding in the Company by 160,512,964 A shares and 115,276,000 H shares on a cumulative basis, representing approximately 0.94% and 0.68% of our total issued share capital as of June 24, 2019, respectively. See “Item 4. Information on the Company - A. History and Development of the Company - Controlling Shareholder’s Shareholding Increase in the Company” for detailed information of the shareholding increase. For the period from May 22, 2020 to May 29, 2020, Chinalco increased its shareholding in the Company by 16,314,000 H shares on a cumulative basis through its subsidiary, representing approximately 0.10% of our total issued share capital as of December 31, 2020.

As of March 31, 2023, there were 43 registered holders of ADRs evidencing 1,920,315 of our ADSs.

As an owner of at least 30% of our issued and outstanding shares, the parent company is deemed a controlling shareholder and therefore may not exercise its voting rights with respect to various matters related to our shares in a manner prejudicial to the interests of our other shareholders. See “Item 10. Additional Information - B. Memorandum and Articles of Association.” In accordance with our Articles of Association, each share of our capital stock has one vote and the shares of the same class have the same rights. Other than the foregoing restrictions, the voting rights of our major holders of domestic and H Shares are identical to those of any other holders of the same class of shares. Holders of domestic shares and H Shares are deemed to be shareholders of different classes for some matters, which may affect their respective interests. Other than the foregoing, holders of H Shares and domestic shares are entitled to the same voting rights.

B. Related Party Transactions

Connected Transactions under Hong Kong Listing Rules

Under the Listing Rules, transactions between connected persons and us, or connected transactions, generally must be reported to the Hong Kong Stock Exchange, announced to the public and/or approved by shareholders unless the foregoing requirements are waived by the Hong Kong Stock Exchange or exempted under the Listing Rules. Each year our independent non-executive directors must review our non-exempt continuing transactions and confirm that these transactions have been entered into:

(i) in the ordinary and usual course of our business;

(ii) with the terms of the transaction being fair and reasonable as far as our shareholders are concerned;

(iii) either on normal commercial terms or, if there are not sufficient comparable transactions to judge whether they are on normal commercial terms, on terms no less favorable to us than terms available to or from (as appropriate) independent third parties; and

(iv) in accordance with the relevant agreement governing them on terms that are fair and reasonable and in the interests of our shareholders as a whole.

Although the definition of connected transactions is not synonymous with the definition of related party transactions, the concepts are sufficiently similar that the description of our connected transactions would satisfy disclosure requirements under U.S. securities laws.

The following table sets forth the details of our major connected transactions for the year ended December 31, 2022:

Agreement	Nature	Term/ Date of the Agreement	Transaction Amount in 2022	Cap for 2022
			(RMB in millions)	*(RMB in millions)*
Continuing Connected Transactions				
Comprehensive Social and Logistics Services Agreement (Counterparty: Chinalco)	Chinalco provides us with a broad range of social and logistics services including education and schooling, public transportation and property management.	The original agreement was entered into on November 5, 2001, and expired on December 31, 2012. Pursuant to the supplementary agreement entered into in 2012, the term was renewed and expired on December 31, 2015. Pursuant to the supplementary agreement entered into in 2015, the term was renewed for three years from January 1, 2016 to December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	258	Annual cap: 500
General Agreement on Mutual Provision of Production Supplies and Ancillary Services (Counterparty: Chinalco)	We purchase from Chinalco ancillary production supplies and services which include, among other things, various raw materials required in alumina and primary aluminum production, transportation and loading services and production supporting services.	The original agreement was entered into on November 5, 2001, and expired on December 31, 2012. Pursuant to the supplementary agreement entered into in 2012, the term was renewed and entered into on December 31, 2015. Pursuant to the supplementary agreement entered into in 2015, the term was renewed for three years from January 1, 2016 to December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. On June 3, 2019, we and Chinalco entered into a supplemental agreement to revise the scope of mutual supply of products and include the pricing principles and methods of payment for the additional products subject to mutual supply. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	10,954	Annual cap for expenditure transactions: 15,400

	We provide Chinalco with products including, among other things, aluminum and alumina products, supporting services and ancillary production services.		36,120	Annual cap for revenue transactions: 37,100
Mineral Supply Agreement (Counterparty: Chinalco)	Chinalco provides us with bauxite and limestone from several mines that it operates. Chinalco must not provide bauxite and limestone to bauxite and limestone requirements.	The original agreement was entered into on November 5, 2001, and expired on December 31, 2012. Pursuant to the supplementary agreement entered into in 2012, the term was renewed and expired in December 31, 2015. Pursuant to the supplementary agreement entered into in 2015, the term was renewed for three years from January 1, 2016 to December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	255	Annual cap: 400
Provision of Engineering, Construction and Supervisory Services Agreement (Counterparty: Chinalco)	Chinalco provides us with certain engineering, construction and supervisory services at the state guidance price and, where there is no state guidance price, at market price. Such services are mainly provided by subsidiaries of Chinalco including China Aluminum International Engineering Corporation Limited.	The original agreement was entered into on November 5, 2001, and expired on December 31, 2012. Pursuant to the supplementary agreement entered into in 2012, the term was renewed and expired on December 31, 2015. Pursuant to the supplementary agreement entered into in 2015, the term was renewed for three years from January 1, 2016 to December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	544	Annual cap: 6,000
Land Use Rights Leasing Agreement (Counterparty: Chinalco)	Chinalco leases 470 parcels of land covering an aggregate area of approximately 61.2 million square meters and spanning across eight provinces in the PRC to us.	The original agreement was entered on November 5, 2001, for a term of 50 years, expiring on June 30, 2051.	1,370	Annual cap: 1,500

Fixed Assets Lease Framework Agreement (Counterparty: Chinalco)	We have agreed with Chinalco to provide leases to each other regarding buildings, constructions, machinery, apparatus, transportation facilities as well as equipment, appliance or tools and other fixed assets owned by either party in relation to production and operation.	The original agreement was entered into on April 28, 2015 and expired on December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	27 31	Annual cap for expenditure transactions: 320 Annual cap for revenue transactions: 300
Financial Services Agreement (Counterparty: Chinalco Finance)	Chinalco Finance has agreed with Chinalco to provide us with deposit services, credit services and miscellaneous financial services. We have the right to choose the financial institution for financial services and the financial institution for deposit services and loan services as well as the amounts of loans and deposits with reference to our own needs. Chinalco Finance undertakes that the terms for the provision of financial services to us at any time would be no less favorable than those of the same type of financial services provided by Chinalco Finance to Chinalco and other subsidiaries of Chinalco or those of the same type of financial services that may be provided to us by other financial institutions.	The original agreement expired on August 25, 2012, for a term of 1 year. Pursuant to the financial services agreement renewed on August 24, 2012, the term was extended and expired on August 25, 2015. Pursuant to the financial services agreement renewed on April 28, 2015, the term was renewed for a term of 3 years from August 26, 2015, and was amended and replaced as a whole by a new financial services agreement. A new financial services agreement was entered on October 26, 2017, for a term of 3 years, expired on October 25, 2020. Another new financial services agreement was entered into on August 27, 2020 for a term of 3 years from October 26, 2020.	11,979 2,577 0.2	Daily cap of deposit balance (including accrued interests): 12,000 Daily cap of loan balance (including accrued interests): 15,000 Other financial services (after October 26, 2020) (2): 40
Finance Lease Agreement (Counterparty: Chinalco Finance Lease Co., Ltd.)	Chinalco Finance Lease Co., Ltd. provides finance lease services to us.	The original finance lease framework agreement was entered into between the Company and Chinalco Lease on August 27, 2015, with a term from August 27, 2015, to December 31, 2016. A new finance lease framework agreement was entered into between the Company and Chinalco Lease on November 13, 2015, with a term of 3 years from January 1, 2016, to December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	0	2,500

Factoring Cooperation Agreement (Counterparty: Chinalco Commercial Factoring Co., Ltd.)	Chinalco Commercial Factoring Co., Ltd. provides factoring financing services to the Company.	The original agreement was entered into on September 27, 2017, and expired on December 31, 2018. Pursuant to the supplementary agreement entered into in 2018, the term was renewed for three years from January 1, 2019 to December 31, 2021. Pursuant to the supplementary agreement entered into in 2021, the term was renewed for three years from January 1, 2022 to December 31, 2024.	0	1,000
One-Off Connected Transactions[(1)]				
Establishment of Green Low-Carbon Fund (Parties: Chalco, ABC Capital Management Co., Ltd., Chinalco Innovation Development Equity Investment Fund Management (Beijing) Co., ABC Financial Assets Investment Co., Ltd., Chinalco, China Copper, Chinalco High-end Manufacturing Co., Ltd. and Chinalco Capital Holdings Co., Ltd.)	As considered and approved on December 21, 2021, the Company proposed to establish China Aluminum Suihe Nonferrous Metals Green Low-carbon Innovation and Development Fund (Beijing) Partnership (Limited Partnership (the “Fund”, tentative name, subject to the business registration) with ABC Capital Management Co., Ltd., Chinalco Innovation Development Equity Investment Fund Management (Beijing) Co., Ltd., ABC Financial Assets Investment Co., Ltd., Chinalco, China Copper, Chinalco High-end Manufacturing Co., Ltd., and Chinalco Capital Holdings Co., Ltd.	October 28, 2022	1	N/A
Grant of Restricted A Shares to Connected Participants (Parties: Chalco and 32 connected participants under the incentive scheme)	As considered and approved on December 21, 2021 and the adjustment made on March 4, 2022, the Company proposed to adopt the Restricted A Share Incentive Scheme which shall not exceed 141,000,000 Shares. Specifically, a total of 6,212,500 restricted A shares were granted by the Company to 30 connected persons.	N/A	N/A	N/A

Shares Transfer Agreement (Parties: Chalco and Yunnan Metallurgical Group Co., Ltd.)	As considered and approved on July 24, 2022, the Company entered into the Shares Transfer Agreement with Yunnan Metallurgical Group Co., Ltd., pursuant to which, the Company has agreed to acquire and Yunnan Metallurgical Group Co., Ltd. has agreed to dispose of 658,911,907 shares in Yunnan Aluminum, representing approximately 19% of the total issued share capital of Yunnan Aluminum. The aforesaid shares transfer was completed in November 2022.The Company currently holds 1,009,202,685 shares in Yunnan Aluminum, representing approximately 29.10% of the total issued share capital of Yunnan Aluminum. The financial results of Yunnan Aluminum for 2022 were consolidated into the financial statements of the Company, and Yunnan Aluminum has become a subsidiary of the Company.	July 24, 2022	6,662	N/A
Equity Transfer Agreement (Parties: Chalco and Chinalco)	As considered and approved on August 23, 2022, the Company entered into the Equity Transfer Agreement with Chinalco, pursuant to which the Company agreed to acquire and Chinalco agreed to sell 100% equity interests in Pingguo Aluminum. Upon completion of the above equity transfer, the Company holds 100% equity interests in Pingguo Aluminum, and Pingguo Aluminum become a wholly-owned subsidiary of the Company.	August 23, 2022	1,887	N/A
Entrusted Loan Agreement (Counterparty: Inner Mongolia Huayun)	The Company agreed to entrust Guangfa Bank Beijing Branch to provide Inner Mongolia Huayun with a loan amounting to RMB2 billion.	Pursuant to an entrusted loan agreement entered into by the Company, Beijing Branch of China Guangfa Bank Co., Ltd. and Inner Mongolia Huayun on September 29, 2022, the term of the loan is from October 10, 2022 until October 8, 2027.	2,000	N/A

Proposed Capital Contribution (Parties: Chalco, Chinalco High-end Manufacturing Co., Ltd., and Yunnan Aluminum Co., Ltd.)	As considered and approved on December 10 2022, (1) the Company proposed to make its capital contribution to Chinalco High-end Manufacturing Co., Ltd. ("Chinalco High-end Manufacturing") with the appraised net value of the assets and liabilities related to slab ingots of Qinghai Branch, Liancheng Branch and Guizhou Branch amounting to approximately RMB183 million and cash amounting to RMB220 million; (2) Yunnan Aluminum Co., Ltd. ("Yunnan Aluminum"), being a non-wholly-owned subsidiary of the Company, proposed to make its capital contribution to Chinalco High-end Manufacturing with its 100% equity interests in Yunnan Haoxin Aluminum Foil Co., Ltd., a wholly-owned subsidiary of Yunnan Aluminum and the appraised net value of the relevant assets amounting to approximately RMB1,233 million and cash amounting to RMB90 million. Upon completion of the aforementioned capital contribution, the Company and Yunnan Aluminum will be expected to acquire approximately 2.08% and 6.86% equity interests in Chinalco High-end Manufacturing, respectively.	December 27, 2022	404 (our Company) 1,323 (Yunnan Aluminum)	N/A

(1) See "Item 4. Information on the Company - A. History and Development of the Company - Subscription for A Shares of Yunnan Aluminum" for detailed information of other one-off connected transactions.

All transactions with related parties are conducted at prices and terms mutually agreed by the parties involved, which are determined as follows:

(a) Sales of materials and finished goods comprised sales of alumina, primary aluminum, copper and scrap materials. Transactions entered into are covered by general agreements on mutual provision of production supplies and ancillary services. The pricing policy is summarized below:

  (1) The price prescribed by the PRC government ("State-prescribed price") is adopted;

  (2) If there is no State-prescribed price, the price recommended in guidance issued by the PRC government ("State-guidance price") is adopted;

  (3) If there is neither a State-prescribed price nor a State-guidance price, then the market price (being price charged to and from independent third parties) is adopted; and

  (4) If none of the above is available, then the adoption of a contractual price (being reasonable costs incurred in providing the relevant services plus not more than 5% of such costs is adopted).

(b) Sales of utility, including electricity, gas, heat and water, are provided at State-prescribed prices.

(c) Engineering, project construction and supervisory services were provided for our construction projects. The State-guidance price or prevailing market price (including the tender price where by way of tender) is adopted for pricing purposes.

(d) The pricing policy for purchases of key and auxiliary materials (including bauxite, limestone, carbon, cement and coal) is the same as that set out in (a) above.

(e) Social services and logistics services provided by Chinalco cover public security, fire services, education and training, school and hospital services, cultural and physical education, newspaper and magazines, broadcasting and printing as well as property management, environmental and hygiene, greenery, nurseries and kindergartens, sanatoriums, canteens and offices, public transport and retirement management and other services. Provisions of these services are covered by the Comprehensive Social and Logistics Services Agreement. The pricing policy is the same as that set out in (a) above.

(f) Pursuant to the Land Use Rights Lease Agreements entered into between Chinalco and us, operating leases for industrial or commercial land are charged at the market rent rate. We also entered into a building rental agreement with Chinalco and pay rent based on the market rate for its lease of buildings owned by Chinalco.

(g) Other services are environmental protection operation services. The prevailing market price is adopted for pricing purposes.

(h) See Note 38(a) to our audited consolidated financial statements for more detailed information about our significant related party transactions.

During the years ended December 31, 2020, 2021 and 2022, our significant transactions with other state-owned enterprises (excluding Chinalco and its subsidiaries) constituted a relatively large portion of our sales of goods and purchases of raw materials, electricity, property, plant and equipment and services. In addition, substantially all restricted cash, time deposits, cash and cash equivalents and borrowings as of December 31, 2020, 2021 and 2022 and the relevant interest earned or paid during the year are transacted with banks and other financial institutions which are controlled by the PRC government and commercial banks.

We provide the following additional information on significant related party transactions during the periods indicated based on Note 38 to our audited consolidated financial statements:

(a) Significant related party transactions

	For the year ended December 31		
	2020	2021	2022
		(RMB in thousands)	
Sales of goods and services rendered:			
Sales of materials and finished goods to:			
Fellow subsidiaries	10,043,031	17,435,785	20,662,740
Associates of Chinalco	575,637	1,428,887	586,988
Joint ventures	6,694,824	9,069,718	10,923,463
Associates	9,233,929	720,261	1,010,855
Non-controlling shareholder of a subsidiary and its subsidiaries	42,298	—	—
	26,589,719	28,654,651	33,184,046
Provision of utility services to:			
Fellow subsidiaries	915,781	683,050	1,159,032
Associates of Chinalco	3,268	14,244	19,936
Joint Ventures	470,984	242,118	404,387
Associates	18,626	—	65,039
	1,408,659	939,412	1,648,394
Rental revenue of land use rights and buildings from:			
Fellow subsidiaries	34,425	29,973	27,988
Associates of Chinalco	237	237	237
Joint ventures	1,426	7,429	12,733
Associates	707	917	2,078
	36,795	38,556	43,036
Purchase of goods and services:			
Purchases of engineering, construction and supervisory services from:			
Fellow subsidiaries	3,544,097	969,568	579,187
Associates of Chinalco	265	192	2,467
Joint ventures	—	251	23,085
Associates	20,195	176,083	142,662
	3,564,557	1,146,094	747,401
Purchases of primary and auxiliary materials, equipment and finished goods from:			
Fellow subsidiaries	3,058,126	3,263,448	4,494,021
Associates of Chinalco	3,919	35,595	91,079
Joint ventures	5,709,253	6,565,742	5,240,707
Associates	10,576,907	9,175,427	2,659,604
Non-controlling shareholder of a subsidiary and its subsidiaries	30,101	—	—
	19,378,306	19,040,212	12,485,411
Purchases of social services and logistics services by:			
Fellow subsidiaries	397,610	400,290	259,188
Associates	—	—	7
	397,610	400,290	259,195
Purchases of utility services from:			
Fellow subsidiaries	7,073,895	6,567,433	6,805,618
Associates of Chinalco	85,469	97,314	121,413
Joint Ventures	542,828	823,146	1,074,266
Associates	161,586	314,528	399,634
	7,863,778	7,802,421	8,400,931
Provision of other services by:			
Fellow Subsidiaries	394,894	270,972	320,611
	394,894	270,972	320,611
Lease payment to:			
Fellow subsidiaries	577,712	656,063	1,399,258
Associates of Chinalco	—	523	14
Joint ventures	—	—	2,088
Associates	49,624	53,711	54,892
	627,336	710,297	1,456,252
Other significant related party transactions:			
Borrowing from a subsidiary of Chinalco	4,410,000	4,666,000	5,052,000
Repayment of borrowings from subsidiaries of Chinalco	3,254,563	7,574,007	4,588,000
Interest expense on borrowings, discounted notes	138,623	142,862	71,224
Interest income from cash and cash equivalents deposited	61,020	80,135	190,235
Trade receivable factor to a subsidiary of Chinalco	—	1,566,707	—
Issuance of notes receivable from a subsidiary of Chinalco	1,026,500	556,354	331,329
Discounted notes receivable to a subsidiary of Chinalco	606,750	128,000	306,826

(b) Balances with related parties

	December 31, 2021	December 31, 2022
Cash and cash equivalents deposited with		
A subsidiary of Chinalco	8,250,506	8,715,645
Trade and notes receivables		
Fellow subsidiaries	1,222,066	1,111,857
Associates of Chinalco	36,680	37,474
Joint ventures	632,596	390,600
Associates	62	722
Non-controlling shareholder of a subsidiary and its subsidiaries	24,465	16,124
	1,915,869	1,556,777
Provision for impairment of receivables	(79,971)	(57,930)
	1,835,898	1,498,847
Other current assets		
Fellow subsidiaries	330,757	90,720
Associates of Chinalco	21,820	20,573
Joint ventures	1,487,416	1,423,900
Associates	383,917	36,002
Non-controlling shareholder of a subsidiary and its subsidiaries	7,450	7,450
	2,231,360	1,578,645
Provision for impairment of other current assets	(1,332,041)	(1,311,839)
	899,319	266,806
Other non-current assets		
Associates	111,845	70,190
Interest-bearing loans and borrowings		
Fellow subsidiaries (including lease liabilities)	13,179,706	12,274,126
Associates of Chinalco	2,245	1,696
Joint ventures	—	12,610
Associates	—	104,446
	13,181,951	12,392,878
Trade and notes payables		
Fellow subsidiaries	1,908,490	1,289,819
Associates of Chinalco	26,920	22,547
Joint ventures	37,807	112,436
Associates	257,118	199,465
Non-controlling shareholder of a subsidiary and its subsidiaries	105,174	77,008
	2,335,509	1,701,275
Other payables and accrued liabilities		
Fellow subsidiaries	1,057,833	679,610
Associates of Chinalco	42,659	244,093
Associates	19,926	29,573
Joint ventures	49,618	87,374
Non-controlling shareholder of a subsidiary and its subsidiaries	—	1,872
	1,170,036	1,042,522
Contract liabilities		
Fellow subsidiaries	40,787	36,471
Associates of Chinalco	34,212	654
Associates	8,969	1,362
Joint ventures	97,816	278,941
	181,784	317,428

Guarantees

We did not provide any guarantees to our related parties to guarantee their loans during the period from January 1, 2022 to March 31, 2023. As of March 31, 2023, the outstanding balance of the loans we guaranteed was nil.

Our related parties did not provided any guarantees to us to guarantee our loans during the period from January 1, 2022 to March 31, 2023. As of March 31, 2023, the outstanding balance of the loans guaranteed by our related parties was nil.

Loans

We provided several entrusted loans to our related parties mainly for the purpose of supplementing working capital during the period from January 1, 2022 to March 31, 2023. The outstanding balance of such entrusted loans was mainly RMB629 million as of March 31, 2023 and the largest amount outstanding of the entrusted loans during the period from January 1, 2022 to March 31, 2023 was RMB100 million. The interest rates on such entrusted loans range from 6% to 10% per annum.

Our related party also provided several loans to us mainly for the purpose of supplementing working capital during the period from January 1, 2022 to March 31, 2023. The outstanding balance of such loans was RMB1.789 billion as of March 31, 2023 and the largest amount outstanding of the loans during the period from January 1, 2022 to March 31, 2023 was RMB1 billion. The interest rates on such loans range from 2% to 4.3% per annum.

C. Interests of Experts and Counsel

Not applicable.

Item 8. Financial Information

A. Consolidated Statements and Other Financial Information

We have appended our consolidated financial statements filed as part of this annual report on Form 20-F.

Legal Proceedings

We are not currently a party to any pending legal proceedings which are expected to have a significant effect on our financial position or results of operations, nor are we aware of any proceedings that are pending or threatened which may have a significant effect on our financial position or results of operations. We may from time to time become a party to various legal or administrative proceedings arising in the ordinary course of our business.

Dividend Policy

Under the Company Law of the PRC and our Articles of Association, all of our shareholders have equal rights to dividends and distributions. The holders of the H Shares share proportionately on a per share basis in all dividends and other distributions declared by our Board. Any final dividend for a fiscal year is subject to shareholders' approval. Cash dividends, if made, are declared in Renminbi with respect to H Shares on a per share basis and paid in HK dollars. The Bank of New York Mellon, as depositary, converts the HK dollar dividend payments and distributes them to holders of ADSs in U.S. dollars, less expenses of conversion.

We believe that our dividend policy strikes a balance between two important goals of providing our shareholders with a competitive return on investment and assuring sufficient reinvestment of profits to enable us to achieve our strategic objectives. The declaration of dividends is subject to the discretion of our Board, which takes into account the following factors:

- our financial results;
- capital requirements;
- contractual restrictions on the payment of dividends by us to our shareholders or by our subsidiaries to us;
- our shareholders' interests;

- the effect on our creditworthiness;
- general business conditions; and
- other factors our Board may deem relevant.

Under our current profit distribution policy as set forth in our Articles of Association, the basic principles of such policy include (i) giving adequate consideration to return to investors and making dividends to shareholders in an applicable percentage of the distributable profits, (ii) maintaining the continuity and stability of our dividend policy, while taking into consideration of our interests in the long term and the overall interests of all shareholders, as well as our sustainable development; and (iii) giving priority to dividends in cash.

More specifically, under such policy, we may make dividends in cash, in shares or in a combination of both cash and shares. Subject to conditions, we may make interim profit distributions. Save in exceptional circumstances, if our profit for the year and our cumulative undistributed profit are positive, we may make dividends in cash and (i) the profit to be distributed in cash per annum will not be less than 10% of the distributable profit realized for that year, or (ii) the total profit to be distributed in cash in the past three years will not be less than 30% of the average annual distributable profit realized in the past three years.

Pursuant to PRC laws and regulations, dividends may only be distributed after allowance has been made for: (1) recovery of losses, if any and (2) allocations to the statutory surplus reserve. The allocations to the statutory surplus reserve is 10% of our net profit determined in accordance with PRC Generally Accepted Accounting Principles, unless the accumulated statutory surplus reserve exceeds 50% of our registered share capital, in which case the surplus reserve is discretional.

See “Item 10. Additional Information - E. Taxation” for a discussion of the tax consequences of receipt of dividends.

B. Significant Changes

Except as disclosed elsewhere in this annual report, we have not experienced any significant changes since the date of our audited consolidated financial statements which is included in this annual report.

Item 9. The Offer and Listing

Our A Shares are traded under the stock code “601600” in the Shanghai Stock Exchange, as our principal host market, while our H Shares are traded under the stock code “02600” in the Hong Kong Stock Exchange as the principal market for our H Shares. Our ADSs have been issued by The Bank of New York Mellon, acting as depositary bank, and prior to September 1, 2022, were listed on the New York Stock Exchange under the symbol “ACH” with each ADS representing 25 H Shares. Our ADSs are now traded over-the-counter on the OTC Market under the stock code “ACHHY.” In light of the delisting, we subsequently delivered a termination letter to the depositary for our ADSs, for the termination of our ADS program on March 30, 2023. Our ADS program is expected to be terminated on June 30, 2023.

Item 10. Additional Information

A. Share Capital

Not applicable.

B. Memorandum and Articles of Association

The following is a summary of certain provisions of our Articles of Association, as amended. Such summary does not purport to be complete. For further information, you and your advisors should refer to the text of our Articles of Association, as amended, and to the texts of applicable laws and regulations. A copy of our Articles of Association is filed as an exhibit to this annual report.

Our objects and purposes

Our Articles of Association as amended from time to time are filed with the Hong Kong Companies Registrar. Our business purpose and business scope can be found in Article 13 and Article 14, respectively, of our Articles of Association.

Directors' power to vote on matters in which he or she has an interest

Under Article 174, a director shall not vote in any resolution of the board of directors for approving any contract, transaction or arrangement in which such director or any of his associates (as defined in the applicable rules governing the listing of securities amended from time to time) is materially interested, and shall not be counted into the quorum of the meeting either. Unless the interested director has disclosed his or her interest to the board of directors in accordance with Article 174 and the contract, transaction or arrangement has been approved by the board of directors at a meeting in which the interested director is not counted in the quorum and has refrained from voting, a contract, transaction or arrangement in which such director is materially interested is voidable at the instance of our Company except as against a bona fide party thereto acting without notice of the breach of duty by such director. According to Article 86(2), matters concerning the remuneration of directors shall be decided by the shareholders' general meeting.

Borrowing powers

Subject to compliance with applicable laws and regulations of the PRC, we have the power to raise and borrow money which power includes (without limitation) the issuance of debentures and the charging or mortgaging of part or whole of our business or properties and other rights permitted. The Articles of Association do not contain any specific provision in respect of the manner in which borrowing powers may be exercised by the directors nor do they contain any specific provision in respect of the manner in which such powers may be varied, other than (a) provisions which give the directors the power to formulate proposals for the issuance of debentures by us; (b) Article 87(2), which provides that the issuance of bonds must be approved by the shareholders in a general meeting by way of a special resolution; and (c) Article 112(4), which provides that the directors have the power to formulate our annual final financial budgets and final accounts.

Age limit for retirement

There is no provision pertaining to the retirement of directors pursuant to an age limit requirement in our Articles of Association.

Directors' qualifying shares

Under Article 107, the directors are not required to hold any qualifying shares.

Dividend rights

Article 55(1) provides that holders of our ordinary shares have the right to receive dividends and distribution of profits in other forms, in proportion to the number of shares held. Under Article 49, when we convene a shareholders' general meeting, distribute dividends, liquidate or perform other activities that require the verification of equity rights, the Board or the general meeting convener must specify a date as the record date. The shareholders registered in the shareholder register at closing on the record date are our shareholders entitled to appropriate rights and interests. Article 206 provides that under the premise of obeying the laws of the PRC, we have the right to forfeit the unclaimed dividends, subject to the expiry of the applicable relevant limitation period.

Voting rights

Article 55(2) provides that holders of our ordinary shares have the right to lawfully request, convene, chair, attend in person or appoint a proxy to attend and vote at shareholders' meetings in respect of the number of shares held. Each ordinary share is entitled to one vote on all matters submitted to a vote of our shareholders at all shareholders' meetings, except for (i) the cumulative voting system under Article 110; and (ii) meetings of a special class of shareholders where only holders of shares of the affected class are entitled to vote on the basis of one vote per share of the affected class, but Article 98 provides that interested shareholders shall not vote at class shareholders' meetings. Article 110 provides that in the case that our controlling shareholders' shareholding percentage is more than 30%, the cumulative voting system may be implemented for the election of directors and supervisors at a shareholders' general meeting.

A special resolution of the shareholders' general meeting will be required for important matters specified in Article 87, such as the increase or reduction of the registered capital and issuance of any class of shares, amendments to our Articles of Association, and our division, merger, dissolution and liquidation, and a special resolution must be adopted by shareholders in attendance (including proxies) at the meeting with supermajority votes as set forth in Article 80. For other matters to be approved in a shareholders' general meeting, an ordinary resolution as set forth in Article 80 will need to be adopted.

Rights to share profits

Article 61(7) provides that a plan for profit distribution and a plan for making up for losses formulated by the Board in accordance with Article 112(6) must be approved by way of the shareholders' general meeting.

Rights to share surplus in the event of liquidation

Article 55(6) provides that the holders of ordinary shares have the right to participate in the distribution of our surplus assets in proportion to the number of shares held in the event of the termination or liquidation of us. Article 228 sets forth the order of priority of payments out of our properties in the event of liquidation.

Enforceability of Shareholders' Rights

Our Articles of Association provide that, with certain limited exceptions, where disputes and claims which concern our affairs and are based on rights or obligations provided for in our Articles of Association, the Company Law of the PRC or other relevant laws arise between holders of H Shares and us, holders of A Shares, or our director, supervisor, general manager or other senior management staff, such disputes and claims must be submitted to arbitration. Chapter 23 of our Articles of Association sets forth further details of the dispute resolution procedure.

Redemption provisions; sinking fund provisions and liability to further capital calls

Article 30 provides that we may repurchase issued shares in compliance with the requirements provided in relevant PRC laws and regulations, regulatory requirements or the Articles of Association and with the approvals from the relevant governing authorities of PRC under the following circumstances: (1) reduction of our registered capital; (2) merger with another company which owns our shares; (3) use of shares for our employee shareholding scheme or as equity incentive; (4) shareholders disagreeing with our general meeting's resolution on merger or division and requiring us to acquire the shares in their possession; (5) use of shares for conversion of corporate bonds convertible into our shares; (6) where it is necessary to safeguard our value and the rights and interests of our shareholders; and (7) other circumstances required by law and administrative regulations. Under Articles 32 and 33, share repurchases by agreements outside a stock exchange are generally subject to our shareholders' approval. Under Article 33, share repurchases under the circumstances described in items (1), (2) and (3) above shall be resolved at the shareholders' general meeting, while share repurchases under the circumstances described in item (5) and (6) above shall be subject to approval by more than two-thirds of directors present at the meeting of the Board.

No shares issued by us are redeemable, entitled to a sinking fund or subject to liability for further capital calls.

Actions necessary to change the rights of holders of our shares or holders of a class of shares

Under Article 87(5), revision of any rights of class shareholders, e.g., rights to dividends, share profits or surplus in the event of liquidation or voting rights, requires a special resolution of the shareholders' general meeting. A special resolution must be adopted by shareholders in attendance (including proxies) at the meeting with supermajority votes as set forth in Article 80.

The rights attached to any class of shares may be varied or abrogated only with the sanction of a special resolution passed at the shareholders' general meeting and by holders of shares of the affected class passed at a separate general meeting of the class convened in accordance with Articles 97 to 101, respectively. The circumstances which are deemed to be a variation or abrogation of the class rights, including alternation of the number of shares of the class, are set forth under Article 97. Except for the circumstances under Article 97(1), (9) and (10), shareholders of the affected class, whether or not otherwise having the right to vote at shareholders' general meetings, have the right to vote at class meetings but interested shareholders (which is defined under Article 98) are not entitled to vote at class meetings.

Resolutions of a class meeting shall be passed by the required percentage of shares (as specified under Article 99) with voting rights held by the class shareholders who, according to Article 98, are entitled to vote at that class meeting. Written notice must be given to all shareholders who are registered as holders of that class in the register of shareholders 45 days (inclusive of date of meeting) before the date of the class meeting. Such notice must contain the matters to be considered at such meeting, the date and the place of meeting. Those shareholders of the class who intend to attend shall send the written reply to us 20 days before the class meeting according to Article 100.

The proceedings of class meetings shall be conducted as near as possible to those of shareholders' general meetings. The provisions in the Articles of Association relating to the proceedings of shareholders' general meetings shall apply to class meetings.

The special procedures for approval by a class of shareholders do not apply where we issue, upon approval by special resolution of shareholders in a general meeting, either separately or concurrently once every 12 months, domestic shares and H Shares not more than 20% of the outstanding shares of the respective class.

Provisions discriminating against any existing or prospective shareholder as a result of owning a substantial number of shares

Chinalco, as our controlling shareholder (which is defined under Article 59), shall not exercise its voting rights in a manner prejudicial to the interest of all or some part of the shareholders when making decisions:

- to relieve a director or supervisor of his duty to act honestly in our best interest;
- to approve the expropriation by a director or supervisor (for his own benefit or for the benefit of another) of our assets, in any manner, including but not limited to an opportunity beneficial to us; or
- to approve the expropriation by a director or supervisor (for his own benefit or for the benefit of another) the individual rights of other shareholders, including but not limited to rights to distributions and voting rights save and except for our restructuring, submitted for approval by the shareholders in a general meeting in accordance with the Articles of Association.

Conditions governing the manner in which annual general meetings and extraordinary general meetings of shareholders are convoked

Shareholders' general meetings can be held as annual general meetings or extraordinary general meetings. Annual general meetings are held once a year within six months after the end of the preceding fiscal year.

The Board is required to convene an extraordinary general meeting within two months of the occurrence of any of the following circumstances:

(1) the number of directors falls below the number required by the Company Law of the PRC or two-thirds of the number required by the Articles of Association;

(2) our unrecovered losses amount to one-third of the total amount of our paid-in-capital;

(3) upon the request of shareholder(s) holding 10% or more of our shares for more than ninety consecutive days (the number of shares held shall be the figures as of the date of the written request from the shareholder); and

(4) whenever the Board deems necessary or the supervisory committee proposes to convene the same.

We shall, within 45 days (inclusive of date of the meeting) before the date of the meeting, send written notices of the shareholders' general meeting and inform all registered shareholders of the matters to be considered at the meeting and the date and venue of the meeting. Those shareholders who intend to attend the meeting shall send the written reply to us 20 days before the meeting. The meeting may be held if the number of voting shares represented by the shareholders intending to attend the meeting meets the threshold prescribed under Article 66. Otherwise, we shall, within five days, inform the shareholders once again of the matters to be considered at, and the date and place of, the meeting in the form of a public announcement, after which we may hold the meeting. A meeting and the resolutions adopted thereat shall not be invalidated due to the accidental omission to give notice of the meeting to, or the non-receipt of notice of the meeting by, a person entitled to receive notice. Motions put forward at the general meeting shall be specific and shall relate to the matters to be considered at a shareholders' general meeting. Motions raised at a general meeting shall:

(1) be free of conflicts with the provision of laws, administrative regulations and Articles of Association, and fall within our business scope and the terms of the reference of the shareholders' general meeting;

(2) have definite topics to discuss and specific matters to resolve; and

(3) be submitted in writing or served to the board of directors.

Limitations on the rights to own securities

Under Article 19, the shares issued to domestic investors and denominated in Renminbi are Domestic-Invested Shares whereas the shares issued to overseas investors and denominated in foreign currency are Foreign-Invested Shares.

Provisions having an effect of delaying, deferring or preventing a change in control

Under Article 116, decisions in respect of market development, merger and acquisition, and investment in a new field, where the consideration to be paid or the assets to be acquired exceed 10% of our total assets, the Board is required to engage relevant professional consultants to provide professional opinions, which shall serve as the key reference for the decision of the Board concerning such investment, merger or acquisition.

Under Article 87(3), division, merger, dissolution and liquidation of us and material acquisitions and disposals by us must be approved by a special resolution at a shareholders' general meeting.

There are no provisions under the Articles of Association pertaining to the ownership threshold above which shareholder ownership must be disclosed.

Conditions governing changes in registered capital

Under Article 112(7), any proposal for the increase or decrease of our registered capital must be formulated by the Board. Article 87(1) further provides that any increase or reduction in share capital requires adoption of a special resolution at a shareholders' general meeting. In addition, according to Article 97, alternation of the number of shares of a class or of a different class having voting rights, distribution rights or other privileges equal or superior to such class is regarded as alternation or abolishment of rights of such class, and must satisfy the requirements for shareholders' meetings of the affected class. See "—Actions necessary to change the rights of holders of our shares or holders of a class of shares."

Certain Differences Between PRC Company Law and Delaware Corporate Law

We are a PRC joint stock company, which is a corporate entity organized under the Company Law of the PRC. The PRC company law differs from laws applicable to United States corporations and their shareholders. A description of securities registered under Section 12 of the Exchange Act is filed as Exhibit 2.4 to this annual report on Form 20-F and includes a summary of certain significant differences between the provisions of the PRC company law applicable to us and the comparable provisions of the laws applicable to companies incorporated in the United States and their shareholders (for this purpose we refer to Delaware corporate law). Such summary does not purport to be complete and is subject to and qualified in its entirety by reference to our Articles of Association, as amended, and to the relevant laws and regulations.

C. Material Contracts

For the two years immediately preceding the date of this annual report, we have not entered into any additional material contracts other than in the ordinary course of business and other than those described in "Item 4. Information on the Company - A. History and Development of the Company" and "Item 7. Major Shareholders and Related Party Transactions - B. Related Party Transactions."

D. Exchange Controls

The existing PRC foreign exchange regulations have significantly reduced government foreign exchange controls for transactions under the current account, including trade and service-related foreign exchange transactions and payment of dividends. We may undertake current account foreign exchange transactions without prior approval from the SAFE by producing commercial documents evidencing such transactions, provided that they are processed through Chinese banks licensed to engage in foreign exchange transactions. The PRC government has stated publicly that it intends to make the Renminbi freely convertible in the future. However, we cannot predict whether the PRC government will continue its existing foreign exchange policy and when the PRC government will allow free conversion of Renminbi to foreign currency.

Foreign exchange transactions under the capital account, including principal payments in respect of foreign currency-denominated obligations, continue to be subject to significant foreign exchange controls and require the approval of the SAFE. These limitations could affect our ability to obtain foreign exchange through debt or equity financing, or to obtain foreign exchange for capital expenditures.

Since 1994, the conversion of Renminbi into HK and U.S. dollars has been based on rates set by the PBOC, which are set daily based on the previous day's PRC interbank foreign exchange market rate and current exchange rates on the world financial markets. From 1994 to July 20, 2005, the official exchange rate for the conversion of Renminbi to U.S. dollars was generally stable. On July 21, 2005, the PRC government introduced a managed floating exchange rate system to allow the value of the Renminbi to fluctuate within a regulated band based on market supply and demand and by reference to a basket of currencies. Since then, the PRC government has made, and may in the future make, further adjustments to the exchange rate system. In April 2012, the PRC government took a milestone step in turning the Renminbi into a global currency by doubling the size of its trading band against the U.S. dollar, pushing through a crucial reform that further liberalizes its financial markets. The PBOC allows the Renminbi to rise or fall 1% from a mid-point every day, effective April 16, 2012, compared with its previous 0.5% limit. The PBOC further allows the Renminbi to rise or fall 2% from a mid-point every day, effective March 17, 2014. In August 2015, the PBOC announced that the daily central parity quotes the market-makers reported to the China Foreign Exchange Trade System operated by the PBOC before the market opens should be based on the closing rate of the inter-bank foreign exchange rate market on the previous day, supply and demand in the market, and price movement of major currencies, effective on August 11, 2015. Fluctuations in exchange rates may adversely affect the value, translated or converted into U.S. dollars or HK dollars, of our net assets, earnings and any declared dividends. We cannot give any assurance that any future movements in the exchange rate of the Renminbi against the U.S. dollar and other foreign currencies will not adversely affect our results of operations and financial condition.

E. Taxation

PRC Taxation

The following summary of the material PRC and United States federal income tax provisions relating to the ownership and disposition of H Shares or ADSs held by the investor as capital assets is based upon laws and relevant interpretations thereof in effect as of the date of this annual report, all of which are subject to change, and does not constitute legal or tax advice. This summary does not deal with all possible tax consequences relating to an investment in our ordinary shares, such as the tax consequences under state, local and other tax laws.

Dividends Paid to Individual Investors

According to the PRC Individual Income Tax Law, as amended, dividends paid by Chinese companies are ordinarily subject to a Chinese withholding tax levied at a flat rate of 20% unless reduced pursuant to an applicable tax treaty. Pursuant to a circular issued by State Administration of Taxation on June 28, 2011, for the purpose of simplifying tax administration, for PRC non-foreign-invested companies listed in Hong Kong, if the withholding tax rate under applicable tax treaties is 10% or less, the PRC company can withhold 10% tax. If the tax rate under applicable tax treaties is less than 10%, the PRC company can apply for a refund on behalf of the individual investor later. If the withholding tax rate under the applicable tax treaties is between 10% and 20%, the receipt of dividends will be subject to the actual tax rate as agreed under such tax treaties.

Capital Gains

With respect to foreign enterprises which are established under the laws of non-PRC jurisdictions and have no establishment or residence in China or whose capital gains from China do not relate to their establishment or residence in China ("non-resident foreign enterprises"), according to the Enterprise Income Tax Law and its implementation rules, which became effective on January 1, 2008, capital gains realized by non-resident foreign enterprises are ordinarily subject to capital gains tax at the rate of 10%, unless exempted or reduced pursuant to an applicable double-taxation treaty or other exemptions. The capital gains realized by resident enterprises, including enterprises established under the laws of non-PRC jurisdictions but whose "de facto management body" is located in the PRC, upon the sales of overseas-listed shares are subject to the PRC enterprise income tax.

With respect to foreign individual investors, the Provisions for Implementation of Individual Income Tax Law of China, as amended, stipulated that individual income tax on gains realized on the sale of equity shares shall be regulated in separate rules to be drafted by the State Council of China. However, as of the date of this annual report, there are no such rules enacted by the State Council yet. On March 30, 1998, the MOF and the SAT jointly issued the "Circular of Taxation Regarding the Continued Exemption of Individual Income Taxes Levied on Income Obtained from the Transfer of Shares," which provided that income derived from the transfer of shares issued by listed companies shall not be taxed as income for the purposes of levying individual income taxes after July 1, 1997.

For PRC mainland investors, on October 31, 2014, the SAT issued “Circular on Tax Policies Relating to the Pilot Program of Shanghai-Hong Kong Stock Connect,” which provided that any capital gain from transferring stocks listed on the Hong Kong Stock Exchange by a PRC mainland investor would not be subject to tax during the period from November 17, 2014 to November 16, 2017. For mainland enterprises, such capital gains would be included in its income and subject to income tax. On November 1, 2017, the MOF, the SAT and the CSRC jointly issued “Circular on Extending Individual Income Tax Policies Relating to the Shanghai-Hong Kong Stock Connect,” which provided that income generated from price differences through investment in stocks listed on the Hong Kong Stock Exchange by PRC mainland individual investors via the Shanghai-Hong Kong Stock Connect would be exempt from individual income tax from November 17, 2017 to December 4, 2019. On December 4, 2019, the MOF, the SAT and the CSRC jointly issued the “Circular on Extending Individual Income Tax Policies Relating to the Shanghai-Hong Kong Stock Connect, Shenzhen-Hong Kong Stock Connect and Mainland-Hong Kong Mutual Recognition of Funds,” which further exempts the individual income tax on income generated from transfer through investment in stocks listed on the Hong Kong Stock Exchange by PRC mainland individual investors via the Shanghai-Hong Kong Stock Connect or Shenzhen-Hong Kong Stock Connect and investment in Mainland-Hong Kong mutually recognized Funds from December 5, 2019 to December 31, 2022. On January 16, 2023, the MOF and the SAT issued the “Circular on Continuing the Implementation of Preferential Individual Income Tax Policies”, which indicates that the preferential individual income tax policy provided in the circular issued on December 4, 2019 will be valid until December 31, 2023.

Tax Treaties

China currently has such treaties with more than one hundred countries and regions, including the following countries:

- the United States;
- Australia;
- Canada;
- France;
- Germany;
- Japan;
- Malaysia;
- Singapore;
- the United Kingdom; and
- the Netherlands.

Under most treaties, the rate of withholding tax imposed by China’s taxation authorities remains 10%. The double taxation treaty between China and the United States provides that 10% withholding tax rate will be applied to the gross amount of dividends repatriated to an eligible U.S. holder. Under the treaty, an eligible U.S. holder is a person who, by reason of domicile, residence, place of head office, place of incorporation or any other criterion of similar nature is subject to taxation in the United States, as applicable under the treaty’s “treaty shopping provisions.”

Additional China Tax Considerations

Pursuant to the prevailing stamp duty regulations, a stamp duty is not imposed by China on the transfer of shares, such as the H Shares or ADSs, of Chinese publicly traded companies that take place outside of China.

United States Federal Income Taxation

Each potential investor is strongly urged to consult its own tax advisor to determine the particular U.S. federal, state, local, treaty and foreign tax consequences of acquiring, owning or disposing of the H Shares or ADSs.

The following summary describes the principal U.S. federal income tax consequences of purchasing, owning and disposing of the H Shares or ADSs. This summary only applies to U.S. holders, as defined below, who hold the H Shares or ADSs as capital assets within the meaning of Section 1221 of the Internal Revenue Code of 1986 as amended (the "Code"). This discussion does not address all of the tax consequences relating to the purchase, ownership and disposition of the H Shares or ADSs, and does not take into account U.S. holders that may be subject to special rules, including:

- financial institutions;
- insurance companies;
- tax-exempt organizations;
- real estate investment trusts, regulated investment companies, grantor trusts;
- persons that have a functional currency other than the U.S. dollar;
- persons that will own H Shares or ADSs through partnerships or other pass-through entities;
- persons that actually or constructively own 10% or more of the combined voting power of our voting stock or of the total value of our stock;
- dealers or traders in securities or currencies;
- certain former citizens or long-term residents of the United States;
- persons that will hold the H Shares or ADSs as a position in a "straddle" or as part of a "hedging" or "conversion" or other risk reduction transaction for U.S. federal income tax purposes;
- persons who receive the H Shares or ADSs as compensation for services;
- "dual resident" corporations;
- persons that generally mark their securities to market for U.S. federal income tax purposes;
- persons who are residents of the People's Republic of China or who are subject to Hong Kong profits tax; or
- persons who purchase or sell the H Shares or ADSs as part of a wash sale for U.S. federal tax purposes.

Moreover, this description does not address U.S. federal estate, gift or alternative minimum taxes, the U.S. federal unearned income Medicare contribution tax, or any foreign state or local tax consequences of the acquisition, ownership and disposition of the H Shares or ADSs. Each U.S. holder should consult its tax advisor with respect to the U.S. federal, state, local and foreign tax consequences of acquiring, owning and disposing of H Shares or ADSs.

This discussion is based on the Code, its legislative history, final, temporary and proposed U.S. Treasury regulations promulgated thereunder, published rulings and court decisions as in effect on the date hereof, as well as on the agreement between the United States and the People's Republic of China for the avoidance of double taxation (the "Treaty"), all of which are subject to change, or change in interpretation, possibly with retroactive effect. In addition, this discussion is based in part upon the assumption that each obligation in the deposit agreement and any related agreements will be performed according to its terms.

You are a "U.S. holder" if you are a beneficial owner of H Shares or ADSs and, for U.S. federal income tax purposes, are:

- an individual citizen or resident of the United States;
- a corporation created or organized under the laws of the United States or any political subdivision thereof;
- an estate the income of which is subject to U.S. federal income tax without regard to its source; or

- a trust: (i) subject to the primary supervision of a U.S. court and one or more U.S. persons (within the meaning of the Code) have the authority to control all substantial decisions of the trust; or (ii) that has validly elected to be treated as a U.S. person under applicable U.S. Treasury Regulations.

If a partnership (including any entity or arrangement treated as a partnership for U.S. federal tax purposes) holds H Shares or ADSs, the tax treatment of the partnership and a partner in such partnership will generally depend upon the status of the partner and the activities of the partnership. If an investor is a partner in a partnership that holds H Shares or ADSs, such investor should consult its tax advisor.

In general, if you hold ADSs evidencing H Shares, you will be treated as the owner of the H Shares represented by the ADSs. Exchanges of H Shares for ADSs, and ADSs for H Shares, generally will not be subject to United States federal income tax.

The tax treatment of your H Shares or ADSs will depend in part on whether or not we are classified as a passive foreign investment company, or PFIC, for United States federal income tax purposes. Except as discussed below under "—Passive Foreign Investment Company Rules," this discussion assumes that we are not classified as a PFIC for U.S. federal income tax purposes.

INVESTORS SHOULD CONSULT THEIR TAX ADVISORS AS TO THE PARTICULAR TAX CONSIDERATIONS APPLICABLE TO THEM RELATING TO THE PURCHASE, OWNERSHIP AND DISPOSITION OF THE H SHARES OR ADSs, INCLUDING THE APPLICABILITY OF U.S. FEDERAL, STATE AND LOCAL TAX LAWS OR NON-U.S. TAX LAWS, ANY CHANGES IN APPLICABLE TAX LAWS AND ANY PENDING OR PROPOSED LEGISLATION OR REGULATIONS.

Distributions on the H Shares or ADSs

The gross amount of any distribution (without reduction for any PRC tax withheld) we make on the H Shares or ADSs, other than certain pro-rata distributions of the H Shares, will be includible in income as dividend income when you, in the case of the H Shares, or the depositary, in the case of ADSs, receive the distribution, actually or constructively. Because we do not calculate earnings and profits in accordance with U.S. tax principles, all distributions by us to U.S. holders will generally be treated as dividends. Any dividend will not be eligible for the dividends-received deduction allowed to certain U.S. corporations in respect of dividends received from U.S. corporations.

If you are a noncorporate U.S. holder, dividends that constitute qualified dividend income will be taxable to you at the preferential rates applicable to long-term capital gains provided that you hold the H Shares or ADSs for more than 60 days during the 121-day period beginning 60 days before the ex-dividend date and meet other holding period requirements. Dividends that we pay with respect to the H Shares or ADSs will be qualified dividend income, provided that, in the year that you receive the dividend, we are eligible for the benefits of the Treaty. We believe that we are currently eligible for the benefits of the Treaty, and we therefore believe that dividends that we currently distribute on the H Shares or ADSs constitute qualified dividend income. However, there can be no assurance that we will be eligible for the benefits of the Treaty in future taxable years, and there can therefore be no assurance that dividends that we distribute on the H Shares or ADSs will continue to constitute qualified dividend income in such years.

The amount of the dividend distribution that you must include in your income as a U.S. holder will be the U.S. dollar value of the HK dollar payments made, determined at the spot HK dollar/U.S. dollar rate on the date the dividend is distributed, regardless of whether the payment is in fact converted into U.S. dollars. Generally, any gain or loss resulting from currency exchange fluctuations during the period from the date the dividend is distributed to the date you or the depositary convert the payment into U.S. dollars will be treated as ordinary income or loss and will not be eligible for the special tax rate applicable to qualified dividend income. Dividends paid by us generally will constitute income from sources outside the United States for U.S. foreign tax credit limitation purposes and will generally be categorized as "passive income" for U.S. foreign tax credit purposes. We may be required to withhold PRC income tax on dividends paid to U.S. holders on the H Shares or ADSs. Subject to various limitations and the following sentence, any PRC tax withheld from distributions in accordance with the Treaty will be deductible or creditable against your U.S. federal income tax liability. However, under recently finalized Treasury regulations, it is possible that taxes may not be creditable unless you are eligible for and elect to apply the benefits of the Treaty.

You may not be able to claim a foreign tax credit (and instead may qualify to claim a deduction) for non-U.S. taxes imposed on dividends paid on the H Shares or ADSs if you (i) have held the H Shares or ADSs for less than a specified minimum period, or (ii) are obligated to make related payments with respect to positions in substantially similar or related property (for example, pursuant to a short sale). The rules relating to the U.S. foreign tax credit are complex and U.S. holders may be subject to various limitations on the amount of foreign tax credits that are available. In addition, in the case of a noncorporate U.S. holder, rules similar to the special rules that apply in determining the foreign tax credit limitation when the taxpayer has foreign source capital gains that are taxed in the U.S. at the lower capital gains rate apply in determining the noncorporate U.S. holder's foreign tax credit limitation arising from dividends that are taxed at the capital gains rate.

Sale, Exchange or Other Disposition

Upon a sale, exchange or other disposition of the H Shares, you will generally recognize capital gain or loss for U.S. federal income tax purposes in an amount equal to the difference between the U.S. dollar value of the amount realized and your tax basis, determined in U.S. dollars, in such H Shares. Generally, gain or loss recognized upon the sale or other disposition of H Shares or ADSs will be capital gain or loss, will be long-term capital gain or loss if the U.S. holder's holding period for such H Shares or ADSs exceeds one year, and will be income or loss from sources within the United States for foreign tax credit limitation purposes. Long-term capital gains of noncorporate U.S. holders are generally taxed at preferential rates. The deductibility of capital losses is subject to significant limitations.

With respect to the sale or exchange of H Shares, the amount realized upon a sale of H Shares generally will be the U.S. dollar value on the settlement date for the sale in the case of a cash basis U.S. holder (or an accrual basis U.S. Holder that so elects). If H Shares are traded on an "established securities market," a cash basis taxpayer or, if it so elects, an accrual basis taxpayer, will determine the U.S. dollar value of the amount realized by translating the amount received at the spot rate of exchange on the settlement date of the sale. A U.S. holder will have a tax basis in the foreign currency received equal to the U.S. dollar amount realized. Any currency exchange gain or loss realized on a subsequent conversion of the foreign currency into U.S. dollars for a different amount generally will be treated as ordinary income or loss from sources within the United States. However, if such foreign currency is converted into U.S. dollars on the date received by the U.S. holder, a cash basis or electing accrual basis U.S. holder should not recognize any gain or loss on such conversion.

Any gain or loss that you recognize upon a sale of the H Shares or ADSs will generally be U.S. source gain or loss for foreign tax credit limitation purposes. Under the Treaty, however, if any PRC tax were to be imposed on any gain from the disposition of H Shares or ADSs, the gain could be treated as PRC source income. In addition, under recently finalized Treasury regulations, you will generally be precluded from claiming a foreign tax credit in respect of any such taxes unless you are eligible for and elect to apply the benefits of the Treaty. U.S. holders are urged to consult their tax advisors regarding the tax consequences if a foreign tax is imposed on a disposition of H Shares or ADSs, including the availability of the foreign tax credit under their particular circumstances. Any Hong Kong stamp duty paid will not be a creditable tax for United States federal income tax purposes, although the proceeds that you are treated as receiving upon a sale of the H Shares will be reduced by the amount of the stamp duty.

Passive Foreign Investment Company Rules

A non-U.S. corporation is a PFIC for any taxable year in which, after applying relevant look-through rules with respect to the income and assets of subsidiaries:

- 75% or more of its gross income consists of passive income, such as dividends, interest, rents, royalties, and gains from the sale of assets that give rise to such income; or

- 50% or more of the average quarterly value of its gross assets consists of assets that produce, or are held for the production of, passive income.

Passive income generally includes dividends, interest, gains from the sale or exchange of investment property, rents and royalties, and certain other specified categories of income. However, passive income does not include certain rents and royalties derived from the active conduct of a trade or business. If the stock of a non-U.S. corporation is publicly traded for the taxable year, the asset test is applied using the fair market value of the assets for purposes of measuring such corporation's assets. If we own at least 25% (by value) of the stock of another corporation, we will be treated, for purposes of the PFIC tests, as owning our proportionate share of the other corporation's assets and receiving our proportionate share of the other corporation's income for purposes of the PFIC income and asset tests.

Based on the composition of our assets and income and the current expectations regarding the price of the H Shares and ADSs, we believe that we were not a PFIC for U.S. federal income tax purposes with respect to our 2022 taxable year and we do not intend or anticipate becoming a PFIC in the foreseeable future. However, the determination of PFIC status is a factual determination that must be made annually at the close of each taxable year and, therefore, there can be no certainty as to our status in this regard until the close of the current or any future taxable year. Changes in the nature of our income or assets or a decrease in the trading price of our shares may cause us to be considered a PFIC in the current or any subsequent year. If we were a PFIC in any year during a U.S. holder's holding period for the H Shares or ADSs, we would ordinarily continue to be treated as a PFIC for each subsequent year during which the U.S. holder owned the H Shares or ADSs.

If we were a PFIC in any taxable year that you held the H Shares or ADSs, you generally would be subject to special rules with respect to "excess distributions" made by us on the H Shares or ADSs and with respect to gain from your disposition of the H Shares or ADSs. An "excess distribution" generally is defined as the excess of the distributions you receive with respect to the H Shares or ADSs in any taxable year, other than the taxable year in which your holding period in the H Shares or ADSs begins, over 125% of the average annual distributions you have received from us during the shorter of the three preceding years, or your holding period for the H Shares or ADSs that preceded the taxable year in which you receive the distribution. Generally, you would be required to allocate any excess distribution or gain from the disposition of the H Shares or ADSs ratably over your holding period for the H Shares or ADSs. The portion of the excess distribution or gain allocated to a prior taxable year, other than a year prior to the first year in which we became a PFIC, would be taxed at the highest U.S. federal income tax rate in effect for such taxable year, and you would be subject to an interest charge on the resulting tax liability, determined as if the tax liability had been due with respect to such particular taxable years. The portion of the excess distribution or gain that is not allocated to prior taxable years, together with the portion allocated to the years prior to the first year in which we became a PFIC, would be included in your gross income for the taxable year of the excess distribution or disposition and taxed as ordinary income.

These adverse tax consequences may be mitigated if the U.S. holder is eligible to and does elect to annually mark-to-market the H Shares or ADSs. If a U.S. holder makes a mark-to-market election, such holder will generally include as ordinary income the excess, if any, of the fair market value of the H Shares or ADSs at the end of each taxable year over its adjusted basis, and will be permitted an ordinary loss in respect of the excess, if any, of the adjusted basis of the H Shares or ADSs over their fair market value at the end of the taxable year (but only to the extent of the net amount of income previously included in income as a result of the mark-to-market election). Any gain recognized on the sale or other disposition of the H Shares or ADSs will be treated as ordinary income and any loss would be an ordinary loss to the extent of the net amount of previously included income as a result of the market-to-market election and, thereafter, a capital loss. The mark-to-market election is available only for "marketable stock," which is stock that is traded in other than *de minimis* quantities on at least 15 days during each calendar quarter on a qualified exchange or other market, as defined in the applicable Treasury regulations.

A U.S. holder's adjusted tax basis in the H Shares or ADSs will be increased by the amount of any income inclusion and decreased by the amount of any deductions under the mark-to-market rules. If a U.S. holder makes a mark-to-market election it will be effective for the taxable year for which the election is made and all subsequent taxable years unless the H Shares or ADSs are no longer regularly traded on a qualified exchange or the IRS consents to the revocation of the election. U.S. holders are urged to consult their tax advisors about the availability of the mark-to-market election, and whether making the election would be advisable in their particular circumstances. However, the stock of any of our subsidiaries that were PFICs would not be eligible for the mark-to-market election.

Alternatively, a timely election to treat us as a qualified electing fund could be made to avoid the foregoing rules with respect to excess distributions and dispositions. You should be aware, however, that if we become a PFIC, we do not intend to satisfy the recordkeeping requirements that would permit you to make a qualified electing fund election.

In addition, notwithstanding any election you make with regard to the shares or ADSs, dividends that you receive from us will not constitute qualified dividend income to you if we are a PFIC (or are treated as a PFIC with respect to you) either in the taxable year of the distribution or the preceding taxable year. Dividends that you receive that do not constitute qualified dividend income are not eligible for taxation at the preferential rates applicable to qualified dividend income. Instead, you must include the gross amount of any such dividend paid by us in your gross income, and it will be subject to tax at rates applicable to ordinary income.

If we were regarded as a PFIC, a U.S. holder of H Shares or ADSs may be required to file an information return on IRS Form 8621.

U.S. holders should consult their tax advisors concerning the U.S. federal income tax consequences of holding the H Shares or ADSs if we were considered to be a PFIC.

Information with Respect to Foreign Financial Assets

Owners of "specified foreign financial assets" with an aggregate value in excess of $50,000 (and in some circumstances, a higher threshold) may be required to file an information report with respect to such assets with their tax returns. "Specified foreign financial assets" may include financial accounts maintained by foreign financial institutions, as well as the following, but only if they are held for investment and not held in accounts maintained by financial institutions: (i) stocks and securities issued by non-United States persons, (ii) financial instruments and contracts that have non-United States issuers or counterparties, and (iii) interests in foreign entities. Holders are urged to consult their tax advisors regarding the application of this reporting requirement to their ownership of the H Shares or ADSs.

Backup Withholding and Information Reporting

If you are a noncorporate U.S. holder, information reporting requirements, on IRS Form 1099, generally will apply to dividend payments or other taxable distributions made to you within the United States, and the payment of proceeds to you from the sale of the H Shares or ADSs effected at a United States office of a broker.

Additionally, backup withholding may apply to such payments if you fail to comply with applicable certification requirements or (in the case of dividend payments) are notified by the IRS that you have failed to report all interest and dividends required to be shown on your federal income tax returns.

Payment of the proceeds from the sale of the H Shares or ADSs effected at a foreign office of a broker generally will not be subject to information reporting or backup withholding. However, a sale effected at a foreign office of a broker could be subject to information reporting in the same manner as a sale within the United States (and in certain cases may be subject to backup withholding as well) if (i) the broker has certain connections to the United States, (ii) the proceeds or confirmation are sent to the United States or (iii) the sale has certain other specified connections with the United States.

You generally may obtain a refund of any amounts withheld under the backup withholding rules that exceed your income tax liability by filing a refund claim with the IRS.

Hong Kong Taxation

The following discussion summarizes the material Hong Kong tax provisions relating to the ownership of H Shares or ADSs held by you.

Dividends

Under current Hong Kong Inland Revenue Department practice, no Hong Kong tax is payable by the recipient in respect of dividends paid by us, either by withholding or otherwise, unless such dividends are attributable to a trade, profession or business carried on in Hong Kong.

Taxation of Capital Gains

Hong Kong profits tax is currently charged at a flat rate of 16.5% for corporations and 15% for unincorporated businesses and individuals, except that the respective half-rates of 8.25% and 7.5% apply for the first HK$2 million of assessable profits for years of assessment beginning on or after April 1, 2018.

No Hong Kong tax is imposed on capital gains arising from the sale of property (such as H Shares) acquired and held as a capital investment. However, if a person carries on a business in Hong Kong that includes trading and dealing in securities, and derives trading gains from such activities or from other Hong Kong sources, Hong Kong profits tax will be payable. Gains from sales of H Shares effected on the Hong Kong Stock Exchange are considered to be from a Hong Kong source for this purpose. The source of gains from off-exchange transactions is less clear and, generally, will depend on whether the purchase and sale contracts were negotiated and, in substance, concluded in Hong Kong. In addition, exemption from profits tax is available for certain classes of taxpayers, notably privately offered onshore and offshore funds operating in Hong Kong, as well as non-Hong Kong residents who do not otherwise carry on business in Hong Kong, subject to compliance with various other requirements.

The Hong Kong tax position with respect to gains from the disposal of ADSs is similar. However, no Hong Kong tax will apply on trading gains arising from the sale of ADSs where the purchase and sale were effected on the OTC Market in the United States.

Hong Kong Stamp Duty

Hong Kong stamp duty is payable by each seller and purchaser for every sold note and every bought note created for every sale and purchase of "Hong Kong stock" (which means stock the transfer of which is required to be registered in Hong Kong), including the H Shares. Stamp duty is currently charged at the total rate of 0.26% of the value of the H Shares transferred (the buyer and seller each paying half of such stamp duty). In addition, a fixed duty of HK$5 is currently payable on an instrument of transfer of H Shares. If one of the parties to a sale is a non-resident of Hong Kong and does not pay the required stamp duty, the unpaid stamp duty will be assessed on the instrument of transfer (if any), and the transferee will be liable for the full payment of such amount.

If the withdrawal of H Shares when ADSs are surrendered or the issuance of ADSs when H Shares are deposited results in a change of beneficial ownership in the H Shares under Hong Kong law, Hong Kong stamp duty at the rate described above for sale and purchase transactions will apply. The issuance of ADSs for deposited H Shares issued directly to the depositary or for the account of the depositary should not lead to a Hong Kong stamp duty liability. Holders of the ADSs are not liable for the Hong Kong stamp duty on transfers of ADSs outside of Hong Kong so long as the transfers do not result in a change of beneficial interest in the H Shares under Hong Kong law.

Estate Duty

The Revenue (Abolition of Estate Duty) Ordinance 2005 came into effect on February 11, 2006 in Hong Kong. No Hong Kong estate duty is payable and no estate duty clearance papers are needed for an application for a grant of representation in respect of holders of H Shares or ADSs whose death occurs on or after February 11, 2006.

F. Dividends and Paying Agents

Not applicable.

G. Statement by Experts

Not applicable.

H. Documents on Display

We are subject to the periodic reporting and other informational requirements of the Exchange Act. Under the Exchange Act, we are required to file reports and other information with the SEC. Specifically, we are required to file an annual report under Form 20-F no later than four months after the close of each of our fiscal years, which is December 31, for fiscal years ended after December 15, 2011. Copies of reports and other information, when so filed, may be inspected without charge and may be obtained at prescribed rates at the SEC's public reference room located at 100 F Street, NE, Washington, D.C. 20549. The public may obtain information regarding the Washington, D.C. Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC also maintains a website at www.sec.gov that contains reports and other information regarding registrants that make electronic filings with the SEC using its EDGAR filing system. As a foreign private issuer, we are exempt from the rules under the Exchange Act prescribing the furnishing and content of quarterly reports and proxy statements, and officers, directors and principal shareholders of ours are exempt from the reporting and short-swing profit recovery provisions contained in Section 16 of the Exchange Act.

I. Subsidiary Information

Not applicable.

Item 11. Quantitative and Qualitative Disclosures about Market Risk

We are exposed to various types of market risks, including credit risk relating to financial assets and changes in foreign exchange rates, interest rates and the prices of alumina and primary aluminum, in the normal course of business.

We borrow short-term, medium-term and long-term funds, including variable rate debts, principally denominated in Renminbi. We hedge a limited amount of our sales through the trade of futures contracts on the SHFE and LME. Our hedging activities are subject to policies approved by our senior management. Substantially all of the financial instruments we hold are for purposes other than trading.

The following discussion, which contains "forward-looking statements" that involve risks and uncertainties, summarize our market-sensitive financial instruments. Such discussions address markets risk only and do not present other risks, which we face in the normal course of business.

Credit Risk

Credit risk arises from balances with banks and financial institutions, trade and notes receivables, other current and non-current receivables as well as credit exposures of customers, including outstanding receivables and committed transactions. We also provide financial guarantees to certain subsidiaries. The carrying amounts of these receivables and amounts of financial guarantees represent our maximum exposure to credit risk in relation to our financial assets and guarantees.

We maintain substantially all of our bank balances and cash and short-term investments in several major state-owned banks in the PRC. Our directors are of the opinion that these assets are not exposed to significant credit risk.

With regard to receivables, the marketing department assesses the credit quality of the customers and related parties, taking into account their financial positions, past experience and other factors. We perform periodic credit evaluations of our customers and believe that adequate provisions for impairment of receivables have been made in the financial statements. Management does not expect any further losses from non-performance by these counterparties.

For the year ended December 31, 2022, revenues of approximately RMB53,183 million are derived from entities directly or indirectly owned or controlled by the PRC government including Chinalco. There were no other individual customers from whom we have derived revenue of more than 10% of our revenue during the year ended December 31, 2020, 2021 and 2022. Thus, our directors are of the opinion that we were not exposed to any significant concentration of credit risk as of December 31, 2020, 2021 and 2022.

Foreign Exchange Rate Risk

We conduct our business primarily in Renminbi, which is our functional and reporting currency. We convert a portion of our Renminbi revenues into other currencies to meet foreign currency obligations and to pay for imported equipment and materials.

Many foreign currency exchange transactions involving Renminbi, including foreign exchange transactions under our capital account, are subject to foreign exchange controls and require the approval of the SAFE. Actions taken by the PRC government could cause future exchange rates to vary significantly from current or historical exchange rates. On July 21, 2005, the PBOC announced a reform of its exchange rate system. Under the reform, the Renminbi is no longer effectively linked to the U.S. dollar but instead is allowed to fluctuate within a narrow and managed band against a basket of foreign currencies, according to market demand and supply conditions. In April 2012, the PRC government took a milestone step in turning the Renminbi into a global currency by doubling the size of its trading band against the U.S. dollar, pushing through a crucial reform that further liberalizes its financial markets. The PBOC allows the Renminbi to rise or fall 1% from a mid-point every day, effective on April 16, 2012, compared with its previous 0.5% limit. The PBOC allows the Renminbi to rise or fall 2% from a mid-point every day, effective on March 17, 2014, compared with its previous 1% limit. In August 2015, the PBOC announced that the daily central parity quotes the market-makers reported to the China Foreign Exchange Trade System operated by the PBOC before the market opens should be based on the closing rate of the inter-bank foreign exchange rate market on the previous day, supply and demand in the market, and price movement of major currencies, effective on August 11, 2015. Any appreciation of the Renminbi will increase the prices of our export sales denominated in foreign currencies and reduce the Renminbi equivalent value of our trade and notes receivable denominated in foreign currencies, which may adversely affect our financial condition and results of operations. Our financial condition and operating performance may also be affected by changes in the value of currencies other than Renminbi in which our earnings and obligations are denominated.

Our bank balances and cash on hand as of December 31, 2022 amounted to RMB19,259.9 million, including Renminbi balances and foreign currency deposits of U.S. dollar, HK dollar, Euro and others, which translated into RMB1,378.6 million, RMB12.5 million, RMB2.0 million and RMB23.4 million, respectively. Most of our sales are domestic and as such we have a limited amount of foreign currency denominated receivables and payables. As of December 31, 2022, we had foreign currency denominated loans with principal amount of RMB8 million in Japanese Yen and RMB737 million in U.S. dollars. In addition, as of December 31, 2022, our trade and notes receivables, financial assets in other current assets and trade and notes payables denominated in U.S. dollars amounted to RMB981 million, RMB152 million and RMB261 million, respectively; our other payables and accrued liabilities denominated in U.S. dollars and HK dollars amounted to RMB0.3 million and RMB2.0 million, respectively.

As of December 31, 2022, if the Renminbi had strengthened/weakened by 5% against U.S. dollars with all other variables held constant, the total comprehensive income for the year would have been approximately RMB47 million lower/higher, mainly as a result of foreign exchange gains and losses arising from the translation of U.S.-dollar-denominated borrowings, account payables, account receivables and cash and cash equivalent. Profit was less sensitive to the fluctuation in the RMB/U.S. dollars exchange rates in 2022 than in 2021, mainly due to the year-on-year decrease in profit and the year-on-year increase in exchange rate in 2022.

As the assets and liabilities denominated in other foreign currencies other than U.S. dollars were relatively minimal to our total assets and liabilities, our directors are of the opinion that we were not exposed to significant foreign currency risk arising from other assets and liabilities denominated in currency other than the functional currency of the group entities as of December 31, 2021 and 2022.

Interest Rate Risk

As of December 31, 2022, as we had no significant interest-bearing assets except for bank deposits and entrusted loans, our income and operating cash flows are substantially independent of changes in market interest rates.

Most of the bank deposits are maintained in savings and time deposit accounts in the PRC. The interest rates are regulated by the PBOC and our Group treasury closely monitors the fluctuation on such rates periodically. The interest rates of entrusted loans are fixed. As the interest rates applied to the entrusted loans were fixed, our directors are of the opinion that we were not exposed to any significant interest rate risk for our financial assets held as of December 31, 2021 and 2022.

The interest rate risk for our financial liabilities primarily arises from interest-bearing loans. Loans borrowed at floating interest rates expose us to cash flow interest rate risk. We enter into debt obligations to support general corporate purposes including capital expenditures and working capital needs. Our Group treasury closely monitors market interest rates and maintains a balance between variable rate and fixed rate borrowings in order to reduce the exposures to the interest rate risk described above.

As of December 31, 2022, if interest rates had been 100 basis points higher/lower for bank and other loans borrowed at floating interest rates with all other variables held constant, net profit for the year would have been RMB233 million lower/higher, respectively, mainly as a result of the higher/lower interest expense on floating rate borrowings.

Our interest rate risk for our financial liabilities also arises from medium-term notes and short-term bonds issued at fixed rates. As the fluctuation of comparable interest rates of corporate bonds with similar terms was relatively low, our directors are of the opinion that we are not exposed to any significant fair value interest rate risk for its fixed interest rate borrowings held as of December 31, 2021 and 2022.

Commodity Price Risk

We are exposed to fluctuations in the prices of alumina, primary aluminum and other products. We import a small portion of our alumina supply from suppliers outside China. Such purchases are made at market prices. In addition, all our sales of alumina, primary aluminum and other products are made at market prices. Therefore, fluctuations in the prices of alumina and primary aluminum have a significant effect on our operating performances.

We use mainly futures contracts and option contracts traded on the SHFE and the LME to hedge against fluctuations in primary aluminum prices. We use the futures contract for hedging other than speculation. As of December 31, 2022, the fair values of the outstanding futures and option contracts amounting to nil and RMB9 million were recognized in financial liabilities at fair value through profit or loss, respectively.

As of December 31, 2021 and 2022, if the commodity futures prices had increased/decreased by 3% and all other variables held constant, the profit for the respective year would have changed by the amounts shown below:

	2021	2022
Primary aluminum	Decrease/increase RMB6 million	Decrease/increase RMB9 million

Liquidity risk

We monitor rolling forecasts of our liquidity requirements to ensure we have sufficient cash to meet operational needs while maintaining sufficient headroom on our undrawn committed borrowing facilities at all times so that we do not breach borrowing limits or covenants (where applicable) on any of our borrowing facilities. Such forecasts take into consideration our debt financing plans, covenant compliance, compliance with internal balance sheet ratio targets and, if applicable, external regulatory or legal requirements. Our management also monitors rolling forecasts of our liquidity reserve on the basis of expected cash flows.

As of December 31, 2022, we had total banking facilities of approximately RMB123,028 million, of which RMB23,839 million had been utilized, and unutilized banking facilities amounted to RMB99,189 million as of December 31, 2022, among which, banking facilities of approximately RMB49,380 million will remain unexpired over the 12 months from December 31, 2022. Our directors believe that such banking facilities could be renewed upon their expiration based on our past experience with banks and our good credit standing. In addition, as of December 31, 2022, we had no credit facilities through our futures agent at LME. The futures agent has the right to adjust the related credit facilities.

The following table sets forth the maturity profile of our financial liabilities as of December 31, 2022:

	Within 1 year(1)	1 to 2 years(1)	2 to 5 years(1)	Over 5 years(1)	Total(1)
			(RMB in millions)		
Lease liabilities, including current portion	1,651.9	1,314.6	3,092.9	13,939.9	19,999.3
Long-term bank and other loans, including current portion	13,486.3	6,604.9	20,579.8	6,878.5	47,549.5
Medium-term notes and bonds, including current portion	4,400.0	6,712.8	6,110.8	2,000.0	19,223.6
Short-term bonds	2,600.0	—	—	—	2,600.0
Short-term bank and other loans	6,461.1	—	—	—	6,461.1
Interest payables for loans and borrowings	2,285.4	1,490.2	1,468.1	1,046.7	6,290.4
Financial liabilities at fair value through profit or loss	8.8	—	—	—	8.8
Financial liabilities included in other payables and accrued liabilities, excluding accrued interest	6,786.9	—	—	—	6,786.9
Financial liabilities included in other non-current liabilities(2)	203.4	50.2	150.6	840.0	1,244.2
Trade and notes payables	22,536.3	—	—	—	22,536.3
Total	**60,420.1**	**16,172.7**	**31,402.2**	**24,705.1**	**132,700.1**

(1) The amounts disclosed are the contractual undiscounted cash flows.
(2) As of December 31, 2022, the carrying value of financial liabilities included in other non-current liabilities was nil.

Item 12. Description of Securities Other Than Equity Securities

A. Debt Securities

Not applicable.

B. Warrants and Rights

Not applicable.

C. Other Securities

Not applicable.

D. American Depositary Shares

Our ADSs were listed on the New York Stock Exchange under the symbol "ACH" with each ADS representing 25 H Shares from December 2001 until being delisted from the NYSE on September 1, 2022. Our ADSs are now traded on the OTC Market with ticker symbol changed from "ACH" to "ACHHY." In light of the delisting, we subsequently delivered a termination letter to the depositary for our ADSs, for the termination of our ADS program on March 30, 2023. Our ADS program is expected to be terminated on June 30, 2023.

The following table summarizes the fees and charges that a holder of our ADSs may have to pay, directly or indirectly, in connection with the ownership of Chalco's ADSs.

Persons depositing or withdrawing shares must pay:	**For:**
$5.00 (or less) per 100 ADSs (or portion thereof)	• Issuance of ADSs, including issuances resulting from a distribution of shares or rights or other property • Cancellation of ADSs for the purpose of withdrawal, including if the deposit agreement terminates
$0.05 (or less) per ADS (or portion thereof)	• Any cash distribution to ADS holders
A fee equivalent to the fee that would be payable if securities distributed to ADS holders had been shares and the shares had been deposited for issuance of ADSs	• Distribution of securities distributed to holders of deposited securities (including rights) that are distributed by the depositary of ADS holders
$0.05 (or less) per ADS (or portion thereof) per calendar year	• Depositary services
As necessary	• Transfer and registration of shares on our share register to or from the name of the depositary or its agent when you deposit or withdraw shares
As necessary	• Cable (including SWIFT) and facsimile transmissions (when expressly provided in the deposit agreement) • Converting foreign currency to U.S. dollars
As necessary	• Taxes and other governmental charges that the depositary or the custodian have to pay on any ADS or share underlying an ADS, such as stock transfer taxes, stamp duty or withholding taxes
As necessary	• Any charges incurred by the depositary or its agents for servicing the deposited securities

The Bank of New York Mellon, as depositary, has agreed to reimburse certain expenses related to the administration and maintenance of our ADR program incurred by us in connection with the program. From January 1, 2022 to December 31, 2022, we received from the depositary reimbursements of US$28,937.69 for our continuing annual stock exchange listing fees and our expenses incurred in connection with investor relationship programs. The depositary has also agreed to waive certain standard out-of-pocket administrative, maintenance and shareholder services expenses related to our ADR program. From January 1, 2022 to December 31, 2022, the total amount of the fees that were waived was US$75,952.05.

PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies

None.

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds

None.

Item 15. Controls and Procedures

Our management, with the participation of our principal executive officer and principal financial officer, after evaluating the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15(d)-15(e) of the Exchange Act) as of the end of the period covered by this annual report, have concluded that, as of such date, our disclosure controls and procedures were effective.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d- 15(f) under the Exchange Act. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles.

Our internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of a company's assets, (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures are being made only in accordance with authorizations of our management and directors, and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of our assets that could have a material effect on the consolidated financial statements. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Under the supervision of and with the participation of the principal executive officer and principal financial officer, our management conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2022, based on the framework in the Internal Control-Integrated Framework (2013 Framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission in May 2013.

Based on our evaluation under the framework in Internal Control-Integrated Framework (2013 Framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission, our management concluded that, as of December 31, 2022, our internal control over financial reporting was effective to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with the IFRS.

Attestation Report of the Registered Public Accounting Firm

The effectiveness of our internal controls over financial reporting as of December 31, 2022 has been audited by PricewaterhouseCoopers Zhong Tian LLP, an independent registered public accounting firm, as stated in their report which appears on page F-3 of this annual report on Form 20-F.

Changes in Internal Control over Financial Reporting

During 2022, there have been no changes in our internal control over financial reporting that occurred during the fiscal year covered by this annual report that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 16A. Audit Committee Financial Expert

Our audit committee members are three independent non-executive directors, namely, Mr. Qiu Guanzhou, Mr. Yu Jinsong and Ms. Chan Yuen Sau Kelly. Our Board has determined that Ms. Chan Yuen Sau Kelly, the chairman of the audit committee, qualifies as an "audit committee financial expert" as defined in Item 16A of Form 20-F and is the financial expert serving on our audit committee. See "Item 6. Directors, Senior Management and Employees."

Item 16B. Code of Ethics

We have adopted a code of ethics that applies to our chief executive officer, chief financial officer, other directors, independent non-executive directors, senior management and employees. We have posted our code of ethics on our website: http://www.chalco.com.cn/en/qywhen/gjglen/202012/P020201215377712432190.pdf. A hard copy of this code of ethics is available to investors free of charge upon written request to the address on the cover of this annual report on Form 20-F.

Item 16C. Principal Accountant Fees and Services

PricewaterhouseCoopers Zhong Tian LLP served as our independent auditor for the fiscal years ended December 31, 2021 and 2022. A description of the fees billed to us by our principal accountants for professional services in each of the last two fiscal years is set forth below:

	Year ended December 31	
	2021	2022
	(RMB in thousands)	
Audit fee(1)	18,170	18,170
Audit-related fee (2)	750	1,950
Tax fees(3)	120	1,190
Other fees	—	200

(1) "Audit fee" represents the fee obtained from audit work charged by PricewaterhouseCoopers and PricewaterhouseCoopers Zhong Tian LLP for the years ended December 31, 2021 and 2022.

(2) "Audit-related fees" represent fees charged by PricewaterhouseCoopers for assurance services for acquisition transactions and bond issuance for the years ended December 31, 2021 and 2022.

(3) "Tax fees" represent the fees charged by PricewaterhouseCoopers Consultants (Shenzhen) Limited, Beijing Branch for providing consulting services for the years ended December 31, 2021 and 2022.

Our audit committee pre-approves all audit, audit-related services, tax services and other services performed by our principal accountants, including the services provided by PricewaterhouseCoopers for the years ended December 31, 2021 and 2022, respectively.

Item 16D. Exemptions from the Listing Standards for Audit Committees

Not applicable.

Item 16E. Purchase of Equity Securities by the Issuer and Affiliated Purchasers

We did not have an equity securities repurchase program and did not repurchase any of our equity securities during the year ended December 31, 2022.

Item 16F. Change in Registrant's Certifying Accountant

We changed our certifying accountant in 2020. Further disclosure is omitted in accordance with the Instruction 2 to Item 16F on Form 20-F. For details, please refer to Item 16F of our annual report on Form 20-F for the year ended December 31, 2020 filed with the SEC on April 22, 2021.

Item 16G. Corporate Governance

We were listed on the NYSE until September 1, 2022. The NYSE has imposed a series of corporate governance standards for companies listed on the NYSE in Section 303A of the NYSE Listed Company Manual. However, the NYSE provides that listed companies that are foreign private issuers, subject to certain limitations and conditions, are permitted to follow "home country" practice in lieu of the provisions of Section 303A of the NYSE Listed Company Manual. As a foreign private issuer listed on the NYSE, we were required to disclose a summary of the significant differences between our corporate governance practice and NYSE corporate governance rules that apply to U.S. domestic issuers.

	NYSE Listed Company Manual Requirements on Corporate Governance	Our Practice
Majority of Independent Directors	NYSE requires that the board of a listed company must comprise a majority of independent directors.	Under applicable PRC and Hong Kong laws and regulations, our Board is not required to be formed with a majority of independent directors. The Listing Rules require that every board of directors of a listed company must include at least three independent non-executive directors and at least one third of the board of directors of a listed company are independent non-executive directors. Our Board currently comprises three independent directors and six non-independent directors, which is in compliance with the requirements by the PRC securities regulatory authorities and of the Listing Rules.
Nominating/Corporate Governance Committee	NYSE requires U.S. domestic issuers to have only independent directors on their nominating/corporate governance committees.	The Listing Rules require that listed companies should establish a nomination committee which is chaired by the chairman of the board or an independent non-executive director and consists of a majority of independent non-executive directors. We have a nomination committee that is chaired by the chairman of our Board and consists of three independent directors and two non-independent directors, which is in compliance with the requirements of the Listing Rules.
Compensation Committee	NYSE requires U.S. domestic issuers to have a compensation committee composed entirely of independent directors.	The Listing Rules require that listed companies should establish a remuneration committee which is chaired by an independent non-executive director and consists of a majority of independent non-executive directors. We have a remuneration committee that is chaired by an independent director and consists of two independent directors and a non-independent director, which is in compliance with the requirements of the Listing Rules.

Item 16H. Mine Safety Disclosure

As of the date of this annual report, we do not own or operate any mine in the United States. For details of the mining safety control of our bauxite mines in China, see “Item 4. Information on the Company - B. Business Overview - Our Mines.”

Item 16I. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

For the immediately preceding annual financial statement period, our auditor, PricewaterhouseCoopers Zhong Tian LLP (a registered public accounting firm that the PCAOB was unable to inspect or investigate completely) issued an audit report for us.

As of the date of this annual report and to our best knowledge:

(i) the SASAC owns 100% equity interest in Chinalco and Chinalco owns 31.9% equity interest in Chalco;

(ii) the SASAC owns 100% equity interest in Chinalco and Chinalco owns 31.9% equity interest in Chalco;

(iii) eight members of our board of directors, including Liu Jianping, Zhu Runzhou, Ou Xiaowu, Jiang Tao, Zhang Jilong, Chen Pengjun, Qiu Guanzhou and Yu Jinsong are members of the Chinese Communist Party; and

(iv) our Articles of Association contains provisions reflecting the requirements of the charter of the Chinese Communist Party, details of which are available in Exhibit 1.1 to this annual report.

PART III

Item 17. Financial Statements

We have elected to provide the financial statements and related information specified in Item 18 in lieu of Item 17.

Item 18. Financial Statements

The audited Consolidated Financial Statements as required under Item 18 are attached hereto starting on page F-1 of this Form 20-F.

Table of Contents

Item 19. Exhibits

Exhibit Number	Description
1.1*	English translation of the Amended Articles of Association of Aluminum Corporation of China Limited
2.1	Registrant's Specimen American Depositary Receipt (incorporated by reference to Exhibit 2.1 of our annual report on Form 20-F/A (file No. 001-15264) filed with the Securities and Exchange Commission on October 9, 2012)
2.2	Registrant's Specimen Certificate for H Shares (incorporated by reference to Exhibit 2.2 of our annual report on Form 20-F/A (file No.001-15264) filed with the Securities and Exchange Commission on October 9, 2012)
2.3	Deposit Agreement among the Registrant, The Bank of New York, as depositary, and Owners and Beneficial Owners of the American Depositary Receipts (incorporated by reference to Exhibit 2.3 of our annual report on Form 20-F/A (file No. 001-15264) filed with the Securities and Exchange Commission on October 9, 2012)
2.4*	Description of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended
4.1	English translation of Form of Employment Contract (incorporated by reference to Exhibit 4.1 of our annual report on Form 20-F/A (file No. 001-15264) filed with the Securities and Exchange Commission on October 9, 2012)
8.1*	List of Subsidiaries of Aluminum Corporation of China Limited as of December 31, 2022
12.1*	Certification by the Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
12.2*	Certification by the Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
13.1*	Certification by the Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
13.2*	Certification by the Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
96.1	Technical Report Summary (incorporated by reference to Exhibit 96.1 of the Amendment No. 1 to Form 20-F (file No. 001-15264) filed with the Securities and Exchange Commission on August 31, 2022)
101.INS*	Inline XBRL Instance Document—this instance document does not appear in the Interactive Data File because its XBRL tags embedded within the Inline XBRL document
101.SCH*	Inline XBRL Taxonomy Extension Schema Document
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104*	Cover Page Interactive Data File (embedded within the Inline XBRL document)

* Filed with this annual report on Form 20-F

SIGNATURES

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this annual report on its behalf.

ALUMINUM CORPORATION OF CHINA LIMITED

By: /s/ Zhu Runzhou
Name: Zhu Runzhou
Title: Executive Director and President
Date: April 25, 2023

INDEX TO THE CONSOLIDATED FINANCIAL STATEMENTS

ALUMINUM CORPORATION OF CHINA LIMITED

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Aluminum Corporation of China Limited

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated statements of financial position of Aluminum Corporation of China Limited and its subsidiaries (the "Company") as of December 31, 2022 and 2021 and the related consolidated statements of profit or loss and other comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2022, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 in conformity with International Financial Reporting Standards issued by the International Accounting Standards Board. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting appearing under Item 15. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Report of Independent Registered Public Accounting Firm (Continued)

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Report of Independent Registered Public Accounting Firm (Continued)

Impairment assessment of property, plant and equipment

As described in Note 4 Estimates and assumptions (a), and Note 7 to the consolidated financial statements, the Group's net carrying value of property, plant and equipment (PP&E) was RMB 109,277 million as of December 31, 2022. Management assesses related assets for potential impairment whenever there are indications that the carrying value of an asset or a group of assets may not be recoverable. As of December 31, 2022, management performed impairment assessment on PP&E with impairment indications at the level of cash generating unit ("CGU") to which the PP&E was allocated using discounted cash flow model. The discounted cash flows model applied for the impairment assessment involved significant assumptions including product prices, discount rate and the fair value of certain PP&E to be disposed of. Based on the impairment test, RMB 3,795 million of impairment losses were recognized by management for PP&E for the year ended December 31, 2022.

The principal considerations for our determination that performing procedures relating to the impairment assessment of PP&E is a critical audit matter are there were significant judgements made by management in determining their respective recoverable amounts using discounted cash flows model. This in turn led to a high degree of auditor judgment, subjectivity and audit effort in evaluating management's significant assumptions including product prices, discount rate and the fair value of certain PP&E to be disposed of. In addition, the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included evaluating and testing the effectiveness of controls relating to management's impairment assessment of PP&E, including controls over the development of model and significant assumptions used in the impairment assessment. These procedures also included, among others, (i) testing management's process for determining the recoverable amount of PP&E with impairment indications; (ii) evaluating the appropriateness of the management's model used to determine the recoverable amount; (iii) evaluating the reasonableness of significant assumption of the product prices by comparing the management forecast prices against historical prices and present market prices, taking into account the published forecast prices; (iv) testing the completeness, accuracy and relevancy of the underlying data used and the mathematical accuracy of the calculations in the model. Professionals with specialized skill and knowledge were used to assist in the evaluation of the appropriateness of the model and the reasonableness of certain significant assumptions, including the discount rate and the fair value of certain PP&E to be disposed of.

Report of Independent Registered Public Accounting Firm (Continued)

Impairment assessment of goodwill

As described in Note 4 Estimates and assumptions (b) and Note 6 to the consolidated financial statements, the Group's carrying value of goodwill was RMB 3,495 million as of December 31, 2022. Management performed impairment assessment of goodwill on an annual basis. When performing the impairment assessment, the recoverable amount of the CGU to which the goodwill was allocated was estimated by management using discounted cash flows model, and compared with the carrying value of the CGU to determine if goodwill was impaired. The discounted cash flows model used for the impairment assessment involved significant assumptions including product prices, long-term growth rate and discount rate. Based on the impairment test, RMB 15 million of impairment losses were recognized by management for goodwill for the year ended December 31, 2022.

The principal considerations for our determination that performing procedures relating to the impairment assessment of goodwill is a critical audit matter are there were significant judgements made by management in determining their respective recoverable amounts using discounted cash flows model. This in turn led to a high degree of auditor judgment, subjectivity and audit effort in evaluating management's significant assumptions including product prices, long-term growth rate and discount rate. In addition, the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included evaluating and testing the effectiveness of controls relating to management's impairment assessment of goodwill, including controls over the development of model and significant assumptions used in the impairment assessment. These procedures also included, among others, (i) testing management's process for determining recoverable amount of goodwill; (ii) evaluating the appropriateness of management's model used to determine recoverable amount; (iii) evaluating the reasonableness of significant assumption of the product prices used by management by comparing the management forecast price against historical prices and present market prices, taking into account the published forecast prices; and (iv) testing the completeness, accuracy and relevancy of the underlying data used and the mathematical accuracy of the calculations in the model. Professionals with specialized skill and knowledge were used to assist in the evaluation of the appropriateness of the model and the reasonableness of certain significant assumptions, including the long-term growth rate and discount rate.

/s/PricewaterhouseCoopers Zhong Tian LLP
Shanghai, the People's Republic of China
April 25, 2023

We have served as the Company's auditor since 2020.

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF FINANCIAL POSITION

As of December 31, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

	Notes	December 31, 2022 RMB'000	December 31, 2022 USD'000	December 31, 2021 RMB'000
ASSETS				
Non-current assets				
Intangible assets	6	12,950,823	1,877,693	13,333,988
Property, plant and equipment	7	109,276,880	15,843,658	121,383,020
Investment properties	8	1,917,623	278,029	1,814,589
Right-of-use assets	22 (a)	17,273,642	2,504,443	19,042,009
Investments in joint ventures	9 (a)	3,339,967	484,250	3,350,959
Investments in associates	9 (b)	6,402,638	928,295	6,441,793
Other financial assets measured at fair value	10	2,161,085	313,328	457,686
Deferred tax assets	11	2,057,900	298,367	2,096,459
Other non-current assets	12	2,431,500	352,534	2,832,661
Total non-current assets		157,812,058	22,880,597	170,753,164
Current assets				
Inventories	13	24,712,322	3,582,950	21,642,654
Trade and notes receivables	14	5,874,021	851,653	7,106,729
Other current assets	15	4,689,697	679,942	4,275,669
Restricted cash	16	2,443,249	354,238	1,400,988
Cash and cash equivalents	16	16,816,684	2,438,190	19,683,619
Total current assets		54,535,973	7,906,973	54,109,659
Total assets		212,348,031	30,787,570	224,862,823

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF FINANCIAL POSITION (CONTINUED)

As of December 31, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

	Notes	December 31, 2022 RMB'000	December 31, 2022 USD'000	December 31, 2021 RMB'000
EQUITY AND LIABILITIES				
EQUITY				
Equity attributable to owners of the Company				
Share capital	17	17,161,592	2,488,197	17,022,673
Shares held for employee share scheme	18	(404,685)	(58,674)	—
Other equity instruments	19	2,000,000	289,973	2,498,429
Other reserves	20	25,556,558	3,705,353	34,152,443
Retained earnings		10,089,547	1,462,846	6,810,078
		54,403,012	7,887,695	60,483,623
Non-controlling interests	40	33,352,955	4,835,724	29,213,945
Total equity		87,755,967	12,723,419	89,697,568
LIABILITIES				
Non-current liabilities				
Interest-bearing loans and borrowings	21	58,596,765	8,495,732	69,674,935
Deferred tax liabilities	11	1,451,692	210,476	1,403,291
Other non-current liabilities	23	2,176,784	315,604	2,171,427
Total non-current liabilities		62,225,241	9,021,812	73,249,653
Current liabilities				
Trade and notes payables	25	22,536,331	3,267,461	18,588,416
Other payables and accrued liabilities	24	9,521,239	1,380,450	12,382,739
Contract liabilities	5	2,049,014	297,079	2,363,043
Financial liabilities at fair value through profit or loss	39.2	8,767	1,271	68,871
Income tax payable		392,119	56,852	847,163
Interest-bearing loans and borrowings	21	27,859,353	4,039,226	27,665,370
Total current liabilities		62,366,823	9,042,339	61,915,602
Total liabilities		124,592,064	18,064,151	135,165,255
Total equity and liabilities		212,348,031	30,787,570	224,862,823
Net current liabilities		(7,830,850)	(1,135,366)	(7,805,943)
Total assets less current liabilities		149,981,208	21,745,231	162,947,221

The accompanying notes on pages F-13 to F-127 are an integral part of these consolidated financial statements.

The financial statements on pages F-6 to F-127 were approved by the Board of Directors on April 25, 2023.

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF PROFIT OR LOSS AND OTHER COMPREHENSIVE INCOME

For the years ended December 31, 2020, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

		2022		2021	2020
	Note	RMB'000	USD'000	RMB'000	RMB'000
Revenue	5	290,987,942	42,189,286	298,885,350	203,993,079
Cost of sales	27	(259,704,084)	(37,653,553)	(264,168,773)	(188,520,176)
Gross profit		31,283,858	4,535,733	34,716,577	15,472,903
Selling and distribution expenses	27	(418,909)	(60,736)	(383,233)	(372,361)
General and administrative expenses	27	(6,008,207)	(871,108)	(6,325,461)	(5,061,001)
Research and development expenses	27	(4,805,174)	(696,685)	(2,417,448)	(1,465,313)
Impairment losses on property, plant and equipment	7	(3,795,420)	(550,284)	(4,064,673)	(681,257)
Net impairment losses on financial assets	28	(414,139)	(60,045)	(1,390,765)	(967,942)
Other income	29	235,785	34,186	173,156	304,399
Other gains/(losses) - net	30	315,359	45,723	(1,641,015)	373,092
Operating profit		16,393,153	2,376,784	18,667,138	7,602,520
Finance income	31	477,137	69,178	311,103	266,209
Finance costs	31	(3,894,867)	(564,703)	(4,532,666)	(5,069,701)
Finance costs, net		(3,417,730)	(495,525)	(4,221,563)	(4,803,492)
Impairment loss on investment in an associate	9 (b)	(75,997)	(11,019)	—	—
Share of net profits/(losses) of investments accounted for using the equity method					
Joint ventures	9 (a)	178,910	25,940	164,100	180,502
Associates	9 (b)	130,632	18,940	(423,247)	(93,518)
		309,542	44,880	(259,147)	86,984
Profit before income tax		13,208,968	1,915,120	14,186,428	2,886,012
Income tax expense	34	(2,365,639)	(342,985)	(2,869,551)	(641,329)
Profit for the year		10,843,329	1,572,135	11,316,877	2,244,683
Profit attributable to:					
Owners of the Company		4,191,927	607,772	5,759,422	862,054
Non-controlling interests		6,651,402	964,363	5,557,455	1,382,629
		10,843,329	1,572,135	11,316,877	2,244,683
Basic and diluted earnings per share attributable to owners of the Company (expressed in RMB and USD per share)	35	0.239	0.035	0.326	0.034
Profit for the year		10,843,329	1,572,135	11,316,877	2,244,683
Other comprehensive income					
Items that will be reclassified to profit or loss					
Exchange differences on translation of foreign operations		(480,513)	(69,668)	254,116	159,943
Items that will not be reclassified to profit or loss					
Changes in fair value of financial assets measured at fair value through other comprehensive income		(43,884)	(6,363)	(6,172)	(91,646)
Income tax effect		7,236	1,049	5,731	9,406
Share of other comprehensive income of associates and joint ventures accounted for using the equity method		(5,628)	(816)	6,292	—
Other comprehensive income for the year, net of tax		(522,789)	(75,798)	259,967	77,703
Total comprehensive income for the year		10,320,540	1,496,337	11,576,844	2,322,386
Total comprehensive income for the year attributable to:					
Owners of the company		3,676,881	533,097	6,010,739	972,773
Non-controlling interests		6,643,659	963,240	5,566,105	1,349,613
		10,320,540	1,496,337	11,576,844	2,322,386

The accompanying notes on pages F-13 to F-127 are an integral part of these consolidated financial statements.

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

As of December 31, 2020, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

	Attributable to owners of the Company												
		Capital reserves											
	Share capital (Note 17)	Share premium	Other reserves	Shares held for employee share scheme	Statutory surplus reserve	Special reserve	Fair value reserve	Other equity instruments	Foreign currency translation reserve	Retained earnings	Total	Non-controlling interests	Total equity
As of December 31, 2021	17,022,673	26,958,144	1,159,190	—	1,892,286	287,983	20,760	2,498,429	600,995	6,824,227	57,264,687	15,518,810	72,783,497
Changes in accounting policies (Note 3.1.4)	—	—	—	—	—	—	—	—	—	61,526	61,526	12,196	73,722
Adjustment due to business combinations under common control (Note 41)	—	3,048,626	1,356	—	—	33,346	146,691	—	3,066	(75,675)	3,157,410	13,682,939	16,840,349
As of January 1, 2022	17,022,673	30,006,770	1,160,546	—	1,892,286	321,329	167,451	2,498,429	604,061	6,810,078	60,483,623	29,213,945	89,697,568
Profit for the year	—	—	—	—	—	—	—	—	—	4,191,927	4,191,927	6,651,402	10,843,329
Other comprehensive income for the year													
Changes in fair value of equity investments at fair value through other comprehensive income, net of tax	—	—	—	—	—	—	(23,061)	—	—	—	(23,061)	(13,587)	(36,648)
Exchange differences on translation of foreign operations	—	—	—	—	—	—	—	—	(486,357)	—	(486,357)	5,844	(480,513)
Share of other comprehensive loss of associates and joint ventures accounted for using the equity method	—	—	—	—	—	—	(5,628)	—	—	—	(5,628)	—	(5,628)
Total comprehensive income for the year	—	—	—	—	—	—	(28,689)	—	(486,357)	4,191,927	3,676,881	6,643,659	10,320,540
Business combinations under common control (Note 41)	—	(8,549,073)	—	—	—	—	—	—	—	(90,242)	(8,639,315)	—	(8,639,315)
Transactions with non-controlling shareholders	—	—	(17,911)	—	—	—	—	—	—	—	(17,911)	15,846	(2,065)
Appropriation to surplus reserves	—	—	—	—	168,254	—	—	—	—	(168,254)	—	—	—
Issuance of shares for employee share scheme (Note 18)	138,919	265,766	—	(404,685)	—	—	—	—	—	—	—	—	—
Employee share schemes-value of employee services	—	—	48,172	—	—	—	—	—	—	—	48,172	86	48,258
Capital contribution to a branch of the Company	—	—	5,080	—	—	—	—	—	—	—	5,080	—	5,080
Other appropriations	—	—	—	—	—	(4,959)	—	—	—	—	(4,959)	(12,725)	(17,684)
Share of reserves of joint ventures and associates	—	—	453	—	—	3,379	—	—	—	—	3,832	—	3,832
Distribution of other equity instruments	—	—	—	—	—	—	—	—	—	(109,071)	(109,071)	—	(109,071)
Dividends distribution by subsidiaries to non-controlling shareholders	—	—	—	—	—	—	—	—	—	—	—	(2,507,856)	(2,507,856)
Distribution of dividends	—	—	—	—	—	—	—	—	—	(544,891)	(544,891)	—	(544,891)
Repayment of senior perpetual securities	—	—	—	—	—	—	—	(2,498,429)	—	—	(2,498,429)	—	(2,498,429)
Issuance of senior perpetual securities	—	—	—	—	—	—	—	2,000,000	—	—	2,000,000	—	2,000,000
As of December 31, 2022	17,161,592	21,723,463	1,196,340	(404,685)	2,060,540	319,749	138,762	2,000,000	117,704	10,089,547	54,403,012	33,352,955	87,755,967

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF CHANGES IN EQUITY (CONTINUED)

As of December 31, 2020, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

	Attributable to owners of the Company												
		Capital reserves											
	Share capital (Note 17)	Share premium	Other reserves	Shares held for employee share scheme	Statutory surplus reserve	Special reserve	Fair value reserve	Other equity instruments	Foreign currency translation reserve	Retained earnings/ (Accumulated losses)	Total	Non-controlling interests	Total equity
As of December 31, 2020	17,022,673	27,353,768	1,161,392	—	5,867,557	180,428	7,618	4,486,429	345,205	(1,975,753)	54,449,317	16,855,847	71,305,164
Changes in accounting policies (Note 3.1.4)	—	—	—	—	—	—	—	—	—	63,068	63,068	—	63,068
Adjustment due to business combinations under common control (Note 41)	—	2,499,341	—	—	—	20,590	115,116	—	3,391	(753,565)	1,884,873	8,737,586	10,622,459
As of January 1, 2021	17,022,673	29,853,109	1,161,392	—	5,867,557	201,018	122,734	4,486,429	348,596	(2,666,250)	56,397,258	25,593,433	81,990,691
Profit for the year	—	—	—	—	—	—	—	—	—	5,759,422	5,759,422	5,557,455	11,316,877
Other comprehensive income for the year													
Changes in fair value of equity investments at fair value through other comprehensive income, net of tax	—	—	—	—	—	—	(10,440)	—	—	—	(10,440)	9,999	(441)
Exchange differences on translation of foreign operations	—	—	—	—	—	—	—	—	255,465	—	255,465	(1,349)	254,116
Share of other comprehensive income of associates and joint ventures accounted for using the equity method	—	—	—	—	—	—	6,292	—	—	—	6,292	—	6,292
Total comprehensive income for the year	—	—	—	—	—	—	(4,148)	—	255,465	5,759,422	6,010,739	5,566,105	11,576,844
Business combinations under common control	—	(395,624)	—	—	—	—	—	—	—	—	(395,624)	—	(395,624)
Capital injection from non-controlling shareholders	—	549,285	9,798	—	—	—	—	—	—	—	559,083	2,137,038	2,696,121
Disposal of subsidiaries	—	—	—	—	—	—	—	—	—	—	—	(3,886)	(3,886)
Appropriation to surplus reserves	—	—	—	—	254,642	—	—	—	—	(254,642)	—	—	—
Other appropriations	—	—	1,356	—	—	115,968	—	—	—	—	117,324	92,918	210,242
Share of reserves of joint ventures and associates	—	—	—	—	—	4,343	—	—	—	—	4,343	—	4,343
Disposal of other equity instrument investments	—	—	—	—	—	—	48,865	—	—	(48,865)	—	—	—
Distribution of other equity instruments	—	—	—	—	—	—	—	—	—	(209,500)	(209,500)	(140,127)	(349,627)
Offset of statutory surplus reserves against accumulated losses	—	—	—	—	(4,229,913)	—	—	—	—	4,229,913	—	—	—
Dividends distribution by subsidiaries to non-controlling shareholders	—	—	—	—	—	—	—	—	—	—	—	(645,286)	(645,286)
Repayment of senior perpetual securities	—	—	(12,000)	—	—	—	—	(1,988,000)	—	—	(2,000,000)	(3,386,250)	(5,386,250)
As of December 31, 2021	17,022,673	30,006,770	1,160,546	—	1,892,286	321,329	167,451	2,498,429	604,061	6,810,078	60,483,623	29,213,945	89,697,568

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF CHANGES IN EQUITY (CONTINUED)

As of December 31, 2020, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

	Attributable to owners of the Company											
		Capital reserve										
	Share capital (Note 17)	Share premium	Other capital reserves	Statutory surplus reserve	Special reserve	Fair value reserve	Other equity instruments	Foreign currency translation reserve	Accumulated losses	Total	Non-controlling interests	Total equity
As of December 31, 2019	17,022,673	27,363,826	1,108,544	5,867,557	139,891	49,511	5,487,104	182,197	(2,465,059)	54,756,244	16,096,611	70,852,855
Changes in accounting policies (Note 3.1.4)	—	—	—	—	—	—	—	—	(240)	(240)	—	(240)
Adjustment due to business combinations under common control (Note 41)	—	2,496,478	—	—	17,664	124,653	—	4,250	(788,005)	1,855,040	8,237,028	10,092,068
As of January 1, 2020	17,022,673	29,860,304	1,108,544	5,867,557	157,555	174,164	5,487,104	186,447	(3,253,304)	56,611,044	24,333,639	80,944,683
Profit for the year	—	—	—	—	—	—	—	—	862,054	862,054	1,382,629	2,244,683
Other comprehensive income for the year												
Changes in fair value of equity investments at fair value through other comprehensive income, net of tax	—	—	—	—	—	(51,430)	—	—	—	(51,430)	(30,810)	(82,240)
Exchange differences on translation of foreign operations	—	—	—	—	—	—	—	162,149	—	162,149	(2,206)	159,943
Total comprehensive income for the year	—	—	—	—	—	(51,430)	—	162,149	862,054	972,773	1,349,613	2,322,386
Business combinations under common control	—	(13,329)	—	—	—	—	—	—	—	(13,329)	23,996	10,667
Capital injection from non-controlling shareholders	—	6,134	—	—	—	—	—	—	—	6,134	482,717	488,851
Issuance of senior perpetual securities	—	—	—	—	—	—	1,000,000	—	—	1,000,000	—	1,000,000
Disposal of subsidiaries	—	—	3,616	—	—	—	—	—	—	3,616	(15,704)	(12,088)
Release of deferred government subsidies	—	—	49,290	—	—	—	—	—	—	49,290	—	49,290
Other appropriations	—	—	—	—	39,567	—	—	—	—	39,567	(6,994)	32,573
Share of reserves of joint ventures and associates	—	—	(58)	—	3,896	—	—	—	—	3,838	—	3,838
Distribution of other equity instruments	—	—	—	—	—	—		—	(275,000)	(275,000)	(146,416)	(421,416)
Underwriting fees of other equity instruments	—	—	—	—	—	—	(675)	—	—	(675)	—	(675)
Dividends distribution of subsidiaries to non-controlling shareholders	—	—	—	—	—	—	—	—	—	—	(427,418)	(427,418)
Repayment of senior perpetual securities	—	—	—	—	—	—	(2,000,000)	—	—	(2,000,000)	—	(2,000,000)
As of December 31, 2020	17,022,673	29,853,109	1,161,392	5,867,557	201,018	122,734	4,486,429	348,596	(2,666,250)	56,397,258	25,593,433	81,990,691

The accompanying notes on pages F-13 to F-127 are an integral part of these consolidated financial statements.

ALUMINUM CORPORATION OF CHINA LIMITED
CONSOLIDATED STATEMENT OF CASH FLOWS

For the years ended December 31, 2020, 2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

		For the year ended December 31			
		2022		2021	2020
	Notes	RMB'000	USD'000	RMB'000	RMB'000
Net cash inflows from operating activities	37	27,745,178	4,022,673	35,156,246	19,418,532
Investing activities					
Purchases of intangible assets		(197,352)	(28,613)	(218,264)	(5,395)
Purchases of property, plant and equipment		(4,416,315)	(640,305)	(3,190,928)	(10,325,459)
Purchases of right-of-use assets		(137,529)	(19,940)	(2,544)	—
Proceeds from disposal of property, plant and equipment		47,875	6,941	1,014,745	1,551,716
Proceeds from disposal of intangible assets		25,320	3,671	9,548	277,715
Proceeds from disposal of right-of-use assets		13,796	2,000	21,421	15,117
Proceeds from disposal of subsidiaries, net of cash		94,496	13,701	20,950	42,910
Proceeds from disposal of a joint venture and an associate		72,079	10,450	113,514	—
Proceeds from acquisition of subsidiaries, net of cash		—	—	—	3,690
Investments in joint ventures		—	—	—	(4,333)
Investments in associates		—	—	—	(175,433)
Investments in other financial assets measured at fair value		(15,330,000)	(2,222,641)	(11,921,000)	(7,020,000)
Proceeds from disposal of other financial assets measured at fair value		15,000,000	2,174,796	12,850,400	11,320,283
Investment loss/(income) from other financial assets measured at fair value		351,537	50,968	(447,136)	524,727
Dividends received from financial assets at fair value through other comprehensive income		11,499	1,667	15,268	125,617
Dividends received from associates and joint ventures		311,895	45,221	542,961	323,109
Change in deposit of futures contracts		673,392	97,633	(617,559)	(21,664)
Repayment of entrusted loans		—	—	60,395	6,000
Assets-related government grants received		61,010	8,846	75,971	53,558
Net cash outflows from investing activities		(3,418,297)	(495,605)	(1,672,258)	(3,307,842)
Financing activities					
Instalment payment of bonds and shares issuance expenses		(8,769)	(1,271)	(55,167)	(29,285)
Proceeds from issuance of short-term bonds and medium-term notes		8,500,000	1,232,384	24,845,054	25,900,000
Repayments of senior perpetual securities		(2,498,429)	(362,238)	(5,386,250)	(2,000,000)
Proceeds from issuance of senior perpetual securities		2,000,000	289,973	—	1,000,000
Repayments of short -term bonds and medium-term notes		(11,543,196)	(1,673,606)	(21,537,420)	(30,638,813)
Repayments of gold leasing arrangements		—	—	—	(6,921,860)
Distributions of senior perpetual securities		(109,071)	(15,814)	(349,627)	(421,416)
Drawdown of short-term and long-term bank and other loans		23,110,651	3,350,729	35,427,456	62,547,304
Repayments of short-term and long-term bank and other loans		(30,462,437)	(4,416,638)	(53,661,147)	(61,447,357)
Lease payments		(1,599,072)	(231,844)	(554,668)	(1,748,202)
Issuance of shares for employee share scheme		404,685	58,674	—	—
Capital injection from non-controlling shareholders		—	—	2,730,055	259,966
Cash consideration paid for business combination under common control		(8,549,073)	(1,239,499)	(395,624)	—
Dividends paid by subsidiaries to non-controlling shareholders		(2,513,038)	(364,356)	(579,047)	(423,331)
Proceeds from loans of non-controlling shareholders		50,000	7,249	—	95,000
Repayments of loans of non-controlling shareholders		(45,000)	(6,524)	—	(60,000)
Purchases of shares of subsidiary from non-controlling shareholders		—	—	—	(69,192)
Interest paid		(3,775,000)	(547,324)	(3,901,665)	(4,272,577)
Others		—	—	4,646	—
Net cash outflow from financing activities		(27,037,749)	(3,920,105)	(23,413,404)	(18,229,763)
Net (decrease)/increase in cash and cash equivalents		(2,710,868)	(393,037)	10,070,584	(2,119,073)
Cash and cash equivalents at the beginning of the year		19,683,619	2,853,856	9,540,589	11,751,710
Net foreign exchange differences		(156,067)	(22,629)	72,446	(92,048)
Cash and cash equivalents at the end of the year	16	16,816,684	2,438,190	19,683,619	9,540,589

The accompanying notes on pages F-13 to F-127 are an integral part of these consolidated financial statements.

ALUMINUM CORPORATION OF CHINA LIMITED
NOTES TO THE FINANCIAL STATEMENTS

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

1 GENERAL INFORMATION

Aluminum Corporation of China Limited (the "Company") (中國鋁業股份有限公司) and its subsidiaries (together the "Group") are principally engaged in the exploration and mining of bauxite resources; production, sales, related technical development and technical services of alumina, primary aluminum, aluminum alloy and carbon; power generation business; exploration, mining and operation of coal resources; trading and logistics.

The Company is a joint stock company which was established on September 10, 2001 and is domiciled in the People's Republic of China (the "PRC") with limited liability. The address of its registered office is No. 62 North Xizhimen Street, Haidian District, Beijing, the PRC.

The Company's shares have been listed on the Main Board of the Hong Kong Stock Exchange and the New York Stock Exchange since 2001. The Company also listed its A shares on the Shanghai Stock Exchange in 2007.

On August 12, 2022 (U.S.Eastern Time), the Company has notified the New York Stock Exchange ("NYSE") of its proposed application for voluntary delisting of its American depositary shares (the "ADSs") from the NYSE. The last trading day of ADSs on the NYSE was on September 1, 2022. On and after such date, the ADSs of the Company would no longer be listed on the NYSE. After the Company completed the delisting on September 1, 2022, the Company will then apply for deregistration of the ADSs.

In the opinion of the directors, the ultimate parent of the Company is Aluminum Corporation of China ("Chinalco") (中國鋁業集團有限公司), a company incorporated and domiciled in the PRC and wholly owned by the State-owned Assets Supervision and Administration Commission of the State Council.

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

1 GENERAL INFORMATION (CONTINUED)

Information about subsidiaries

Particulars of the Company's principal subsidiaries are as follows:

Name	Place of registration and business	Registered capital	Principal activities	Percentage of equity attributable to the Company	
				Direct	Indirect
Shanxi Huaxing Aluminum Co. Ltd. ("Shanxi Huaxing") (山西華興鋁業有限公司)	PRC/Mainland China	1,850,000	Manufacture and distribution of alumina	60.00 %	40.00 %
Baotou Aluminum Co., Ltd. ("Baotou Aluminum") (包頭鋁業有限公司)	PRC/Mainland China	2,245,510	Manufacture and distribution of primary aluminum, aluminum alloy and related fabricated products and carbon products	100.00 %	—
China Aluminum International Trading Co., Ltd. ("Chalco Trading") (中鋁國際貿易有限公司)	PRC/Mainland China	1,731,111	Import and export activities	100.00 %	—
Chalco Shanxi New Material Co., Ltd. ("Shanxi New Material") (中鋁山西新材料有限公司)	PRC/Mainland China	4,279,601	Manufacture and distribution of alumina, primary aluminum and anode carbon products and electricity generation and supply	85.98 %	—
China Aluminum International Trading Group Co., Ltd. ("Trading Group") (中鋁國際貿易集團有限公司)	PRC/Mainland China	1,030,000	Import and export activities	100.00 %	—
Zunyi Aluminum Co., Ltd. (遵義鋁業股份有限公司)	PRC/Mainland China	3,204,900	Manufacture and distribution of primary aluminum and alumina	67.45 %	—
Chalco Hong Kong Ltd. ("Chalco Hong Kong") (中國鋁業香港有限公司)	Hong Kong	HKD6,778,835 in thousand	Overseas investments and alumina import and export activities, and mining and distribution of bauxite.	100.00 %	—
Chalco Mining Co., Ltd. ("Chalco Mining") (中鋁礦業有限公司)	PRC/Mainland China	4,028,859	Manufacture, acquisition and distribution of bauxite mines, limestone ore and alumina	100.00 %	—
Chalco Energy Co., Ltd. ("Chalco Energy") (中鋁能源有限公司)	PRC/Mainland China	1,384,398	Thermoelectric supply and investment management	100.00 %	—
China Aluminum Ningxia Energy Group Co., Ltd. ("Ningxia Energy") (中鋁寧夏能源集團)	PRC/Mainland China	5,025,800	Thermal power, wind power and solar power generation, coal mining, and power-related equipment manufacturing	70.82 %	—
Guizhou Huajin Aluminum Co., Ltd. ("Guizhou Huajin") (貴州華錦鋁業有限公司)	PRC/Mainland China	1,000,000	Manufacture and distribution of alumina	60.00 %	—

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

1 GENERAL INFORMATION (CONTINUED)

Name	Place of registration and business	Registered capital	Principal activities	Percentage of equity attributable to the Company	
				Direct	Indirect
Chalco Zhengzhou Research Institute of Non-ferrous Metal Co., Ltd. (中國鋁業鄭州有色金屬研究院有限公司)	PRC/Mainland China	214,858	Research and development services	100.00 %	—
Chinalco New Materials Co., Ltd (“Chinalco New Material “) (中鋁新材料有限公司)	PRC/Mainland China	6,450,000	Manufacture and distribution of alumina, aluminium hydroxide and trading	100.00 %	
China Aluminum Logistics Group Corporation Co., Ltd. (中鋁物流集團有限公司)	PRC/Mainland China	964,291	Logistics and transportation	100.00 %	—
Chinalco Shanxi Jiaokou Xinghua Technology Ltd. (“Xinghua Technology“) (中鋁集團山西交口興華科技股份有限公司)	PRC/Mainland China	588,182	Manufacture and distribution of primary aluminum	33.00 %	33.00 %
Chinalco Shanghai Company Limited (“Chinalco Shanghai“) (中鋁(上海)有限公司)	PRC/Mainland China	968,300	Trading and engineering project management and leasing	100.00 %	—
Shanxi Chinalco Resources Co., Ltd. (“Shanxi Chinalco Resources”) (山西中鋁華潤有限公司)	PRC/Mainland China	1,641,750	Manufacture and distribution of primary aluminum	40.00 %	—
Guizhou Huaren New Material Co., Ltd. (“Guizhou Huaren”) (貴州華仁新材料有限公司)	PRC/Mainland China	1,200,000	Manufacture and distribution of primary aluminum	40.00 %	—
Chinalco Materials Co., Ltd. (中鋁物資有限公司)	PRC/Mainland China	1,000,000	Import and export activities and trading	100.00 %	—
Yunnan Aluminum Co., Ltd. (“Yunnan Aluminum”) (雲南鋁業股份有限公司).	PRC/Mainland China	3,467,957	Manufacture and distribution of primary aluminum and alumina	29.10 %	—
Chalco (Shanghai) Carbon Co., Ltd.(“Shanghai Carbon”)(中鋁（上海）碳素有限公司)	PRC/Mainland China	1,000,000	Manufacture and distribution of anode and cathode carbon	100.00 %	—
Lanzhou Aluminum Co., Ltd.(蘭州鋁業有限公司)	PRC/Mainland China	1,593,648	Manufacture and distribution of primary aluminum	100.00 %	—

2 SIGNIFICANT CHANGES IN THE CURRENT REPORTING PERIOD

In 2022, the Company acquired 19% equity interest in Yunnan Aluminum and the entire equity interests in Pingguo Aluminum, both of which were subsidiaries of Chinalco. These transactions were regarded as business combinations under common control (Note 41) and merger accounting was applied by the Group as described in Note 3.3(a). The comparative information has been restated accordingly.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

This note provides a list of the significant accounting policies adopted in the preparation of these consolidated financial statements. These policies have been consistently applied to all the years presented, unless otherwise stated. The financial statements are for the Group consisting of the Company and its subsidiaries.

3.1 Basis of preparation

3.1.1 Compliance with IFRS

The consolidated financial statements of the Company have been prepared in accordance with International Financial Reporting Standards (“IFRS”) as issued by the International Accounting Standards Board (“IASB”).

The preparation of the financial statements in conformity with IFRS requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the Group’s accounting policies. The areas involving a higher degree of judgement or complexity, or areas where assumptions and estimates are significant to the consolidated financial statements are disclosed in Note 4.

3.1.2 Going concern

As of December 31, 2022, the Group’s current liabilities exceeded its current assets by approximately RMB7,831 million (December 31, 2021: RMB7,806 million). The directors of the Company have considered the Group’s available sources of funds as follows:

- The Group’s expected net cash inflows from operating activities for 2023;
- Unutilized banking facilities of approximately RMB99,189 million As of December 31, 2022, of which RMB49,380 million will be available over the 12 months from December 31, 2022. The directors of the Company are in the view that these banking facilities could be renewed upon expiration based on the Group’s past experience and good credit standing;
- Other available sources of financing from banks and other financial institutions given the Group’s credit history.

The directors of the Company believe that the Group has adequate resources to continue operations for the foreseeable future of not less than 12 months from December 31, 2022. Accordingly, the directors of the Company are of the opinion that it is appropriate to adopt the going concern basis in preparing the consolidated financial statements.

3.1.3 Historical cost convention

The financial statements have been prepared on a historical cost basis except for certain financial assets and financial liabilities measured at fair value.

(Amounts expressed in thousands of RMB unless otherwise stated)

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.1 Basis of preparation (Continued)

3.1.4 New and amended standards adopted by the Group

The Group has applied the following amendment for the first time for their annual reporting period commencing January 1, 2022.

(i) The amendment to IAS 16 Property, Plant and Equipment-Proceeds before Intended Use

The amendment to IAS 16 Property, Plant and Equipment prohibits deduction of the cost of an item of property, plant and equipment from any proceeds received from selling items produced while the entity is preparing the asset for its intended use. It also clarifies that an entity is 'testing whether the asset is functioning properly' when it assesses the technical and physical performance of the asset. The financial performance of the asset is not relevant to this assessment.

This change in accounting policy has been accounted for retrospectively and the comparative information has been restated. The effect of adjustment on earliest period presented is as following:

Items	**RMB January 1, 2020**
Property, plant and equipment	(240)
Retained earnings	(240)

	For the year ended December 31, 2020
Revenue	117,109
Cost of sales	(53,801)

Items	**RMB January 1, 2021**
Property, plant and equipment	63,068
Retained earnings	63,068

	For the year ended December 31, 2021
Revenue	82,280
Cost of sales	(71,626)

Other than the amendment to IAS16, there are also new and amended standards that are mandatory for the first time for the Group's financial year beginning on January 1, 2022 and are applicable by the Group: Annual improvements, Amendments to IFRS 3, Amendments to IAS 37. The adoption of these amended standards did not have any significant financial impact to the Group.

As the retrospective application of the amendment to IAS 16 Property, Plant and Equipment did not have material impact to the Group's financial position and performance, the Group did not present the third balance sheet as of January 1, 2021.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.1 Basis of preparation (Continued)

3.1.5 New standards and interpretations not yet adopted

Certain new accounting standards and interpretations have been published that are not mandatorily effective for December 31, 2022 reporting periods and have not been early adopted by the Group. Except for the amendments of IAS 12 on deferred income tax which impact is being assessed by management, other new standards are not expected to have a material impact on the entity in the current or future reporting periods and on foreseeable future transactions.

3.2 Principles of consolidation and equity accounting

3.2.1 Subsidiaries

Subsidiaries are all entities (including structured entities) over which the Group has control. The Group controls an entity where the Group is exposed to, or has rights to, variable returns from its involvement with the entity and affect those returns through its power to direct the activities of the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group. They are deconsolidated from the date that control ceases.

The acquisition method of accounting is used to account for business combinations by the Group (Note 3.3).

Inter-company transactions, balances and unrealized gains on transactions between group companies are eliminated. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the transferred asset. Accounting policies of subsidiaries have been changed where necessary to ensure consistency with the policies adopted by the Group.

Non-controlling interests in the results and equity of subsidiaries are shown separately in the consolidated statement of profit or loss and other comprehensive income, statement of changes in equity and balance sheet respectively.

3.2.2 Associates

Associates are all entities over which the Group has significant influence but not control or joint control. This is generally the case where the Group holds between 20% and 50% of the voting rights. Investments in associates are accounted for using the equity method of accounting (Note 3.2.4), after initially being recognized at cost.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.2 Principles of consolidation and equity accounting (Continued)

3.2.3 Joint arrangements

Under IFRS 11 'Joint Arrangements', investments in joint arrangements are classified as either joint operations or joint ventures. The classification depends on the contractual rights and obligations of each investor, rather than the legal structure of the joint arrangement. The Group only has joint ventures.

Joint ventures

Interests in joint ventures are accounted for using the equity method (Note 3.2.4), after initially being recognized at cost in the consolidated statement of financial position.

3.2.4 Equity method

Under the equity method of accounting, the investments are initially recognized at cost and adjusted thereafter to recognise the Group's share of the post-acquisition profits or losses of the investee in profit or loss, and the Group's share of movements in other comprehensive income of the investee in other comprehensive income. Dividends received or receivable from associates and joint ventures are recognized as a reduction in the carrying amount of the investment.

Where the Group's share of losses in an equity-accounted investment equals or exceeds its interest in the entity, including any other unsecured long-term receivables, the Group does not recognise further losses, unless it has incurred obligations or made payments on behalf of the other entity.

Unrealized gains on transactions between the Group and its associates and joint ventures are eliminated to the extent of the Group's interest in these entities. Unrealized losses are also eliminated unless the transaction provides evidence of an impairment of the asset transferred. Accounting policies of equity-accounted investees have been changed where necessary to ensure consistency with the policies adopted by the Group.

The carrying amount of equity-accounted investments is tested for impairment in accordance with the policy described in Note 3.11.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.2 Principles of consolidation and equity accounting (Continued)

3.2.5 Changes in ownership interests

The Group treats transactions with non-controlling interests that do not result in a loss of control as transactions with equity owners of the Group. A change in ownership interest results in an adjustment between the carrying amounts of the controlling and non-controlling interests to reflect their relative interests in the subsidiary. Any difference between the amount of the adjustment to non-controlling interests and any consideration paid or received is recognized in a separate reserve within equity attributable to owners of the Company.

When the Group ceases to consolidate or equity account for an investment because of a loss of control, joint control or significant influence, any retained interest in the entity is remeasured to its fair value with the change in carrying amount recognized in profit or loss. This fair value becomes the initial carrying amount for the purposes of subsequently accounting for the retained interest as an associate, joint venture or financial asset. In addition, any amounts previously recognized in other comprehensive income in respect of that entity are accounted for as if the Group had directly disposed of the related assets or liabilities. This may mean that amounts previously recognized in other comprehensive income are reclassified to profit or loss or transferred to another category of equity as specified/ permitted by applicable IFRSs.

If the ownership interest in a joint venture or an associate is reduced but joint control or significant influence is retained, only a proportionate share of the amounts previously recognized in other comprehensive income are reclassified to profit or loss where appropriate.

3.3 Business combination

(a) Merger accounting for business combinations under common control

The consolidated financial statements incorporate the financial statements of the combining entities or businesses in business combination under common control as if they had been combined from the date when the combining entities or businesses first came under the control of the ultimate holding company.

The net assets of the combining entities or businesses are consolidated using the carrying amount from the ultimate holding company's perspective. No amount is recognized for goodwill or excess of the Group's interest in the book value of the net assets over cost at the time of the common control combination, to the extent of the continuation of the ultimate holding company's interest.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.3 Business combination (Continued)

(a) Merger accounting for business combinations under common control (Continued)

The consolidated statement of comprehensive income includes the results of each of the combining entities or businesses from the earliest date presented or since the date when the combining entities or businesses first came under common control, where this is a shorter period, regardless of the date of the common control combination.

The comparative financial data have been restated to reflect the business combinations under common control occurred during this year (Note 41).

Transaction costs, including professional fees, registration fees, costs of furnishing information to shareholders, costs or losses incurred in combining operations of the previously separate businesses and other costs incurred in relation to the common control combination that is to be accounted for by using the merger accounting method are recognized as expenses in the period in which they are incurred.

(b) Acquisition method of accounting for other business combinations and goodwill

The acquisition method of accounting is used to account for the acquisition of subsidiaries by the Group, other than common control combinations. The consideration transferred is measured at the acquisition date fair value which is the sum of acquisition date fair value of assets transferred by the Group, liabilities assumed by the Group to the former owner of the acquiree and the equity interests issued by the Group in exchange for control of the acquiree. The consideration transferred included the fair value of any assets and liabilities resulting from a contingent consideration arrangement. Acquisition-related costs are expensed as incurred. Identifiable assets acquired and liabilities and contingent liabilities assumed in a business combination are measured initially at fair value at the acquisition date. For each business combination, the Group elects whether to measure the non-controlling interests in the acquiree that are present ownership interests and entitle their holders to a proportional share of net assets in the event of liquidation at fair value or at the proportional share of the acquiree's identifiable net assets.

When the Group acquires a business, it assesses the financial assets and liabilities assumed for appropriate classification and designation in accordance with the contractual terms, economic circumstances and pertinent conditions as at the acquisition date. This includes the separation of embedded derivatives in host contracts of the acquiree.

If the business combination is achieved in stages, the previously held equity interest is remeasured at its acquisition date fair value and any resulting gain or loss is recognized in profit or loss.

Goodwill is initially measured at cost, being the excess of the aggregate of the consideration transferred, the amount recognized for non-controlling interests and any fair value of the Group's previously held equity interests in the acquiree over the identifiable net assets acquired and liabilities assumed. If the sum of this consideration and other items is lower than the fair value of the net assets acquired, the difference is, after reassessment, recognized in profit or loss as a gain on bargain purchase.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.3 Business combination (Continued)

(b) Acquisition method of accounting for other business combinations and goodwill (Continued)

After initial recognition, goodwill is measured at cost less any accumulated impairment losses. Goodwill is tested for impairment at least annually or more frequently if events or changes in circumstances indicate that the carrying value may be impaired. The Group performs its annual impairment test of goodwill as of December 31. For the purpose of impairment testing, goodwill acquired in a business combination is, from the acquisition date, allocated to each of the Group's cash-generating units, or groups of cash-generating units, that are expected to benefit from the synergies of the combination, irrespective of whether other assets or liabilities of the Group are assigned to those units or groups of units.

Impairment is determined by assessing the recoverable amount of the cash-generating unit (group of cash- generating units) to which the goodwill relates. Where the recoverable amount of the cash-generating unit (group of cash-generating units) is less than the carrying amount, an impairment loss is recognized. An impairment loss recognized for goodwill is not reversed in a subsequent period.

Where goodwill has been allocated to a cash-generating unit (or group of cash-generating units) and part of the operation within that unit is disposed of, the goodwill associated with the operation disposed of is included in the carrying amount of the operation when determining the gain or loss on the disposal. Goodwill disposed of in these circumstances is measured based on the relative value of the operation disposed of and the portion of the cash-generating unit retained.

3.4 Separate financial statements

Investments in subsidiaries are accounted for at cost less impairment. Cost includes direct attributable costs of investment. The results of subsidiaries are accounted for by the Company on the basis of dividend received and receivable.

Impairment testing of the investments in subsidiaries is required upon receiving a dividend from these investments if the dividend exceeds the total comprehensive income of the subsidiary in the period the dividend is declared or if the carrying amount of the investment in the separate financial statements exceeds the carrying amount in the consolidated financial statements of the investee's net assets including goodwill.

3.5 Segment reporting

Operating segments are reported in a manner consistent with the internal reporting provided to the chief operating decision maker. The chief operating decision-makers, who are responsible for allocating resources and assessing the performance of the operating segments, have been identified as the executive presidents committee of the Company that make strategic decisions.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.6 Foreign currency translation

(a) Functional and presentation currency

Items included in the financial statements of each of the Group's entities are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). The consolidated financial statements are presented in RMB, which is the Company's functional and presentation currency.

(b) Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation of monetary assets and liabilities denominated in foreign currencies at year end exchange rates are generally recognized in profit or loss.

Non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined. Translation differences on assets and liabilities carried at fair value are reported as part of the fair value gain or loss. For example, translation differences on non-monetary assets and liabilities such as equities held at fair value through profit or loss are recognized in profit or loss as part of the fair value gain or loss and translation differences on non-monetary assets such as equities classified as fair value through other comprehensive income are recognized in other comprehensive income.

(c) Group companies

The results and financial positions of all the group entities (none of which has the currency of a hyper-inflationary economy) that have a functional currency different from the presentation currency are translated into the presentation currency as follows:

(i) assets and liabilities in each statement of financial position presented are translated at the closing rates at the end of the reporting period;

(ii) income and expenses in each statement of profit and loss and other comprehensive income are translated at average exchange rates (unless this average is not a reasonable approximation of the cumulative effect of the rates prevailing on the transaction dates, in which case income and expenses are translated at the rates at the dates of the transactions); and

(iii) all resulting exchange differences are recognized in other comprehensive income.

Goodwill and fair value adjustments arising on the acquisition of a foreign operation are treated as assets and liabilities of the foreign operation and translated at the closing rate.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.6 Foreign currency translation (Continued)

(d) Disposal of foreign operation and partial disposal

On the disposal of a foreign operation (that is, a disposal of the group's entire interest in a foreign operation, or a disposal involving loss of control over a subsidiary that includes a foreign operation, a disposal involving loss of joint control over a joint venture that includes a foreign operation, or a disposal involving loss of significant influence over an associate that includes a foreign operation), all of the currency translation differences accumulated in equity in respect of that operation attributable to the owners of the Company are reclassified to profit or loss.

3.7 Property, plant and equipment

Property, plant and equipment, other than construction in progress, are stated at cost less accumulated depreciation and any impairment losses. When an item of property, plant and equipment is classified as held for sale or when it is part of a disposal group classified as held for sale, it is not depreciated and is accounted for in accordance with IFRS 5. Construction in progress represents buildings under construction, which is stated at cost less any impairment losses, and is not depreciated. The cost of an item of property, plant and equipment comprises its purchase price and any directly attributable costs of bringing the asset to its working condition and location for its intended use.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Group and the cost of the item can be measured reliably. The carrying amount of any component accounted for as a separate asset is derecognized when replaced. All other repairs and maintenance are charged to profit or loss during the reporting period in which they are incurred.

Except for the coal mining structures which depreciation is calculated using the unit-of-production method, depreciation of property, plant and equipment is calculated using the straight-line method to allocate their cost or revalued amounts, net of their residual values, over their estimated useful lives as follows:

Buildings and infrastructure	8 – 45 years
Machinery	3 – 30 years
Transportation facilities	6 – 10 years
Office and other equipment	3 – 10 years

Residual values, useful lives and the depreciation method are reviewed, and adjusted if appropriate, at least at each financial year end.

Construction in progress ("CIP") represents buildings under construction, which is stated at cost less any impairment losses, and is not depreciated. Cost comprises the direct costs of construction and capitalized borrowing costs on related borrowed funds during the period of construction. CIP is reclassified to the appropriate categories of property, plant and equipment when completed and ready for use.

An asset's carrying amount is written down immediately to its recoverable amount if the asset's carrying amount is greater than its estimated recoverable amount (Note 3.11).

Gains and losses on disposals are determined by comparing proceeds with carrying amount. These are included in profit or loss.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.8 Investment properties

Investment properties are interests in land use rights and buildings (including the leasehold property held as a right-of-use asset which would otherwise meet the definition of an investment property) held to earn rental income and/or for capital appreciation, rather than for use in the production or supply of goods or services or for administrative purposes; or for sale in the ordinary course of business. Such properties are measured initially at cost, including transaction costs. After initial recognition, the Group uses the cost methods to measure all of its investment properties.

Depreciation is calculated using the straight-line method to allocate their cost, net of their residual values, over their estimated useful lives as follows:

Buildings	25 – 50 years
Land use rights	40 – 70 years

The carrying amounts of investment properties measured using the cost method are reviewed for impairment when events or changes in circumstances indicate that the carrying amounts may not be recoverable.

Any gains or losses on the retirement or disposal of an investment property are recognized in profit or loss in the year of the retirement or disposal.

3.9 Intangible assets

(a) Goodwill

Goodwill is measured as described in Note 3.3. Goodwill on acquisitions of subsidiaries is included in intangible assets. Goodwill is not amortized but it is tested for impairment annually, or more frequently if events or changes in circumstances indicate that it might be impaired, and is carried at cost less accumulated impairment losses. Gains and losses on the disposal of an entity include the carrying amount of goodwill relating to the entity sold.

Goodwill is allocated to cash-generating units for the purpose of impairment testing. The allocation is made to those cash-generating units or groups of cash-generating units that are expected to benefit from the business combination in which the goodwill arose. The units or groups of units are identified at the lowest level at which goodwill is monitored for internal management purposes, being the operating segments (Note 5).

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.9 Intangible assets (Continued)

(b) Mining rights and mineral exploration rights

The Group's mineral exploration rights and mining rights relate to coal, bauxite and other mines.

(i) Recognition

Except for mineral exploration rights and mining rights acquired in a business combination, mineral exploration rights and mining rights are initially recorded at cost which includes the acquisition consideration, qualifying exploration and other direct costs. The mineral exploration rights are stated at cost less any impairment, and the mining rights are stated at cost less any amortization and impairment.

(ii) Reclassification

Mineral exploration rights are converted to mining rights when obtain mining rights certification, or technical feasibility and commercial viability of extracting a mineral resource are demonstrable, and are subject to amortization when commercial production has commenced.

The Group assesses the stage of each mine under construction to determine when a mine moves into the production stage. The criteria used to assess the start date are determined based on the unique nature of each mine construction project. The Group considers various relevant criteria, such as completion of a reasonable period of testing of the mine and equipment, ability to produce in saleable form (within specifications) and ability to sustain ongoing production to assess when a mine is substantially complete and ready for its intended use.

(iii) Amortization

Mining rights other than coal mining rights are amortized on a straight-line basis over a shorter period of the mining right valid period and expected mining life. Estimated mineable periods of the majority of the mining rights range from 3 to 30 years.

Coal mining rights are amortized on a unit-of-production basis over the economically recoverable reserves evaluated based on the reserves estimated in accordance with the standards of the mine concerned.

(iv) Impairment

An impairment review is performed when there are indicators that the carrying amount of the mineral exploration rights and mining rights may exceed their recoverable amounts. To the extent that this occurs, the excess is fully provided as an impairment loss.

(c) Computer software

Acquired computer software licenses are capitalized on the basis of the costs incurred to acquire and bring to use specific software. These costs are amortized over their estimated useful lives, which do not exceed 10 years. Costs associated with maintaining computer software programmers are recognized as an expense as incurred.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.9 Intangible assets (Continued)

(d) Aluminum production quota

Historically the Group acquired aluminum production quotas from third parties as the license for certain newly developed aluminum production lines. Aluminum production quota are initially recorded at cost and subsequently states at cost less any amortization and impairment. Amortization is provided on a straight-line basis over expected useful life of related aluminum production lines.

3.10 Research and development costs

Research and development expenditures are classified as research expenditures and development expenditures according to the nature of the expenditures and whether there is significant uncertainty of development activities transforming to assets.

Research expenditures are recognized in profit or loss for the current period. Development expenditures are recognized as assets when all of the following criteria are met:

(i) it is technically feasible to complete the asset so that it will be available for use or sale;

(ii) management intends to complete the asset and intends and has the ability to use or sell it;

(iii) it can be demonstrated that the asset will generate probable future economic benefits;

(iv) there are adequate technical, financial and other resources to complete the development of the asset and management has the ability to use or sell the asset; and

(v) the expenditure attributable to the asset during its development phase can be reliably measured.

Development expenditures that do not meet the criteria above are recorded in profit or loss for the current period as incurred. Development expenditures that have been recorded in profit or loss in previous periods will be not recognized as assets in subsequent periods. The Group has not had any development expenditure capitalized.

3.11 Impairment of non-financial assets

Goodwill and intangible assets that have an indefinite useful life are not subject to amortization and are tested annually for impairment, or more frequently if events or changes in circumstances indicate that they might be impaired. Other assets are tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. An impairment loss is recognized for the amount by which the asset's carrying amount exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal and value in use. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash inflows which are largely independent of the cash inflows from other assets or groups of assets (cash-generating units). Non-financial assets other than goodwill that suffered an impairment are reviewed for possible reversal of the impairment at the end of each reporting period.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.12 Non-current assets (or disposal groups) held for sale

Non-current assets (or disposal groups) are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use and a sale is considered highly probable. They are measured at the lower of their carrying amount and fair value less costs to sell, except for assets such as deferred tax assets, assets arising from employee benefits, financial assets and investment property that are carried at fair value and contractual rights under insurance contracts, which are specifically exempt from this requirement.

An impairment loss is recognized for any initial or subsequent write-down of the asset (or disposal group) to fair value less costs to sell. A gain is recognized for any subsequent increases in fair value less costs to sell of an asset (or disposal group), but not in excess of any cumulative impairment loss previously recognized. A gain or loss not previously recognized by the date of the sale of the non-current asset (or disposal group) is recognized at the date of derecognition.

Non-current assets (including those that are part of a disposal group) are not depreciated or amortized while they are classified as held for sale. Interest and other expenses attributable to the liabilities of a disposal group classified as held for sale continue to be recognized.

Non-current assets classified as held for sale and the assets of a disposal group classified as held for sale are presented separately from the other assets in the balance sheet. The liabilities of a disposal group classified as held for sale are presented separately from other liabilities in the balance sheet.

3.13 Investments and other financial assets

(a) Classification

The Group classifies its financial assets in the following measurement categories:

- those to be measured subsequently at fair value (either through OCI or through profit or loss), and
- those to be measured at amortized cost.

The classification depends on the entity’s business model for managing the financial assets and the contractual terms of the cash flows.

Except for trade receivables that do not contain a significant financing component or for which the Group has applied the practical expedient of not adjusting the effect of a significant financing component, the Group initially measures a financial asset at its fair value, plus in the case of a financial asset not at fair value through profit or loss, transaction costs. Trade receivables and notes receivable that do not contain a significant financing component or for which the Group has applied the practical expedient are initially measured at the transaction price determined under IFRS 15 in accordance with the policies set out for “Revenue recognition” below.

For a financial asset to be classified and measured at amortized cost or fair value through other comprehensive income, it needs to give rise to cash flows that are solely payments of principal and interest (“SPPI”) on the principal amount outstanding. Financial assets with cash flows that are not SPPI are classified and measured at fair value through profit or loss, irrespective of the business model.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.13 Investments and other financial assets (Continued)

(a) Classification (Continued)

The Group's business model for managing financial assets refers to how it manages its financial assets to generate cash flows. The business model determines whether cash flows will result from collecting contractual cash flows, selling the financial assets, or both. Financial assets classified and measured at amortized cost are held within a business model with the objective to hold financial assets to collect contractual cash flows, while financial assets classified and measured at fair value through other comprehensive income are held within a business model with the objective of both holding to collect contractual cash flows and selling. Financial assets which are not held within the aforementioned business models are classified and measured at fair value through profit or loss.

All regular way purchases and sales of financial assets are recognized on the trade date, that is, the date that the Group commits to purchase or sell the asset. Regular way purchases or sales are purchases or sales of financial assets that require delivery of assets within the period generally established by regulation or convention in the market place.

(b) Subsequent measurement

The subsequent measurement of financial assets depends on their classification as follows:

(i) Financial assets at amortized cost (debt instruments)

Financial assets at amortized cost are subsequently measured using the effective interest method and are subject to impairment. Gains and losses are recognized in profit or loss when the asset is derecognized, modified or impaired.

(ii) Financial assets at fair value through other comprehensive income (debt instruments)

For debt investments at fair value through other comprehensive income, interest income, foreign exchange revaluation and impairment losses or reversals are recognized in profit or loss and computed in the same manner as for financial assets measured at amortized cost. The remaining fair value changes are recognized in other comprehensive income. Upon derecognition, the cumulative fair value change recognized in other comprehensive income is recycled to profit or loss.

(iii) Financial assets designated at fair value through other comprehensive income (equity investments)

Upon initial recognition, the Group can elect to classify irrevocably its equity investments as equity investments designated at fair value through other comprehensive income when they meet the definition of equity under IAS 32 Financial Instruments: Presentation and are not held for trading. The classification is determined on an instrument-by-instrument basis.

Gains and losses on these financial assets are never recycled to profit or loss. Dividends are recognized as other income in profit or loss when the right of payment has been established, it is probable that the economic benefits associated with the dividend will flow to the Group and the amount of the dividend can be measured reliably, except when the Group benefits from such proceeds as a recovery of part of the cost of the financial asset, in which case, such gains are recorded in other comprehensive income. Equity investments designated at fair value through other comprehensive income are not subject to impairment assessment.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.13 Investments and other financial assets (Continued)

(b) Subsequent measurement (Continued)

(iv) Financial assets at fair value through profit or loss

Financial assets at fair value through profit or loss are carried in the statement of financial position at fair value with net changes in fair value recognized in profit or loss.

This category includes derivative instruments, wealth management products and equity investments which the Group had not irrevocably elected to classify at fair value through other comprehensive income. Dividends on equity investments classified as financial assets at fair value through profit or loss are also recognized as other gains in profit or loss when the right of payment has been established, it is probable that the economic benefits associated with the dividend will flow to the Group and the amount of the dividend can be measured reliably.

A derivative embedded in a hybrid contract, with a financial liability or non-financial host, is separated from the host and accounted for as a separate derivative if the economic characteristics and risks are not closely related to the host; a separate instrument with the same terms as the embedded derivative would meet the definition of a derivative; and the hybrid contract is not measured at fair value through profit or loss. Embedded derivatives are measured at fair value with changes in fair value recognized in profit or loss. Reassessment only occurs if there is either a change in the terms of the contract that significantly modifies the cash flows that would otherwise be required or a reclassification of a financial asset out of the fair value through profit or loss category.

A derivative embedded within a hybrid contract containing a financial asset host is not accounted for separately. The financial asset host together with the embedded derivative is required to be classified in its entirety as a financial asset at fair value through profit or loss.

A financial asset (or, where applicable, a part of a financial asset or part of a group of similar financial assets) is primarily derecognized (i.e., removed from the Group's consolidated statement of financial position) when:

- the rights to receive cash flows from the asset have expired; or

- the Group has transferred its rights to receive cash flows from the asset or has assumed an obligation to pay the received cash flows in full without material delay to a third party under a "pass-through" arrangement; and either (a) the Group has transferred substantially all the risks and rewards of the asset, or (b) the Group has neither transferred nor retained substantially all the risks and rewards of the asset, but has transferred control of the asset.

When the Group has transferred its rights to receive cash flows from an asset or has entered a pass-through arrangement, it evaluates if, and to what extent, it has retained the risk and rewards of ownership of the asset. When it has neither transferred nor retained substantially all the risks and rewards of the asset nor transferred control of the asset, the Group continues to recognize the transferred asset to the extent of the Group's continuing involvement. In that case, the Group also recognizes an associated liability. The transferred asset and the associated liability are measured on a basis that reflects the rights and obligations that the Group has retained.

Continuing involvement that takes the form of a guarantee over the transferred asset is measured at the lower of the original carrying amount of the asset and the maximum amount of consideration that the Group could be required to repay.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.13 Investments and other financial assets (Continued)

(c) Impairment of financial assets

The Group recognizes an allowance for expected credit losses ("ECLs") for all debt instruments not held at fair value through profit or loss. ECLs are based on the difference between the contractual cash flows due in accordance with the contract and all the cash flows that the Group expects to receive, discounted at an approximation of the original effective interest rate.

General approach

ECLs are recognized in three stages. For credit exposures for which there has not been a significant increase in credit risk since initial recognition, ECLs are provided for credit losses that result from default events that are possible within the next 12 months (a 12-month ECL). For those credit exposures for which there has been a significant increase in credit risk since initial recognition, a loss allowance is required for credit losses expected over the remaining life of the exposure, irrespective of the timing of the default (a lifetime ECL). For those have objective evidence of impairment at the reporting date, lifetime ECL are recognized and interest revenue is calculated on the net carrying amount.

At each reporting date, the Group assesses whether the credit risk on a financial instrument has increased significantly since initial recognition. When making the assessment, the Group compares the risk of a default occurring on the financial instrument as at the reporting date with the risk of a default occurring on the financial instrument as at the date of initial recognition and considers reasonable and supportable information that is available without undue cost or effort, including historical and forward-looking information.

The Group considers a financial asset to be in default when internal or external information indicates that the Group is unlikely to receive the outstanding contractual amounts in full before taking into account any credit enhancements held by the Group. A financial asset is written off when there is no reasonable expectation of recovering the contractual cash flows.

Debt investments at fair value through other comprehensive income and financial assets at amortized cost are subject to impairment under the general approach and they are classified within the following stages for measurement of ECLs except for trade receivables, notes receivable and contract assets which apply the simplified approach as detailed below.

Stage 1 - Financial instruments for which credit risk has not increased significantly since initial recognition and for which the loss allowance is measured at an amount equal to 12-month ECLs

Stage 2 - Financial instruments for which credit risk has increased significantly since initial recognition but that are not credit-impaired financial assets and for which the loss allowance is measured at an amount equal to lifetime ECLs

Stage 3 - Financial assets that are credit-impaired at the reporting date (but that are not purchased or originated credit-impaired) and for which the loss allowance is measured at an amount equal to lifetime ECLs

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.13 Investments and other financial assets (Continued)

(c) Impairment of financial assets (Continued)

Simplified approach

For trade receivables, notes receivable and contract assets that do not contain a significant financing component or when the Group applies the practical expedient of not adjusting the effect of a significant financing component, the Group applies the simplified approach in calculating ECLs. Under the simplified approach, the Group does not track changes in credit risk, but instead recognizes a loss allowance based on lifetime ECLs at each reporting date. The Group has established a provision matrix that is based on its historical credit loss experience, adjusted for forward-looking factors specific to the debtors and the economic environment.

For trade receivables, notes receivable and contract assets that contain a significant financial component and lease receivables, the Group chooses as its accounting policy to adopt the simplified approach in calculating ECLs with policies as described above.

3.14 Financial liabilities

(a) Initial recognition and measurement

Financial liabilities are classified, at initial recognition, as financial liabilities at fair value through profit or loss, loans and borrowings, payables, or as derivatives designated as hedging instruments in an effective hedge, as appropriate.

All financial liabilities are recognized initially at fair value and, in the case of loans and borrowings and payables, net of directly attributable transaction costs.

The Group's financial liabilities include trade and other payables, derivative financial instruments and interest-bearing bank and other borrowings.

(b) Subsequent measurement

The subsequent measurement of financial liabilities depends on their classification as follows:

(i) Financial liabilities at fair value through profit or loss

Financial liabilities at fair value through profit or loss include financial liabilities held for trading and financial liabilities designated upon initial recognition as at fair value through profit or loss.

Financial liabilities are classified as held for trading if they are incurred for the purpose of repurchasing in the near term. This category also includes derivative financial instruments entered by the Group that are not designated as hedging instruments in hedge relationships as defined by IFRS 9. Separated embedded derivatives are also classified as held for trading unless they are designated as effective hedging instruments. Gains or losses on liabilities held for trading are recognized in profit or loss. The net fair value gain or loss recognized in profit or loss does not include any interest charged on these financial liabilities.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.14 Financial liabilities (Continued)

(b) Subsequent measurement (Continued)

(ii) Financial liabilities at amortized cost (loans and borrowings)

After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortized cost, using the effective interest rate method unless the effect of discounting would be immaterial, in which case they are stated at cost. Gains and losses are recognized in profit or loss when the liabilities are derecognized as well as through the effective interest rate amortization process.

Amortized cost is calculated by taking into account any discount or premium on acquisition and fees or costs that are an integral part of the effective interest rate. The effective interest rate amortization is included in finance costs in profit or loss.

(iii) Financial liabilities at amortized cost (trade and other payables)

These amounts represent liabilities for goods and services provided to the Group prior to the end of financial year which are unpaid. The amounts are unsecured and are usually paid within 30 days of recognition. Trade and other payables are presented as current liabilities unless payment is not due within 12 months after the reporting period. They are subsequently measured at amortized cost using the effective interest method.

(iv) Financial guarantee contracts

Financial guarantee contracts issued by the Group are those contracts that require a payment to be made to reimburse the holder for a loss it incurs because the specified debtor fails to make a payment when due in accordance with the terms of a debt instrument. A financial guarantee contract is recognized initially as a liability at its fair value, adjusted for transaction costs that are directly attributable to the issuance of the guarantee. Subsequent to initial recognition, the Group measures the financial guarantee contracts at the higher of: (i) the ECL allowance determined in accordance with the policy as set out in "Impairment of financial assets"; and (ii) the amount initially recognized less, when appropriate, the cumulative amount of income recognized.

(c) Derecognition of financial liabilities

A financial liability is derecognized when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as a derecognition of the original liability and a recognition of a new liability, and the difference between the respective carrying amounts is recognized in profit or loss.

3.15 Offsetting financial instruments

Financial assets and liabilities are offset and the net amount is reported in the balance sheet where the Group currently has a legally enforceable right to offset the recognized amounts, and there is an intention to settle on a net basis or realize the asset and settle the liability simultaneously.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.16 Derivatives

Derivatives are initially recognized at fair value on the date a derivative contract is entered into and are subsequently remeasured to their fair value at the end of each reporting period. The accounting for subsequent changes in fair value depends on whether the derivative is designated as a hedging instrument. The Group's derivative instruments do not qualify for hedge accounting. Changes in the fair value of any derivative instrument that does not qualify for hedge accounting are recognized immediately in profit or loss and are included in other gains/(losses).

3.17 Inventories

Raw materials and stores, work in progress and finished goods are stated at the lower of cost and net realizable value. Cost comprises direct materials, direct labor and an appropriate proportion of variable and fixed overhead expenditure, the latter being allocated on the basis of normal operating capacity. Costs are assigned to individual items of inventory on the basis of weighted average costs. Costs of purchased inventory are determined after deducting rebates and discounts. Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

3.18 Cash and cash equivalents

For the purpose of presentation in the statement of cash flows, cash and cash equivalents includes cash on hand and demand deposits, and short term highly liquid investments that are readily convertible into known amounts of cash, are subject to an insignificant risk of changes in value, and have a short maturity of generally within three months when acquired, and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities in the balance sheet.

3.19 Borrowing costs

General and specific borrowing costs that are directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is required to complete and prepare the asset for its intended use or sale. Qualifying assets are assets that necessarily take a substantial period of time to get ready for their intended use or sale.

Investment income earned on the temporary investment of specific borrowings pending their expenditure on qualifying assets is deducted from the borrowing costs eligible for capitalization.

Other borrowing costs are expensed in the period in which they are incurred.

3.20 Current and deferred income tax

The income tax expense or credit for the period is the tax payable on the current period's taxable income based on the applicable income tax rate for each jurisdiction adjusted by changes in deferred tax assets and liabilities attributable to temporary differences and to unused tax losses.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.20 Current and deferred income tax (Continued)

Current income tax

The current income tax charge is calculated on the basis of the tax laws enacted or substantively enacted at the end of the reporting period in the countries where the Company and its subsidiaries and associates or jointly ventures operate and generate taxable income. Management periodically evaluates positions taken in tax returns with respect to situations in which applicable tax regulation is subject to interpretation and considers whether it is probable that a taxation authority will accept an uncertain tax treatment. The Group measures its tax balances either based on the most likely amount or the expected value, depending on which method provides a better prediction of the resolution of the uncertainty.

Deferred income tax

Deferred income tax is provided in full, using the liability method, on temporary differences arising between the tax bases of assets and liabilities and their carrying amounts in the consolidated financial statements. However, deferred tax liabilities are not recognized if they arise from the initial recognition of goodwill. Deferred income tax is also not accounted for if it arises from initial recognition of an asset or liability in a transaction other than a business combination that at the time of the transaction affects neither accounting nor taxable profit or loss. Deferred income tax is determined using tax rates (and laws) that have been enacted or substantively enacted by the end of the reporting period and are expected to apply when the related deferred income tax asset is realized or the deferred income tax liability is settled.

Deferred tax assets are recognized only if it is probable that future taxable amounts will be available to utilize those temporary differences and losses.

Deferred tax liabilities and assets are not recognized for temporary differences between the carrying amount and tax bases of investments in foreign operations where the Company is able to control the timing of the reversal of the temporary differences and it is probable that the differences will not reverse in the foreseeable future.

Deferred tax assets and liabilities are offset where there is a legally enforceable right to offset current tax assets and liabilities and where the deferred tax balances relate to the same taxation authority. Current tax assets and tax liabilities are offset where the entity has a legally enforceable right to offset and intends either to settle on a net basis, or to realize the asset and settle the liability simultaneously.

Current and deferred tax is recognized in profit or loss, except to the extent that it relates to items recognized in other comprehensive income or directly in equity. In this case, the tax is also recognized in other comprehensive income or directly in equity, respectively.

3.21 Employee benefits

Employee benefits mainly include salaries, bonuses, allowances and subsidies, pension insurance, social insurance and housing funds, labor union fees, employees' education fees and other expenses related to the employees for their services. The Group recognizes employee benefits as liabilities during the accounting period when employees rendered the services and allocates the related cost of assets and expenses based on different beneficiaries.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.21 Employee benefits (Continued)

(a) Bonus plans

The expected cost of bonus plans is recognized as a liability when the Group has a present legal or constructive obligation as a result of services rendered by employees and a reliable estimate of the obligation can be made.

(b) Retirement benefit obligations

The Group primarily pays contributions on a monthly basis to participate in a pension plan organized by the relevant municipal and provincial governments in the PRC. The municipal and provincial governments undertake to assume the retirement benefit obligations of all existing and future retired employees payable under these plans. The Group has no legal or constructive obligations for further contributions if the fund does not hold sufficient assets to pay all employees the benefit relating to their current and past services.

(c) In addition, the Company and its eligible subsidiaries have established an enterprise annuity plan in accordance with national policies and relevant requirements under the Company's system. Fees required for the enterprise annuity plan shall be jointly paid by the enterprise and its employees. Employees may elect to join or not to join the enterprise annuity plan on voluntary basis.

As of December 31, 2022, the Group had no forfeited contributions available to offset contributions payable in future years. For the year ended December 31, 2022, other than the early retirement scheme implemented by the Group as described in Note 23(i), the Group didn't have any other defined benefit plan.

(d) Other social insurance and housing funds

The Group provides other social insurance and housing funds to the qualified employees in the PRC based on certain percentages of their salaries. These percentages are not to exceed the upper limits of the percentages prescribed by the Ministry of Human Resources and Social Security of the PRC. These benefits are paid to social security organisations and the amounts are expensed as incurred. The Group has no legal or constructive obligations for further contributions if the fund does not hold sufficient assets to pay all employees the benefit relating to their current and past services.

(e) Termination benefit obligations

Termination benefit obligations are payable when employment is terminated by the Group before the normal retirement date, or whenever an employee accepts voluntary redundancy in exchange for these benefits. The Group recognizes termination benefit obligations when it is demonstrably committed to either: terminating the employment of current employees according to a detailed formal plan without possibility of withdrawal; or providing termination benefits as a result of an offer made to encourage voluntary redundancy. The specific terms vary among the terminated employees depending on various factors including position, length of service and district of the employees concerned. Benefits falling due for more than 12 months after the end of the reporting period are discounted to their present values.

(f) The Abolition of the use of the accrued benefits derived from employers' "mandatory" contributions to MPF and ORSO to offset the long service payment ("LSP") and severance payment (the "Amendment") accrued from the Transition Date (not later than 2025) was enacted on June 17, 2022. As the LSP is a defined benefit plan, the Amendment changes the employer's legal obligation which is considered as a plan amendment under HKAS 19/IAS 19 and thus the impact should be considered in 2022. However, as the Group only has very few employees that in the scope of the Amendment, the Group is of the view that the Amendment will have immaterial impact to the Group's financial position and performance.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.22 Share-based payment

(a) Equity-settled share-based payment transactions

The Group operates a share incentive plan, under which the Company issued restricted shares to certain employees of the Group as the consideration for the services received from such employees. The fair value of the services received in exchange for the grant of the restricted shares is recognized as an expense on the consolidated statement of profit with a corresponding increase in equity. In terms of the restricted shares awarded to employees, the total amount to be expensed is determined by reference to the fair value of equity instruments granted. In addition, the Company has an obligation to re-purchase the restricted shares forfeited due to unsatisfaction of service condition or performance condition. Accordingly, treasury shares and corresponding liability for the consideration of re-purchase of the restricted shares are recognized at the issue date of the shares.

Service and non-marketing performance conditions are included in calculation of the number of restricted shares that are expected to vest. The total amount expensed is recognized over the vesting period, which is the period over which all of the specified vesting conditions are to be satisfied.

At the end of each reporting period, the Group revises its estimates of the number of restricted shares that are expected to vest based on the non-marketing performance and service conditions. It recognizes the impact of the revision to original estimates, if any, in the consolidated income statement, with a corresponding adjustment to equity.

3.23 Provisions

Provisions for legal claims, asset retirement obligations are recognized when the Group has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources will be required to settle the obligation and the amount can be reliably estimated. Provisions are not recognized for future operating losses.

Where there are a number of similar obligations, the likelihood that an outflow will be required in settlement is determined by considering the class of obligations as a whole. A provision is recognized even if the likelihood of an outflow with respect to any one item included in the same class of obligations may be small.

Provisions are measured at the present value of management's best estimate of the expenditure required to settle the present obligation at the end of the reporting period. The discount rate used to determine the present value is a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The increase in the provision due to the passage of time is recognized as interest expense.

3.24 Revenue recognition

Revenue from contracts with customers

Revenue from contracts with customers is recognized when control of goods or services is transferred to the customers at an amount that reflects the consideration to which the Group expects to be entitled in exchange for those goods or services.

When the consideration in a contract includes a variable amount, the amount of consideration is estimated to which the Group will be entitled in exchange for transferring the goods or services to the customer. The variable consideration is estimated at contract inception and constrained until it is highly probable that a significant revenue reversal in the amount of cumulative revenue recognized will not occur when the associated uncertainty with the variable consideration is subsequently resolved.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.24 Revenue recognition (continued)

When the contract contains a financing component which provides the customer with a significant benefit of financing the transfer of goods or services to the customer for more than one year, revenue is measured at the present value of the amount receivable, discounted using the discount rate that would be reflected in a separate financing transaction between the Group and the customer at contract inception. When the contract contains a financing component which provides the Group a significant financial benefit for more than one year, revenue recognized under the contract includes the interest expense accreted on the contract liability under the effective interest method. For a contract where the period between the payment by the customer and the transfer of the promised goods or services is one year or less, the transaction price is not adjusted for the effects of a significant financing component, using the practical expedient in IFRS 15.

(a) Sale of industrial products

Revenue from the sale of industrial products (including sales of scrap and other materials) is recognized at the point in time when control of the asset is transferred to the customer, generally on acceptance of the industrial products. Revenue from electricity is recognized upon transmission of electricity based on the confirmation from the power grid.

(b) Rendering of services

The Group provides transportation service and the revenue from services is recognized over time, using an input method to measure progress towards complete satisfaction of the service, because the customer simultaneously receives and consumes the benefits provided by the Group.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.25 Earnings per share

(a) Basic earnings per share

Basic earnings per share is calculated by dividing:

- the profit attributable to owners of the Company, excluding any costs of servicing equity other than ordinary shares;
- by the weighted average number of ordinary shares outstanding during the financial year, adjusted for bonus elements in ordinary shares issued during the year and excluding treasury shares.

(b) Diluted earnings per share

Diluted earnings per share adjusts the figures used in the determination of basic earnings per share to take into account:

- the after-income tax effect of interest and other financing costs associated with dilutive potential ordinary shares, and
- the weighted average number of additional ordinary shares that would have been outstanding assuming the conversion of all dilutive potential ordinary shares.

3.26 Dividend income

Dividend income is recognized when the shareholders' right to receive payment has been established, it is probable that the economic benefits associated with the dividend will flow to the Group and the amount of the dividend can be measured reliably.

3.27 Leases

Leases are recognized as a right-of-use asset and a corresponding liability at the date at which the leased asset is available for use by the Group.

Contracts may contain both lease and non-lease components. The Group allocates the consideration in the contract to the lease and non-lease components based on their relative stand-alone prices.

Lease terms are negotiated on an individual basis and contain a wide range of different terms and conditions. The lease agreements do not impose any covenants other than the security interests in the leased assets that are held by the lessor. Leased assets may not be used as security for borrowing purposes.

Assets and liabilities arising from a lease are initially measured on a present value basis. Lease liabilities include the net present value of the following lease payments:

- fixed payments (including in-substance fixed payments), less any lease incentives receivable;

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.27 Leases (Continued)

- variable lease payment that are based on an index or a rate, initially measured using the index or rate as at the commencement date;
- amounts expected to be payable by the Group under residual value guarantees;
- the exercise price of a purchase option if the Group is reasonably certain to exercise that option, and
- payments of penalties for terminating the lease, if the lease term reflects the Group exercising that option.

Lease payments to be made under reasonably certain extension options are also included in the measurement of the liability.

The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be readily determined, which is generally the case for leases in the Group, the lessee's incremental borrowing rate is used, being the rate that the individual lessee would have to pay to borrow the funds necessary to obtain an asset of similar value to the right-of-use asset in a similar economic environment with similar terms, security and conditions.

To determine the incremental borrowing rate, the Group:

- where possible, uses recent third-party financing received by the individual lessee as a starting point, adjusted to reflect changes in financing conditions since third party financing was received;
- uses a build-up approach that starts with a risk-free interest rate adjusted for credit risk for leases held by the Group, which does not have recent third-party financing, and,
- makes adjustments specific to the lease, e.g. term, country, currency and security.

If a readily observable amortizing loan rate is available to the individual lessee (through recent financing or market data) which has a similar payment profile to the lease, then the Group entities use that rate as a starting point to determine the incremental borrowing rate.

The Group is exposed to potential future increases in variable lease payments based on an index or rate, which are not included in the lease liability until they take effect. When adjustments to lease payments based on an index or rate take effect, the lease liability is reassessed and adjusted against the right-of-use asset.

Lease payments are allocated between principal and finance cost. The finance cost is charged to profit or loss over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period.

Right-of-use assets are measured at cost comprising the following:

- the amount of the initial measurement of lease liability;
- any lease payments made at or before the commencement date less any lease incentives received;
- any initial direct costs, and
- restoration costs.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.27 Leases (Continued)

Right-of-use assets are generally depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis as follows:

Buildings	2 – 20 years
Machinery	2 – 10 years
Land use rights	10 – 50 years

If the Group is reasonably certain to exercise a purchase option, the right-of-use asset is depreciated over the underlying asset's useful life.

Payments associated with short-term leases of equipment and vehicles and all leases of low-value assets are recognized on a straight-line basis as an expense in profit or loss. The Group applies the short-term lease recognition exemption to its short-term leases of machinery and equipment (that is those leases that have a lease term of 12 months or less from the commencement date and do not contain a purchase option). It also applies the recognition exemption for leases of low-value assets to leases of office equipment that are considered to be of low value (i.e. below RMB30,000).

Rental income

Rental income is recognized on a time proportion basis over the lease terms. Variable lease payments that do not depend on an index or a rate are recognized as income in the accounting period in which they are incurred.

3.28 Dividend distribution

Provision is made for the amount of any dividend declared, being appropriately authorized and no longer at the discretion of the entity, on or before the end of the reporting period but not distributed at the end of the reporting period.

3.29 Government grants

Government grants are recognized at their fair value where there is reasonable assurance that the grant will be received and all attaching conditions will be complied with. When the grant relates to an expense item, it is recognized as income on a systematic basis over the periods that the costs, which it is intended to compensate, are expensed.

Asset-related government grants are recognized when the government document designates that the government grants are used for constructing or forming long-term assets. If the government document is inexplicit, the Group should make a judgement based on the basic conditions to obtain the government grants, and recognizes them as asset-related government grants if the conditions are to construct or to form long-term assets. Otherwise, the government grants should be income-related.

3 SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

3.29 Government grants (Continued)

For asset-related government grants that is related to long lived assets that already exist at the time of recognizing the government grant, the grant is deducted in calculating the carrying amount of the asset. The grant is recognized in profit or loss over the life of a depreciable asset as a reduced depreciation expense. If the asset is not yet purchased or constructed at the time of recognizing the government grant, the grant is recognized as deferred income and will be deducted from the cost of the asset once the asset is recognized.

Income-related government grants that are specific to compensate expenses or costs that have already incurred, they are directly recognized in profit or loss for the current period as deduction of the related expenses or costs. If the income-related government grants are specific to compensate future expenses or costs of the Group, they are recognized as deferred income and will be released to profit or loss when the related expenses or costs are incurred.

3.30 Interest income

Interest income on financial assets at amortized cost and financial assets at FVOCI calculated using the effective interest method is recognized in profit or loss as part of other income. Interest income is presented as finance income where it is earned from financial assets that are held for cash management purposes. Any other interest income is included in other income.

Interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset except for financial assets that subsequently become credit-impaired. For credit-impaired financial assets the effective interest rate is applied to the net carrying amount of the financial asset (after deduction of the loss allowance).

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES

The preparation of the Group’s consolidated financial statements requires management to make judgements, estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities, and the accompanying disclosures, and the disclosure of contingent liabilities. Uncertainty about these judgements, assumptions and estimates could result in outcomes that require a material adjustment to the carrying amounts of assets or liabilities affected in future periods.

Judgements

In the process of applying the Group’s accounting policies and preparing the Group’s consolidated financial statements, management has made the following judgements, apart from those involving estimates, which have a significant effect on the amounts recognized in the consolidated financial statements.

(a) Significant influence over an entity in which the Group holds less than 20% of voting rights

At December 31, 2022, the Group owned a 6.68% equity interest in China Copper Mineral Resources Co.,Ltd. (“China Resources”) (中銅礦產資源有限公司). The Group considers that it has significant influence over Chalco Resources even though it owns less than 20% of the voting rights, on the grounds that the Group can appoint one out of the five directors of the Board of Directors of Chalco Resources, thus have the right to participate in decision making of China Resources.

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES (CONTINUED)

Judgements (Continued)

(a) Significant influence over an entity in which the Group holds less than 20% of voting rights (Continued)

At December 31, 2022, the Group owned a 16% equity interest in Baise New Aluminum Power Co., Ltd. ("New Aluminum Power") (百色新鋁電力有限公司). The Group considers that the Group has significant influence over New Aluminum Power even though it owns less than 20% of the voting rights, on the grounds that the Group can appoint one out of the nine directors of the Board of Directors of New Aluminum Power, thus have the right to participate in decision making of New Aluminum Power.

At December 31, 2022, the Group owned 14.71% of the voting right of Chinalco Capital Holdings Co., Ltd. ("Chinalco Capital") (中鋁資本控股有限公司). The Group considers that the Group has significant influence over Chinalco Capital even though it owns less than 20% of the voting rights, on the grounds that the Group can appoint one out of the three directors of the Board of Directors of Chinalco Capital, thus have the right to participate in decision making of Chinalco Capital.

At December 31, 2022, the Group owned a 14.29% equity interest in Inner Mongolia Geliugou Co., Ltd. ("Inner Mongolia Geliugou") (內蒙古圪柳溝能源有限公司). The Group considers that it has significant influence over Inner Mongolia Geliugou even though it owns less than 20% of the voting rights, on the grounds that the Group can appoint one out of the seven directors of the Board of Directors of Inner Mongolia Geliugou, thus have the right to participate in decision making of Inner Mongolia Geliugou.

At December 31, 2022, the Group owned a 19.49% equity interest in Chalco Innovation Development Investment Co., Ltd. ("Chalco Innovation") (中鋁創新開發投資有限公司). The Group considers that it has significant influence over Chalco Innovation even though it owns less than 20% of the voting rights, on the grounds that the Group can appoint one out of the seven directors of the Board of Directors of Chalco Innovation, thus have the right to participate in decision making of Chalco Innovation.

(b) Consolidation of entities in which the Group holds less than a majority of voting rights

As of December 31, 2022, the Company owned 29.10% of the total issued share capital of Yunnan Aluminum and was the largest shareholder of Yunnan Aluminum. Considering the following factors, the directors of the Company are of the view that the Company have defacto control over Yunnan Aluminum, and accordingly Yunnan Metallurgical is regarded as a defacto agent of the Company in respect of the shareholding of Yunnan Aluminum, and therefore consolidated Yunnan Aluminum in the Company's consolidated financial statements:

(i)Yunnan Metallurgical, which is a fellow subsidiary of the Company under common control of Chinalco, is the second largest shareholder of Yunnan Aluminum with 13% of shareholding. Pursuant to the share transfer agreement between the Company and Yunnan Metallurgical, the Company will be able to nominate more than half of directors of Yunnan Aluminum. In addition, pursuant to Chinalco's directions to the Company and Yunnan Metallurgical, the Company will have Yunnan Metallurgical's support in exercising voting rights at the board and shareholders' meeting. Consequently, the Company is able to have a majority voting rights at the board of Yunnan Aluminum and controls in aggregate 42.10% voting rights at the shareholders' meeting of Yunnan Aluminum.

(ii)Other than the Company and Yunnan Metallurgical, the remaining investors of Yunan Aluminum are made up of a large number of widely dispersed, unrelated individual investors who do not have a mechanism to act collectively to veto the Company's decisions.

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES (CONTINUED)

Judgements (Continued)

(b) Consolidation of entities in which the Group holds less than a majority of voting rights (Continued)

(iii)Taking into account the large volume of inter-company transactions between the Group and Yunnan Aluminum and the similarity of industry and synergies of operation between the Group and Yunnan Aluminum, the Company has sufficient experience, ability and incentive to direct the relevant activities of Yunnan Aluminum, which expose the Group to variable returns, thus the Group have control over Yunnan Aluminum.

As of December 31, 2022, the Group owned a 40.23% equity interest in Ningxia Yinxing Energy Co., Ltd. ("Yinxing Energy") (寧夏銀星能源股份有限公司). Since the remaining 59.77% of the equity shares in Yinxing Energy are held by a large number of individual shareholders, in opinion of the directors of the Company, the Group has control over Yinxing Energy, and Yinxing Energy continues to be included in the consolidation scope.

As of December 31, 2022, the Company owned a 40% equity interest in Guizhou Huaren New Materials Co., Ltd. ("Guizhou Huaren")(貴州華仁新材料有限公司). In accordance with the acting-in-concert agreement signed between the Company and Qingzhen Industry Investment Co., Ltd. ("Qingzhen Industry")(清鎮市工業投資有限公司) and Guizhou Chengqian Enterprise (Group) Co., Ltd. ("Guizhou Chengqian") (貴州成黔企業(集團)有限公司), Qingzhen Industry and Guizhou Chengqian would exercise the shareholders' and board of directors' votes in concert with the Group's voting decisions. Therefore, the directors of the Company believe that the Company has control over Guizhou Huaren and consolidated Guizhou Huaren's financial statements.

As of December 31, 2022, the Company owned 40% of the shares of Shanxi China Aluminum China Resources Co., Ltd. ("Shanxi Zhongrun")(山西中鋁華潤有限公司). In accordance with the acting-in-concert agreement signed between the Company and China Resources Power Engineering Services Co., Ltd. ("China Resources Power Engineering")(華潤電力工程服務有限公司), China Resources Power Engineering would exercise the shareholders' and board of directors' votes in concert with the Group. Therefore, the directors of the Company believe that the Company has control over Shanxi Zhongrun and consolidated Shanxi Zhongrun.

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES (CONTINUED)

Estimates and assumptions

The key assumptions concerning the future and other key sources of estimation uncertainty at the reporting date, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year, are described below. The Group's assumptions and estimates are based on parameters available when the consolidated financial statements were prepared. Existing circumstances and assumptions about future developments, however, may change due to market changes or circumstances arising beyond the control of the Group. Such changes are reflected in the assumptions when they occur.

(a) Impairment assessment of property, plant and equipment

As of December 31, 2022, the Group's net carrying amount of property, plant and equipment was RMB109,277 million. Management assesses related assets for potential impairment whenever there are indications that the carrying value of an asset or a group of assets may not be recoverable. As of December 31, 2022, management performed impairment assessment on property, plant and equipment with impairment indications at the level of cash generating unit ("CGU") to which the property, plant and equipment was allocated using discounted cash flow model. The discounted cash flows model used for the impairment assessment of property, plant and equipment involved significant assumptions including product prices, discount rate and the fair value of certain property, plant and equipment to be disposed of. Based on the impairment test, RMB3,795 million of impairment losses were recognized by management for property, plant and equipment for the year ended December 31, 2022.

(b) Impairment assessment of goodwill

As of December 31, 2022, the Company's carrying value of goodwill was RMB 3,495 million. Management performed impairment assessment of goodwill on an annual basis. When performing the impairment assessment, the recoverable amount of the CGU to which the goodwill was allocated was estimated by management using discounted cash flow model, and compared with the carrying amount of the CGU to determine if goodwill was impaired. The discounted cash flow models used for the impairment assessment of goodwill involved significant assumptions including product prices, the long-term growth rate and the discount rate. Based on the impairment test, RMB 15 million of impairment losses were recognized by management for goodwill for the year ended December 31, 2022.

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES (CONTINUED)

Estimates and assumptions (Continued)

(c) Property, plant and equipment and intangible assets (excluding goodwill) – estimated useful lives and residual values

The Group determines the estimated useful lives and residual values (if applicable) and consequently the related depreciation/amortization charges for its property, plant and equipment and intangible assets (excluding goodwill). These estimates are based on the historical experience, anticipated change of technology, market condition and the actual consumptions of related assets. The depreciation/amortization charge will increase when useful lives are less than previously estimated. In addition, technically obsolete or non-strategic assets that have been abandoned or sold will be written off or written down.

Actual economic lives may differ from estimated useful lives and actual residual values may differ from estimated residual values. Periodic review could result in change in useful lives and residual values and therefore change in depreciation/amortization expense in future periods.

(d) Coal reserve estimates and units-of-production amortization for coal mining rights

Coal reserves are estimates of the quantity of ores that can be economically and legally extracted from the Group's coal mines. The proved and probable reserves are calculated in accordance with the standards of the mine concerned. Estimates and assumptions are required with a number of factors including production techniques, production costs. Because the economic assumptions used to estimate coal reserves changes from time to time, estimates of coal reserves may change accordingly. Changes in reported reserves may affect the Group's depreciation and amortization recognized by the unit-of-production basis.

(e) Estimated net realizable value of inventories

In accordance with the Group's accounting policy, the Group estimated net realizable value of inventories based on specific facts and circumstances. For different types of inventories, it requires the estimation on selling prices, costs of conversion, selling expenses and the related tax expense to calculate the net realizable amount of inventories. For inventories held for executed sales contracts, management estimates the net realizable amount based on the contracted price. For raw materials and work-in-progress, management has established a model in estimating the net realizable amount at which the inventories can be realized in the normal course of business after considering the manufacturing cycles, production capacity and forecasts, estimated future conversion costs and selling prices. Management also takes into account the price or cost fluctuations and other related matters occurring after the end of the reporting period which reflect conditions that existed at the end of the reporting period.

It is reasonably possible that if there is a significant change in circumstances including the Group's business and the external environment, outcomes within the next financial year would be significantly affected.

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES (CONTINUED)

Estimates and assumptions (Continued)

(f) Investments in joint ventures and associates – recoverable amount

In accordance with the Group's accounting policy, each investment in a joint venture and an associate is evaluated in every reporting period to determine whether there are any indicators of impairment. If any such indicators exists, an estimate of the recoverable amount is performed and an impairment loss is recognized to the extent that the carrying amount exceeds the recoverable amount. The recoverable amount of the investment in a joint venture and an associate is measured at the higher of fair value less costs of disposal and value in use.

(g) Determination of the lease term

The Group leased certain land use rights and property, plant and equipment from Chinalco. The lease term is determined based on the Group's assessment if the related termination option or extension option would be reasonably exercised taking into account the use of the land and operating status. The Group will reassess the lease term if any significant events or changes in circumstances that may have impact on the exercise of such options and are under the control of the Group occurred.

(h) Income tax

The Group estimates its income tax provision and deferred taxation in accordance with the prevailing tax rules and regulations, taking into account any special approvals obtained from the relevant tax authorities and any preferential tax treatment to which it is entitled in each location or jurisdiction in which the Group operates. There are many transactions and calculations for which the ultimate tax determination is uncertain during the ordinary course of business. The Group recognizes liabilities for anticipated tax audit issues based on estimates of whether additional taxes will be due. Where the final tax outcome of these matters is different from the amounts that were initially recorded, the differences will impact on the income tax and deferred tax provisions in the period in which the determination is made.

(Amounts expressed in thousands of RMB unless otherwise stated)

4 SIGNIFICANT ACCOUNTING JUDGEMENTS AND ESTIMATES (CONTINUED)

Estimates and assumptions (Continued)

(h) Income tax (Continued)

Deferred tax assets are recognized for unused tax losses and deductible temporary differences, such as the provision for impairment of receivables, inventories and property, plant and equipment and accruals of expenses not yet deductible for tax purposes, to the extent that it is probable that taxable profits will be available against which the losses deductible temporary difference can be utilized. Significant estimation is required in determining the recoverability of deferred tax assets.

In the event that future tax rules and regulations or related circumstances change, adjustments to current and deferred taxation may be necessary which would impact on the Group's results or financial position.

(i) Impairment of receivables

The loss allowances for receivables are based on assumptions about risk of default and expected loss rates to determine the expected loss. The Group uses judgement in making these assumptions and selecting the inputs to the impairment calculation, based on the Group's history, existing market conditions as well as forward looking estimates at the end of each reporting period.

The Group takes into account different macroeconomic scenarios in considering forward looking information in mainland China. The Group regularly monitors and reviews the key macroeconomic assumptions and parameters related to the calculation of expected credit losses, including the risk of economic downturn, external market environment, technological environment, changes in customer conditions, gross domestic product ("GDP") and consumer price index ("CPI"), etc. The key macroeconomic parameters are listed below:

		Scenarios		
Year ended 31 December 2022	Year	Basic	Negative	Positive
Growth Rate of GDP	2023	5.04 %	4.70 %	6.04 %
Growth Rate of CPI	2023	2.12 %	1.63 %	2.67 %

		Scenarios		
Year ended 31 December 2021	Year	Basic	Negative	Positive
Growth Rate of GDP	2022	5.30 %	5.04 %	5.57 %
Growth Rate of CPI	2022	2.20 %	2.09 %	2.31 %

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION

(a) Revenue

Revenue recognized during the year is as follows:

	For the years ended December 31		
	2022	2021	2020
Revenue from contracts with customers (net of value-added tax)			
Sale of goods	288,853,556	297,102,961	202,036,585
Transportation services	1,817,566	1,470,334	1,621,570
	290,671,122	298,573,295	203,658,155
Revenue from other sources			
Rental income	316,820	312,055	334,924
	290,987,942	298,885,350	203,993,079

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (Continued)

(a) Revenue (Continued)

(i) Disaggregated revenue information

	For the year ended December 31, 2022						
	Alumina segment	Primary Aluminum segment	Energy Segment	Trading Segment	Corporate and other operating segments	Inter-segment elimination	Total
Type of goods or services							
Sales of goods	55,513,960	138,428,806	9,322,537	252,408,567	1,840,375	(168,660,689)	288,853,556
Transportation services	—	—	—	6,397,541	—	(4,579,975)	1,817,566
Total	55,513,960	138,428,806	9,322,537	258,806,108	1,840,375	(173,240,664)	290,671,122
Geographical markets							
Mainland China	55,513,960	138,428,806	9,322,537	245,370,030	1,840,375	(173,240,664)	277,235,044
Outside of Mainland China	—	—	—	13,436,078	—	—	13,436,078
Total	55,513,960	138,428,806	9,322,537	258,806,108	1,840,375	(173,240,664)	290,671,122
Timing of revenue recognition							
Goods transferred at a point in time	55,513,960	138,428,806	9,322,537	252,408,567	1,840,375	(168,660,689)	288,853,556
Services transferred over time	—	—	—	6,397,541	—	(4,579,975)	1,817,566
Total	55,513,960	138,428,806	9,322,537	258,806,108	1,840,375	(173,240,664)	290,671,122

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For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(a) Revenue (Continued)

(i) Disaggregated revenue information (Continued)

	For the year ended December 31, 2021						
	Alumina segment	Primary Aluminum segment	Energy Segment	Trading Segment	Corporate and other operating segments	Inter-segment elimination	Total
Type of goods or services							
Sales of goods	53,813,335	118,456,198	7,915,219	248,379,137	1,439,359	(132,900,287)	297,102,961
Transportation services	—	—	—	4,255,266	—	(2,784,932)	1,470,334
Total	53,813,335	118,456,198	7,915,219	252,634,403	1,439,359	(135,685,219)	298,573,295
Geographical markets							
Mainland China	53,813,335	118,456,198	7,915,219	239,342,124	1,439,359	(135,685,219)	285,281,016
Outside of Mainland China	—	—	—	13,292,279	—	—	13,292,279
Total	53,813,335	118,456,198	7,915,219	252,634,403	1,439,359	(135,685,219)	298,573,295
Timing of revenue recognition							
Goods transferred at a point in time	53,813,335	118,456,198	7,915,219	248,379,137	1,439,359	(132,900,287)	297,102,961
Services transferred over time	—	—	—	4,255,266	—	(2,784,932)	1,470,334
Total	53,813,335	118,456,198	7,915,219	252,634,403	1,439,359	(135,685,219)	298,573,295

	For the year ended December 31, 2020						
	Alumina segment	Primary Aluminum segment	Energy Segment	Trading Segment	Corporate and other operating segments	Inter-segment elimination	Total
Type of goods or services							
Sales of goods	44,177,153	81,245,663	7,184,216	178,623,815	1,126,033	(110,320,295)	202,036,585
Transportation services	—	—	—	3,802,666	—	(2,181,096)	1,621,570
Total	44,177,153	81,245,663	7,184,216	182,426,481	1,126,033	(112,501,391)	203,658,155
Geographical markets							
Mainland China	44,177,153	81,245,663	7,184,216	173,486,314	1,126,033	(112,501,391)	194,717,988
Outside of Mainland China	—	—	—	8,940,167	—	—	8,940,167
Total	44,177,153	81,245,663	7,184,216	182,426,481	1,126,033	(112,501,391)	203,658,155
Timing of revenue recognition							
Goods transferred at a point in time	44,177,153	81,245,663	7,184,216	178,623,815	1,126,033	(110,320,295)	202,036,585
Services transferred over time	—	—	—	3,802,666	—	(2,181,096)	1,621,570
Total	44,177,153	81,245,663	7,184,216	182,426,481	1,126,033	(112,501,391)	203,658,155

(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(a) Revenue (Continued)

(ii) The following table shows the amounts of revenue recognized in the current reporting period that were included in the contract liabilities at the beginning of the reporting period:

	For the years ended December 31		
	2022	2021	2020
Revenue recognized that was included in contract liabilities at the beginning of the reporting period:			
Sale of goods	2,124,417	1,349,157	1,350,929
Others	66,228	88,090	73,541
	2,190,645	1,437,247	1,424,470

(iii) Performance obligations

Information about the Group's performance obligations is summarized below:

Revenue from sales of products (including sales of the other materials)

The performance obligation is satisfied upon delivery of the industrial products and payment is generally due within 30 to 90 days from delivery, except for new customers, where advance is normally required.

Sales of goods were made in a short period of time and the performance obligation was mostly satisfied in one year or less at the end of each year, thus the Group applied the expedient of not to disclose the transaction price allocated to unsatisfied performance obligation.

(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(a) Revenue (Continued)

(iii) Performance obligations (Continued)

Transportation service

The performance obligation is satisfied over time as services are rendered and payment is generally due upon completion of the relevant services.

Amounts expected to be recognized as revenue from contract liabilities at December 31, 2022 and 2021:

	For the years ended December 31	
	2022	2021
Within one year	2,049,014	2,363,043
After one year	93,240	116,545
	2,142,254	2,479,588

(b) Segment information

The executive presidents committee of the Company have been identified as the chief operating decision makers. The committee is responsible for the review of the internal reports in order to allocate resources to operating segments and assess their performance.

The committee considers the business from a product perspective comprising alumina, primary aluminum and energy for the Group's manufacturing business, which are identified as separate reportable operating segments. In addition, the Group's trading business is identified as a separate reportable operating segment. The Group's reportable operating segments also include corporate and other operating segments.

The committee assesses the performance of operating segments based on profit or loss before income tax in related periods. The manner of assessment used by the committee is consistent with that applied to the consolidated financial information for the year ended December 31, 2021. Management has determined the reportable operating segments based on the reports reviewed by the committee that are used to make strategic decisions.

The Group's five reportable operating segments are summarized as follows:

- The alumina segment, which consists of mining and purchasing bauxite and other raw materials, refining bauxite into alumina, and selling alumina both internally to the Group's aluminum enterprises and trading enterprises and externally to customers outside the Group. This segment also includes the production and sale of multi-form alumina bauxite.

- The primary aluminum segment, which consists of procuring alumina and other raw materials, supplemental materials and electricity power, smelting alumina to produce primary aluminum which is sold to the Group's trading enterprises and external customers, including Chinalco and its subsidiaries. This segment also includes the production and sale of carbon products and aluminum alloy and other aluminum products.

(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(b) Segment information (Continued)

- The trading segment, which consists of the trading of alumina, primary aluminum, aluminum fabrication products, other non-ferrous metal products, coal products and raw materials and supplemental materials and logistics and transport services to internal manufacturing plants and external customers. The products are sourced from fellow subsidiaries and international and domestic suppliers of the Group. Sales of products manufactured by the Group's manufacturing business are included in the total revenue of the trading segment and are eliminated with the segment revenue of the respective segments which supplied the products to the trading segment.

- The energy segment mainly includes coal mining, electricity generation by thermal power, wind power and solar power, new energy related equipment manufacturing business. Sales of coals are mainly to the Group's internal and external coal consuming customers; electricity is sold to regional power grid corporations.

- Corporate and other operating segments, which mainly include management of corporate, research and development activities and others.

Prepaid current income tax and deferred tax assets are excluded from segment assets, and income tax payable and deferred tax liabilities are excluded from segment liabilities. All sales among the reportable operating segments were conducted on terms mutually agreed among group companies, and have been eliminated upon consolidation.

	Year ended December 31, 2022						
	Alumina Segment	Primary aluminum Segment	Energy Segment	Trading Segment	Corporate and other operating segments	Inter-segment elimination	Total
Total revenue	55,761,730	138,465,822	9,322,537	258,854,321	1,943,932	(173,360,400)	290,987,942
Inter-segment revenue	(39,350,290)	(51,962,565)	(261,486)	(80,283,574)	(1,502,485)	173,360,400	—
Sales of self-produced products				48,849,680			
Sales of products sourced from external suppliers				129,721,067			
Revenue from external customers	16,411,440	86,503,257	9,061,051	178,570,747	441,447	—	290,987,942
Segment profit /(loss) before income tax	340,451	10,346,336	2,200,960	2,013,377	(843,055)	(849,101)	13,208,968
Income tax expense							(2,365,639)
Profit for the year							10,843,329
Other items							
Finance income	62,662	86,864	29,589	20,991	277,031	—	477,137
Finance costs	(713,584)	(1,088,391)	(580,129)	(166,221)	(1,346,542)	—	(3,894,867)
Share of profits and losses of joint ventures	75,405	—	(7,143)	9,065	101,583	—	178,910
Share of profits and losses of associates	(46,239)	(94,941)	(71,493)	45,847	297,458	—	130,632
Depreciation of right-of-use assets	(473,827)	(601,898)	(129,335)	(21,335)	(55,967)	—	(1,282,362)
Depreciation and amortization (excluding the depreciation of right- of-use assets)	(3,674,136)	(3,957,718)	(1,645,072)	(341,700)	(72,831)	—	(9,691,457)
Gains/(losses) on disposal of property, plant and equipment, intangible assets and right-of-use assets	90,041	180,999	(1,621)	56,280	(2,040)	—	323,659
Gain on disposal of business	—	—	—	—	27,804	—	27,804
Realized gain on futures contracts, net	—	—	—	20,104	216,707	—	236,811
Other income	25,510	44,628	54,727	110,885	35	—	235,785
Impairment loss on intangible assets	(75,842)	—	—	—	—	—	(75,842)
Impairment loss on property, plant and equipment	(3,160,902)	(634,518)	—	—	—	—	(3,795,420)
Unrealized gain on futures contracts, net	—	—	—	47,725	11,346	—	59,071
(Losses)/gains on disposal of subsidiaries	(19,530)	61	4,567	25,296	75,949	—	86,343
Changes for impairment of inventories	(392,513)	(1,625)	558	(93,295)	3,582	—	(483,293)
Provision for impairment of receivables	(407,608)	(26,737)	(25,619)	53,201	(7,376)	—	(414,139)
Dividends of equity investments at fair value through other comprehensive income	—	—	2,160	—	9,339	—	11,499
Investments in associates	187,806	500,489	689,399	396,810	4,628,134	—	6,402,638
Investments in joint ventures	1,076,120	—	343,745	48,675	1,871,427	—	3,339,967
Additions during the period:							
Intangible assets	138,835	40,719	17,722	—	76	—	197,352
Right-of-use assets	89,337	449,305	1,496	140,021	—	—	680,159
Property, plant and equipment	728,647	852,512	921,542	45,186	49,865	—	2,597,752

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NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(b) Segment information (Continued)

	Year ended December 31, 2021						
	Alumina Segment	Primary aluminum Segment	Energy Segment	Trading Segment	Corporate and other operating segments	Inter-segment elimination	Total
Total revenue	54,043,368	118,513,506	7,915,219	252,704,917	1,453,108	(135,744,768)	298,885,350
Inter-segment revenue	(36,463,601)	(39,899,709)	(240,575)	(58,162,607)	(978,276)	135,744,768	—
Sales of self-produced products				47,246,018			
Sales of products sourced from external suppliers				147,296,292			
Revenue from external customers	17,579,767	78,613,797	7,674,644	194,542,310	474,832	—	298,885,350
Segment profit /(loss) before income tax	2,798,129	12,783,818	(234,808)	1,336,268	(1,981,441)	(515,538)	14,186,428
Income tax expense							(2,869,551)
Profit for the year							11,316,877
Other items							
Finance income	117,265	71,097	38,313	50,829	33,599	—	311,103
Finance costs	(1,041,744)	(1,450,695)	(578,079)	(119,398)	(1,342,750)	—	(4,532,666)
Share of profits of joint ventures	80,612	—	16,095	13,240	54,153	—	164,100
Share of profits/(losses) of associates	(3,546)	(2,182)	(633,467)	45,538	170,410	—	(423,247)
Depreciation of right-of-use assets	(334,825)	(226,526)	(32,088)	(128,043)	(50,469)	—	(771,951)
Depreciation and amortization (excluding the depreciation of right- of-use assets)	(3,491,950)	(4,169,274)	(1,889,351)	(164,469)	(74,119)	—	(9,789,163)
(Losses)/gains on disposal of property, plant and equipment, intangible assets and right-of-use assets	(611,828)	(58,699)	(9,772)	3,222	(2,320)	—	(679,397)
Realized loss on futures, forward and option contracts, net	—	—	—	(132,354)	(413,171)	—	(545,525)
Other income	11,909	57,298	56,022	47,836	91	—	173,156
Impairment loss on intangible assets	(413,036)	(2,623)	—	—	—	—	(415,659)
Impairment loss on property, plant and equipment	(1,854,694)	(2,206,546)	(3,433)	—	—	—	(4,064,673)
Unrealized loss on futures contracts,net	—	—	—	(30,552)	(28,657)	—	(59,209)
Losses on disposal of subsidiaries	—	—	(27,404)	—	—	—	(27,404)
Changes for impairment of inventories	(16,098)	(114,170)	12,250	(13,039)	(2,601)	—	(133,658)
Provision for impairment of receivables	(122,370)	(40,627)	(176,715)	(330,122)	(720,931)	—	(1,390,765)
Dividends of equity investments at fair value through other comprehensive income	—	4,384	—	3,333	7,579	—	15,296
Investments in associates	196,453	578,313	759,194	382,062	4,525,771	—	6,441,793
Investments in joint ventures	1,076,120	—	353,177	55,712	1,865,950	—	3,350,959
Additions during the period:							
Intangible assets	97,925	22,351	—	140	—	—	120,416
Right-of-use assets	2,934,500	2,721,001	377	212,812	276,430	—	6,145,120
Property, plant and equipment	1,951,823	1,167,984	391,894	35,467	89,344	—	3,636,512

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NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(b) Segment information (Continued)

	Year ended December 31, 2020						
	Alumina Segment	Primary aluminum Segment	Energy Segment	Trading Segment	Corporate and other operating segments	Inter-segment elimination	Total
Total revenue	44,263,444	81,405,264	7,184,216	182,510,025	1,126,586	(112,496,456)	203,993,079
Inter-segment revenue	(31,174,724)	(34,068,498)	(243,788)	(46,261,296)	(748,150)	112,496,456	—
Sales of self-produced products				33,162,614			
Sales of products sourced from external suppliers				103,086,115			
Revenue from external customers	13,088,720	47,336,766	6,940,428	136,248,729	378,436	—	203,993,079
Segment profit/(loss) before income tax	1,164,996	3,862,836	(77,235)	770,172	(2,192,077)	(642,680)	2,886,012
Income tax expense							(641,329)
Profit for the year							2,244,683
Other items							
Finance income	44,697	68,645	36,333	73,026	43,508	—	266,209
Finance costs	(879,211)	(1,667,322)	(995,572)	(173,520)	(1,354,076)	—	(5,069,701)
Share of profits of joint ventures	75,405	—	35,308	5,011	64,778	—	180,502
Share of profits/(losses)of associates	(2,262)	(338,044)	(17,905)	38,683	226,010	—	(93,518)
Depreciation of right-of-use assets	(342,347)	(234,387)	(96,967)	(21,075)	(50,469)	—	(745,245)
Depreciation and amortization (excluding the depreciation of right-of-use assets)	(3,184,799)	(4,122,376)	(1,867,632)	(232,807)	(42,184)	—	(9,449,798)
(Losses)/gains on disposal of property, plant and equipment, intangible assets and right-of-use assets	25,489	(345,537)	99,363	(1,911)	(610)	—	(223,206)
Realized loss on futures, forward and option contracts, net	—	—	—	675,442	(152,064)	—	523,378
Other income	122,011	69,247	55,561	38,910	18,670	—	304,399
Impairment loss on property, plant and equipment	(23,136)	(653,170)	—	(4,951)	—	—	(681,257)
Unrealized loss on futures contracts,net	—	—	—	(27,705)	17,311	—	(10,394)
Losses on disposal of a subsidiaries	—	—	—	11,305	—	—	11,305
Changes for impairment of inventories	(136,827)	103,524	(15,642)	2,184	981	—	(45,780)
Provision for impairment of receivables	(59,105)	(22,487)	(108,059)	(395,053)	(383,238)	—	(967,942)
Dividends of equity investments at fair value through other comprehensive income	—	—	—	—	125,015	—	125,015
Investments in associates	205,625	612,531	1,565,235	396,454	4,221,258	—	7,001,103
Investments in joint ventures	1,076,085	—	334,763	43,258	1,920,447	—	3,374,553
Additions during the period:							
Intangible assets	86,698	5,787	—	1,413	266	—	94,164
Right-of- use assets	12,001	6,838	59,010	2,875	2,893	—	83,617
Property, plant and equipment	2,570,240	6,706,374	881,810	328,835	33,440	—	10,520,699

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(b) Segment information (Continued)

	As of December 31, 2022					
	Alumina Segment	Primary aluminum Segment	Energy Segment	Trading Segment	Corporate and other operating segments	Total
Segment assets	90,762,410	94,207,732	34,235,502	35,025,454	42,393,166	296,624,264
Reconciliation:						
Elimination of inter-segment receivables						(85,734,994)
Other eliminations						(741,195)
Corporate and other unallocated assets:						
Deferred tax assets						2,057,900
Prepaid income tax						142,056
Total assets						212,348,031
Segment liabilities	48,985,559	50,177,428	18,837,349	21,225,051	69,257,860	208,483,247
Elimination of inter-segment payables						(85,734,994)
Corporate and other unallocated liabilities:						
Deferred tax liabilities						1,451,692
Income tax payable						392,119
Total liabilities						124,592,064

	As of December 31, 2021					
	Alumina Segment	Primary aluminum Segment	Energy Segment	Trading Segment	Corporate and other operating segments	Total
Segment assets	97,099,222	90,931,136	35,261,548	31,625,689	48,195,444	303,113,039
Reconciliation:						
Elimination of inter-segment receivables						(79,480,000)
Other eliminations						(928,814)
Corporate and other unallocated assets:						
Deferred tax assets						2,096,459
Prepaid income tax						62,139
Total assets						224,862,823
Segment liabilities	52,154,184	47,125,596	25,419,575	21,037,605	66,657,841	212,394,801
Elimination of inter-segment payables						(79,480,000)
Corporate and other unallocated liabilities:						
Deferred tax liabilities						1,403,291
Income tax payable						847,163
Total liabilities						135,165,255

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

5 REVENUE AND SEGMENT INFORMATION (CONTINUED)

(b) Segment information (Continued)

The Group mainly operates in Mainland China. Geographical information on operating segments is as follows:

	For the years ended December 31		
	2022	2021	2020
Segment revenue from external customers			
– Mainland China	277,551,864	285,593,071	195,052,913
– Outside of Mainland China	13,436,078	13,292,279	8,940,166
	290,987,942	298,885,350	203,993,079

	December 31, 2022	December 31, 2021
Non-current assets (excluding financial assets and deferred tax assets)		
– Mainland China	150,927,698	165,459,440
– Outside Mainland China	2,595,140	2,627,731
	153,522,838	168,087,171

For the year ended December 31, 2022, revenues of approximately RMB53,183 million (2021: RMB65,128 million, 2020: RMB54,955 million) were derived from entities directly or indirectly owned or controlled by the PRC government including Chinalco. These revenues are mainly attributable to the alumina, primary aluminum, energy and trading segments. There were no individual customers that contributed 10% or more of the Group’s revenue during the years ended December 31, 2020, 2021 and 2022.

(Amounts expressed in thousands of RMB unless otherwise stated)

6 INTANGIBLE ASSETS

	Goodwill	Mining rights	Mineral exploration rights	Computer Software, production quota and others	Total
Year ended December 31, 2022					
Opening net carrying amount	3,509,515	7,315,211	984,286	1,524,976	13,333,988
Additions	—	134,806	19,356	43,190	197,352
Disposals	—	—	—	(1,774)	(1,774)
Disposal of subsidiaries	—	—	—	(8,572)	(8,572)
Impairment	(15,495)	(60,347)	—	—	(75,842)
Amortization	—	(444,764)	—	(58,157)	(502,921)
Transfer from property, plant and equipment (Note 7)	—	—	—	1,945	1,945
Currency translation differences	874	5,773	—	—	6,647
Closing net carrying amount	3,494,894	6,950,679	1,003,642	1,501,608	12,950,823
As of December 31, 2022					
Cost	3,510,864	10,585,156	1,239,376	2,118,444	17,453,840
Accumulated amortization and impairment	(15,970)	(3,634,477)	(235,734)	(616,836)	(4,503,017)
Net carrying amount	3,494,894	6,950,679	1,003,642	1,501,608	12,950,823

	Goodwill	Mining rights	Mineral exploration rights	Computer Software, production quota and others	Total
Year ended December 31, 2021					
Opening net carrying amount	3,509,857	7,638,216	1,276,295	1,565,165	13,989,533
Additions	—	98,352	13,452	8,612	120,416
Disposals	—	(3,639)	—	—	(3,639)
Impairment	—	(175,245)	(237,791)	(2,623)	(415,659)
Amortization	—	(351,748)	—	(55,539)	(407,287)
Transfer from property, plant and equipment (Note 7)	—	45,522	—	10,346	55,868
Currency translation differences	(342)	(1,692)	(2,225)	(985)	(5,244)
Reclassifications and internal transfers	—	65,445	(65,445)	—	—
Closing net carrying amount	3,509,515	7,315,211	984,286	1,524,976	13,333,988
As of December 31, 2021					
Cost	3,509,515	10,435,028	1,220,020	2,098,631	17,263,194
Accumulated amortization and impairment	—	(3,119,817)	(235,734)	(573,655)	(3,929,206)
Net carrying amount	3,509,515	7,315,211	984,286	1,524,976	13,333,988

(Amounts expressed in thousands of RMB unless otherwise stated)

6 INTANGIBLE ASSETS (CONTINUED)

For the years ended December 31, 2020, 2021 and 2022, the amortization expenses of intangible assets recognized in profit or loss were analyzed as follows:

	For the years ended December 31		
	2022	2021	2020
Cost of sales	474,639	384,383	467,573
General and administrative expenses	28,282	22,904	25,839
	502,921	407,287	493,412

As of December 31, 2022, the Group pledged mining rights and mineral exploration rights totaling RMB1,353 million (December 31, 2021: RMB1,400 million) for certain interest-bearing loans and borrowings as set out in Note 26.

Impairment testing of goodwill

The lowest level within the Group at which goodwill is monitored for internal management purposes is the operating segment before aggregation. Therefore, goodwill is allocated to the Group's CGUs and groups of CGUs that are expected to benefit from the synergies of the relevant business combination. A summary of goodwill allocation is presented below:

	December 31, 2022		December 31, 2021	
	Alumina	Primary aluminum	Alumina	Primary aluminum
Qinghai Branch	—	217,267	—	217,267
Guangxi Branch	189,419	—	189,419	—
Lanzhou Aluminum Co., Ltd.	—	1,924,259	—	1,924,259
PT. Nusapati Prima ("PTNP")	—	—	14,621	—
Shanxi Huaxing	1,163,949	—	1,163,949	—
	1,353,368	2,141,526	1,367,989	2,141,526

The recoverable amount of the CGU or group of CGUs is determined based on value-in-use calculations. These calculation of VIU use pre-tax cash flow projections based on financial budgets approved by management covering a five-year period. Cash flows beyond the 5-year period are extrapolated using the estimated growth rate of 2% (2021: 2%) not exceeding the long-term average growth rate for the businesses in which the CGU operates. Other key assumptions applied in the impairment testing include future prices of aluminum and alumina and the discount rate. Management determined these key assumptions based on past performance and their expectations on market development. Furthermore, the Group adopts a pre-tax and inflation rate of 12.62% (2021: 12.62%) that reflects specific risks related to CGU or groups of CGUs as the discount rate. These estimates and judgments may be affected by unexpected changes in the future market or economic conditions.

Based on the assessment, other than the impairment of PTNP in 2022, there was no other impairment of goodwill as of December 31, 2022 and December 31, 2021.

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NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

7 PROPERTY, PLANT AND EQUIPMENT

	Buildings and infrastructure	Machinery	Transportation facilities	Office and other equipment	Construction in progress	Total
Year ended December 31, 2022						
Opening net carrying amount	51,127,711	63,707,307	1,150,354	422,674	4,974,974	121,383,020
Reclassifications and internal transfers	1,258,516	2,494,471	73,713	264,322	(4,091,022)	—
Transfer to intangible assets (Note 6)	—	—	—	—	(1,945)	(1,945)
Transfer from right-of-use assets and non-current assets(i)	—	69,673	—	—	—	69,673
Transfer to investment properties (Note 8)	(47,419)	—	—	—	—	(47,419)
Additions	245,583	637,092	16,474	36,798	1,661,805	2,597,752
Disposal of subsidiaries(ii)	(275,851)	(622,777)	(2,731)	(13,046)	—	(914,405)
Government grants	(42,650)	(31,401)	—	—	—	(74,051)
Disposals(iii)	(201,361)	(588,064)	(10,265)	(2,950)	(235,477)	(1,038,117)
Depreciation	(2,321,947)	(6,381,950)	(172,736)	(66,984)	—	(8,943,617)
Impairment loss(iv)	(1,307,597)	(2,458,240)	(1,092)	(178)	(28,313)	(3,795,420)
Currency translation differences	32,739	8,504	151	15	—	41,409
Closing net carrying amount	48,467,724	56,834,615	1,053,868	640,651	2,280,022	109,276,880
As of December 31, 2022						
Cost	79,348,680	139,849,462	2,865,120	1,228,931	2,799,011	226,091,204
Accumulated depreciation and impairment	(30,880,956)	(83,014,847)	(1,811,252)	(588,280)	(518,989)	(116,814,324)
Net carrying amount	48,467,724	56,834,615	1,053,868	640,651	2,280,022	109,276,880

	Buildings and infrastructures	Machinery	Transportation facilities	Office and other equipment	Construction in progress	Total
Year ended December 31, 2021						
Opening net carrying amount	53,851,749	69,545,237	1,226,487	395,840	5,906,059	130,925,372
Reclassifications and internal transfers	1,614,203	1,787,874	124,273	66,887	(3,593,237)	—
Transfer to intangible assets (Note 6)	—	—	—	—	(55,868)	(55,868)
Transfer from right-of-use assets and non-current assets (i)	143,646	1,398,593	—	85	—	1,542,324
Transfer to investment properties (Note 8)	(139,377)	—	—	—	—	(139,377)
Transfer to right-of-use assets (Note 22)	—	—	—	—	(68,377)	(68,377)
Additions	28,425	320,881	14,386	9,954	3,262,866	3,636,512
Government grants	(447)	(81,171)	—	—	—	(81,618)
Disposals	(136,718)	(723,183)	(14,711)	(5,726)	(275,834)	(1,156,172)
Depreciation	(2,149,404)	(6,768,573)	(196,094)	(43,880)	—	(9,157,951)
Impairment loss	(2,105,735)	(1,754,211)	(3,789)	(303)	(200,635)	(4,064,673)
Currency translation differences	21,369	(18,140)	(198)	(183)	—	2,848
Closing net carrying amount	51,127,711	63,707,307	1,150,354	422,674	4,974,974	121,383,020
As at December 31, 2021						
Cost	78,450,622	138,836,999	2,888,838	972,191	5,842,483	226,991,133
Accumulated depreciation and impairment	(27,322,911)	(75,129,692)	(1,738,484)	(549,517)	(867,509)	(105,608,113)
Net carrying amount	51,127,711	63,707,307	1,150,354	422,674	4,974,974	121,383,020

(i) After the expiration of sale and leaseback contracts, the right-of-use assets recognized previously upon initial adoption of IFRS 16, were recognized as property, plant and equipment.

(ii) In 2022, certain subsidiaries were disposed of or liquidated, resulted in a decrease in property, plant and equipment with carrying amount of RMB914 million.

(Amounts expressed in thousands of RMB unless otherwise stated)

7 PROPERTY, PLANT AND EQUIPMENT (CONTINUED)

(iii) In 2022, property, plant and equipment with carrying amount of RMB610 million was disposed of by the Group as consideration for a capital investment in Chinalco High-end Manufacturing Co., Ltd. ("Chinalco High-end Manufacturing") (Note (10)).

(iv) In the prior years, the Group terminated an alumina production line and the related facilities as a result of urban development by a local government. Based on the relevant rules and regulations, the Group would be entitled to a compensation by the local government from the commercial development of the land on which the production line was located. During the year ended December 31, 2022, the Group was informed by the local government that, because of the real estate market outlook and the change in urban planning, it is no longer feasible to commercially develop this piece of land and to compensate the Group in any form. The change of government decision constitutes an impairment indicator. An impairment test was performed by management based on fair value less cost of disposal and an impairment loss of RMB2,101 million was recognized as of December 31, 2022.

The land occupied by the terminated alumina production line is leased from Chinalco. The Group reassessed the leasing term, and accordingly, land use right assets of RMB893 million and lease liabilities of RMB927 million were written off and a disposal gain of RMB35 million was recognized in 2022.

Due to the change of production plan and other factors, certain asset groups of the Group were in the status of shutdown, temporary idleness or under-capacity production. The Group considered that there were indications of impairment in these asset groups and conducted impairment tests. As a result, impairment provision of RMB1,694 million was made for property, plant and equipment during the year ended December 31, 2022 (2021: RMB4,065 million).

(v) As of December 31, 2022, the Group pledged certain property, plant and equipment with a net carrying value amounting to RMB4,967 million (December 31, 2021: RMB5,680 million) for certain interest-bearing loans and borrowings as set out in Note 26.

(vi) As of December 31, 2022, the Group was in the process of applying for the ownership certificates of buildings with a net carrying value of RMB4,822 million (December 31, 2021: RMB4,904 million). There has been no litigations, claims or assessments against the Group for compensation with respect to the use of these buildings as at the date of approval of these financial statements. Management considers that it is probable that the Group will be able to obtain the relevant ownership certificates from the appropriate authorities.

(vii) For the year ended December 31, 2020, 2021 and 2022, depreciation expenses recognized in profit or loss are analyzed as follows:

	For the years ended December 31		
	2022	2021	2020
Cost of sales	8,573,282	8,710,009	8,304,401
General and administrative expenses	213,483	253,864	188,231
Research and development expenses	152,217	185,108	155,288
Selling and distribution expenses	4,635	8,970	5,903
	8,943,617	9,157,951	8,653,823

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8 INVESTMENT PROPERTIES

	Buildings	Land use rights	Total
Year ended December 31, 2022			
Opening net carrying amount	608,966	1,205,623	1,814,589
Transfer from property, plant and equipment (Note 7)	47,419	—	47,419
Transfer to right-of-use assets (Note 22)	—	(5,997)	(5,997)
Disposals	(982)	—	(982)
Additions	92,708	14,663	107,371
Depreciation	(23,690)	(21,087)	(44,777)
Closing net carrying amount	724,421	1,193,202	1,917,623
As at December 31, 2022			
Cost	966,751	1,354,998	2,321,749
Accumulated depreciation and impairment	(242,330)	(161,796)	(404,126)
Net carrying amount	724,421	1,193,202	1,917,623

	Buildings	Land use rights	Total
Year ended December 31, 2021			
Opening net carrying amount	481,489	1,120,387	1,601,876
Transfer from property, plant and equipment (Note 7)	139,377	—	139,377
Transfer from right-of-use assets (Note 22)	—	90,314	90,314
Others	—	7,472	7,472
Depreciation	(11,900)	(12,550)	(24,450)
Closing net carrying amount	608,966	1,205,623	1,814,589
As of December 31, 2021			
Cost	779,253	1,346,953	2,126,206
Accumulated depreciation and impairment	(170,287)	(141,330)	(311,617)
Net carrying amount	608,966	1,205,623	1,814,589

The Group’s investment properties consist of land use rights held for rental income and buildings leased to third parties under operating leases.

(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN JOINT VENTURES AND ASSOCIATES

(a) Investments in joint ventures

Movements in investments in joint ventures are as follows:

	December 31, 2022	December 31, 2021
As of January 1	3,350,959	3,374,553
Share of profits for the year	178,910	164,100
Share of changes in reserves	4,302	60
Cash dividends declared	(194,204)	(187,754)
As of December 31	3,339,967	3,350,959

As of December 31, 2022, all joint ventures of the Group were unlisted.

As of December 31, 2022, particulars of the Group’s material joint venture are as follows:

				Effective equity interest held		
Name	Place of establishment and operation	Registered and paid-in capital	Principal activities	Ownership interest	Voting power	Profit sharing
Guangxi Huayin Aluminum Co.,Ltd. (“Guangxi Huayin”) (廣西華銀鋁業有限公司)	PRC/Mainland China	2,441,987	Manufacturing	33.00 %	33.00 %	33.00 %

Guangxi Huayin, which is considered a material joint venture of the Group, is accounted for using the equity method.

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9 INVESTMENTS IN JOINT VENTURES AND ASSOCIATES (Continued)

(a) Investments in joint ventures (Continued)

The English name represents the best effort by management of the Group in translating the Chinese name of the company as it does not have any official English name.

The following table illustrates the summarized financial information in respect of Guangxi Huayin:

	December 31, 2022	December 31, 2021
Cash and cash equivalents	234,140	224,154
Other current assets	1,191,044	1,498,110
Current assets	1,425,184	1,722,264
Non-current assets	5,385,501	5,024,444
Current liabilities	1,705,062	1,844,884
Non-current liabilities	785,426	526,827
Net assets	4,320,197	4,374,997
Reconciliation to the Group's interest in the joint venture:		
Proportion of the Group's ownership	33.00 %	33.00 %
The Group's share of net assets of the joint venture	1,425,665	1,443,749
Carrying amount of the investment	1,425,665	1,443,749

(Amounts expressed in thousands of RMB unless otherwise stated)

9 INVESTMENTS IN JOINT VENTURES AND ASSOCIATES (Continued)

(a) Investments in joint ventures (Continued)

	For the year ended December 31		
	2022	2021	2020
Revenue	5,838,110	5,126,994	4,631,737
Gross profit	883,100	890,301	800,965
Interest income	15,671	14,465	7,388
Depreciation and amortization	321,567	553,493	531,512
Interest expenses	35,989	40,506	51,855
Profit before income tax	270,748	246,447	195,189
Income tax	36,498	44,333	21,152
Other comprehensive income	—	—	—
Total comprehensive income for the year	234,250	202,114	174,037
Dividend received	99,000	99,000	99,000

The following table illustrates the aggregate financial information of the Group’s joint ventures that are not individually material:

	December 31, 2022	December 31, 2021
Share of the joint ventures’ profits and losses for the year	102,180	96,255
Share of the joint ventures’ total comprehensive income	102,180	96,255
Aggregate carrying amount of the Group’s investments in joint ventures	1,914,302	1,907,210

There were no material contingent liabilities relating to the Group’s interests in the joint ventures and the joint ventures themselves.

(b) Investments in associates

Movements in investments in associates are as follows:

	December 31, 2022	December 31, 2021
As of January 1	6,441,793	7,001,103
Capital injections	17,089	309,251
Capital reduction	—	(140,170)
Share of profits/(losses) for the year	130,632	(423,247)
Dividends declared	(104,781)	(315,722)
Share of changes in reserves	(6,098)	10,578
Impairment	(75,997)	—
As of December 31	6,402,638	6,441,793

As of December 31, 2022, all associates of the Group were unlisted.

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9 INVESTMENTS IN JOINT VENTURES AND ASSOCIATES (CONTINUED)

(b) Investments in associates (Continued)

As of December 31, 2022, particular of the Group's material associate is as follow:

Name	Place of establishment and operation	Registered and paid-in capital	Principal activities	Effective equity interest held: Ownership interest	Voting power	Profit sharing
China Aluminum Investment Development Co., Ltd.(中鋁投資發展有限公司)	PRC/Mainland China	1,229,748	Asset management	24.12 %	24.12 %	24.12 %

China Aluminum Investment Development Co., Ltd., which is considered a material associate of the Group, is accounted for using the equity method.

The English name represents the best effort by management of the Group in translating the Chinese name of the company as it does not have any official English name.

The following table illustrates the summarized financial information in respect of China Aluminum Investment Development Co., Ltd.:

	December 31, 2022	December 31, 2021
Cash and cash equivalents	230,401	246,253
Other current assets	1,751,345	1,737,717
Current assets	1,981,746	1,983,970
Non-current assets	3,266,027	3,310,908
Current liabilities	65,186	58,263
Non-current liabilities	—	—
Net assets	5,182,587	5,236,615
Non-controlling interests	—	—
Reconciliation to the Group's interest in the associate:		
Proportion of the Group's ownership	24.12 %	24.12 %
The Group's share of net assets of the associate	1,250,040	1,263,072
Carrying amount of the investment	1,250,040	1,263,072

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9 INVESTMENTS IN JOINT VENTURES AND ASSOCIATES (CONTINUED)

(b) Investments in associates (Continued)

	For the years ended December 31		
	2022	**2021**	**2020**
Revenue	167,607	151,219	157,062
Gross profit	81,734	68,469	73,510
Interest income	4,210	1,739	1,823
Depreciation and amortization	44,621	44,630	45,069
Profit before income tax	64,884	85,066	74,109
Income tax	16,774	21,986	20,267
Other comprehensive income	—	—	—
Total comprehensive income for the year	48,110	63,080	53,842
Dividend received	24,636	11,015	8,124

The following table illustrates the aggregate financial information of the Group's associates that are not individually material:

	December 31, 2022	**December 31, 2021**
Share of the associates' profits and losses	119,028	(438,462)
Share of the associates' total other comprehensive income	(5,628)	6,292
Share of the associates' total comprehensive income	113,400	(432,170)
Aggregate carrying amount of the Group's investments in the associates	5,152,598	5,178,721

There were no material contingent liabilities relating to the Group's interests in the associates and the associates themselves.

(Amounts expressed in thousands of RMB unless otherwise stated)

10 OTHER FINANCIAL ASSETS MEASURED AT FAIR VALUE

	December 31, 2022	December 31, 2021
Listed equity investments, at fair value		
Dongxing securities Co., Ltd.(東興證券股份有限公司)	5,039	7,674
China Aluminum International Engineering Corporation Limited(中鋁國際工程股份有限公司)	29,558	37,459
Zhuhai Kingma Holding Co., Ltd.(珠海金馬控股股份有限公司)	154	—
	34,751	45,133
Unlisted equity investments, at fair value		
Sanmenxia Dachang Mining Co., Ltd.(三門峽達昌礦業有限公司)	19,336	20,921
Inner Mongolia Ganqimaodu Port Development Co., Ltd.(內蒙古甘其毛都港務發展股份有限公司)	12,078	16,669
Yinchuan Economic and Technological Development Zone Investment Holding Co., Ltd. (銀川經濟技術開發區投資控股有限公司)	20,149	20,577
Chinalco High End Manufacturing Co., Ltd.(中國鋁業集團高端製造股份有限公司) (i)	1,727,129	-
Xingxian Shengxing Highway Investment Management Co., Ltd. (興縣盛興公路投資管理有限公司)	113,850	135,079
Fangchenggang Chisha Pier Co., Ltd.(防城港赤沙碼頭有限公司)	42,700	21,700
Jinlong Copper Co., Ltd.(金隆銅業有限公司)	170,265	170,265
Others	20,827	27,342
	2,126,334	412,553
	2,161,085	457,686

The above equity investments were irrevocably designated at fair value through other comprehensive income as the Group considers these investments to be strategic in nature.

Note:

(i) On December 27, 2022, the Group completed its investment in 9.16% equity interest in Chinalco High-end Manufacturing at a consideration comprising certain assets and liabilities related to slab ingot production lines, 100% equity interests in Yunnan Haoxin Aluminum Foil Co., Ltd. ("Yunnan Haoxin"), a subsidiary of the Group, and cash and cash equivalents of RMB220 million (collectively the "Consideration Assets"). Upon completion, gains on disposals of production lines and a subsidiary totalling RMB65 million, representing the valuation of the 9.16% equity interest in Chinalco High-end Manufacturing in excess of the valuation of Consideration Assets, was recognized.

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11 DEFERRED TAX

Deferred tax assets and liabilities are offset when there is a legally enforceable right to offset current income tax assets against current income tax liabilities and when the deferred taxes relate to the same tax authority.

The movements in deferred tax assets and liabilities during the year ended December 31, 2022 without taking into consideration the offsetting of balances within the same tax jurisdiction, are as follows:

Movements in deferred tax assets:

	Provision for impairment	Accrued expenses	Tax losses	Unrealized profit at consolidation	Others	Total
As of December 31, 2020	510,518	109,585	470,379	226,086	230,579	1,547,147
Business combination under common control	124,234	13,550	108,619	225,264	64,619	536,286
As of January 1, 2021	634,752	123,135	578,998	451,350	295,198	2,083,433
Credit/(charged) to profit or loss	444,530	(90,856)	(244,843)	75,936	(47,187)	137,580
As of December 31, 2021	1,079,282	32,279	334,155	527,286	248,011	2,221,013
As of December 31, 2021	695,988	23,673	243,610	293,650	188,642	1,445,563
Business combination under common control	383,294	8,606	90,545	233,636	59,369	775,450
As of January 1, 2022	1,079,282	32,279	334,155	527,286	248,011	2,221,013
Credit/(charged) to profit or loss	118,494	(8,612)	(141,929)	(6,955)	88,440	49,438
As of December 31, 2022	1,197,776	23,667	192,226	520,331	336,451	2,270,451

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11 DEFERRED TAX (CONTINUED)

Movements in deferred tax liabilities:

	Interest capitalization	Fair value changes of financial assets	Withholding Tax	Depreciation and amortization and others	Fair value adjustments arising from acquisition of subsidiaries	Total
As of December 31, 2020	25,840	8,900	—	37,107	1,431,152	1,502,999
Business combination under common control	—	—	—	79,384	23,695	103,079
As of January 1, 2021	25,840	8,900	—	116,491	1,454,847	1,606,078
Charged to other comprehensive income	—	(5,733)	—	—	—	(5,733)
Credited to profit or loss	(7,915)	(1,325)	—	23,885	(87,145)	(72,500)
As of December 31, 2021	17,925	1,842	—	140,376	1,367,702	1,527,845
As of December 31, 2021	17,925	1,842	—	71,967	1,346,201	1,437,935
Business combination under common control	—	—	—	68,409	21,501	89,910
As of January 1, 2022	17,925	1,842	—	140,376	1,367,702	1,527,845
Charged to other comprehensive income	—	(7,236)	—	—	—	(7,236)
Credited to profit or loss	(2,093)	6,375	204,786	38,338	(103,772)	143,634
As of December 31, 2022	15,832	981	204,786	178,714	1,263,930	1,664,243

(Amounts expressed in thousands of RMB unless otherwise stated)

11 DEFERRED TAX (CONTINUED)

For presentation purposes, RMB212 million (2021: RMB 125 million) of deferred tax assets and liabilities have been offset in the consolidated statement of financial position. The following is an analysis of the deferred tax balances of the Group for financial reporting purposes:

	December 31, 2022	December 31, 2021
Net deferred tax assets	2,057,900	2,096,459
Net deferred tax liabilities	1,451,692	1,403,291

As of December 31, 2022, accumulated tax losses and deductible temporary differences not recognized for deferred tax assets are as follows:

	December 31, 2022	December 31, 2021
Deductible temporary differences	16,298,974	12,764,306
Accumulated tax losses	7,674,394	7,192,320
	23,973,368	19,956,626

As of December 31, 2022, the expiry profile of these tax losses not recognized for deferred tax assets is analyzed as follows:

	December 31, 2022	December 31, 2021
Expiring in		
2022	—	765,163
2023	447,159	556,052
2024	1,199,709	1,397,436
2025	2,133,390	2,146,025
2026	1,160,961	1,440,774
2027 and beyond	2,733,175	886,870
	7,674,394	7,192,320

For the years ended December 31, 2020 ,2021 and 2022
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12 OTHER NON-CURRENT ASSETS

	December 31, 2022	December 31, 2021
Financial assets		
Long-term receivables (i)	513,281	504,307
Less: impairment (ii)	(443,088)	(15,542)
	70,193	488,765
Prepayment for mining rights	873,277	806,534
Long-term prepaid expenses	838,568	653,241
Deferred losses for sale and leaseback transactions	77,449	97,070
Input VAT to be deducted	241,757	305,150
Others	330,256	481,901
	2,361,307	2,343,896
	2,431,500	2,832,661

(i) As of December 31, 2022 and December 31, 2021, long-term receivables were denominated in RMB and non-interest bearing.

(ii) During the year ended December 31, 2022, an impairment loss of RMB384 million was recognized for a long-term lease receivable from a third party lessee due to its default on the lease contract of an alumina production line of the Group.

13 INVENTORIES

	December 31, 2022	December 31, 2021
Raw materials	7,322,376	6,568,752
Work-in-progress	11,660,396	10,512,450
Finished goods	6,177,766	4,639,875
Spare parts	622,541	645,564
Packaging materials and others	162,874	26,351
	25,945,953	22,392,992
Less: provision for impairment of inventories	(1,233,631)	(750,338)
	24,712,322	21,642,654

Movements in the provision for impairment of inventories are as follows:

	December 31, 2022	December 31, 2021
As of January 1	750,338	616,680
Provision for impairment of inventories (Note)	943,732	485,088
Disposal of a subsidiary	(5,452)	—
Reversal arising from increase in net realizable value	(4,766)	(14,624)
Written off upon sales of inventories	(450,221)	(336,806)
As of December 31	1,233,631	750,338

As of December 31, 2022 and December 31, 2021, the Group had no pledged inventories for bank and other borrowings.

(Amounts expressed in thousands of RMB unless otherwise stated)

13 INVENTORIES (CONTINUED)

Note

During the year, the Group changed its overall alumina production plan, which reduced the alumina production level of certain subsidiaries considering overall layout of alumina capacity, cost efficiency of production and the supply of bauxite in different regions. Accordingly, a certain amount of bauxite originally intended for the production of alumina now becomes excessive. The Group has decided to dispose of this excessive bauxite directly.

Given the change in the intended use of the bauxite inventories, the Group has re-assessed the provision of this excessive bauxite based on the direct selling price of bauxite ores. As a result, an inventory impairment loss of RMB535 million was recognized.

14 TRADE RECEIVABLES AND NOTES RECEIVABLE

	December 31, 2022	December 31, 2021
Trade receivables	5,055,178	4,043,972
Less: impairment	(948,782)	(1,012,722)
	4,106,396	3,031,250
Notes receivable:		
Measured at amortized cost	411,145	1,207,602
Measured at fair value through other comprehensive income	1,356,480	2,867,877
	5,874,021	7,106,729

As of December 31, 2022, all balances of trade and notes receivables were denominated in RMB, other than an amount of RMB981 million which was denominated in USD (December 31,2021: RMB520 million in USD).

As of December 31, 2022, the Group pledged certain trade and notes receivable amounting to RMB289 million (December 31, 2021: RMB1,983 million) for certain secured borrowings as set out in Note 26.

Generally, the Group’s sales were on advance payments or documents against payment and only qualified long term customers were granted with credit terms. As of December 31, 2022, the ageing analysis of trade receivables based on invoice date was as follows:

	As of December 31, 2022	As of December 31, 2021
Within 1 year	2,780,524	2,332,703
Between 1 and 2 years	860,619	153,410
Between 2 and 3 years	112,902	237,916
Over 3 years	1,301,133	1,319,943
	5,055,178	4,043,972
Less: loss allowance for impairment	(948,782)	(1,012,722)
	4,106,396	3,031,250

(Amounts expressed in thousands of RMB unless otherwise stated)

14 TRADE RECEIVABLES AND NOTES RECEIVABLE (CONTINUED)

An impairment analysis is performed at each reporting date using a provision matrix to measure expected credit losses. The provision rates are based on days past due for groupings of various customer segments with similar loss patterns (i.e., by geographical region, product type, customer type and rating, and coverage by letters of credit or other forms of credit insurance). The calculation reflects the probability-weighted outcome, the time value of money and reasonable and supportable information that is available at the reporting date about past events, current conditions and forecasts of future economic conditions. The Group also assesses impairment loss individually if there is evidence of significant increases in credit risk at an individual level.

Set out below is the information about the credit risk exposure on the Group's trade receivables collectively assessed using a provision matrix:

	As of December 31, 2022		
	Gross carrying amount	Expected credit losses	Expected credit losses loss rate (%)
Alumina and primary aluminum			
Within 1 year	998,902	5,636	0.56
Between 1 and 2 years	4,796	59	1.23
Between 2 and 3 years	12,116	50	0.41
Over 3 years	43,500	37,810	86.92
	1,059,314	43,555	
Trading			
Within 1 year	631,722	9,977	1.58
Between 1 and 2 years	358	42	11.73
Between 2 and 3 years	—	—	—
Over 3 years	2,918	1,526	52.30
	634,998	11,545	
Energy			
Within 1 year	1,117,078	1,752	0.16
Between 1 and 2 years	854,495	3,028	0.35
Between 2 and 3 years	100,772	645	0.64
Over 3 years	149,890	32,807	21.89
	2,222,235	38,232	
Corporate and other operating segments			
Within 1 year	32,817	489	1.49
Between 1 and 2 years	869	188	21.63
Between 2 and 3 years	—	—	—
Over 3 years	19,727	19,252	97.59
	53,413	19,929	
	3,969,960	113,261	
Individually assessed trade receivables	1,085,218	835,521	
	5,055,178	948,782	

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14 TRADE RECEIVABLES AND NOTES RECEIVABLE (CONTINUED)

Set out below is the information about individually assessed trade receivables:

	As of December 31, 2022		
	Gross carrying amount	Expected credit losses	Expected credit losses loss rate (%)
Zhuhai Hongfan nonferrous metal Chemical Co., Ltd	270,419	270,419	100.00
Chalco Henan Aluminum Fabrication Co.,Ltd.	247,163	—	—
Xinjiang Jiarun Resources Holdings Co., Ltd.	213,293	213,293	100.00
Guizhou Jinpingguo Aluminum Rod Co., Ltd.	111,138	111,138	100.00
Others	243,205	240,671	98.96
	1,085,218	835,521	

The Group has no individual provision for impairment of notes receivables. The Group measures provision for loss on the basis of expected credit losses. The Group considers that notes receivables are not exposed to significant credit risk and has limited default risk.

Movements in the loss allowance for impairment of trade receivables are as follows:

	2022	2021	2020
As of January 1	1,012,722	988,802	814,986
Impairment loss	34,807	364,618	405,574
Write off	(17,021)	(285,178)	(142,786)
Reversal	(38,481)	(38,465)	(90,752)
Others	(43,245)	(17,055)	1,780
As of December 31	948,782	1,012,722	988,802

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15 OTHER CURRENT ASSETS

	December 31, 2022	December 31, 2021
Financial assets		
— Deposits paid to suppliers	525,666	1,315,545
— Dividends receivable	360,342	373,252
— Entrusted loans and loans receivable from third parties	1,417,284	1,466,236
— Entrusted loans and loans receivable from related parties	1,278,093	1,348,016
— Recoverable reimbursement for freight charges	285,428	351,976
— Other financial assets	1,040,632	710,518
	4,907,445	5,565,543
Less: impairment allowance	(3,194,988)	(3,207,132)
	1,712,457	2,358,411
Deductible input value added tax receivables	577,041	778,251
Prepaid income tax	142,056	62,139
Prepayments to related parties for purchases	127,748	154,644
Prepayments to suppliers for purchases and others	2,052,125	846,272
Others	78,270	75,952
	2,977,240	1,917,258
Less: impairment allowance	—	—
	2,977,240	1,917,258
Total other current assets	4,689,697	4,275,669

As of December 31, 2022, all balances of other current assets were denominated in RMB, other than an amount of RMB151 million which was denominated in USD (December 31, 2021: RMB99 million in USD).

As of December 31, 2022 and 2021, except for entrusted loans and loans receivable which were interest-bearing, all amounts in other current assets were non-interest bearing.

As of December 31, 2022, the ageing analysis of financial assets included in other current assets was as follows:

	December 31, 2022	December 31, 2021
Within 1 year	1,355,199	1,888,964
Between 1 and 2 years	181,198	190,999
Between 2 and 3 years	89,680	51,675
Over 3 years	3,281,368	3,433,905
	4,907,445	5,565,543
Less: provision for impairment	(3,194,988)	(3,207,132)
	1,712,457	2,358,411

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

15 OTHER CURRENT ASSETS (CONTINUED)

Movements in the provision for impairment of in other current assets are as follows:

	2022	2021	2020
As of January 1	3,207,132	2,273,183	1,733,567
Impairment loss	96,725	1,053,773	673,277
Write off	(3,020)	(135,049)	(113,504)
Reversal	(105,023)	(4,877)	(20,157)
Others	(826)	20,102	—
As of December 31	3,194,988	3,207,132	2,273,183

Financial assets included in other current assets at amortized cost are subject to impairment under the general approach and they are classified within the following stages for measurement of ECLs.

As of December 31, 2022	Gross carrying amount	Expected credit losses
Stage 1 – 12 months expected credit loss	1,403,623	4,743
Stage 2 – life time expected credit loss	103,277	19,853
Stage 3 – life time expected credit loss with credit-impaired	3,400,545	3,170,392
	4,907,445	3,194,988

As of December 31, 2021	Gross carrying amount	Expected credit losses
Stage 1 – 12 months expected credit loss	2,007,620	6,503
Stage 2 – life time expected credit loss	207,409	9,598
Stage 3 – life time expected credit loss with credit-impaired	3,350,514	3,191,031
	5,565,543	3,207,132

16 CASH AND CASH EQUIVALENTS AND RESTRICTED CASH

	December 31, 2022	December 31, 2021
Restricted cash	2,443,249	1,400,988
Cash and cash equivalents	16,816,684	19,683,619
	19,259,933	21,084,607

(Amounts expressed in thousands of RMB unless otherwise stated)

16 CASH AND CASH EQUIVALENTS AND RESTRICTED CASH (CONTINUED)

Restricted cash mainly represented deposits held for use in issuing notes payable and letters of credit.

As of December 31, 2022 and 2021, cash and cash equivalent and restricted cash of the Group were denominated in the following currencies:

	December 31, 2022	December 31, 2021
RMB	17,843,469	19,498,843
USD	1,378,559	1,566,024
HKD	12,517	11,562
EUR	1,989	1,957
Others	23,399	6,221
	19,259,933	21,084,607

Cash at banks earns interest at floating rates based on daily bank deposit rates. The bank balances, time deposits and restricted cash are deposited with creditworthy banks with no recent history of default.

17 SHARE CAPITAL

	December 31, 2022	December 31, 2021
Listed A shares	13,217,626	13,078,707
Listed H shares	3,943,966	3,943,966
	17,161,592	17,022,673

As of December 31, 2022 and 2021, all issued shares were registered and fully paid. Both A shares and H shares rank pari passu in all aspects.

The number of the Company's authorized and issued ordinary shares was 17,161,591,551 at par value of RMB1.00 per share as of December 31, 2022, including 138,918,600 restricted share (Note 18).

18 RESTRICTED SHARES HELD FOR EMPLOYEE SHARE SCHEME

	December 31, 2022 Shares (thousands)	December 31, 2021 Shares (thousands)	December 31, 2022 RMB	December 31, 2021 RMB
Restricted shares held for employee share scheme	(138,919)	—	(404,685)	—

These shares are held for the 2021 Restricted A Share Incentive Scheme (the "Incentive Scheme").

(Amounts expressed in thousands of RMB unless otherwise stated)

18 RESTRICTED SHARES HELD FOR EMPLOYEE SHARE SCHEME (CONTINUED)

The establishment of the Incentive Scheme was approved by the shareholders at the 2022 first extraordinary general meeting on April 26, 2022.The Incentive Scheme is designed to provide long-term incentives to middle level managers and above (including Executive Directors) in order to improve the long-term shareholder returns. Under the scheme, participants are granted 112,270 thousands Restricted A Shares with a grant price of RMB3.08 per share on May 25, 2022, and 26,649 thousands Restricted A Shares with a grant price of RMB2.21 per share on November 24, 2022. All these shares are restricted for sale until certain service and performance conditions are met. The fair value of these restricted shares at the grant date was valued based on RMB4.97 per share on May 25, 2022, and RMB4.42 per share on November 24, 2022, respectively.

	Number of shares (thousands)	Repurchase obligation
As of December 31, 2021	—	—
Grant of restricted shares under the Incentive Scheme	(138,919)	(404,685)
As of December 31, 2022	(138,919)	(404,685)

Expenses arising from share-based payment transactions

	For the year ended December 31,		
	2022	2021	2020
Shares issued under employee share scheme	48,258	—	—

19 OTHER EQUITY INSTRUMENTS

Outstanding perpetual medium-term notes	December 31, 2021 RMB	Issue	Redemption	Decmber 31, 2022 RMB
2019 Second Medium-term Notes	1,498,429	—	1,498,429	—
2020 Second Medium-term Notes	1,000,000	—	1,000,000	—
2022 Third Medium-term Notes (i)	—	1,000,000	—	1,000,000
2022 Fourth Medium-term Notes (ii)	—	1,000,000	—	1,000,000
	2,498,429	2,000,000	2,498,429	2,000,000

(i) On August 17, 2022, the Company issued RMB1,000 million perpetual medium-term notes with an initial distribution rate at 2.87% (the “2022 Third Medium-term Notes”). The proceeds from the issuance of the 2022 Third Medium-term Notes were RMB1,000 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 2.87% per annum on the 2022 Third Medium-term Notes have been made annually in arrears from August 17, 2022 and may be deferred at the discretion of the Company. The 2022 Third Medium-term Notes have no fixed maturity date and are callable only at the Group’s option on August 19, 2025 or any coupon distribution date after August 19, 2025 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. The coupon distribution rate will be reset to a percentage per annum equal to the sum of (a) the initial spread of 0.57 percent, (b) the China Treasury Rate, and (c) a margin of maximum 300 basic points every three years since August 19, 2025. While any coupon distribution payments are unpaid or deferred, the Company cannot declare or pay dividends to shareholders or decrease the share capital. As of December 31, 2022, no coupon distribution payments are unpaid or deferred.

19 OTHER EQUITY INSTRUMENTS (CONTINUED)

(ii) On September 20, 2022, the Company issued RMB1,000 million perpetual medium-term notes with an initial distribution rate at 2.68% (the "2022 Fourth Medium-term Notes"). The proceeds from the issuance of the 2022 Fourth Medium-term Notes were RMB1,000 million. The proceeds were used for the repayment of interest-bearing loans and borrowings. Coupon payments of 2.68% per annum on the 2022 Fourth Medium-term Notes have been made annually in arrears from September 20, 2022 and may be deferred at the discretion of the Company. The 2022 Fourth Medium-term Notes have no fixed maturity date and are callable only at the Group's option on September 22, 2024 or any coupon distribution date after September 22, 2024 at their principal amounts together with any accrued, unpaid or deferred coupon distribution payments. The coupon distribution rate will be reset to a percentage per annum equal to the sum of (a) the initial spread of 0.59 percent, (b) the China Treasury Rate, and (c) a margin of maximum 300 basic points every two years since September 22, 2024. While any coupon distribution payments are unpaid or deferred, the Company cannot declare or pay dividends to shareholders or decrease the share capital. As of December 31, 2022, no coupon distribution payments are unpaid or deferred.

Pursuant to the terms and conditions of the 2022 Third Medium-term Notes and the 2022 Fourth Medium-term Notes, the Group has no contractual obligations to repay their principal or to pay any coupon distributions. Thus in the opinion of the directors of the Company, they do not meet the definition of financial liabilities according to IAS 32 Financial Instruments: Presentation, and are classified as equity and subsequent distributions declared will be treated as distributions to equity owners.

20 RESERVES

The amounts of the Group's reserves and the movements therein for the current and prior years are presented in the consolidated statement of changes in equity of the Group.

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NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

21 INTEREST-BEARING LOANS AND BORROWINGS

	December 31, 2022	December 31, 2021
Long-term loans and borrowings		
Lease liabilities (Note 22(b))	10,099,506	11,493,471
Medium-term notes and bonds (Note (b))		
– Guaranteed (Note (e))	6,939,665	6,343,589
– Unsecured	12,782,976	12,878,997
Long-term bank and other loans (Note (a))		
– Secured (Note (f))	7,173,497	11,305,535
– Guaranteed (Note (e))	2,008,337	4,347,079
– Unsecured	38,367,723	33,594,042
	47,549,557	49,246,656
Total long-term loans and borrowings	77,371,704	79,962,713
Current portion of lease liabilities	(890,033)	(974,941)
Current portion of medium-term notes and bonds	(4,398,561)	(2,999,599)
Current portion of long-term bank and other loans	(13,486,345)	(6,313,238)
	(18,774,939)	(10,287,778)
Non-current portion of long-term loans and borrowings	58,596,765	69,674,935

	December 31, 2022	December 31, 2021
Short-term loans and borrowings		
Bank and other loans (Note (c))		
– Secured (Note (f))	368,995	513,100
– Unsecured	6,092,108	11,424,078
	6,461,103	11,937,178
Short-term bonds, unsecured (Note (d))	2,623,311	5,440,414
Current portion of lease liabilities	890,033	974,941
Current portion of medium-term notes and bonds	4,398,561	2,999,599
Current portion of long-term bank and other loans	13,486,345	6,313,238
	21,398,250	15,728,192
Total short-term borrowings and current portion of long-term loans and borrowings	27,859,353	27,665,370

As of December 31, 2022, except for loans and borrowings of the Group amounting to RMB8 million (December 31, 2021: RMB11 million) and RMB737 million (December 31, 2021:RMB1,333 million) which were denominated in JPY and USD, respectively, all loans and borrowings were denominated in RMB.

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21 INTEREST-BEARING LOANS AND BORROWINGS (CONTINUED)

As of December 31, 2022, included in the Group's interest-bearing loans and borrowings are amounts due to fellow subsidiaries RMB12,274 million (December 31, 2021: RMB13,180 million), as set out in Note 38(b). As of December 31, 2022, the amount of interest-bearing loans and borrowings obtained from a joint venture and an associate are RMB117 million (December 31, 2021: RMB0 million).

As of December 31, 2022, Shandong Huayu Alloy Materials Co. Ltd. ("Shandong Huayu"), a subsidiary of the Company did not repay the short-term secured bank loans according to the terms of the agreement with principal amount of RMB106 million (December 31, 2021: RMB113 million), which resulted in an event of default. The bank loans were already presented as liabilities. There is no further impact extended to the Group as no guarantees was provided by any entity within the Group to Shandong Huayu and there was no cross default provisions for other debts of the Group triggered by this default.

(a) Long-term bank and other loans

The maturity of long-term bank and other loans is set out below:

	Loans from banks and other financial institutions		Other loans		Total	
	December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021
Within 1 year	13,484,315	6,162,067	2,030	151,171	13,486,345	6,313,238
Between 1 and 2 years	6,602,850	17,422,804	2,030	2,445	6,604,880	17,425,249
Between 2 and 5 years	20,575,761	10,780,742	4,060	6,445	20,579,821	10,787,187
Over 5 years	6,878,511	14,720,982	—	—	6,878,511	14,720,982
	47,541,437	49,086,595	8,120	160,061	47,549,557	49,246,656

The weighted average annual interest rate of long-term bank and other loans for the year ended December 31, 2022 was 4.10% (2021: 4.55%).

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

21 INTEREST-BEARING LOANS AND BORROWINGS (CONTINUED)

(b) Medium-term notes and bonds

Outstanding medium-term bonds and private placement notes of the Group as of December 31, 2022 are summarized as follows:

	Face value /maturity	Effective interest rate	December 31, 2022	December 31, 2021
2018 Medium-term bonds	RMB900,000/2023	5.06 %	899,865	899,323
2018 Medium-term bonds	RMB1,600,000/2023	4.57 %	1,598,947	1,597,988
2019 Medium-term notes	RMB2,000,000/2024	4.31 %	1,993,080	1,989,090
2019 Medium-term bonds	RMB2,000,000/2022	3.84 %	—	1,999,809
2019 Medium-term bonds	RMB2,000,000/2029	4.57 %	1,997,623	1,997,440
2019 Medium-term bonds	RMB1,000,000/2022	3.52 %	—	999,790
2020 Medium-term bonds	RMB1,000,000/2023	3.07 %	999,962	999,787
2020 Medium-term notes	RMB900,000/2023	3.04 %	899,787	898,866
2020 Medium-term bonds	RMB500,000/2025	3.31 %	499,900	499,876
2021 Medium-term notes	RMB1,000,000/2024	3.21 %	997,969	997,028
2022 Medium-term notes	RMB2,000,000/2025	3.08 %	1,996,665	—
2022 Medium-term notes	RMB400,000/2025	2.73 %	399,557	—
2022 Medium-term notes	RMB500,000/2024	2.50 %	499,621	—
2021 Hong Kong Medium-term bonds	USD500,000/2024	1.74 %	3,472,428	3,173,180
2021 Hong Kong Medium-term bonds	USD500,000/2026	2.24 %	3,467,237	3,170,409
			19,722,641	19,222,586

Medium-term notes and bonds were issued for capital expenditures and operating cash flows purposes, as well as for the purpose of re-financing of bank loans.

(Amounts expressed in thousands of RMB unless otherwise stated)

21 INTEREST-BEARING LOANS AND BORROWINGS (CONTINUED)

(c) Short-term bank and other loans

The weighted average annual interest rate of short-term bank and other loans for the year ended December 31, 2022 was 2.76% (2021: 3.03%).

(d) Short-term bonds

Outstanding short-term bonds as of December 31, 2022 and 2021 are summarized as follows:

	Face value /maturity	Effective interest rate	December 31, 2022	December 31, 2021
Short-term bonds	RMB400,000/2021	2.70 %	—	406,036
Short-term bonds	RMB2,000,000/2021	2.59 %	—	2,022,571
Short-term bonds	RMB1,000,000/2021	2.55 %	—	1,006,240
Short-term bonds	RMB2,000,000/2021	2.80 %	—	2,005,567
Short-term bonds	RMB2,000,000/2022	2.58 %	—	—
Short-term bonds	RMB1,000,000/2022	2.30 %	—	—
Short-term bonds	RMB600,000/2022	2.05 %	608,105	—
Short-term bonds	RMB1,000,000/2022	1.93 %	1,009,288	—
Short-term bonds	RMB1,000,000/2022	1.59 %	1,005,918	—
			2,623,311	5,440,414

All the above short-term bonds were issued for working capital needs.

(e) Guaranteed interest-bearing loans and borrowings

Details of guarantors for the Group's interest-bearing loans and borrowings are set out as follows:

Guarantors	December 31, 2021	December 31, 2022
Long-term loans		
The Company	7,443,377	7,397,333
Baotou Aluminum Limited Company(包頭鋁業有限公司) and Baotou Communications Investment Group Limited Company(包頭交通投資集團有限公司) (Note (i)	412,500	825,000
The Company and COSCO SHIPPING BULK Limited company (中遠海運散貨運輸有限公司) (Note (iii)	327,125	318,785
Ningxia Energy (Note (ii)	765,000	935,000
Yunnan Aluminum(Note (ii)	—	1,214,550
	8,948,002	10,690,668

Notes:

(i) The guarantors include a subsidiary of the Company and a third party.
(ii) The guarantors are subsidiaries of the Company.
(iii) The joint guarantors include the Company and a third party.

(Amounts expressed in thousands of RMB unless otherwise stated)

21 INTEREST-BEARING LOANS AND BORROWINGS (CONTINUED)

(f) Secured interest-bearing loans and borrowings, the assets pledged for bank and other borrowings were set out in Note 26.

22 LEASE

The Group as a lessee

The Group has lease contracts for various items of plant and machinery, motor vehicles, other equipment and land use rights used in its operations.

(a) Right-of-use assets

The carrying amounts of the Group's right-of-use assets and the movements during 2022 and 2021 are as follows:

	Buildings	Machinery	Land use rights	Total
As of January 1, 2022	359,104	385,186	18,297,719	19,042,009
Additions	56,117	22,393	601,649	680,159
Transfer from investment properties (Note 8)	—	—	5,997	5,997
Lease modification (Note 7)	—	(3,816)	(977,923)	(981,739)
Transfer to property, plant and equipment	—	(64,939)	—	(64,939)
Transfer to investment properties	—	—	(46,981)	(46,981)
Disposal	—	—	(78,446)	(78,446)
Depreciation	(82,820)	(62,167)	(1,137,375)	(1,282,362)
Currency translation differences	(56)	—	—	(56)
As of December 31, 2022	332,345	276,657	16,664,640	17,273,642

	Buildings	Machinery	Land use rights	Total
As of January 1, 2021	240,402	1,772,007	13,484,314	15,496,723
Additions	8,546	11,228	117,471	137,245
Transfer from property, plant and equipment (Note 7)	—	—	68,377	68,377
Lease modification (i)	377,873	—	5,300,918	5,678,791
Transfer to property, plant and equipment	(143,646)	(1,199,382)	—	(1,343,028)
Transfer to investment properties	—	—	(90,314)	(90,314)
Disposal	—	—	(32,173)	(32,173)
Depreciation	(124,048)	(130,923)	(516,980)	(771,951)
Impairment losses	—	(67,744)	(37,561)	(105,305)
Currency translation differences	(23)	—	3,667	3,644
As of December 31, 2021	359,104	385,186	18,297,719	19,042,009

(i) Pursuant to the framework lease contract entered into between the Company and Chinalco in 2001, the annual consideration for certain lands leased by the Group from Chinalco for the period commencing January 1, 2022 was re-negotiated between contract parties, which constitute lease modifications As of December 31, 2021 and results in remeasurement of the lease liabilities and a corresponding adjustment to the right-of-use assets.

As of December 31, 2022, the Group has pledged land use rights at a net carrying value amounting to RMB241 million (December 31, 2021: RMB234 million) for bank and other borrowings as set out in Note 26.

(Amounts expressed in thousands of RMB unless otherwise stated)

22 LEASE (CONTINUED)

The Group as a lessee (Continued)

(b) Lease liabilities

The carrying amount of lease liabilities and the movements during the year are as follows:

	Year ended December 31, 2022
Carrying amount of January 1	11,493,471
New leases	477,299
Lease modification	(951,047)
Accretion of interest recognized during the year	678,855
Payments	(1,599,072)
Carrying amount at December 31	10,099,506
Analyzed into:	
Current portion	890,033
Non-current portion	9,209,473

(c) The amounts recognized in profit or loss in relation to leases are as follows:

	2022	2021	2020
Interests on lease liabilities	678,855	344,886	438,033
Depreciation charge of right-of-use assets	1,282,362	771,951	745,245
Expenses relating to short-term leases and leases of low-value assets	28,967	51,739	91,537
Total amount recognized in profit or loss	1,990,184	1,168,576	1,274,815

(d) The total cash outflow for leases is disclosed in Notes 37(c).

The Group as a lessor

Rental income recognized by the Group during the year was RMB317 million (2021: RMB312 million, 2020: RMB335 million), details of which are included in Note 5. In the opinions of the directors, the undiscounted lease payments receivable by the Group in future periods under non-cancellable operating leases are not material.

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23 OTHER NON-CURRENT LIABILITIES

	December 31, 2022	December 31, 2021
Financial liabilities		
– Long-term payables for mining rights	623,085	798,204
– Other financial liabilities	37,782	82,660
	660,867	880,864
Obligations in relation to early retirement schemes (Note (i))	138,464	249,476
Deferred government grants	181,693	206,476
Deferred gain relating to sales and leaseback agreements	42,417	50,631
Contract liabilities	93,240	116,545
Provision for rehabilitation	830,154	506,006
Others	229,949	161,429
	1,515,917	1,290,563
	2,176,784	2,171,427

(i) Obligations in relation to early retirement schemes

Since 2014, certain subsidiaries and branches implemented termination retirement benefit schemes which allow qualified employees to early retire on a voluntary basis. The Group undertakes the obligations to pay the termination retirement employees' living allowance for a period of no more than five years in the future on a monthly basis according to the termination retirement benefit schemes, in addition to the social insurance and housing fund pursuant to the regulation of the local Social Security Bureau. Living allowance, social insurance and the housing fund are together referred to as the "Payments". The Payments are forecasted to increase by 3% per annum with reference to the inflation rate and adjusted based on the average death rate in China. The Payments are discounted at the treasury bond rate As of December 31, 2022. As of December 31, 2022, the current portion is included in "Other payables and accrued liabilities".

As of December 31, 2022 and 2021, obligations in relation to retirement benefits under the Group's early retirement schemes are as follows:

	December 31, 2022	December 31, 2021
As of January 1	502,155	572,358
Provision made during the year (Note 32)	46,919	269,895
Interest costs	5,283	4,782
Payment during the year	(283,237)	(344,880)
As of December 31	271,120	502,155
Non-current	138,464	249,476
Current (Note 24)	132,656	252,679
	271,120	502,155

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

24 OTHER PAYABLES AND ACCRUED LIABILITIES

	December 31, 2022	December 31, 2021
Financial liabilities		
– Payable for capital expenditures	2,507,415	4,999,157
– Interests payable	360,093	494,085
– Deposits	1,856,949	1,760,156
– Dividends payable by subsidiaries to non-controlling shareholders	435,544	447,848
– Consideration payable for investment projects	73,237	38,374
– Current portion of payables for mining rights (Note 23)	176,971	182,959
– Payable of government levies on self-operated power plants	105,287	411,021
– Restricted shares repurchase obligation	404,685	—
– Others	1,424,584	1,283,125
	7,344,765	9,616,725
Taxes other than income taxes payable (i)	1,239,287	1,781,725
Accrued payroll and bonus	197,591	249,581
Staff welfare payables	415,986	354,942
Current portion of obligations in relation to early retirement schemes (Note 23)	132,656	252,679
Contributions payable for pension costs	41,118	37,509
Others	149,836	89,578
	2,176,474	2,766,014
	9,521,239	12,382,739

(i) Taxes other than income taxes payable mainly comprise accruals for value-added tax, resources tax, city construction tax and education surcharge.

25 TRADE AND NOTES PAYABLES

	December 31, 2022	December 31, 2021
Trade payables	15,440,190	13,909,245
Notes payable	7,096,141	4,679,171
	22,536,331	18,588,416

As of December 31, 2022, all balances of trade and notes payables were denominated in RMB, other than an amount of RMB261 million which was nominated in USD (December 31, 2021: RMB241 million in USD).

(Amounts expressed in thousands of RMB unless otherwise stated)

25 TRADE AND NOTES PAYABLES (CONTINUED)

The ageing analysis of trade and notes payables is as follows:

	December 31, 2022	December 31, 2021
Within 1 year	21,523,421	17,012,772
Between 1 and 2 years	511,560	946,337
Between 2 and 3 years	157,729	236,106
Over 3 years	343,621	393,201
	22,536,331	18,588,416

The trade and notes payables are non-interest-bearing and are normally settled within one year or normal business cycle.

26 PLEDGE OF ASSETS

The Group has pledged various assets as collateral against certain secured borrowings as set out in Note 21. As of December 31, 2022, a summary of these pledged assets was as follows:

	December 31, 2022	December 31, 2021
Carrying value of assets pledged:		
Property, plant and equipment (Note 7)	4,967,190	5,680,508
Right-of-use assets (Note 22(a))	241,287	234,369
Intangible assets (Note 6)	1,352,618	1,399,972
Trade and notes receivables (Note 14)	289,110	1,982,986
	6,850,205	9,297,835

As of December 31, 2022, in addition to the loans and borrowings which were secured by the above assets, the current portion of long-term loans and borrowings amounting to RMB1,402 million (December 31, 2021: RMB1,525 million), and the non-current portion of long-term loans and borrowings amounting to RMB6,390 million (December 31, 2021: RMB7,959 million) were secured against the contractual rights of receiving electricity fees from its customers in the future.

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

27 EXPENSE BY NATURE

	For the years ended December 31		
	2022	2021	2020
Purchases of inventories in relation to trading activities	128,285,396	138,350,569	91,918,688
Raw materials and consumables used, and changes in work-in-progress and finished goods	58,119,628	62,159,977	44,991,195
Power and utilities	43,449,772	35,419,204	25,464,292
Depreciation of right-of-use assets	1,282,362	771,951	745,245
Depreciation and amortization (other than depreciation of right-of-use assets) expenses	9,691,457	9,789,163	9,449,798
Employee benefits expenses (Note 32)	11,451,648	11,008,847	9,892,157
Repairs and maintenance	3,257,456	3,796,066	2,010,678
Transportation expenses	9,545,420	7,227,249	5,548,616
Taxes other than income tax expense (Note (i))	2,860,228	2,595,082	1,880,012
Inventory impairment loss	938,966	470,464	1,411,908
Auditors' remunerations			
– PricewaterhouseCoopers and PricewaterhouseCoopers Zhong Tian LLP			
– Audit services	18,170	18,170	18,170
– Non-audit services	3,340	870	700
Others	2,032,531	1,687,303	2,087,392
	270,936,374	273,294,915	195,418,851

(i) Taxes other than income tax expense mainly comprise surcharges, land use tax, property tax and stamp duty.

28 NET IMPAIRMENT LOSSES ON FINANCIAL ASSETS

	For the years ended December 31		
	2022	2021	2020
Impairment losses on other non-current assets (Note 12)	426,111	15,716	—
(Reversal of)/Impairment losses on trade and notes receivables (Note 14)	(3,674)	326,153	314,822
(Reversal of)/Impairment losses on other current assets (Note 15)	(8,298)	1,048,896	653,120
	414,139	1,390,765	967,942

29 OTHER INCOME

For the year ended December 31, 2022, government grants amounting to RMB236 million (2021: RMB173 million, 2020: RMB304 million) were recognized as income to facilitate the Group's development. There are no unfulfilled conditions or contingencies attached to the grants.

(Amounts expressed in thousands of RMB unless otherwise stated)

30 OTHER (LOSSES)/GAINS-NET

	For the years ended December 31		
	2022	2021	2020
Gains/(losses) on disposal of subsidiaries (i)	86,343	(27,404)	11,305
Realized and unrealized gains/(losses) on futures, forward and option contracts, net (ii)	295,882	(604,734)	512,984
Gains/(losses) on disposal of property, plant and equipment, intangible assets and right-of-use assets, net	323,659	(679,397)	(223,206)
Others	(390,525)	(329,480)	72,009
	315,359	(1,641,015)	373,092

(i) During the year ended December 31, 2022, the Group disposed of certain subsidiaries with gains totalling RMB86 million, which included a gain of disposal of Yunnan Haoxin of RMB37 million (Note 10).

(ii) The Group did not apply hedge accounting for these futures, forward and option contracts.

31 FINANCE INCOME/FINANCE COSTS

An analysis of finance income/finance costs is as follows:

	For the years ended December 31		
	2022	2021	2020
Finance income-interest income	477,137	311,103	266,209
Interest expense	(3,832,874)	(4,512,188)	(5,209,163)
Less: Interest expense capitalized in property, plant and equipment	5,140	1,727	220,785
Interest expense, net of capitalized interest	(3,827,734)	(4,510,461)	(4,988,378)
Exchange losses, net	(67,133)	(22,205)	(81,323)
Finance costs	(3,894,867)	(4,532,666)	(5,069,701)
Finance costs, net	(3,417,730)	(4,221,563)	(4,803,492)
Capitalization rate during the year	3.55%	4.00%	4.00% to 6.68%

(Amounts expressed in thousands of RMB unless otherwise stated)

32 EMPLOYEE BENEFIT EXPENSE

An analysis of employee benefit expenses is as follows:

	For the years ended December 31		
	2022	2021	2020
Salaries and bonuses	7,601,169	6,929,589	6,591,266
Housing fund	718,428	707,809	670,150
Staff welfare and other expenses(i)	3,002,984	3,049,839	2,554,762
Shares issued under employee share scheme (Note 18)	48,258	—	—
Employment expenses in relation to early retirement schemes (Note 23)	46,919	269,895	67,747
Employment expenses in relation to termination benefits	33,890	51,715	8,232
	11,451,648	11,008,847	9,892,157

(i) Staff welfare and other expenses represent staff welfare, staff union expenses, staff education expenses and unemployment insurance expenses etc.

In 2020, the group entities in Mainland China were exempt from payment of employee social benefits during the period from February to December 2020 under national Covid-19 supportive policies.

Employee benefit expenses include emoluments payable to directors, supervisors and remunerations to senior management as set out in Note 33.

(Amounts expressed in thousands of RMB unless otherwise stated)

33 DIRECTORS' AND SUPERVISORS' REMUNERATION

(a) Directors' and supervisors' remuneration

Directors' and supervisors' remuneration were as follows:

	For the years ended December 31		
	2022	2021	2020
Fees	618	579	683
Basic salaries, housing fund, other allowances and benefits in kind	4,244	4,526	3,996
Pension costs	505	449	207
	5,367	5,554	4,886

The remuneration of each director and supervisor of the Company for the year ended December 31, 2022 is set out below:

Names of directors and supervisors	Fees	Salaries	Discretionary bonuses	Pension costs	Total
Executive Directors:					
Liu Jianping(iii)	—	—	—	—	—
Zhu Runzhou(iii)	—	1,160	—	101	1,261
Ou Xiaowu (iii)	—	933	—	101	1,034
Jiang Tao (iii)	—	844	—	101	945
	—	2,937	—	303	3,240
Non-Executive Directors:					
Zhang Jilong(iii)	—	—	—	—	—
Chen Pengjun(iii)	—	—	—	—	—
Wang Jun	—	—	—	—	—
Qiu Guanzhou(iii)	206	—	—	—	206
Yu Jinsong(iii)	206	—	—	—	206
Chan Yuen Sau Kelly(iii)	206	—	—	—	206
	618	—	—	—	618
Supervisors:					
Ye Guohua(iii)	—	—	—	—	—
Shan Shulan(iii)	—	—	—	—	—
Lin Ni(iii)	—	—	—	—	—
Guan Xiaoguang(i)	—	198	—	24	222
Xu Shuxiang(ii) (iii)	—	319	—	77	396
Yue Xuguang(iii)	—	790	—	101	891
	—	1,307	—	202	1,509

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33 DIRECTORS' AND SUPERVISORS' REMUNERATION (CONTINUED)

(a) Directors' and supervisors' remuneration (Continued)

The remuneration of each director and supervisor of the Company for the year ended December 31, 2021 is set out below:

Names of directors and supervisors	Fees	Salaries	Discretionary bonuses	Pension costs	Total
Executive Directors:					
Liu Jianping	—	—	—	—	—
Zhu Runzhou	—	1,176	—	93	1,269
Ou Xiaowu	—	973	—	93	1,066
Jiang Tao	—	837	—	77	914
	—	2,986	—	263	3,249
Non-Executive Directors:					
Ao Hong	—	—	—	—	—
Zhang Jilong	—	—	—	—	—
Wang Jun	—	—	—	—	—
Chen Lijie	95	—	—	—	95
Lie-A-Cheong Tai-Chong, David	95	—	—	—	95
Hu Shihai	95	—	—	—	95
Qiu Guanzhou	98	—	—	—	98
Chan Yuen Sau Kelly	98	—	—	—	98
Yu Jinsong	98	—	—	—	98
	579	—	—	—	579
Supervisors:					
Ye Guohua	—	—	—	—	—
Shan Shulan	—	—	—	—	—
Guan Xiaoguang	—	770	—	93	863
Yue Xuguang	—	770	—	93	863
Lin Ni	—	—	—	—	—
	—	1,540	—	186	1,726

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33 DIRECTORS' AND SUPERVISORS' REMUNERATION (CONTINUED)

(a) Directors' and supervisors' remuneration (Continued)

The remuneration of each director and supervisor of the Company for the year ended December 31, 2020 is set out below:

Names of directors and supervisors	Fees	Salaries	Discretionary bonuses	Pension costs	total
Executive Directors:					
Lu Dongliang	—	—	—	—	—
He Zhihui	—	866	—	37	903
Jiang Yinggang	—	562	—	31	593
Zhu Runzhou	—	894	—	44	938
	—	2,322	—	112	2,434
Non-executive Directors:					
Ao Hong	—	—	—	—	—
Wang Jun	50	—	—	—	50
Chen Lijie	211	—	—	—	211
Lie-A-Cheong Tai-Chong, David	211	—	—	—	211
Hu Shihai	211	—	—	—	211
	683	—	—	—	683
Supervisors:					
Ye Guohua	—	—	—	—	—
Ou Xiaowu	—	134	—	7	141
Shan shulan	—	—	—	—	—
Guan Xiaoguang	—	770	—	44	814
Yue Xuguang	—	770	—	44	814
Total	—	1,674	—	95	1,769

Notes:

(i) On March 18, 2022, Mr. Guan Xiaoguang was resigned as a supervisor of the Company.

(ii) On March 18, 2022, Ms. Xu Shuxiang was elected as a supervisor in the seventh session of the Supervisory Committee of the Company.

(iii) On June 21, 2022, Mr. Liu Jianping, Mr. Zhu Runzhou, Mr. Ou Xiaowu and Mr. Jiang Tao were elected as Executive Directors in the eighth session of the Board of the Company. Mr. Zhang Jilong and Mr. Chen Pengjun were elected as non-executive directors in the eighth session of the Board of the Company. Mr. Qiu Guanzhou, Mr. Yu Jinsong and Ms. Chan Yuen Sau Kelly were elected as Independent Non-Executive Directors of the eighth session of the Board of the Company.

On June 21, 2022, Ms. Xu Shuxiang and Mr. Yue Xuguang were elected as the employee representative supervisors in the eighth session of the Supervisory Committee of the Company.

On June 21, 2022, Mr. Ye Guohua, Ms. Shan Shulan and Ms. Lin Ni were elected as shareholder representative supervisors in the eighth session of the Supervisory Committee of the Company.

During the year, in addition to the remuneration disclosed above, share-based compensations with a cost of RMB112 thousand, RMB108 thousand and RMB104 thousand, were provided to Executive Director Mr. Zhu Runzhou, Mr. Ou Xiaowu, and Mr. Jiang Tao, respectively (2021: Nil, 2020: Nil).

33 DIRECTORS' AND SUPERVISORS' REMUNERATION (CONTINUED)

(a) Directors' and supervisors' remuneration (Continued)

(iv) During the year ended December 31, 2022, 750,000 restricted shares were granted to the directors (2021: Nil, 2020: Nil), and no restricted shares were granted to the supervisors of the Company (2021: Nil, 2020: Nil).

(v) During the year ended December 31, 2022, no remuneration was paid to the directors or the supervisors of the Company (among which included the five highest paid employees) as an inducement to join or upon joining the Company or as compensation for loss of office (2021: Nil, 2020: Nil).

(vi) Directors of the Company, Mr. Chen Pengjun and Mr. Wang Jun (resigned) waived their remuneration as non-executive directors of the Company for 2022. The annual remuneration before tax as a non-executive director of the Company is RMB150,000 for 2022. In 2021, the director of the Company, Mr. Wang Jun (resigned) waived his remuneration as non-executive director of the Company. The annual remuneration before tax as a non-executive director of the Company was RMB150,000 for 2021.

(b) Directors' retirement benefits

During the year, no retirement benefits operated by the Group were paid or made, directly or indirectly, to or receivable by a director in respect of his services as a director or other services in connection with the management of the affairs of the Company or its subsidiaries (2021: Nil, 2020: Nil).

(c) Directors' termination benefits

During the year, no payments or benefits in respect of termination of director's services were paid or made, directly or indirectly, to or receivable by a director; nor are any payable (2021: Nil, 2020: Nil).

(d) Consideration provided to third parties for making available directors' services

During the year, no consideration was provided to or receivable by third parties for making available director's services (2021: Nil, 2020: Nil).

(e) Information about loans, quasi-loans and other dealings in favor of directors, controlled bodies corporate by and connected entities with such directors

There are no loans, quasi-loans or other dealings in favor of directors, controlled bodies corporate by and connected entities (2021: Nil, 2020: Nil).

(f) Directors' material interests in transactions, arrangements or contracts

No significant transactions, arrangements and contracts in relation to the Group's business to which the Company was a party and in which a director of the Company had a material interest, whether directly or indirectly, subsisted at the end of the year or at any time during the year (2021: Nil, 2020: Nil).

(Amounts expressed in thousands of RMB unless otherwise stated)

33 DIRECTORS' AND SUPERVISORS' REMUNERATION (CONTINUED)

(g) Five highest paid individuals

During the year ended December 31, 2022, the five highest paid individuals of the Group include three directors (2021: three directors, 2020: three directors) whose remuneration is reflected in the analysis presented above. The remuneration payable to the remaining two individuals during 2022 (2021: two, 2020: two) is as follows:

	December 31, 2022	December 31, 2021	December 31, 2020
Basic salaries, housing fund, other allowances and benefits in kind	1,612	1,699	1,594
Discretionary bonuses	—	—	—
Pension costs	202	186	88
	1,814	1,885	1,682

The number of the remaining two highest paid individuals during 2022 (2021: two, 2020: two) whose remuneration fell within the following band is as follows:

	Number of individuals		
	December 31, 2022	December 31, 2021	December 31, 2020
Nil to RMB1,000,000	2	2	2

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34 INCOME TAX EXPENSE

	For the years ended December 31		
	2022	2021	2020
Current income tax expense	2,271,443	3,079,631	960,202
Deferred tax expense/(benefit)	94,196	(210,080)	(318,873)
	2,365,639	2,869,551	641,329

The Group's entities established and operated in mainland China are subject to PRC corporate income tax at the standard rate of 25% (2021: 25%, 2020: 25%) on their respective estimated taxable profits for the year. Certain branches and subsidiaries of the Company located in the western regions of the mainland China are granted tax concessions including a preferential tax rate of 15% (2021: 15%, 2020: 15%). The provision for Hong Kong profits tax is calculated at 16.5% of the estimated assessable profits for the year ended December 31, 2022 (2021: 16.5%,2020: 16.5%).

	For the years ended December 31		
	2022	2021	2020
Profit before income tax	13,208,968	14,186,428	2,886,012
Tax expense calculated at the statutory tax rate of the Company 25% (2021: 25%, 2020: 25%)	3,302,242	3,546,607	721,503
Tax effects of:			
Impact of different tax rates applied to subsidiaries	(263,643)	(80,794)	(77,929)
Preferential income tax rates applicable to certain branches and subsidiaries	(1,476,012)	(1,216,984)	(350,681)
Impact of change in income tax rate	(130,616)	45,101	(52,177)
Impact of temporary differences and tax losses not recognized for deferred tax assets	1,214,908	783,320	575,404
Tax incentive in relation to deduction of certain expenses	(198,130)	(186,889)	(80,268)
Distribution of other equity instruments deductible for tax purpose	(21,182)	(76,807)	(86,034)
Expenses not deductible for tax purposes	66,541	72,721	65,924
Profits and losses attributable to joint ventures and associates	(67,477)	(1,946)	(25,526)
Over-provision of current income tax of previous periods	(60,992)	(14,778)	(48,887)
Income tax expense	2,365,639	2,869,551	641,329
Effective tax rate	18 %	20 %	22 %

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35 EARNINGS PER SHARE ATTRIBUTABLE TO OWNERS OF THE COMPANY

	For the years ended December 31		
	2022	2021	2020
Profit attributable to owners of the Company (in thousands of RMB)	4,191,927	5,759,422	862,054
Adjustment: cumulative distributions reserved of other equity instruments (in thousands of RMB)	(117,292)	(209,500)	(275,000)
Adjusted profit attributable to ordinary shares holders of the Company	4,074,635	5,549,922	587,054

For the purpose of calculating basic earnings per share, the Group adjusted the profit attributable to owners of the Company by deducting the after-tax amounts of cumulative distributions reserved for the year for other equity instruments, which were issued by the Group and classified as equity instrument (Note 19).

	For the years ended December 31		
	2022	2021	2020
Number of ordinary shares in issue (thousands) as of January 1	17,022,673	17,022,673	17,022,673
Weighted average number of ordinary shares in issue	17,022,673	17,022,673	17,022,673
Basic earnings per share (RMB)	0.239	0.326	0.034

The restricted shares issued by the Group during 2022 had immaterial dilutive effect, thus the diluted earnings per share approximately equals to the basic earnings per share.

Basic earnings per share was calculated by dividing the adjusted profit attributable to ordinary shares holders of the Company by the weighted average number of shares in issue during the year.

36 DIVIDENDS

On March 21, 2023, the Board of Directors proposed a final dividend of RMB0.036 per share, totaling RMB618 million for the year ended December 31, 2022, which is subject to the approval of the shareholders of the Company at the forthcoming annual general meeting.

On June 21, 2022, the general meeting of shareholders approved a final dividend of RMB0.0318 per share, totaling RMB545 million for the year ended December 31, 2021, which had been paid as of December 31, 2022.

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37 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS

(a) Reconciliation of profit before taxation to cash generated from operations

	Notes	For the years ended December 31 2022	2021	2020
Cash flows generated from operating activities				
Profit before income tax		13,208,968	14,186,428	2,886,012
Adjustments for:				
Share of profits of joint ventures	9(a)	(178,910)	(164,100)	(180,502)
Share of (profits)/losses of associates	9(b)	(130,632)	423,247	93,518
Depreciation of property, plant and equipment	7	8,943,617	9,157,951	8,653,823
Depreciation of investment properties	8	44,777	24,450	24,405
Depreciation of right-of-use assets	22(a)	1,282,362	771,951	745,245
Amortization of intangible assets	6	502,921	407,287	493,412
Amortization of prepaid expenses included in other non-current assets		200,142	199,475	278,158
(Gains)/losses on disposal of other property, plant and equipment, land use rights, net	30	(323,659)	679,397	223,206
Impairment losses on property, plant and equipment	7	3,795,420	4,064,673	681,257
Impairment losses of intangible assets	6	75,842	415,659	416
Impairment losses of right-of-use assets	22(a)	—	105,305	15,790
Impairment losses of inventory	13	938,966	470,464	1,411,908
Impairment (reversals)/losses of trade and notes receivables	28	(3,674)	326,153	314,822
Impairment (reversals)/losses of other current assets	28	(8,298)	1,048,896	653,120
Impairment losses of other non-current assets	28	426,111	15,716	—
Impairment losses of investments in joint ventures and associates	9(b)	75,997	—	—
Realized and unrealized (gains)/losses on futures, option and forward contracts	30	(295,882)	604,734	(512,984)
(Gains)/losses on disposal of subsidiaries	30	(86,343)	27,404	(11,305)
Gains on disposal of business		(27,804)	—	—
(Losses)/gains on disposal of investments in joint ventures and associates		—	(6,663)	27,736
Losses on accounts receivable factoring and others		3,808	91,283	—
Gains on debt restructuring		—	—	(5,020)
Dividends of equity investments at fair value through other comprehensive income		(11,499)	(15,296)	(125,015)
Finance costs		3,785,280	4,436,030	5,068,257
Change in special reserve		(17,684)	208,886	32,573
		32,199,826	37,479,330	20,768,832
Changes in working capital:				
(Increase)/decrease in inventories		(4,008,634)	1,324,101	(1,912,675)
Increase in trade and notes receivables		(1,328,745)	(794,608)	(4,366,288)
Decrease in other current assets		139,610	125,731	230,869
(Increase)/decrease in restricted cash		(1,042,261)	300,472	395,872
(Increase)/decrease in other non-current assets		98,364	25,803	(70,637)
Increase/(decrease) in trade and notes payables		4,713,149	(2,189,748)	3,521,798
(Decrease)/increase in other payables and accrued liabilities		(137,209)	1,712,674	1,884,283
Decrease in other non-current liabilities		(76,287)	(62,592)	(177,045)
Cash generated from operations		30,557,813	37,921,163	20,275,009
Mainland China corporate income taxes paid		(2,812,635)	(2,764,917)	(856,477)
Net cash generated from operating activities		27,745,178	35,156,246	19,418,532
Major non-cash transactions of investing activities and financing activities				
Notes receivables endorsed for settlement of purchases of property, plant and equipment and lease liabilities		1,515,934	3,135,322	2,276,782
(Decrease)/increase of right-of-use assets		(439,109)	6,269,450	(7,361)
Investments in other financial assets measured at fair value		1,417,129	—	—
Acquisition of business		—	—	42,230
		2,493,954	9,404,772	2,311,651

(b) Reconciliation of liabilities arising from financing activities

The table below details changes in the Group's liabilities from financing activities, including both cash and non-cash changes. Liabilities arising from financing activities are liabilities for which cash flows was, or future cash flows will be, classified in the Group's consolidated statement of cash flows as cash flows from financing activities.

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37 NOTES TO THE CONSOLIDATED STATEMENT OF CASH FLOWS (CONTINUED)

(b) Reconciliation of liabilities arising from financing activities (Continued)

	Liabilities from financing activities					Other assets	
	Borrowings	**Medium-term notes and bonds**	**Leases**	**Other payables arising from financing activities**	**Sub Total**	**Cash/bank Overdraft**	**Total**
Net debt As of January 1, 2021	79,448,062	21,386,635	5,629,835	913,645	107,378,177	899,955	108,278,132
Financing cash flows	(18,233,691)	3,276,882	(554,668)	(4,480,712)	(19,992,189)	—	(19,992,189)
New leases and modification of contract	—	—	6,073,418	—	6,073,418	—	6,073,418
Foreign exchange adjustments	(30,537)	(143,597)	—	—	(174,134)	—	(174,134)
Finance expenses	—	143,080	344,886	3,942,711	4,430,677	—	4,430,677
Dividends declared	—	—	—	645,286	645,286	—	645,286
Transfer between bank deposits and overdrafts	—	—	—	—	—	(899,955)	(899,955)
Net debt As of December 31, 2021	61,183,834	24,663,000	11,493,471	1,020,930	98,361,235	—	98,361,235
Financing cash flows	(7,396,786)	(3,051,965)	(1,599,072)	(6,238,038)	(18,285,861)	—	(18,285,861)
New leases and modification of contract	—	—	(473,748)	—	(473,748)	—	(473,748)
Foreign exchange adjustments	223,612	585,868	—	—	809,480	—	809,480
Finance expenses	—	149,049	678,855	2,948,758	3,776,662	—	3,776,662
Dividends declared	—	—	—	3,142,987	3,142,987	—	3,142,987
Transfer between bank deposits and overdrafts	—	—	—	—	—	—	—
Net debt As of December 31, 2022	54,010,660	22,345,952	10,099,506	874,637	87,330,755	—	87,330,755

(c) Total cash outflow for leases

The total cash outflow for leases included in the statement of cash flows is as follows:

	For the years ended December 31		
	2022	**2021**	**2020**
Within operating activities	65,163	52,728	253,334
Within financing activities	1,599,072	554,668	1,748,202
	1,664,235	607,396	2,001,536

(Amounts expressed in thousands of RMB unless otherwise stated)

38 SIGNIFICANT RELATED PARTY TRANSACTIONS AND BALANCES

The Company is controlled by Chinalco, a state-owned enterprise established in Mainland China. Related parties include Chinalco and its subsidiaries (other than the Group), other government-related entities and their subsidiaries ("Other State-Owned Enterprises"), other entities and corporations over which the Company is able to control or exercise significant influence and key management personnel of the Company and Chinalco as well as their close family members.

The principal related party transactions with Chinalco and its fellow subsidiaries, associates and joint ventures of the Group which were carried out in the ordinary course of business, are as follows.

(a) Significant related party transactions

	Notes	For the years ended December 31		
		2022	2021	2020
Sales of goods and services rendered:				
Sales of materials and finished goods to:	(i)			
Fellow subsidiaries	(ix)	20,662,740	17,435,785	10,043,031
Associates of Chinalco		586,988	1,428,887	575,637
Joint ventures		10,923,463	9,069,718	6,694,824
Associates		1,010,855	720,261	9,233,929
Non-controlling shareholder of a subsidiary and its subsidiaries		—	—	42,298
		33,184,046	28,654,651	26,589,719
Provision of utility services to:	(ii)			
Fellow subsidiaries	(ix)	1,159,032	683,050	915,781
Associates of Chinalco		19,936	14,244	3,268
Joint ventures		404,387	242,118	470,984
Associates		65,039	—	18,626
		1,648,394	939,412	1,408,659
Rental revenue of land use rights and buildings from:	(vi)			
Fellow subsidiaries	(ix)	27,988	29,973	34,425
Associates of Chinalco		237	237	237
Joint ventures		12,733	7,429	1,426
Associates		2,078	917	707
		43,036	38,556	36,795
Purchases of engineering, construction and supervisory services from:	(iii)			
Fellow subsidiaries	(ix)	579,187	969,568	3,544,097
Associates of Chinalco		2,467	192	265
Joint ventures		23,085	251	—
Associates		142,662	176,083	20,195
		747,401	1,146,094	3,564,557
Provision of social services and logistics services by:	(v)			
Fellow subsidiaries	(ix)	259,188	400,290	397,610
Associates		7	—	—
		259,195	400,290	397,610
Purchases of primary and auxiliary materials, equipment and finished goods from:				
Fellow subsidiaries	(iv)	4,494,021	3,263,448	3,058,126
Associates of Chinalco	(ix)	91,079	35,595	3,919
Joint ventures		5,240,707	6,565,742	5,709,253
Associates		2,659,604	9,175,427	10,576,907
Non-controlling shareholder of a subsidiary and its subsidiaries		—	—	30,101
		12,485,411	19,040,212	19,378,306
Purchases of utility services from:	(ii)			
Fellow subsidiaries	(ix)	6,805,618	6,567,433	7,073,895
Associates of Chinalco		121,413	97,314	85,469
Joint ventures		1,074,266	823,146	542,828
Associates		399,634	314,528	161,586
		8,400,931	7,802,421	7,863,778
Purchases of other services by:				
Fellow subsidiaries		320,611	270,972	394,894
		320,611	270,972	394,894

(Amounts expressed in thousands of RMB unless otherwise stated)

38 SIGNIFICANT RELATED PARTY TRANSACTIONS AND BALANCES (CONTINUED)

(a) Significant related party transactions (Continued)

		For the years ended December 31		
	Notes	2022	2021	2020
Lease payment to:	(vi)			
Fellow subsidiaries	(ix)	1,399,258	656,063	577,712
Associates of Chinalco		14	523	—
Joint ventures		2,088	—	—
Associates		54,892	53,711	49,624
		1,456,252	710,297	627,336
New right-of-use assets in current period				
Additions				
Fellow subsidiaries	(vi)	347,836	83,249	22,936
Joint ventures		14,079	—	—
Associates		6,948	—	—
Contract modification				
Fellow subsidiaries	(vi)	(992,701)	5,675,721	(43,395)
Interest expense on lease liabilities		671,239	309,107	311,067
Other significant related party transactions:	(viii)			
Borrowing from a subsidiary of Chinalco	(viii)	5,052,000	4,666,000	4,410,000
Repayment of borrowings from a subsidiary of Chinalco	(viii)	4,588,000	7,574,007	3,254,563
Interest expense on borrowings and discounted notes	(viii)	71,224	142,862	138,623
Interest income from cash and cash equivalents deposited	(viii)	190,235	80,135	61,020
Trade receivable factor to a subsidiary of Chinalco	(viii)	—	1,566,707	—
Issuance of notes receivable from a subsidiary of Chinalco	(viii)	331,329	556,354	1,026,500
Discounted notes receivable to a subsidiary of Chinalco	(viii)	306,826	128,000	606,750

All transactions with related parties were conducted at prices and on terms mutually agreed by the parties involved, which are determined as follows:

(i) Sales of materials and finished goods comprised sales of alumina, primary aluminum, copper and scrap materials. Transactions entered into are covered by general agreements on a mutual provision of production supplies and ancillary services. The pricing policy is summarized below:

1. The price prescribed by the PRC government ("state-prescribed price") is adopted;
2. If there is no state-prescribed price, state-guidance price is adopted;
3. If there is neither state-prescribed price nor state-guidance price, then the market price (being price charged to and from independent third parties) is adopted; and
4. If none of the above is available, then the adoption of a contractual price (being reasonable costs incurred in providing the relevant services plus not more than 5% of such costs is adopted).

(ii) Utility services, including electricity, gas, heat and water, are provided at the state-prescribed price.

(iii) Engineering, project construction and supervisory services were provided for construction projects. The state-guidance price or prevailing market price (including the tender price where by way of tender) is adopted for pricing purposes.

(iv) The pricing policy for purchases of key and auxiliary materials (including bauxite, limestone, carbon, cement and coal) is the same as that set out in (i) above.

38 SIGNIFICANT RELATED PARTY TRANSACTIONS AND BALANCES (CONTINUED)

(a) Significant related party transactions (Continued)

(v) Social services and logistics services provided by Chinalco Group cover public security, fire services, education and training, school and hospital services, cultural and physical education, newspaper and magazines, broadcasting and printing as well as property management, environmental and hygiene, greenery, nurseries and kindergartens, sanatoriums, canteens and offices, public transport and retirement management and other services. Provisions of these services are covered by the Comprehensive Social and Logistics Services Agreement. The pricing policy is the same as that set out in (i) above.

(vi) Pursuant to the land use right lease agreements entered into between the Group and Chinalco Group, operating leases for industrial or commercial land are charged at the market rent rate. The Group also entered into a building rental agreement with Chinalco Group and paid rents based on the market rate for its lease of buildings owned by Chinalco.

(vii) Other services are environmental protection operation services. The prevailing market price is adopted for pricing purposes.

(viii) Chinalco Finance Company Limited (“Chinalco Finance”) (中鋁財務有限責任公司), a wholly-owned subsidiary of Chinalco and a non-bank financial institution established in the PRC, provides deposit services, credit services and miscellaneous financial services to the Group. The terms for the provision of financial services to the Group are no less favorable than those of the same type of financial services provided by Chinalco Finance to Chinalco and other members of its group or those of the same type of financial services that may be provided to the Group by other financial institutions.

During the year ended December 31, 2022, the Group has no factoring transaction with Chinalco Finance. During the year ended December 31, 2021, the Group derecognized accounts receivable of RMB1,650 million by factoring transaction with Chinalco Finance, and the related fees amounted to RMB83.29 million were recognized in other losses.

(ix) These related party transactions also constitute connected transactions or continuing connected transactions as defined in Chapter 14A of the Listing Rules.

(x) In 2022, the Company acquired 19% of the issued share capital of Yunnan Aluminum from Yunnan Metallurgical, a subsidiary of Chinalco, for a cash consideration of RMB6,662 million and 100% equity interests of Pingguo Aluminum from Chinalco for a cash consideration of RMB1,887 million (Note 41).

(xi) In September 2021, pursuant to the agreement entered into between China Rare Earth Co., Ltd. (“China Rare Earth”, “中國稀有稀土有限公司”， a subsidiary of Chinalco), Zunyi Aluminum Co., Ltd. (“Zunyi Aluminum”, “遵義鋁業股份有限公司”, a subsidiary of the Company), Chalco Mining Co., Ltd. (“Chalco Mining”, “中鋁礦業有限公司”, a subsidiary of the Company), the Group acquired the gallium business of China Rare Earth for a consideration of RMB396 million in cash. This transaction is regarded as a business combination under common control.

(xii) In 2022, the Group made an equity investment in Chinalco High-end Manufacturing and obtained approximately 9.16% equity interests (Note 10).

The English names represent the best effort made by management of the Group in translating the Chinese names of the Companies as they do not have any official English names.

(Amounts expressed in thousands of RMB unless otherwise stated)

38 SIGNIFICANT RELATED PARTY TRANSACTIONS AND BALANCES (CONTINUED)

(b) Balances with related parties

Other than those disclosed elsewhere in the consolidated financial statements, the outstanding balances with related parties at the year-end are as follows:

	December 31, 2022	December 31, 2021
Cash and cash equivalents deposited with		
A subsidiary of Chinalco (i)	8,715,645	8,250,506
Trade and notes receivables		
Fellow subsidiaries	1,111,857	1,222,066
Associates of Chinalco	37,474	36,680
Joint ventures	390,600	632,596
Associates	722	62
Non-controlling shareholder of a subsidiary and its subsidiaries	16,124	24,465
	1,556,777	1,915,869
Provision for impairment of receivables	(57,930)	(79,971)
	1,498,847	1,835,898

(i) Pursuant to the agreement entered into between the Company and Chinalco Finance, Chinalco Finance agreed to provide deposit services, credit services and other financial services to the Group.

(Amounts expressed in thousands of RMB unless otherwise stated)

38 SIGNIFICANT RELATED PARTY TRANSACTIONS AND BALANCES (CONTINUED)

(b) Balances with related parties (Continued)

	December 31, 2022	December 31, 2021
Other current assets		
Fellow subsidiaries	90,720	330,757
Associates of Chinalco	20,573	21,820
Joint ventures	1,423,900	1,487,416
Associates	36,002	383,917
Non-controlling shareholder of a subsidiary and its subsidiaries	7,450	7,450
Provision for impairment of other current assets	(1,311,839)	(1,332,041)
	266,806	899,319
Other non-current assets		
Associates	70,190	111,845
Interest-bearing loans and borrowings:		
Fellow subsidiaries (including lease liabilities)	12,274,126	13,179,706
Associates of Chinalco	1,696	2,245
Joint ventures	12,610	—
Associates	104,446	—
	12,392,878	13,181,951
Trade and notes payables		
Fellow subsidiaries	1,289,819	1,908,490
Associates of Chinalco	22,547	26,920
Joint ventures	112,436	37,807
Associates	199,465	257,118
Non-controlling shareholder of a subsidiary and its subsidiaries	77,008	105,174
	1,701,275	2,335,509
Other payables and accrued liabilities		
Fellow subsidiaries	679,610	1,057,833
Associates of Chinalco	244,093	42,659
Associates	29,573	19,926
Joint ventures	87,374	49,618
Non-controlling shareholder of a subsidiary and its subsidiaries	1,872	—
	1,042,522	1,170,036
Contract liabilities:		
Fellow subsidiaries	36,471	40,787
Associates of Chinalco	654	34,212
Associates	1,362	8,969
Joint ventures	278,941	97,816
	317,428	181,784

Apart from transactions with Chinalco and its fellow subsidiaries, associates and joint ventures of the Group, the Group’s transactions with other state-controlled entities include but is not limited to the following:

- Sales and purchases of goods and services,
- Purchases of assets,
- Lease of assets; and
- Bank deposits and borrowings

These transactions are conducted in the ordinary course of the Group’s business

The terms of all balances were unsecured.

(Amounts expressed in thousands of RMB unless otherwise stated)

38 SIGNIFICANT RELATED PARTY TRANSACTIONS AND BALANCES (CONTINUED)

(c) Compensation of key management personnel

	For the years ended December 31		
	2022	2021	2020
Fees	617	580	683
Basic salaries, other allowances and benefits in kind	5,900	6,225	5,810
Pension costs	707	634	301
	7,224	7,439	6,794

Key management includes directors, supervisors and members of senior management.

(d) Commitments with related parties

As of December 31, 2022 and 2021, except for the other capital commitments disclosed in Note 44(b) to these financial statements, the Group had no significant commitments with related parties.

39 FINANCIAL AND CAPITAL RISK MANAGEMENT

39.1 Financial risk management

The Group's activities expose it to a variety of financial risks, including market risk (including foreign currency risk, interest rate risk and commodity price risk), credit risk and liquidity risk. The Group's overall risk management program focuses on the unpredictability of financial markets and seeks to minimize the potential adverse effects on the Group's financial performance.

Risk management is carried out by the treasury management department (the "Group Treasury") under policies approved by the Board of Directors of the Company. The Group Treasury identifies, evaluates and hedges financial risks through close cooperation with the Group's operating units.

(a) Market risk

(i) Foreign currency risk

The Group's foreign currency risk arose from transaction conducted in currency other than the functional currency of the group entities. The Group's foreign currency risk primarily arises from foreign currency deposits, trade receivables, trade payables and short-term and long-term loans denominated in United States dollars ("USD"). Related exposures are disclosed in Notes 16, 14, 25 and 21 to the consolidated financial statements, respectively. The Group Treasury closely monitors the international foreign currency market on the change of exchange rates and takes these into consideration when investing in foreign currency deposits and borrowing loans. As of December 31, 2022, the Group only had significant exposure to USD.

As of December 31, 2022, if RMB had strengthened/weakened by 5% against USD with all other variables held constant, the profit for the year would have been approximately RMB47 million lower/higher (2021: RMB29 million lower/higher), mainly as a result of foreign exchange gains and losses arising from translation of USD denominated borrowings, account payables, account receivables and cash and cash equivalent.

As the assets and liabilities denominated in other foreign currencies other than USD were relatively minimal to the total assets and liabilities of the Group, the directors of the Company are of the opinion that the Group was not exposed to significant foreign currency risk arising from other assets and liabilities denominated in currency other than the functional currency of the group entities as of December 31, 2022 and 2021.

(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.1 Financial risk management (Continued)

(a) Market risk (Continued)

(ii) Interest rate risk

As of December 31, 2022, as the Group had no significant interest-bearing assets or liabilities except for bank deposits (Note 16), entrusted loans (Note 15) and Interest-bearing loans (Note 21).

Most of the bank deposits are maintained in savings and time deposit accounts in the PRC. The interest rates are regulated by the People's Bank of China and the Group Treasury closely monitors the fluctuation on such rates periodically. The directors of the Company are of the opinion that the Group was not exposed to any significant interest rate risk for its financial assets held as of December 31, 2022 and 2021.

The interest rate risk for the Group's financial liabilities primarily arises from interest-bearing loans. Loans borrowed at floating interest rates expose the Group to cash flow interest rate risk. The Group Treasury closely monitors market interest rates and maintains a balance between variable rate and fixed rate borrowings in order to reduce the exposures to the interest rate risk described above.

As of December 31, 2022, if interest rates had been 100 basis points (December 31, 2021: 100 basis points) higher/lower for bank and other loans borrowed at floating interest rates with all other variables held constant, net profit for the year would have been RMB233 million lower/higher (2021: RMB277 million), respectively, mainly as a result of the higher/ lower interest expense on floating rate borrowings.

The fair value interest rate risk of the Group mainly arises from medium term notes and short term bonds issued at fixed rates. As the fluctuation of comparable interest rates of corporate bonds with similar terms was relatively low, the directors of the Company are of the opinion that the Group was not exposed to any significant fair value interest rate risk for its fixed interest rate borrowings held as of December 31, 2022 and 2021.

(iii) Commodity price risk

The Group uses futures and option contracts to reduce its exposure to fluctuations in the price of primary aluminum and other products. The Group uses the futures contract for offsetting other than speculation. With reference to the hedging of primary aluminum, production company hedges the output of primary aluminum and trading company hedges the quantities of buyout and self-supporting. However, the Group didn't apply hedging accounting.

The Group uses mainly futures contracts and option contracts traded on the Shanghai Futures Exchange and London Metal Exchange ("LME") to hedge against fluctuations in primary aluminum prices. As of December 31, 2022, the fair values of the outstanding futures contracts amounting to RMB9 million (December 31, 2021: RMB69 million) were recognized in financial liabilities at fair value through profit or loss.

As of December 31, 2022, if the commodity futures prices had increased/ decreased by 3% (December 31, 2021: 3%) and all other variables held constant, profit for the year would have changed by the amounts shown below:

	December 31, 2022	December 31, 2021
Primary aluminum	Decrease/increase RMB9 million	Decrease/increase RMB6 million

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.1 Financial risk management (Continued)

(b) Credit risk

Credit risk arises from balances with banks and financial institutions, trade and notes receivables, other current and non-current receivables as well as credit exposures of customers, including outstanding receivables and committed transactions.

The Group maintains substantially all of its bank balances and cash and short-term investments in Chinalco Finance and several major state-owned banks in the PRC. With strong support from the PRC government to these state-owned banks, the directors of the Company are of the opinion that there is no significant credit risk on such assets being exposed to losses.

The Group applies the simplified approach to its trade receivables to provide for expected credit losses prescribed by IFRS 9, which permits the use of the lifetime expected loss provision for trade receivables. The Group has made individual assessment for trade receivables from clients with top rating and receivables with pledged assets and impairment provisions are made.

To measure the expected credit losses of trade receivables other than those assessed individually as mentioned above, trade receivables have been grouped based on shared credit risk characteristics and the days past due. The expected credit loss model also incorporates forward-looking information.

For other current and non-current receivables, the Group considers the probability of default upon initial recognition of an asset and whether there has been a significant increase in credit risk on an ongoing basis throughout each reporting period. To assess whether there is a significant increase in credit risk the Company compares the risk of a default occurring on the asset as of the reporting date with the risk of default as of the date of initial recognition. It considers available reasonable and supportive forwarding-looking information. Especially the following indicators are incorporated:

- internal credit rating
- external credit rating
- actual or expected significant adverse changes in business, financial or economic conditions that are expected to cause a significant change to the borrower’s ability to meet its obligations
- significant changes in the expected performance and behavior of the clients

The Group measures expected credit loss rates on the basis of a loss rate approach by segmenting its portfolio into appropriate groupings based on shared credit risk characteristics. At the end of each year, the Group updates its historical loss information with forward-looking information. As the historical credit loss rates were comparatively stable and no significant changes were expected to the forward-looking information after the consideration of reasonable and supportable forecasts of comparatively stable customer relationship and customers’ credit ratings, the expected credit loss rates remained consistent during 2022.

(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.1 Financial risk management (Continued)

(b) Credit risk (Continued)

The table below shows the credit quality and the maximum exposure to credit risk based on the Group's credit policy, which is mainly based on past due information unless other information is available without undue cost or effort, and year-end staging classification as of December 31, 2022. The amounts presented are carrying amounts for financial assets and the exposure to credit risk for the financial guarantee contracts, if any.

	Stage 1	Stage 2	Stage 3	Simplified	Total
Trade receivables	—	—	—	5,055,178	5,055,178
Financial assets in other current assets	1,409,640	107,559	3,390,246	—	4,907,445
Restricted cash	2,443,249	—	—	—	2,443,249
Notes receivable	—	—	—	1,767,625	1,767,625
Cash and cash equivalents	16,816,684	—	—	—	16,816,684
Financial assets in other non-current assets	—	—	513,281	—	513,281
Total	20,669,573	107,559	3,903,527	6,822,803	31,503,462

The carrying amounts of short-term investments and these receivables included in Notes 12, 14, 15 and 16 represent the Group's maximum exposure to credit risk. The directors of the Company are of the opinion that the Group was not exposed to any significant concentration of credit risk as of December 31, 2022 and 2021.

(c) Liquidity risk

Cash flow forecast is performed in the operating entities of the Group and aggregated by the Group Treasury. The Group Treasury monitors rolling forecasts of the Group's liquidity requirements to ensure it has sufficient cash to meet operational needs while maintaining sufficient headroom on its undrawn committed borrowing facilities at all times so that the Group does not breach borrowing limits or covenants (where applicable) on any of its borrowing facilities. This forecast takes into consideration of the Group's debt financing plans, covenant compliance, compliance with internal balance sheet ratio targets and, if applicable, external regulatory or legal requirements, for example, currency restrictions.

Management also monitors rolling forecasts of the Group's liquidity reserve on the basis of expected cash flows.

As of December 31, 2022, the Group's current liabilities exceeded its current assets by approximately RMB7,831 million (December 31, 2021: RMB7,806 million), please refer to Note 3.1.2 for the assessment made by the Company.

The table below analyzes the maturity profile of the Group's financial liabilities as at the end of the reporting period. The amounts disclosed in the table are the contractual undiscounted cash flows.

(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.1 Financial risk management (Continued)

(c) Liquidity risk (Continued)

	Within 1 year	1 to 2 years	2 to 5 years	Over 5 years	Total
As of December 31, 2022					
Lease liabilities, including current portion	1,651,935	1,314,558	3,092,936	13,939,859	19,999,288
Long-term bank and other loans, including current portion	13,486,345	6,604,880	20,579,821	6,878,511	47,549,557
Medium-term notes and bonds, including current portion	4,400,000	6,712,761	6,110,823	2,000,000	19,223,584
Short-term bonds	2,600,000	—	—	—	2,600,000
Short-term bank and other loans	6,461,103	—	—	—	6,461,103
Interest payables for loans and borrowings	2,285,428	1,490,176	1,468,119	1,046,655	6,290,378
Financial liabilities at fair value through profit or loss	8,767	—	—	—	8,767
Financial liabilities included other payables and accrued liabilities, excluding accrued interest	6,786,894	—	—	—	6,786,894
Financial liabilities included in other non-current liabilities	203,428	50,198	150,595	839,964	1,244,185
Trade and notes payables	22,536,331	—	—	—	22,536,331
	60,420,231	16,172,573	31,402,294	24,704,989	132,700,087

	Within 1 year	1 to 2 years	2 to 5 years	Over 5 years	Total
As of December 31, 2021					
Lease liabilities, including current portion	1,513,435	1,402,567	4,137,823	14,651,190	21,705,015
Long-term bank and other loans, including current portion	6,164,215	17,424,952	10,787,187	14,720,982	49,097,336
Medium-term notes and bonds, including current portion	3,000,000	4,400,000	9,875,700	2,000,000	19,275,700
Short-term bonds	5,400,000	—	—	—	5,400,000
Short-term bank and other loans	11,937,178	—	—	—	11,937,178
Interest payables for loans and borrowings	2,703,535	2,242,239	3,961,075	1,680,780	10,587,629
Financial liabilities at fair value through profit or loss	68,871	—	—	—	68,871
Financial liabilities included other payables and accrued liabilities, excluding accrued interest	8,939,681	—	—	—	8,939,681
Financial liabilities included in other non-current liabilities	352,273	202,541	147,002	885,208	1,587,024
Trade and notes payables	18,588,416	—	—	—	18,588,416
	58,667,604	25,672,299	28,908,787	33,938,160	147,186,850

(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.2 Financial instruments

(a) Financial instruments by category

The carrying amounts of each of the categories of financial instruments of the Group as of the end of the reporting period are as follows:

Financial assets

	As of December 31, 2022				
	Financial assets at fair value through profit or loss-held for trading	Financial assets at amortized cost	Equity instruments at fair value through other comprehensive income	Debt instruments at fair value through other comprehensive income	Total
Current					
Trade receivables	—	5,055,178	—	—	5,055,178
Notes receivable	—	411,145	—	1,356,480	1,767,625
Restricted cash	—	2,443,249	—	—	2,443,249
Cash and cash equivalents	—	16,816,684	—	—	16,816,684
Financial assets included in other current assets	—	4,907,445	—	—	4,907,445
Subtotal	—	29,633,701	—	1,356,480	30,990,181
Non-current					
Other financial assets measured at fair value	—	—	2,161,085	—	2,161,085
Other non-current assets	—	513,281	—	—	513,281
Subtotal	—	513,281	2,161,085	—	2,674,366
Total	—	30,146,982	2,161,085	1,356,480	33,664,547

Financial liabilities

	As of December 31, 2022		
	Financial assets at fair value through profit or loss-held for trading	Financial liabilities at amortized cost	Total
Current			
Financial liabilities at fair value through profit or loss	8,767	—	8,767
Interest-bearing loans and borrowings	—	27,859,353	27,859,353
Financial liabilities included in other payables and accrued liabilities (Note 24)	—	7,344,765	7,344,765
Trade and notes payables	—	22,536,331	22,536,331
Subtotal	8,767	57,740,449	57,749,216
Non-current			
Financial liabilities included in other non-current liabilities (Note 23)	—	660,867	660,867
Interest-bearing loans and borrowings	—	58,596,765	58,596,765
Subtotal	—	59,257,632	59,257,632
Total	8,767	116,998,081	117,006,848

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.2 Financial instruments (Continued)

(a) Financial instruments by category (Continued)

Financial assets

	As of December 31, 2021				
	Financial assets at fair value through profit or loss-held for trading	Financial assets at amortized cost	Equity instruments at fair value through other comprehensive income	Debt instruments at fair value through other comprehensive income	Total
Current					
Trade receivables	—	4,043,972	—	—	4,043,972
Notes receivable	—	1,207,602	—	2,867,877	4,075,479
Restricted cash	—	1,400,988	—	—	1,400,988
Cash and cash equivalents	—	19,683,619	—	—	19,683,619
Financial assets included in other current assets	—	5,565,543	—	—	5,565,543
Subtotal	—	31,901,724	—	2,867,877	34,769,601
Non-current					
Other financial assets measured at fair value	—	—	457,686	—	457,686
Other non-current assets	—	504,307	—	—	504,307
Subtotal	—	504,307	457,686	—	961,993
Total	—	32,406,031	457,686	2,867,877	35,731,594

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.2 Financial instruments (Continued)

(a) Financial instruments by category (Continued)

Financial Liabilities

	As of December 31, 2021		
	Financial assets at fair value through profit or loss- held for trading	Financial liabilities at amortized cost	Total
Current			
Financial liabilities at fair value through profit or loss	68,871	—	68,871
Interest-bearing loans and borrowings	—	27,665,370	27,665,370
Financial liabilities included in other payables and accrued liabilities (Note 24)	—	9,616,725	9,616,725
Trade and notes payables	—	18,588,416	18,588,416
Subtotal	68,871	55,870,511	55,939,382
Non-current			
Financial liabilities included in other non- current liabilities (Note 23)	—	880,864	880,864
Interest-bearing loans and borrowings	—	69,674,935	69,674,935
Subtotal	—	70,555,799	70,555,799
Total	68,871	126,426,310	126,495,181

(b) Fair value and fair value hierarchy

Fair value

Management has assessed that the fair values of cash and cash equivalents, restricted cash and time deposits, trade and notes receivables, financial assets included in other current assets, entrusted loans, trade and notes payables, financial liabilities included in other payables and accrued liabilities, short-term and the current portion of interest-bearing loans and borrowings, interest payable and the current portion of long-term payables approximate to their carrying amounts largely due to the short term maturities of these instruments.

Other than those with carrying amounts that reasonably approximate to fair values and those carried at fair value, are as follows:

	Carrying amounts		Fair values	
	December 31, 2022	December 31, 2021	December 31, 2022	December 31, 2021
Financial liabilities				
Financial liabilities included in other non-current liabilities (Note 23)	660,867	880,864	590,869	768,170
Long-term interest-bearing loans and borrowings, excluding lease liability (Note 21)	49,387,292	59,156,405	45,885,166	55,623,890
	50,048,159	60,037,269	46,476,035	56,392,060

The fair values of the financial assets and liabilities are determined as the amount at which the instrument could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale.

(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.2 Financial instruments (Continued)

(b) Fair value and fair value hierarchy (Continued)

The fair values of the financial assets included in other non-current assets and financial liabilities included in other non-current liabilities and long-term interest-bearing loans and borrowings have been calculated by discounting the expected future cash flows using rates currently available for instruments on with similar terms, credit risk and remaining maturities.

Fair value hierarchy

The following tables illustrate the fair value measurement hierarchy of the Group's financial instruments:

Assets measured at fair value

	Fair value measurement using			
As of December 31, 2022	**Quoted prices in active markets (Level 1)**	**Significant observable inputs (Level 2)**	**Significant unobservable inputs (Level 3)**	**Total**
Notes receivable	—	—	1,356,480	1,356,480
Listed equity investments	34,751	—	—	34,751
Other unlisted investment	—	—	2,126,334	2,126,334
	34,751	—	3,482,814	3,517,565

	Fair value measurement using			
As of December 31, 2021	**Quoted prices in active markets (Level 1)**	**Significant observable inputs (Level 2)**	**Significant unobservable inputs (Level 3)**	**Total**
Notes receivable	—	—	2,867,877	2,867,877
Listed equity investments	45,133	—	—	45,133
Other unlisted investment	—	—	412,553	412,553
	45,133	—	3,280,430	3,325,563

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.2 Financial instruments (Continued)

(b) Fair value and fair value hierarchy (Continued)

Fair value hierarchy (Continued)

Liabilities measured at fair value

As of December 31, 2022	Fair value measurement using Quoted prices in active markets (Level 1)	Significant observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Financial liabilities at fair value through profit or loss: Futures contracts	8,767	—	—	8,767
	8,767	—	—	8,767

As of December 31, 2021	Fair value measurement using Quoted prices in active markets (Level 1)	Significant observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Financial liabilities at fair value through profit or loss: Futures contracts	68,871	—	—	68,871
	68,871	—	—	68,871

Liabilities for which fair values are disclosed：

As of December 31, 2022	Fair value measurement using Quoted prices in active markets (Level 1)	Significant observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Financial liabilities at amortized cost:				
Financial liabilities included in other non-current liabilities	—	—	590,869	590,869
Long-term interest-bearing loans and borrowings	—	—	45,885,166	45,885,166
	—	—	46,476,035	46,476,035

As of December 31, 2021	Fair value measurement using Quoted prices in active markets (Level 1)	Significant observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Total
Financial liabilities at amortized cost:				
Financial liabilities included in other non-current liabilities	—	—	768,170	768,170
Long-term interest-bearing loans and borrowings	—	—	55,623,890	55,623,890
	—	—	56,392,060	56,392,060

(Amounts expressed in thousands of RMB unless otherwise stated)

39 FINANCIAL AND CAPITAL RISK MANAGEMENT (CONTINUED)

39.2 Financial instruments (Continued)

(b) Fair value and fair value hierarchy (Continued)

Fair value hierarchy (Continued)

During the year ended December 31, 2022, the Group had no transfers of fair value measurements between Level 1 and Level 2 and no transfers into or out of Level 3 for both financial assets and financial liabilities (2021: Nil).

Below is a summary of significant unobservable inputs to the valuation of financial instruments as of December 31, 2022:

	Valuation Technique	Significant unobservable input
Other equity investments		
December 31, 2022	Discounted cashflow model	Discount rate, gross margin,sales growth rate
Notes receivable		
December 31, 2022	Discounted cashflow model	Discount rate
Financial liabilities included in other non-current liabilities		
December 31, 2022	Discounted cashflow model	Discount rate
Long-term interest-bearing loans and borrowings		
December 31, 2022	Discounted cashflow model	Discount rate

39.3 Capital risk management

The Group's capital management objectives are to safeguard the Group's ability to continue as a going concern in order to provide returns for shareholders and benefits for other stakeholders, and to maintain an optimal capital structure to reduce the cost of capital.

In order to maintain or adjust the capital structure, the Group may adjust the amount of dividends paid to shareholders, issue new shares or sell assets to reduce debts.

Consistent with other entities in the industry, the Group monitors capital on the basis of its debt to asset ratio. Debt to asset ratio as of December 31, 2022 and 2021 are as follows:

	December 31, 2022	December 31, 2021
Debt to asset ratio	58.67 %	60.11 %

(Amounts expressed in thousands of RMB unless otherwise stated)

40 NON - CONTROLLING INTERESTS

Details of the Group's subsidiaries that have material non-controlling interests are set out below:

	December 31, 2022	December 31, 2021
Percentage of equity interest held by non-controlling interests		
Yunnan Aluminum	70.90 %	70.90 %
Ningxia Energy	29.18 %	29.18 %
Profit/(loss) for the year allocated to non-controlling interests		
Yunnan Aluminum	3,822,549	2,850,754
Ningxia Energy	818,960	(90,237)
Dividends distributed to non-controlling interests		
Yunnan Aluminum	464,414	103,234
Ningxia Energy	1,630	115,380
Accumulated balances of non-controlling interests at the year end		
Yunnan Aluminum	17,602,176	14,261,948
Ningxia Energy	5,893,332	5,055,069

(Amounts expressed in thousands of RMB unless otherwise stated)

40 NON - CONTROLLING INTERESTS (CONTINUED)

The following tables illustrate the summarized financial information of the above subsidiaries. The amounts disclosed are before any inter-company eliminations:

	Yunnan Aluminum	
	2022	2021
Revenue	48,463,025	41,668,819
Total expenses	43,195,002	37,456,484
Profit for the year	5,268,023	4,212,335
Total comprehensive income for the year	5,250,479	4,225,069
Current assets	8,245,650	5,360,494
Non-current assets	30,798,212	32,476,625
Current liabilities	9,046,545	9,836,320
Non-current liabilities	4,720,806	7,090,461
Net cash flows from operating activities	6,916,119	6,961,628
Net cash flows used in investing activities	(1,033,033)	(1,181,811)
Net cash flows used in financing activities	(4,590,174)	(4,773,308)
Effect of foreign exchange rate changes, net	4,194	(1,466)
Net increase in cash and cash equivalents	1,297,106	1,005,043

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

40 NON - CONTROLLING INTERESTS (CONTINUED)

	Ningxia Energy	
	2022	2021
Revenue	9,038,881	7,670,316
Total expenses	7,397,765	7,979,557
Profit/(loss) for the year	1,641,116	(309,241)
Total comprehensive income/(loss) for the year	1,641,116	(309,241)
Current assets	3,615,322	2,912,805
Non-current assets	27,756,457	29,086,775
Current liabilities	9,043,923	8,256,229
Non-current liabilities	9,651,197	12,710,354
Net cash flows from operating activities	3,529,657	5,458,921
Net cash flows used in investing activities	(760,210)	(802,678)
Net cash flows used in financing activities	(2,446,726)	(5,381,480)
Effect of foreign exchange rate changes, net	—	—
Net increase/(decrease) in cash and cash equivalents	322,721	(725,237)

41 BUSINESS COMBINATION UNDER COMMON CONTROL

(a) Acquisition 19% of the issued share capital of Yunnan Aluminum

Pursuant to the agreement entered into in July 2022 between Yunnan Metallurgical, the Company has agreed to acquire and Yunnan Metallurgical has agreed to dispose of 658,911,907 shares in Yunnan Aluminum, representing approximately 19% of the total issued share capital of Yunnan Aluminum for a cash consideration of RMB6,662 million. Upon the completion of the transaction, the Company held 1,009,202,685 shares in Yunnan Aluminum, representing approximately 29.10% of the total issued share capital of Yunnan Aluminum and became the largest shareholder of Yunnan Aluminum. The acquisition was completed on November 22, 2022.

As the Company, Yunnan Aluminum is under common control of Chinalco before and after the transactions, and that control is not transitory, the transaction is regarded as business combination under common control. The consolidated financial statements for the year ended December 31, 2022 has combined the financial statements of the acquired company from the beginning of the earliest period presented (Note 3.3(a)). The comparative financial data have been restated accordingly.

(Amounts expressed in thousands of RMB unless otherwise stated)

41 BUSINESS COMBINATION UNDER COMMON CONTROL (CONTINUED)

(a) Acquisition 19% of the issued share capital of Yunnan Aluminum (continued)

Revenue and net profit of the acquired entities for the period from January 1, 2022 to the acquisition date and for the year ended December 31, 2021 are as follows:

	For the period from January 1, 2022 to the acquisition date	2021
Revenue	44,816,260	41,668,819
Net profit	4,722,177	4,212,335

Details of the purchase consideration, the net assets acquired are as follows:

Purchase consideration:	
Cash paid	6,661,599
Total purchase consideration	6,661,599

The carrying amounts of assets, liabilities and equity of the acquired companies at the acquisition date and December 31, 2021 are as follows:

	Acquisition date	December 31, 2021
Current assets	7,784,570	5,360,494
Non-current assets	30,958,951	32,476,625
Current liabilities	(9,439,091)	(9,836,320)
Non-current liabilities	(4,130,537)	(7,090,461)
Net assets	25,173,893	20,910,338
Less: non-controlling interests	3,318,207	2,719,017
Net assets attributable to owners of the company	21,855,686	18,191,321

The adjustment on the beginning balance of the Group's total equity amounting to RMB9,965 million and RMB16,104 million for the year ended December 31, 2021 and 2022, respectively, represented the total equity of Yunnan Aluminum at the same date which were combined to the consolidated balance sheet of the Group. The consideration of RMB6,662 million paid in 2022 was treated as a decrease in capital reserves.

(b) Acquisition 100% of equity interests in Pingguo Aluminum

Pursuant to the agreement entered into in August 2022 between Chinalco and the Company, the Company agreed to acquire the 100% of equity interests of Pingguo Aluminum, for a cash consideration of RMB1,887 million. The acquisition was completed on December 1, 2022.

(Amounts expressed in thousands of RMB unless otherwise stated)

41 BUSINESS COMBINATION UNDER COMMON CONTROL (CONTINUED)

(b) Acquisition 100% of equity interests in Pingguo Aluminum (continued)

As the Company, Pingguo Aluminum is under common control of Chinalco before and after the transactions, and that control is not transitory, the transaction is regarded as business combination under common control. The consolidated financial statements for the year ended December 31, 2022 has combined the financial statements of the acquired company from the beginning of the earliest period presented (Note 3.3(a)). The comparative financial data have been restated accordingly.

Revenue and net profit of the acquired entities for the period from January 1, 2022 to the acquisition date and for the year ended December 31, 2021 are as follows:

	For the period from January 1, 2022 to the acquisition date	2021
Revenue	437,080	463,874
Net profit	68,312	36,887

Details of the purchase consideration, the net assets acquired are as follows:

Purchase consideration :	
Cash paid	1,887,474
Total purchase consideration	1,887,474

The carrying amounts of assets, liabilities and equity of the acquired companies at the acquisition date and December 31, 2021 are as follows:

	Acquisition date	December 31, 2021
Current assets	428,011	319,694
Non-current assets	472,321	494,583
Current liabilities	(136,806)	(117,723)
Non-current liabilities	—	-
Net assets	763,526	696,554
Less: non-controlling interests	6,564	5,834
Net assets attributable to owners of the company	756,962	690,720

The adjustment on the beginning balance of the Group’s total equity amounting to RMB657 million and RMB736 million for the year ended 31 December 2021 and 2022, respectively, represented the total equity of Pingguo Aluminum at the same date which were combined to the consolidated balance sheet of the Group. The consideration of RMB1,887 million paid in 2022 was treated as a decrease in capital reserves.

ALUMINUM CORPORATION OF CHINA LIMITED

NOTES TO THE FINANCIAL STATEMENTS (CONTINUED)

For the years ended December 31, 2020 ,2021 and 2022
(Amounts expressed in thousands of RMB unless otherwise stated)

41 BUSINESS COMBINATION UNDER COMMON CONTROL (CONTINUED)

(c) Acquisition of gallium business

In September 2021, pursuant to the agreement entered into between China Rare Earth, Zunyi Aluminum and Chalco Mining, the Group acquired the gallium business of China Rare Earth, a subsidiary of Chinalco, for a cash consideration of RMB396 million. This transaction is regarded as a business combination under common control. The consolidated financial statements for the year ended December 31, 2021 has combined the financial statements of the acquired gallium business from the beginning of the earliest period presented (Note 3.3(a)). The comparative financial data have been restated accordingly.

Revenue and net profit of the gallium business for the period from January 1, 2021 to the acquisition date and for the year ended December 31, 2020 are as follows:

	For the period from January 1, 2021 to the acquisition date	2020
Revenue	178,229	112,428
Net profit	32,315	26,219

Details of the purchase consideration, the net assets acquired are as follows:

Purchase consideration:	
Cash paid	395,624
Total purchase consideration	395,624

The carrying amounts of assets, liabilities and equity of the gallium business at the acquisition date and December 31, 2020 are as follows:

	Acquisition date	December 31, 2020
Current assets	103,353	66,215
Non-current assets	70,660	74,270
Current liabilities	(3,770)	(7,037)
Non-current liabilities	(4,480)	—
Net assets – closing balance	165,763	133,448
Net assets – beginning balance	133,448	95,389

(Amounts expressed in thousands of RMB unless otherwise stated)

41 BUSINESS COMBINATION UNDER COMMON CONTROL (CONTINUED)

(d) Acquisition of Henan Zhongzhou Logistics

In April 2020, pursuant to the agreement entered into between Chalco Logistics Group Zhongzhou Co., Ltd. ("Chalco Logistics Zhongzhou", "中鋁物流集團中州有限公司", a subsidiary of Chalco Logistics), Henan Zhongzhou Logistics Co., Ltd. ("Henan Zhongzhou Logistics", "河南中州物流有限公司", a subsidiary of Zhongzhou Aluminum Factory prior of the transaction), Chalco Logistics Group Co., Ltd. ("Chalco Logistics", "中鋁物流集團有限公司", a subsidiary of the Company), Henan Zhongzhou Aluminum Factory Co., Ltd. ("Zhongzhou Aluminum Factory", "河南中州鋁廠有限公司", a subsidiary of Chinalco) and Chalco Zhongzhou Aluminum Industry Co., Ltd. ("Zhongzhou Aluminum Industry", "中鋁中州鋁業有限公司"), Chalco Logistics Zhongzhou merged Henan Zhongzhou Logistics, which was a 100% owned subsidiary of Zhongzhou Aluminum Factory prior to the transaction, by issuing new shares of Chalco Logistics Zhongzhou to Zhongzhou Aluminum Factory.

(e) Acquisition of Chongqing Xinan Transportation

Pursuant to the agreement entered into between Chalco Logistics, Southwest Aluminum Industry (Group) Co., Ltd. ("Southwest Aluminum Industry", "西南鋁業（集團）有限責任公司", a subsidiary of Chinalco) and Chongqing Southwest Aluminum Transportation Co., Ltd. ("Southwest Aluminum Transportation", "重慶西南鋁運輸有限公司", a subsidiary of Southwest Aluminum Industry prior to the transaction), Chalco Logistics acquired Southwest Aluminum Transportation on June 30, 2020 by subscription of its 51% newly issued shares for a cash consideration of RMB8.189 million.

42 DISPOSAL OF SUBSIDIARIES

For the year ended December 31, 2020, 2021 and 2022, except for the disposal of 100% equity interests in Yunnan Haoxin as disclosed in Note 10, other disposals or liquidations of subsidiaries are not material.

43 CONTINGENT LIABILITIES

As of December 31, 2022 and the date of this report, the Group is in process of application with related government departments for re-verifying carbon emission data for certain coal-fired power plants to avoid unnecessary obligations of excessive emission, the conclusion of which will not result in material additional liabilities to be recognized by the Group.

The Group is a defendant in a number of lawsuits arising in the ordinary course of business. While the outcomes of such lawsuits cannot be determined at present, management believes that any resulting liabilities will not have a material adverse effect on the financial position or operating results the Group.

44 COMMITMENTS

(a) Capital commitments

	December 31, 2022	December 31, 2021
Property, plant and equipment	2,181,828	1,794,574

(Amounts expressed in thousands of RMB unless otherwise stated)

44 COMMITMENTS (CONTINUED)

(b) Other capital commitments

As of December 31, 2022, the commitments to make capital contributions to the Group's joint ventures and associates were as follows:

	December 31, 2022	December 31, 2021
Associates	31,800	31,800
Joint ventures	410,000	410,000
Investments measured at fair value	1,019,000	—
	1,460,800	441,800

45 EVENTS AFTER THE REPORTING PERIOD

As of the date of this report, except for the dividend proposed by the Board of Directors disclosed in Note 36, no significant subsequent event happened.

46 COMPARATIVE AMOUNT

Certain comparative amounts have been restated as a result of the business combinations under common control as disclosed in Note 41 and application of new amendment to IAS16 as described in Note 3.1.4.

47 APPROVAL OF THE FINANCIAL STATEMENT

The financial statements were approved and authorized for issue by the Board of Directors on April 25, 2023.

Exhibit 1.1

Important Note: The following is an English translation of the Chinese version of the Articles of Association of Aluminum Corporation of China Limited (中國鋁業股份 有限公司章程 *). In case of any discrepancies or inconsistencies, the Chinese version shall always prevail.*

ARTICLES OF ASSOCIATION

OF

Aluminum Corporation of China Limited

(Adopted at the Extraordinary Shareholders' General Meeting of the Company on September 24, 2001)
(Approved by the State Economic and Trade Commission on September 26, 2001)
(Amended with the Approval of the Shareholders' General Meeting of the Company on June 12, 2002)
(Amended with the Approval of the State Economic and Trade Commission on July 5, 2002)
(Amended with the Approval of the Shareholders' General Meeting of the Company on June 7, 2004)
(Amended with the Approval of the State-owned Assets Supervision and Administration Commission of the State Council on July 30, 2004)
(Amended with the Approval of the Shareholders' General Meeting of the Company on June 9, 2005)
(Amended with the Approval of the Shareholders' General Meeting of the Company on October 14, 2005)
(Amended with the Approval of the Shareholders' General Meeting of the Company on May 10, 2006)
(Amended with the Approval of the Shareholders' General Meeting of the Company on February 27, 2007)
(Amended with the Approval of the Shareholders' General Meeting of the Company on October 12, 2007)
(Amended with the Approval of the Shareholders' General Meeting of the Company on May 9, 2008)
(Amended with the Approval of the Shareholders' General Meeting of the Company on October 28, 2008)
(Amended with the Approval of the Shareholders' General Meeting of the Company on May 26, 2009)
(Amended with the Approval of the State-owned Assets Supervision and Administration Commission of the State Council on September 11, 2009)
(Amended with the Approval of the Shareholders' General Meeting of the Company on June 22, 2010)
(Amended with the Approval of the Shareholders' General Meeting of the Company on February 28, 2011)
(Amended with the Approval of the Shareholders' General Meeting of the Company on October 12, 2012)
(Amended with the Approval of the Shareholders' General Meeting of the Company on December 29, 2015)
(Amended with the Approval of the Shareholders' General Meeting of the Company on October 26, 2017)
(Amended with the Approval of the Shareholders' General Meeting of the Company on December 10, 2019)
(Amended with the Approval of the Shareholders' General Meeting of the Company on September 29, 2022)

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ARTICLES OF ASSOCIATION OF
Aluminum Corporation of China Limited

CHAPTER 1 General Provisions

Article 1. To safeguard the legitimate rights and interests of Aluminum Corporation of China Limited* (the "**Company**"), its shareholders and creditors, and to regulate the organization and activities of the Company, the Company formulated the Articles of Association in accordance with laws and regulations such as the Company Law of the People's Republic of China (the "**Company Law**"), the Securities Law of the People's Republic of China (the "**Securities Law**"), the Constitution of the Communist Party of China (the "**Party Constitution**"), the Special Regulations of the State Council on the Overseas Offer and Listing of Shares by Joint Stock Limited Companies (the "**Special Regulations**"), the Mandatory Provisions for Articles of Association of Companies to be Listed Overseas, the Guidelines on Articles of Association of Listed Companies, the Code of Corporate Governance for Listed Companies in China, the rules governing the listing of shares or securities on the stock exchanges on which the Company's Shares are listed (including the Shanghai Stock Exchange, The Stock Exchange of Hong Kong Limited and the New York Stock Exchange) (the "**Relevant Listing Rules**").

Article 2. The Company is a joint stock limited company established in accordance with the Company Law, the Special Regulations, other relevant State laws and administrative regulations.

Following approval by the State Economic and Trade Commission by virtue of the GJMQG [2001] No. 818, the Company was registered with the State Administration for Industry and Commerce (the "**SAIC**") on September 10, 2001, and obtained a business license of an enterprise with legal personality. The Company's unified social credit code is 911100007109288314.

The Company's sponsors include Aluminum Corporation of China, Guangxi Investment Group Co., Ltd., Guizhou Materials Development and Investment Co., Ltd.

Article 3. The Company's registered name:
Full name in Chinese: 中國鋁業股份有限公司
Abbreviated name in Chinese: " 中國鋁業 "
Full name in English: Aluminum Corporation of China Limited Abbreviated name in English: Chalco

Article 4. The Company's domicile: No. 62, North Xizhimen Street, Beijing, China
Postal code: 100082
Tel: (010) 82298322
Fax: (010) 82298158

Article 5. The legal representative of the Company shall be the chairman of its Board of Directors.

Article 6. The Company is a joint stock limited company existing in perpetuity.

Each shareholder shall enjoy rights and assume liabilities to the extent of his shareholding in the Company. The Company shall assume liabilities for its debt to the extent of its entire assets.

The Company is an independent legal person, which shall be governed and protected by China laws, administrative rules and other regulations issued by the Government.

Article 7. These Articles of Association shall enter into effect if they are adopted by the special resolutions at the Shareholders' General Meeting of the Company.

Article 8. These Articles of Association shall become a legally binding document that regulates the organization and acts of the Company and the rights and obligations between the Company and the shareholders and between shareholders inter se from the date on which they become effective.

Article 9. These Articles of Association shall be binding upon the Company and its shareholders, directors, supervisors, President and other senior management staff. All the above persons may make claims related to Company matters in accordance with these Articles of Association.

Subject to CHAPTER 23 of these Articles of Association, shareholders may sue the Company; the Company may sue shareholders, directors, supervisors, the President and other senior management staff; shareholders may sue shareholders; and shareholders may sue directors, supervisors, the President and other senior management staff of the Company in accordance with these Articles of Association.

For the purposes of the preceding paragraph, the term “sue” shall include the institution of proceedings in a court or the application to an arbitration institution for arbitration.

Article 10. The Company may invest in other enterprises. However, except as otherwise provided by laws, the Company shall not become an investor that is jointly and severally liable for the debt of the invested enterprises.

The Company shall not be an unlimited liability shareholder of any other for-profit organizations.

Article 11. Under the premise of obeying the laws and administrative regulations of China, the Company has the right of financing or borrowing. The right of financing of the Company includes (but is not limited to) the right to issue the corporate bonds, to mortgage or pledge the right of ownership.

CHAPTER 2 Purpose and Scope of Business

Article 12. In accordance with the relevant regulations of the Party Constitution and the Company Law, organizations of the Communist Party of China (hereinafter the "**Party**") shall be established; the Party Committee shall play the leadership role, providing direction, managing the overall situation and promoting implementation. The working organs of the Party shall be established, equipped with sufficient staff to deal with Party affairs and provided with sufficient funds to operate the Party organization.

Article 13. The business purpose of the Company is: to maximize the shareholders' interests, implement law-based governance of the Company, establish the management system and operational mechanism that are in line with international standards, strengthen the professional management, improve the efficiency and effectiveness; improve the technological content of products guided by the market and via product upgrades and technical innovations, continue reducing the costs, expanding the market share, thus, to improve the Company's overall competitiveness.

Article 14. The business scope of the Company shall be in accordance with the items approved by the agency with which the Company is registered.

The business scope of the Company shall include: the exploration and mining of bauxite and other metals, limestone and coal; the production and sale of aluminum, magnesium and other metal products, smelted products and processed products; the production and sales of coal; the production and sales of carbon products and related non-ferrous metal products, water, electricity and steam, industrial oxygen and nitrogen; the production, sales, loading, unloading and transportation services of autoclaved fly ash bricks; the production and sales of sulfuric acid (or the hazardous chemicals); electricity generation and sales; research and development, production and sales of products from comprehensive utilization of mine tailings (including red mud); prospective design, construction and installation; the manufacturing, installation and maintenance of machinery and equipment, spare parts, non-standard equipment; the repairing of automotive and construction machinery; the manufacture and sales of automobile of special process; the road transport of cargo; the installation, maintenance, inspection and sales of telecommunications communication and testing instruments; automat measurement control, the design, installation and testing of network and software system; the material inspection and analysis; operation of office automation and instruments; relevant technological development and technical services.

Article 15. The Company may, based on business development demand, establish wholly owned subsidiaries and holding companies, branches, offices and other branches.

Subject to the approval by relevant government agencies, the Company may adjust its form and scope of business timely, and may establish branches (no matter whether or not it is wholly owned) and offices inside and outside the People's Republic of China as well as in Hong Kong, Macao or Taiwan according to the business development demand.

CHAPTER 3 Shares and Registered Capital

Article 16. The Company shall have ordinary shares at all times. The ordinary shares issued by the Company include domestic shares and foreign shares. It may have other kinds of shares according to the need, upon approval by the authorities that are authorized by the State Council to examine and approve companies.

Article 17. All the shares issued by the Company shall have a par value which shall be RMB1 Yuan for each share.

For the purposes of the above paragraph, the term "RMB" shall refer to the legal tender of the People's Republic of China.

Article 18. The Company may issue shares to domestic investors and foreign investors following approval from the State Council authorities in charge of securities.

For the purposes of the preceding paragraph, the term "foreign investors" shall mean investors from foreign countries or from the Hong Kong Special Administrative Region, the Macao Special Administrative Region or Taiwan that subscribe for shares issued by the Company; and the term "domestic investors" shall mean investors inside the PRC, excluding the above-mentioned regions, that subscribe for shares issued by the Company.

Article 19. Shares issued by the Company to domestic investors and to be subscribed for in Renminbi shall be referred to as "domestic investment shares". Shares issued by the Company to foreign investors and to be subscribed in a foreign currency shall be referred to as "foreign investment shares". Foreign investment shares listed outside the People's Republic of China shall be referred to as "foreign investment shares listed outside the People's Republic of China". Both holders of domestic investment shares and overseas listed foreign investment shares are holders of common shares and shall enjoy identical rights and bear identical obligations.

For the purposes of the preceding paragraph, the term "foreign currency" means the legal tender, other than the Renminbi, of another country or region that can be used to pay subscription moneys to the Company and which is recognized by the competent state foreign exchange control authority.

The domestic investment shares issued by the Company shall be centrally deposited with Shanghai Branch of China Securities Depository and Clearing Corporation Limited; the overseas listed foreign investment shares issued by the Company shall be centrally deposited with Hong Kong Securities Clearing Company Limited.

Article 20. Foreign investment shares issued by the Company and listed in Hong Kong shall be referred to as "H shares". H shares shall refer to the shares which have been approved to be listed on the Stock Exchange of Hong Kong Limited (the "**Stock Exchange**"), the par value of which is denominated in Renminbi, and which are subscribed for and traded in Hong Kong dollars.

Article 21. Upon approval by the authority that is authorized by the State Council to approve companies, the Company can issue 11.45 billion shares of ordinary shares; the Company issued a total 8 billion common shares (domestic shares) to its sponsors at the time of its establishment. Upon the approval of the State Council and the national authorities in charge of securities, one of the sponsors, Aluminum Corporation of China has transferred part of shares to China Cinda Asset Management Corporation, China Orient Asset Management Corporation and China Development Bank, in which, 1,662.28 million shares are transferred to China Cinda Asset Management Corporation; 621.67 million shares are transferred to China Orient Asset Management Corporation; 572.84 million shares are transferred to China Development Bank. The investment made by the sponsors at the time of the establishment of the Company is as follows:

Sponsor's name	**Number of shares**	**Investment Type**	**Investment Time**
Aluminum Corporation of China	7,673,770,000	Net assets	June 28, 2001
Guangxi Investment Group Co., Ltd.	196,800,000	Net assets	June 28, 2001
Guizhou Materials Development and Investment Co., Ltd.	129,430,000	Net assets	June 28, 2001
Total	8,000,000,000		

Article 22. The Company publicly issued 2,749,889,968 shares of overseas listed foreign investment shares (H shares) after the establishment of the Company, in which, there are 2,499,900,153 shares of new shares and 249,989,815 shares of stock shares sold by part of shareholders.

After completion of the aforementioned issues of H shares, the Company has total share capital of 10,499,900,153 shares. The composition of the share capital is as follows: there are 7,750,010,185 domestic shares, accounting for 73.81 percent of the Company's total shares, in which, the sponsor, Aluminum Corporation of China holds 4,656,261,060 shares, accounting for 44.35 percent of the Company's total shares; the sponsor, Guangxi Investment Group Co., Ltd. holds 196,800,000 shares, accounting for 1.87 percent of the Company's total shares; the sponsor, Guizhou Materials Development and Investment Co., Ltd. holds 129,430,000 shares, accounting for 1.23 percent of the Company's total shares; China Cinda Asset Management Corporation holds 1,610,332,210 shares, accounting for 15.43 percent of the Company's total shares; China Orient Asset Management Corporation holds 602,246,135 shares, accounting for 5.73 percent of the Company's total shares; China Development Bank holds 554,940,780 shares, accounting for 5.29 percent of the Company's total shares; the holders of the overseas listed foreign investment shares (H shares) hold 2,749,889,968 shares, accounting for 26.19 percent of the Company's total shares.

Following approval by the approval authority authorized by the State Council, the Company issued additional 549,976,000 shares of overseas listed foreign investment shares (H shares) in 2004.

After completion of the aforementioned issues of H shares, the Company has total share capital of 11,049,876,153 shares. The composition of the share capital is as follows: there are 7,750,010,185 domestic shares, accounting for 70.13 percent of the Company's total shares, in which, the sponsor, Aluminum Corporation of China holds 4,656,261,060 shares, accounting for 42.14 percent of the Company's total shares; the sponsor, Guangxi Investment Group Co., Ltd. holds 196,800,000 shares, accounting for 1.78 percent of the Company's total shares; the sponsor, Guizhou Materials Development and Investment Co., Ltd. holds 129,430,000 shares, accounting for 1.17 percent of the Company's total shares; China Cinda Asset Management Corporation holds 1,610,332,210 shares, accounting for 14.57 percent of the Company's total shares; China Orient Asset Management Corporation holds 602,246,135 shares, accounting for 5.45 percent of the Company's total shares; China Development Bank holds 554,940,780 shares, accounting for 5.02 percent of the Company's total shares; the holders of the overseas listed foreign investment shares (H shares) hold 3,299,865,968 shares, accounting for 29.87 percent of the Company's total shares.

Following the approval of the State Council, China Construction Bank Corporation has recovered the Company's 6.42 percent shares managed by China Cinda Asset Management Corporation and held the shares by itself in 2005, thus becoming the Company's shareholder. The Company's total number of shares has not been changed, but the number of shares held by China Cinda Asset Management Corporation is reduced accordingly.

After completion of the aforementioned shareholder change, the Company has total share capital of 11,049,876,153 shares. The composition of the share capital is as follows: there are 7,750,010,185 domestic shares, accounting for 70.13 percent of the Company's total shares, in which, the sponsor, Aluminum Corporation of China holds 4,656,261,060 shares, accounting for 42.14 percent of the Company's total shares; the sponsor, Guangxi Investment Group Co., Ltd. holds 196,800,000 shares, accounting for 1.78 percent of the Company's total shares; the sponsor, Guizhou Materials Development and Investment Co., Ltd. holds 129,430,000 shares, accounting for 1.17 percent of the Company's total shares; China Cinda Asset Management Corporation holds 900,559,074 shares, accounting for 8.15 percent of the Company's total shares; China Construction Bank Corporation holds 709,773,136 shares, accounting for 6.42 percent of the Company's total shares; China Orient Asset Management Corporation holds 602,246,135 shares, accounting for 5.45 percent of the Company's total shares; China Development Bank holds 554,940,780 shares, accounting for 5.02 percent of the Company's total shares; the holders of the overseas listed foreign investment shares (H shares) hold 3,299,865,968 shares, accounting for 29.87 percent of the Company's total shares.

Following approval by the approval authority authorized by the State Council, the Company issued additional 644,100,000 shares of overseas listed foreign investment shares (H shares) in 2006, in which, there are 600,000,000 shares of new shares and 44,100,000 shares of stock shares sold by part of shareholders.

After completion of the aforementioned issues of H shares, the Company has total share capital of 11,649,876,153 shares. The composition of the share capital is as follows: there are 7,705,910,185 domestic shares, accounting for 66.15 percent of the Company's total shares, in which, the sponsor, Aluminum Corporation of China holds 4,612,161,060 shares, accounting for 39.59 percent of the Company's total shares; the sponsor, Guangxi Investment Group Co., Ltd. holds 196,800,000 shares, accounting for 1.69 percent of the Company's total shares; the sponsor, Guizhou Materials Development and Investment Co., Ltd. holds 129,430,000 shares, accounting for 1.11 percent of the Company's total shares; China Cinda Asset Management Corporation holds 900,559,074 shares, accounting for 7.73 percent of the Company's total shares; China Construction Bank Corporation holds 709,773,136 shares, accounting for 6.09 percent of the Company's total shares; China Orient Asset Management Corporation holds 602,246,135 shares, accounting for 5.17 percent of the Company's total shares; China Development Bank holds 554,940,780 shares, accounting for 4.76 percent of the Company's total shares; the holders of the overseas listed foreign investment shares (H shares) hold 3,943,965,968 shares, accounting for 33.85 percent of the Company's total shares.

Following the approval of the special resolution by the Shareholders' General Meeting of the Company and following the approval by the approval authority authorized by the State Council, the Company issued 1,236,731,739 A shares and 637,880,000 shares in 2007.

Upon the issuance, the composition of the Company's share capital is as follows: there are 13,524,487,892 ordinary shares, in which, the holders of A shares hold 9,580,521,924 shares, accounting for 70.84 percent of the Company's total ordinary shares; the holders of overseas listed foreign investment shares hold 3,943,965,968 shares, accounting for 29.16 percent of the Company's total ordinary shares.

Following the approval of the special resolution by the Shareholders' General Meeting of the Company and following the approval by the approval authority authorized by the State Council, the Company issued additional 1,379,310,344 A shares by way of non-public issuance in June 2015.

Upon the completion of the additional issuance, the composition of the Company's current share capital is as follows: there are 14,903,798,236 ordinary shares, in which, the holders of A shares hold 10,959,832,268 shares, accounting for 73.54 percent of the Company's total ordinary shares; the holders of overseas listed foreign investment shares hold 3,943,965,968 shares, accounting for 26.46 percent of the Company's total ordinary shares.

Upon approval at a Shareholders' General Meeting of the Company and by the relevant authorities of the State Council, the Company completed the registration formalities for the additional shares regarding the acquisition of assets by issuance of shares in February 2019. Following such issuance, the composition of the share capital of the Company is as follows: there are 17,022,672,951 ordinary shares, in which 13,078,706,983 shares are held by holders of A shares and 3,943,965,968 shares are held by holders of overseas listed foreign investment shares, accounting for 76.83% and 23.17% of the Company's total issued ordinary shares, respectively.

With the approval of the Shareholders' General Meeting of the Company and the approval of the relevant department of the State Council, the Company completed the registration procedures for new shares under the 2021 Restricted Share Incentive Scheme in June 2022. Upon completion of the additional new shares, the share capital structure of the Company is as follows: 17,134,943,251 ordinary shares, of which 13,190,977,283 shares are held by holders of A shares, representing 76.98% of the total issued ordinary shares of the Company; and 3,943,965,968 shares are held by holders of overseas listed foreign shares, representing 23.02% of the total issued ordinary shares of the Company.

Article 23. After the Company's plan for the offering of domestic investment shares and overseas listed foreign investment shares has been approved by the CSRC, the Board of Directors of the Company may arrange for implementation of such plan by means of separate issues.

The Company's plans for the offerings of domestic investment shares and overseas listed foreign investment shares in accordance with the preceding paragraph may be implemented separately within the validity period of approval from the date of approval by the China Securities Regulatory Commission (the "**CSRC**").

Article 24. If the Company offers domestic investment shares and overseas listed foreign investment shares separately within the total number of shares specified in the offer plan, each such offering shall be fully subscribed for in one time. If special circumstances make it impossible for each such offering to be fully subscribed for in one time, the shares may be offered in installments, subject to the approval of the CSRC.

Article 25. The registered capital of the Company is RMB17,134,943,251.

Article 26. The Company may approve capital increases depending on its business and development requirements in accordance with the relevant provisions of the Articles of Association of the Company.

The Company may increase its capital by the following methods:

(1) raising of new shares from non-specific investors;

(2) placing of new shares to existing shareholders;

(3) allotment of new shares to existing shareholders;

(4) conversion of funds in the capital common reserve to share capital;

(5) other methods permitted by laws and administrative regulations.

If the Company is to increase its capital by an offering of new shares, it shall do so by the procedure provided for in relevant state laws after such increase has been approved in accordance with these Articles of Association.

Article 27. Except as otherwise provided by laws and administrative regulations, shares in the Company may be transferred freely with no lien attached.

CHAPTER 4 Reduction of Capital and Buyback of Shares

Article 28. In accordance with the provisions of the Articles of Association, the Company may reduce its registered capital.

Article 29. If the Company is to reduce its capital, it must prepare a balance sheet and a list of its property.

The Company shall notify its creditors within 10 days from the date of adoption of the resolution to reduce its registered capital and publish a public announcement of the resolution in newspapers within 30 days. Creditors shall, within 30 days of receiving written notice, or within 45 days of the date of the public announcement for those who have not received written notice, be entitled to require the Company to pay its debts in full or to provide a corresponding security for repayment.

The reduced registered capital of the Company may not be less than the statutory minimum.

Article 30. The Company shall not repurchase its own shares other than under any of the following circumstances:

(1) reduction of its registered capital;

(2) merger with another company holding shares of the Company;

(3) use of shares for employee shareholding scheme or as equity incentive;

(4) a shareholder opposes a resolution on the merger or division of the Company adopted at a Shareholders' General Meeting and requests that the Company purchase his or her shares;

(5) use of shares for conversion of corporate bonds which are convertible into shares issued by the Company;

(6) where it is necessary to safeguard the value of the Company and the rights and interests of its shareholders;

(7) other circumstances required in laws or administrative regulations.

If the Company buys back its own outstanding shares, it shall do by the provisions set forth from Article 31 to Article 34 of these Articles of Association.

Article 31. After the Company is approved by relevant State authorities to buy back its own shares, it may proceed in any of the following manners:

(1) issuance to all of the shareholders of a buyback offer on a pro rata basis;

(2) buyback through open transactions on a stock exchange;

(3) buyback by agreement outside a stock exchange;

(4) other manners as permitted by laws and administrative regulations or the State Council's authorities in charge of securities.

Buyback of shares of the Company under the circumstances set forth in items (3), (5) and (6) of the Article 30 shall be conducted through open centralized transaction.

Article 32. If the Company is to buy back shares by agreement outside a stock exchange, prior approval shall be obtained from the Shareholders' General Meeting in accordance with these Articles of Association. Upon prior approval by the Shareholders' General Meeting obtained in the same manner, the Company may terminate or vary a contract concluded in the manner set forth above or waive any of its rights under such contract.

For the purposes of the preceding paragraph, "contracts for the buyback of shares" shall include (but not be limited to) agreements whereby buyback obligations are undertaken and buyback rights are acquired.

The Company may not transfer a contract for the buyback of its own shares or any of its rights thereunder.

Article 33. Buyback of shares of the Company under the circumstances set forth in items (1), (2) and (3) of the Article 30 shall be resolved at the Shareholders' General Meeting. Buyback of shares of the Company under the circumstances set forth in items (5) and (6) of the Article 30 shall be subject to approval by more than two-thirds of Directors present at the meeting of the board of directors.

The shares bought back by the Company under the circumstances set forth in item (1) of the Article 30 shall be cancelled within ten days after the date of buyback; under the circumstances set forth in items (2) and (4), the shares shall be transferred or cancelled within six months after the date of buyback; under the circumstances set forth in items (3), (5) and (6), the aggregated number of shares of the Company held by itself shall be not more than 10% of the total issued shares of the Company and shall be transferred or cancelled within three years after the date of buyback.

The amount of the Company's registered capital shall be reduced by the total par value of the shares canceled.

Article 34. Unless the Company has already entered the liquidation stage, it must comply with the following provisions in buying back its outstanding shares:

(1) if the Company buys back shares at their par value, the amount thereof shall be deducted from the book balance of distributable profit and/or from the proceeds of a fresh share offer made to buy back the old shares;

(2) if the Company buys back shares at a price higher than their par value, the portion corresponding to their par value shall be deducted from the book balance of the Company's distributable profit and/or from the proceeds of a fresh share offer made to buy back the old shares; and the portion in excess of the par value shall be handled according to the following methods:

(i) if the shares being bought back were issued at their par value, the amount shall be deducted from the book balance of the Company's distributable profit;

(ii) if the shares being bought back were issued at a price higher than their par value, the amount shall be deducted from the book balance of distributable profit and/or the proceeds of a fresh share offer made to repurchase the old shares; however, the amount deducted from the proceeds of the fresh share offer may not exceed the total premium obtained at the time of issuance of the old shares nor may it exceed the amount in the Company's premium account (or capital common reserve account) (including the premiums from the fresh share offer) at the time of the buyback;

(3) the sums paid by the Company for the purposes set forth below shall be paid out of the Company's distributable profit:

(i) acquisition of the right to buy back its own shares;

(ii) amendment of any contract for the buyback of its own shares;

(iii) release from any of its obligations under a buyback contract.

(4) after the par value of the cancelled shares has been deducted from the registered capital of the Company in accordance with relevant regulations, that portion of the amount deducted from the distributable profit and used to buy back shares which corresponds to the par value of the shares bought back shall be credited to the Company's capital common reserve account.

CHAPTER 5 Financial Assistance for the Purchase of Company Shares

Article 35. Neither the Company nor its subsidiaries shall at any time provide any financial assistance in any form to purchasers or prospective purchasers of shares of the Company. Purchasers of shares of the Company as referred to above shall include persons that directly or indirectly assume obligations as a result of purchasing shares of the Company.

Neither the Company nor its subsidiaries shall at any time provide any financial assistance in any form to the above obligors in order to reduce or release them from their obligations.

The provisions of this Article shall not apply to the circumstances described in Article 37 of this Chapter.

Article 36. For the purposes of this Chapter, the term "financial assistance" shall include (but not be limited to) financial assistance in the forms set forth below:

(1) gift;

(2) security (including the undertaking of liability or provision of property by the guarantor in order to secure the performance of the obligation by the obligor), indemnity (not including, however, indemnity arising from the Company's own fault), release or waiver of rights;

(3) provision of a loan or conclusion of a contract under which the obligations of the Company are to be fulfilled before the obligations of the other party to the contract, or the amendment of, or the transfer of rights under, such loan or contract;

(4) financial assistance in any other form if the Company is insolvent or has no net assets or if such assistance would lead to a major reduction in the Company's net assets.

For the purposes of this Chapter, the term "assume obligations" shall include the assumption of an obligation by the obligor by reason of concluding a contract or making an arrangement (whether or not such contract or arrangement is enforceable, and whether or not such obligation is undertaken by the obligor individually or jointly with any other person) or by changing its financial position in any other way.

Article 37. The acts listed below shall not be regarded as acts prohibited under Article 35 of these Articles of Association:

(1) where the Company provides the relevant financial assistance genuinely for the benefit of the Company and the main purpose of the financial assistance is not the purchase of shares of the Company, or the financial assistance is an incidental part of some overall plan of the Company;

(2) lawful distribution of the Company's property in the form of dividends;

(3) distribution of dividends in the form of shares;

(4) reduction of registered capital, buyback of shares, adjustment of the equity structure, etc. in accordance with these Articles of Association;

(5) provision of a loan by the Company within its scope of business and in the ordinary course of its business (provided that the same does not lead to a reduction in the net assets of the Company, unless the financial assistance was paid out of the Company's distributable profit).

CHAPTER 6 Share Certificates and Register of Shareholders

Article 38. The Company's shares shall be registered shares.

The Company's share certificates shall clearly state the following main particulars:

(1) the Company's name;

(2) the date of incorporation of the Company;

(3) the class of shares, par value and the number of shares represented thereby;

(4) the serial number of the share certificate;

(5) other matters as required by the Company Law, Special Provisions and the securities exchange(s) on which the shares of the Company are listed.

Article 39. Shares of the Company may be transferred, gifted, succeeded to and mortgaged in accordance with relevant laws, administrative regulations and these Articles of Association.

When shares are transferred and assigned, registration shall be carried out with the share registrar appointed by the Company.

Article 40. The share certificates shall be signed by the legal representative of the Company. If the signatures of other senior management staff of the Company are required by the stock exchange on which Company shares are listed, the share certificates shall also be signed by such other senior management staff. The share certificates shall become effective after the Company's seal (including the corporation securities' seal) is affixed thereto or printed thereon. The affixing of the Company's seal (including the corporation securities' seal) on the share certificates shall require the authorization of the Board of Directors. The signature of the Chairman of the Board of Directors or of other relevant senior management staff on the share certificates may also be in printed form.

Article 41. The Company shall not accept its own share certificates as the subject matter of a pledge.

Article 42. Shares held by the promoters in the Company shall be transferred in accordance with the provisions of laws, regulations and/or the listing rules.

The directors, supervisors, the President and other senior management staff of the Company shall report to the Company the shares (including preferred shares) of the Company that they hold and the changes in their shareholdings. Such shares shall be transferred in accordance with the provisions in laws, regulations and/or the listing rules.

Article 43. If a director, supervisor, the President or other senior management staff of the Company, or a holder of at least 5 percent of the shares of the Company, sells the shares of the Company that he or she holds within six months after acquiring the same, or buys such shares back within six months after selling the same, the gains obtained therefrom shall belong to the Company and the Board of Directors of the Company shall recover such gains from him or her. However, a securities company that underwrote shares on a firm commitment basis and which, after purchasing the shares remaining after the sale, holds at least 5 percent of the shares shall not be subject to the six-month time limit when selling such shares.

Directors, supervisors, President and other senior management of the Company shall report to the Company their shareholdings in the Company and changes thereof, and shall not transfer more than 25% of the total number of shares of the Company they hold each year during their terms of office; they shall not transfer the shares of the Company they hold within half a year after they leave their positions; if they leave their positions before the expiration of their terms of office, they shall not transfer more than 25% of the total number of shares of the Company they hold each year before the expiration of their original terms of office and within six months after the expiration of their original terms of office.

The shares held by directors, supervisors, President and other senior management and natural person shareholders referred to in the preceding paragraph include the shares held by their spouses, parents and children and held in others' accounts.

If the Board of Directors of the Company fails to act in accordance with the preceding paragraph, shareholders shall have the right to demand that the Board of Directors act within 30 days. If the Board of Directors of the Company fails to act within such time period, shareholders shall have the right, in the interests of the Company, to directly institute a legal action in a court in their own name.

If the Board of Directors of the Company fails to act in accordance with the first paragraph, the responsible directors shall be jointly and severally liable in accordance with the laws.

Article 44. The Company shall keep a register of shareholders, in which the following particulars shall be recorded:

(1) the name, address (domicile), profession or nature of each shareholder;

(2) the class and quantity of shares held by each shareholder;

(3) the amount paid or payable for the shares held by each shareholder;

(4) the serial numbers of the shares held by each shareholder;

(5) the date on which each shareholder is registered as such;

(6) the date on which each shareholder ceases to be a shareholder.

The register of shareholders shall be sufficient evidence of the holding of Company shares by a shareholder, unless there is evidence to the contrary.

Article 45. The Company may, pursuant to an understanding or agreement reached between the CSRC and the foreign securities regulator, keep its register of holders of overseas listed foreign investment shares outside the PRC, and appoint an overseas agent to administer the same. The original register of shareholders of holders of H shares shall be maintained in Hong Kong.

The Company shall keep at its domicile a duplicate of the register of holders of overseas listed foreign investment shares. The appointed overseas agent shall ensure that the register of holders of overseas listed foreign investment shares and its duplicate are consistent at all times.

If the original and duplicate of the register of holders of overseas listed foreign investment shares and its duplicate are inconsistent, the original shall prevail.

Article 46. The Company shall keep a complete register of shareholders. The register of shareholders shall include the following parts:

(1) a register kept at the Company's domicile other than those provided for under items (2) and (3) of this paragraph;

(2) the register of holders of overseas listed foreign investment shares kept in the place of the overseas stock exchange on which the shares are listed;

(3) registers of shareholders kept in such other places as the Board of Directors may decide necessary for listing of the Company's shares.

Article 47. The various parts of the register of shareholders shall not overlap. The transfer of shares registered in a certain part of the register of shareholders shall not, during the continuance of the registration of such shares, be registered in any other part of the register.

All overseas listed foreign investment shares listed in Hong Kong for which the share capital has been paid in full may be transferred freely in accordance with the Articles of Association. The Board of Directors may refuse to recognize any instrument of transfer without giving any reason unless such transfer is carried out in compliance with the following conditions:

(1) payment of HK$2.50 per instrument of transfer or higher charge as agreed at such time by the SEHK has been made to the Company for the purpose of registering the instrument of transfer and other documents relating to or which may affect the title to the shares;

(2) the instrument of transfer only involves overseas listed foreign investment shares listed in Hong Kong;

(3) the stamp duty payable on the instrument of transfer as required by Hong Kong laws has been paid;

(4) relevant share certificates and evidence that the transferor has the right to transfer such shares as reasonably required by the Board of Directors have been provided;

(5) if the shares are to be transferred to joint holders, the number of registered joint holders may not exceed four; and

(6) the relevant shares are not encumbered by any Company lien.

All transfers of overseas listed foreign investment shares shall be effective with a written instrument of transfer in general or ordinary form or such other form as acceptable to the Board of Directors. And the instrument of transfer shall become effective after being manually signed or the Company seal (if the transferor or the transferee is a company) is affixed thereto or printed thereon. If the transferor or transferee of the Company's shares is a recognized clearing house or an agent thereof, the signature on the written instrument of transfer may be manually signed or mechanically printed. All instruments of transfer must be kept at the legal address of the Company or other place as may be designated by the Board of Directors from time to time.

Changes to and corrections of each part of the register of shareholders shall be carried out in accordance with the laws of its situs.

Article 48. Where laws, regulations, departmental rules, regulatory documents and securities regulatory authorities of the place where the Company's shares are listed stipulate on the period of closure of the register of members prior to a Shareholders' General Meeting or the record date set by the Company for the purpose of distribution of dividends, such provisions shall prevail.

The register of holders of overseas listed foreign shares listed in Hong Kong shall not be closed for more than 30 days in total within one year, but may be extended for a further period of up to 30 days upon approval by the Shareholders' General Meeting. If the Company receives an application for inspection of the register of members during the aforesaid period of closure of the register of members, it shall, at the request of the applicant, issue a certificate signed by the company secretary, specifying the approval authority and the period for closure of the register of members.

Article 49. When the Company is to convene a Shareholders' General Meeting, to distribute dividends, to be liquidated or to carry out other acts requiring confirmation of equity interests, the Board of Directors or the convener of the Shareholders' General Meeting shall decide upon a date as the record date. Shareholders whose names appear on the register at closing on the record date shall be the shareholders entitled to the relevant rights and interests.

Article 50. Any person that challenges the register of shareholders and requests that his or her name be entered into or removed from the register may apply to the competent court for rectification of the register.

Article 51. Any shareholder who is registered in the register of shareholders or any person who requests that his or her name be entered into the register of shareholders may, if his or her share certificate (the "**original share certificate**") is lost, apply to the Company for issuance of a replacement certificate in respect of such shares (the "**relevant shares**").

Applications for the replacement of share certificates from holders of domestic investment shares who have had their certificates stolen or damaged, or who have lost the same shall be handled in accordance with Article 143 of the Company Law.

Applications for the replacement of share certificates from holders of overseas listed foreign investment shares who have had their certificates stolen or damaged, or who have lost the same may be handled in accordance with the laws, stock exchange rules or other relevant regulations of the place where the original of the register of holders of overseas listed foreign investment shares is kept.

Applications for the replacement of share certificates from holders of H shares shall comply with the following requirements:

(1) the applicant shall submit the application in the standard form prescribed by the Company accompanied by a notarial certificate or statutory declaration. The notarial certificate or statutory declaration shall include the applicant's reason for the application, the circumstances and evidence of the loss of the share certificate and a declaration that no other person may request registration as a shareholder in respect of the relevant shares.

(2) the Company shall not have received any declaration requesting registration as a shareholder in respect of the shares from any person other than the applicant before it decides to issue a replacement share certificate.

(3) if the Company decides to issue a replacement share certificate to the applicant, it shall publish a public announcement of its intention to do so in the newspapers or periodicals designated by the Board of Directors; the period of the public announcement shall be 90 days, during which its publication shall be repeated at least once every 30 days.

(4) before publishing the public announcement of its intention to issue a replacement share certificate, the Company shall submit a copy of the announcement to be published to the stock exchange where it is listed and may proceed with publication after having received a reply from the stock exchange confirming that the announcement has been displayed in the stock exchange; the announcement shall be displayed in the stock exchange for a period of 90 days;

if the application for issuance of a replacement share certificate was made without the consent of the registered holder of the relevant shares, the Company shall mail to such shareholder a photocopy of the public announcement that it intends to publish.

(5) if, at the expiration of the 90-day periods provided for in items (3) and (4) hereof, the Company has not received any objection to the issuance of a replacement share certificate from any person, it may issue a replacement share certificate in accordance with the application of the applicant.

(6) when the Company issues a replacement share certificate under this Article, it shall immediately cancel the original share certificate and record such cancellation and the issuance of the replacement share certificate in the register of shareholders.

(7) all expenses of the Company for the cancellation of the original share certificate and the issuance of a replacement share certificate shall be borne by the applicant. The Company shall be entitled to refuse to take any action until the applicant has provided reasonable security.

Article 52. After the Company has issued a replacement share certificate in accordance with these Articles of Association, it may not delete from the register of shareholders the name of a bona fide purchaser of the replacement share certificate mentioned above or of a shareholder that is subsequently registered as the owner of the shares (provided that he or she is a bona fide purchaser).

Article 53. The Company shall not be held liable for damages in respect of any damage suffered by any person from the cancellation of the original share certificate or the issuance of the replacement share certificate, unless the claimant can prove fraud on the part of the Company.

CHAPTER 7 Equity Interests and Obligations of the Shareholders

Article 54. The Company's shareholders are persons that lawfully hold shares of the Company and whose names are entered in the register of shareholders.

Shareholders shall enjoy rights and bear obligations according to the class and quantity of shares held by them. Holders of shares of the same class shall enjoy equal rights and bear equal obligations.

For the joint shareholders, if one of the joint shareholders has passed away, the surviving shareholders shall be deemed by the Company to have the ownership of the related shares, but the Board of Directors is entitled to ask for the provision of the suitable death certificate for the purpose of revision of the register of shareholders. For the joint shareholders of any classes of shares, only the first named shareholder in the register of shareholders has the right to receive the share certificates of the related shares, receive the notice of the Company, attend the Shareholders' General Meeting and exercise his or her voting right; while, any notice delivered to the said shareholder shall be deemed as the notice has been delivered to all of the joint shareholders of the related shares.

Article 55. Holders of ordinary shares of the Company shall enjoy the following rights:

(1) collect dividends and other profit distributions on the basis of the number of shares held by them;

(2) demand, convene, preside over, participate or appoint their proxies to participate in Shareholders' General Meeting in accordance with laws, and exercise voting rights pursuant to their shareholdings;

(3) supervise and control the Company's business activities, and raise suggestions or inquiries;

(4) transfer, donate, or pledge shares in accordance with laws, administrative regulations and the Company's Articles of Association;

(5) obtain relevant information in accordance with the Articles of Association of the Company, which shall include:

i. obtaining the Articles of Association of the Company after payment of a charge to cover costs;

ii. being entitled to browse and make a copy after payment of reasonable charges, including:

(i) all parts of the register of shareholders;

(ii) personal information on the directors, supervisors, President and other senior management staff of the Company, including:

(a) current and previous names and aliases;

(b) main addresses (domiciles);

(c) nationalities;

(d) full-time and other part-time occupations and duties;

(e) identification documents and their numbers.

(iii) the status of the Company' share capital;

(iv) reports of the aggregate par value, number of shares, and highest and lowest prices of each category of shares bought back by the Company since the last fiscal year as well as all the expenses paid by the Company therefore;

(v) meeting minutes of the Shareholders' General Meeting, resolution of the meeting of the Board of Directors, and resolution of the meeting of the Board of Supervisors;

(vi) stub copy of corporate bond and financial reports.

(6) participate in the distribution of the surplus assets of the Company according to their shareholding when the Company is terminated or liquidated;

(7) with respect to any shareholder, who objects to the resolution of the Shareholders' General Meeting on the merger or division of the Company, requires the Company to buy back his or her shares;

(8) institute a legal action in a People's Court and claim relevant rights, in accordance with the Company Law, other laws, administrative rules and regulations or the Articles of Association, against the acts that damage the Company's interests or infringe the legitimate rights of the shareholders;

(9) other rights conferred by laws, administrative rules and regulations and the Company's Articles of Association.

Article 56. Holders of common shares of the Company bear the following obligations:

(1) to comply with the Articles of Association of the Company;

(2) to pay subscription moneys according to the shares subscribed for by them and the method of acquiring such shares;

(3) not to return their shares except in circumstances specified in laws and regulations;

(4) not to abuse their shareholders' rights to harm the interests of the Company or those of other shareholders; not to abuse the Company's independent legal person status or shareholders' limited liability to harm the interests of the Company's creditors; if a shareholder abuses his or her shareholder rights, thereby causing the Company or another shareholder to sustain a loss, he or she shall be held liable for damages in accordance with laws; if a shareholder abuses the Company's independent legal person status or shareholders' limited liability to evade a debt, thereby materially harming the interests of a creditor of the Company, he or she shall bear joint and several liability for the debt of the Company;

(5) to submit a written report to the Company on the date when they who have 5% or above of interests in shares carrying voting rights charged their shares;

(6) other obligations imposed by laws, administrative rules and regulations and these Articles of Association.

Shareholders shall not bear any liability for further contributions to share capital other than the conditions agreed to by the subscribers for the shares at the time of subscription.

Article 57. The controlling shareholders and actual controllers of the Company may not take advantage of their connected relationships to harm the interests of the Company, and they shall be held liable for damages if they violate regulations which causes the Company to sustain a loss.

The controlling shareholders and the actual controllers of the Company bear a fiduciary duty toward the Company and retail shareholders. The controlling shareholder shall exercise its rights as an investor in strict accordance with laws. It may not use such means as a profit distribution, asset restructuring, investment in a third party, appropriation of funds, loan security, etc. or use its controlling position to harm the lawful rights and interests of the Company and the retail shareholders.

Article 58. In addition to the obligations imposed by laws, administrative rules and regulations and the listing rules of the stock exchange on which Company shares are listed, the controlling shareholder of the Company may not, in exercising its shareholder powers, make decisions prejudicial to the interests of all or some of the shareholders due to the exercise of its voting rights on the issues set forth below:

(1) relieving a director or supervisor of the responsibility to act honestly in the best interests of the Company;

(2) approving that a director or supervisor (for his or her own or another person's benefit) deprive the Company of its property in any way, including (but not limited to) any opportunities that are advantageous to the Company;

(3) approving that a director or supervisor (for his or her own or another person's benefit) deprive other shareholders of their individual rights or interests, including (but not limited to) rights to distributions and voting rights, but excluding a restructuring of the Company submitted to the Shareholders' General Meeting for adoption in accordance with these Articles of Association.

Article 59. For the purposes of the preceding Article, the term "controlling shareholder" shall refer to a person that satisfies any of the following conditions:

(1) a person who, acting alone or in concert with others, has the power to elect not less than one half of the directors;

(2) a person who, acting alone or in concert with others, has the power to exercise or control 30 percent or more of the Company's voting rights;

(3) a person who, acting alone or in concert with others, holds 30 percent or more of the issued and outstanding shares of the Company;

(4) a person who, acting alone or in concert with others, has de facto control of the Company in any other manner.

CHAPTER 8 Shareholders' General Meeting

Article 60. The Shareholders' General Meeting shall be the organ of authority of the Company and shall exercise its functions and powers in accordance with the laws.

Article 61. The Shareholders' General Meeting shall exercise the following functions and powers:

(1) to decide on the business policies and investment plans of the Company;

(2) to elect and replace directors and decide on matters concerning the remuneration of directors;

(3) to elect and replace the supervisors who are to be appointed from among the shareholders' representatives and decide on matters concerning the remuneration of supervisors;

(4) to consider and approve reports of the Board of Directors;

(5) to consider and approve reports of the Board of Supervisors;

(6) to consider and approve the Company's annual financial budget plans and final accounting plans;

(7) to consider and approve the Company's profit distribution plans and plans for making up losses;

(8) to pass resolutions concerning the increase or reduction of the Company's registered capital;

(9) to pass resolutions on the merger, division, dissolution or liquidation of the Company;

(10) to pass resolutions on the issuance of corporate bonds;

(11) to pass resolutions on the engagement, dismissal or non- renewal of the engagement of accounting firms by the Company;

(12) to amend the Articles of Association of the Company;

(13) to decide on transactions in which the amount of material assets purchased or sold by the Company within one year exceeds 25% of the latest audited total assets of the Company;

(14) to pass resolutions on matters relating to the security for third parties that laws, administrative regulations and the Company's Articles of Association require to be resolved by the Shareholders' General Meeting;

(15) to consider and approve changes in the use of raising funds;

(16) to consider and approve the employee stock ownership plan, stock incentive plan or other share-based compensation (such as allotment or share options, etc.) granted to employees;

(17) other matters that laws, administrative regulations, departmental rules or the Company's Articles of Association require to be resolved by the Shareholders' General Meeting.

The Shareholders' General Meeting may delegate or entrust relevant matters to be handled by the Board of Directors.

Article 62. Any external guarantee matters of the Company shall be passed by through deliberation by the Board of Directors. The following guarantee matters after the deliberation by the Board of Directors shall be submitted to the Shareholders' General Meeting for approval:

(1) any guarantee provided after the total guarantee amount of the Company and its holding subsidiaries exceeds 50 percent of the latest audited net assets;

(2) any guarantee provided for those whose asset to liability ratio exceeds 70 percent;

(3) any guarantee with a single amount guaranteed exceeding 10 percent of the latest audited net assets;

(4) security to be provided for a shareholder, the actual controller or a connected person thereof;

(5) any guarantee provided after the gross amount of external guarantees of the Company exceeds 30% of its latest audited total assets;

(6) any guarantee provided by the Company within one year of which the amount exceeds 30% of its latest audited total assets;

(7) other guarantee matters to be submitted to General Meeting for review and approval as required by laws, administrative regulations and the Articles of Association of the Company.

If a director, the President or other senior officer violates a provision on the approval authority or consideration procedure for the provision of security to third parties as specified in laws or these Articles of Association, thereby causing the Company to sustain a loss, he or she shall be held liable for damages and the Company may institute a legal action against him or her in accordance with the laws.

Article 63. The matters that shall be decided by the Shareholders' General Meeting in accordance with the laws, the administrative regulations and rules, departmental rules as well as the Articles of Association must be reviewed by the Shareholders' General Meeting, in order to protect the decision-making power of the Company's shareholders on such matters. When lawful, necessary and reasonable, the Shareholders' General Meeting may authorize the Board of Directors to decide to the extent authorized on specific matters that relate to the matters to be resolved and that cannot be promptly decided on at the Shareholders' General Meeting.

As for the authorization of the Board of Directors by the Shareholders' General Meeting, the ordinary resolutions of the Shareholders' General Meeting shall be adopted by shareholders in attendance (including proxies) holding at least half of the voting rights; the special resolutions of the Shareholders' General Meeting shall be adopted by shareholders in attendance (including proxies) holding at least two-thirds of the voting rights. The content of authorization should be clear and specific.

Article 64. Without the prior approval of the Shareholders' General Meeting, the Company may not conclude any contract with any person other than a director, a supervisor, a President or other senior management staff of the Company for the delegation of the whole business management or important business management of the Company to that person.

Article 65. Shareholders' general meetings can be divided into annual shareholders' general meetings and extraordinary shareholders' general meetings. Annual meetings shall be convened once a year and shall be held within six months following the preceding fiscal year.

The Board of Directors shall convene an extraordinary shareholders' general meeting within two months after the occurrence of any of the following circumstances:

(1) the number of directors is less than the number provided for in the Company Law or less than two-thirds prescribed in the Articles of Association of the Company;

(2) the losses of the Company that have not been made up reach one-third of the total share capital of the Company;

(3) upon the request of a shareholder who alone has held or shareholders who together have held at least 10 percent (including 10 percent) of the shares of the Company (the shareholding referred to above shall be calculated as of the day on which the written request is made);

(4) The Board of Directors considers that there is a need or the Board of Supervisors proposes a meeting.

Article 66. When the Company is to hold a general shareholders' meeting, the convener shall, by way of announcement, 45 days (including the meeting day) prior to the meeting, inform all the shareholders of the matters to be considered at and the date and place of the meeting. Shareholders that intend to attend the meeting shall, on the date set forth in the announcement, serve a written reply on the Company stating that they will attend the meeting.

Based on the written replies received, the Company shall calculate the number of voting shares represented by the shareholders intending to attend the meeting.

Article 67. The motion of the Shareholders' General Meeting shall be the specific motion raised for the matters to be discussed at the Shareholders' General Meeting. The motion of the Shareholders' General Meeting shall meet the following requirements:

(1) its content does not contravene laws, administrative regulations and these Articles of Association and falls within duties of the Shareholder' General Meeting;

(2) it has specific subject and detailed matters to be examined at the meeting;

(3) it shall be submitted or sent to the Board of Directors in writing.

Article 68. When the Company is to hold an annual Shareholders' General Meeting, the Board of Directors, the Board of Supervisors and a shareholder alone or shareholders together holding at least 3 percent of the Company's shares shall be entitled to propose motions to the Company.

A shareholder alone or shareholders together holding at least 3 percent of the shares of the Company may submit extempore motions in writing to the convener 10 days prior to the date of such meeting. The convener shall issue a supplementary notice of the Shareholders' General Meeting and make a public announcement of the contents of such extempore motion within two days after receipt of the motion.

Except as provided in the preceding paragraph, the convener may not make any changes to the motions set forth in the notice of the Shareholders' General Meeting or add any new motions once the notice and announcement of the Shareholders' General Meeting have been issued.

Article 69. The matters to be discussed at or decided by the Shareholders' General Meeting shall be determined in accordance with the Company Law and these Articles of Association. The Shareholders' General Meeting shall make decision on any matters prescribed by these Articles of Association.

The Shareholders' General Meeting may not vote and pass resolution on motions that are not set forth in the Article 66 and Article 68 or that are not consistent with Article 67 of these Articles of Association.

Article 70. The notice of a Shareholders' General Meeting shall:

(1) be made in writing;

(2) specify the place, time and term of the meeting;

(3) describe the matters and proposals to be discussed at the meeting;

(4) provide to the shareholders the information and explanations necessary to make informed decisions on the matters to be discussed; without limiting the generality of the foregoing, when the Company proposes a merger, buyback of shares, restructuring of share capital or other reorganization, it shall provide the specific conditions and contract (if any) of the transaction contemplated and earnestly explain the cause and effect of the transaction;

(5) contain a disclosure of the nature and extent of the material interests, if any, of any director, supervisor, the President or other senior management staff in any matter to be discussed; and an explanation of the difference, if any, between the way in which the matter to be discussed would affect such director, supervisor, the President or other senior management staff in his or her capacity as shareholder and the way in which such matter would affect other shareholders of the same class;

(6) contain the full text of any special resolution proposed to be moved at the meeting;

(7) contain conspicuously a statement that all shareholders of ordinary shares (including shareholders of preference shares with restored voting rights) are entitled to attend the Shareholders' General Meeting, and may appoint proxy(ies) in writing to attend and vote at the meeting on their behalves. Shareholders entitled to attend and vote are entitled to appoint one or more proxies to attend and vote on their behalves, and that such proxies need not be shareholders of the Company;

(8) state the time and place for serving the instruments of appointment for voting at the meeting.

(9) specify the record date for shareholders who are entitled to attend the Shareholders' General Meeting;

(10) state the name and telephone number of the regular contact person of the meeting;

(11) specify the time and procedures for voting online or by other means.

Article 71. Notice of a Shareholders' General Meeting shall be delivered to the shareholders (whether or not entitled to vote thereat), by hand or prepaid mail at the recipient's address shown in the register of shareholders.

For the holders of domestic shares, notice of a Shareholders' General Meeting may also be delivered by way of public announcement. Such announcement shall be published in one or more newspapers or periodicals designated by the securities regulatory authority of the State Council within the period from the 45th day to the 50th day (including the 45th and the 50th day) prior to the date of the meeting to be held. Once the announcement is made, all the holders of domestic shares shall be deemed to have received the notice of the relevant Shareholders' General Meeting.

For holders of H Shares, notice of a Shareholders' General Meeting may also be delivered or provided by other means as specified in Article 236 of these Articles of Association, subject to laws, regulations and the relevant listing rules of the place where the Company's shares are listed.

Article 72. Any shareholder entitled to attend and vote at a Shareholders' General Meeting shall have the right to appoint one or more persons (who need not be shareholders) as his or her proxies to attend and vote on his or her behalf. Such proxy may exercise the following rights in accordance with his or her appointment by the shareholder:

(1) the shareholders right to be heard at the Shareholders' General Meeting;

(2) the right to demand or join in the demand for a ballot;

(3) unless otherwise provided in accordance with the applicable listing rules or other securities laws and regulations, the voting rights shall be exercised by show of hands or by ballot, except that if a shareholder has appointed more than one proxy, such proxies may only exercise their voting rights by ballot.

Article 73. Shareholders shall appoint their proxies by written instruments, which shall be signed by the principals or their agents appointed in writing. If the principal is a legal person, the instrument shall be under the seal of the legal person or signed by its director(s) or duly authorized agent(s). The instrument of appointment shall specify the number of shares of the principal that the proxy represents. In case more than one person are appointed to be the proxies of shareholders, the instrument of appointment shall specify the number of voting shares which each proxy represents.

Article 74. The instrument appointing a voting proxy shall be deposited at the domicile of the Company or at such other place as specified in the notice of the meeting within 24 hours prior to the meeting at which the proxy is authorized to vote or 24 hours prior to the specified time of the vote. If the instrument is signed by another person authorized by the principal, the power of attorney or other document authorizing the signature shall be notarized. The notarized power of attorney or other authorizing document shall be deposited together with the instrument appointing the voting proxy at the domicile of the Company or at such other place as specified in the notice of the meeting.

If the principal is a legal person, its legal representative or the person authorized by a resolution of its Board of Directors or other decision-making body shall attend the Shareholders' General Meeting of the Company as the representative of such legal person.

Where the shareholder is a recognised clearing house (or its proxy) within the meaning of the Securities and Futures Ordinance of Hong Kong, the shareholder may authorise a representative of the Company or one or more persons as it thinks fit to act as its representative (s) at any Shareholders' General Meeting or any class meeting of shareholders or creditors' meeting provided that the proxy (ies) shall have the same statutory rights as other shareholders, including the right to speak and vote; however, if more than one person is so authorised, the power of attorney shall specify the number and class of shares in respect of which each such person is so authorised. The persons so authorised may exercise the rights on behalf of the recognised clearing house (or its agent) as if they were the individual shareholders of the Company.

Article 75. Any form issued by the Board of Directors of the Company to the shareholders for the appointment of proxies shall give the shareholders free choice to instruct their proxies to cast an affirmative or negative vote and enable the shareholders to give separate instructions on each matter to be voted on in connection with each point of discussion of the meeting. The instrument of appointment shall specify that in the absence of instructions from the shareholder, the proxy may vote as he or she thinks fit.

Article 76. A vote made in accordance with the terms of an instrument of appointment shall be valid notwithstanding the previous death or loss of capacity of the principal or revocation of the proxy or of the authority under which the proxy was executed, or the transfer of the relevant shares, as long as the Company did not receive written notice of the event before the relevant meeting commenced.

Article 77. When the Shareholders' General Meeting considers matters relating to a connected transaction, the connected shareholders shall not participate in the vote, and the number of voting shares represented by them shall not count toward the total number of valid voting shares. The announcement of the resolutions of the Shareholders' General Meeting shall fully disclose the way the unconnected shareholders voted.

Article 78. Any proxy who represents an individual shareholder to attend the Shareholders' General Meeting shall provide his or her identification document as well as the power of attorney signed by the principal or the representative authorized by the principal. In the case of the legal representative of a corporate shareholder appoints a proxy to attend the meeting, the proxy shall provide his or her identification document as well as the power of attorney signed by the legal representative. Any proxy authorized by way of a resolution of its Board of Directors or other decision making body who attend the Shareholders' General Meeting shall provide his or her identification document as well as the power of attorney signed by the Board of Directors or other decision making body and under the seal of the legal person. The instrument of appointment shall specify the date of issuance.

Article 79. The Board of Directors, independent directors, shareholders holding more than one percent of the voting shares or investor protection institutions established in accordance with laws, administrative regulations or the provisions of the CSRC may act as soliciting parties, either by themselves or by entrusting securities companies or securities service institutions, to publicly request shareholders to appoint them to attend the Shareholders' General Meeting on their behalves, and to exercise shareholders' rights such as proposal rights and voting rights on their behalves. The public solicitation of rights shall be done in compliance with the provisions of the relevant regulatory authorities and the stock exchange where the Company's shares are listed and traded.

Article 80. Resolutions of the Shareholders' General Meeting are divided into ordinary resolutions and special resolutions.

Ordinary resolutions of the Shareholders' General Meeting shall be adopted by shareholders in attendance (including proxies) holding at least half of the voting rights. Special resolutions of the Shareholders' General Meeting shall be adopted by shareholders in attendance (including proxies) holding at least two-thirds of the voting rights.

The shareholders (including their proxies) attending the meeting shall express one of the following opinions on the proposals submitted for voting: for, against or abstention. As for the unpolled vote or abstention, the Company will not treat it as the vote with voting right when calculating the voting result of this matter.

Article 81. When shareholders (including proxies) vote at the Shareholders' General Meeting, they shall exercise their voting rights according to the number of voting shares that they represent. Except for the cumulative voting system adopted by the directors or supervisors provided in Article 114 of these Articles of Association, each share shall have one vote. No voting rights shall be attached to the Company shares held by the Company, and such shares shall not be counted among the total number of voting shares present at the Shareholders' General Meeting.

Subject to the applicable listing rules as amended from time to time, where any shareholder is required to abstain from voting on any particular matter being considered or restricted to voting only for or only against any particular matter being considered, any votes cast by or on behalf of such shareholder in contravention of such requirement or restriction shall not be counted.

If the purchase of the voting shares of the Company by a shareholder violates the provisions of paragraphs 1 and 2 of Article sixty-three of the Securities Law, such shares in excess of the prescribed proportion shall not exercise the voting rights within thirty-six months after the purchase, and shall not be included in the total number of voting shares represented by shareholders attending the Shareholders' General Meeting.

Article 82. Votes at a Shareholders' General Meeting shall be taken by a show of hands, unless otherwise provided in rules governing the applicable listing rules or other securities laws and regulations or unless a vote by ballot is demanded before or after any vote by show of hands by:

(1) the chairman of the meeting;

(2) at least two shareholders with voting rights or proxies with voting rights;

(3) one or several shareholders (including proxies) holding, alone or together, at least 10 percent of the shares carrying the right to vote at the Shareholders' General Meeting.

Unless otherwise provided in rules governing the applicable listing rules or other securities laws and regulations or unless a vote by ballot is demanded, the chairman of the meeting shall announce whether the motion has been carried in accordance with the results of the vote by show of hands, and shall record the same in the minutes of the meeting (without need to evidence the number of votes for or against the resolutions adopted at the meeting, or the percentages thereof), which shall be conclusive evidence.

The demand for a vote by ballot may be withdrawn by the person who made it.

Article 83. If the matter demanded to be voted upon by ballot is the election of the chairman or the adjournment of the meeting, a ballot shall be taken immediately. If a ballot is demanded for any other matter, such ballot shall be taken at the time decided upon by the chairman and the meeting may proceed with the discussion of other matters; the result of the ballot shall still be regarded as a resolution passed at that meeting.

Article 84. When a ballot is held, shareholders (including proxies) having the right to two or more votes need not use all of their voting rights in the same way.

Article 85. When the numbers of votes for and against are equal, regardless of whether the vote is taken by show of hands or by ballot, the chairman of the meeting shall be entitled to one additional vote.

Article 86. Decisions of the Shareholders' General Meeting on any of the following matters shall be adopted by ordinary resolution:

(1) to decide on the business policies and investment plans of the Company;

(2) to elect and change directors and decide on matters concerning the remuneration of directors;

(3) to elect and change the supervisors who are to be appointed from among the shareholders' representatives and decide on matters concerning the remuneration of supervisors;

(4) to consider and approve reports of the Board of Directors;

(5) to consider and approve reports of the Supervisory Committee;

(6) to consider and approve the Company's annual financial budget plans and final accounting plans;

(7) to consider and approve the Company's profit distribution plans and plans for making up losses;

(8) to pass resolutions on the engagement, dismissal or non- renewal of the engagement of accounting firms by the Company;

(9) to consider and approve changes in the use of raising funds;

(10) the matters other than those which laws, administrative rules and regulations or these Articles of Association require to be adopted by special resolution.

Article 87. Decisions of the Shareholders' General Meeting on any of the following matters shall be adopted by special resolution:

(1) the increase or reduction of the registered capital and issuance of any class of shares, warrants or other similar securities of the Company;

(2) the issuance of corporate bonds;

(3) division, split, merger, dissolution and liquidation, as well as major acquisitions or disposals of the Company;

(4) the amendment of these Articles of Association;

(5) the amendment of the rights of any class shareholders;

(6) to resolve matters relating to the purchase and/or sale by the Company within one year of material assets valued at more than 25 percent of the Company's total assets;

(7) provisions of security that laws, administrative regulations, as well as these Articles of Association specify to be approved at the Shareholders' General Meeting;

(8) employee shareholding schemes, equity incentive schemes or other share-related compensation granted to employees (such as allotment or share options, etc.);

(9) other matters which laws, administrative rules and regulations or these Articles of Association require to be adopted by special resolution or which the Shareholders' General Meeting considers will have a material impact on the Company and therefore require, by an ordinary resolution, to be adopted by special resolution.

Article 88. Any resolution adopted at the Shareholders' General Meeting shall be consistent with the relevant provisions of Chinese laws, administrative regulations and rules, as well as these Articles of Association.

Article 89. In case that the independent directors, board of supervisors or shareholders alone or together holding at least 10 percent of the Company's shares request to call an extraordinary Shareholders' General Meeting or classified shareholders' meeting, the following procedures shall be followed:

(1) The proponent(s) may sign one or more written requests of identical form and substance requesting that the Board of Directors convene an Extraordinary Shareholders' General Meeting. The Board of Directors shall give a written response on whether or not it agrees to call such extraordinary shareholders' general meeting within 10 days after receipt of the proposal to call such meeting.

(2) If the Board of Directors agrees to call an Extraordinary Shareholders' General Meeting, it shall issue a notice calling such meeting within 5 days after it has so resolved. The consent of the relevant original proponent(s) shall be secured if any change is to be made in the notice to the original request.

(3) If the Board of Directors does not agree to call an Extraordinary Shareholders' General Meeting, the reasons shall be stated and announced.

(4) If the Board of Directors does not agree the proposal of the Board of Supervisors to call an Extraordinary Shareholders' General Meeting or fails to give a response within 10 days after receipt of the request, it shall be deemed to be unable to or have failed to perform its duty of convening the Shareholders' General Meeting, and the Board of Supervisors may itself convene and preside over such meeting. The procedure according to which they convene such meeting shall, to the extent possible, be identical to the procedure according to which Shareholders' General Meetings are to be convened by the Board of Directors.

(5) If the Board of Directors does not agree the request of the shareholders to call an Extraordinary Shareholders' General Meeting, or does not reply without any reason within 10 days upon receipt of the request, the shareholders shall have the right to propose to the Board of Supervisors in writing that it calls the Extraordinary Shareholders' General Meeting.

If the Board of Supervisors agrees to call the Extraordinary Shareholders' General Meeting, it shall issue a notice calling such meeting within 5 days after receipt of the request. The consent of the relevant original proponent(s) shall be secured if any change is to be made in the notice to the original request.

If the Board of Supervisors fails to issue a notice calling the Shareholders' General Meeting by the prescribed deadline, it shall be deemed to have failed to convene and preside over such meeting, and a shareholder or shareholders of the Company may himself/themselves convene and preside over such meeting (Until the resolution(s) of the Shareholders' General Meeting is/are announced, the shareholding percentages of the convening shareholders may be not less than 10 percent). The procedure according to which they convene such meeting shall, to the extent possible, be identical to the procedure according to which Shareholders' General Meetings are to be convened by the Board of Directors.

When the Board of Supervisors or shareholders itself/ themselves convene a Shareholders' General Meeting, the Board of Directors shall be informed in written notice; the filing procedures shall be handled at relevant department in charge in accordance with the applicable requirements. The Board of Directors and the Secretary to the Board of Directors shall give their cooperation. The Board of Directors shall provide the register of shareholders as of the date of record. The reasonable expenses incurred by such meetings shall be borne by the Company and shall be deducted from the sums owed by the Company to the negligent directors (if any).

Article 90. Shareholders' General Meetings shall be convened and presided over by the Chairman of the Board. If the Chairman of the Board fails or is unable to perform his or her duties, the meeting shall be presided over by the Vice Chairman of the Board. If the Vice Chairman of the Board is not designated or the Vice Chairman of the Board fails or is unable to perform his or her duties, the meeting shall be presided over by the director jointly elected by at least one half of the directors. Where no chairman is designated, the shareholders attending the meeting may elect one person to preside over the meeting. If for any reason the shareholders are unable to elect a chairman, the shareholder holding the largest number of voting shares and attending the meeting (whether in person or by proxy) shall preside over the meeting.

At a Shareholders' General Meeting convened by the Board of Supervisors, the Chairman of the Board of Supervisors shall preside. If the Chairman of the Board of Supervisors fails or is unable to perform his or her duties, the meeting shall be presided over by the supervisor jointly elected by at least one half of the supervisors.

If a Shareholders' General Meeting is convened by a shareholder himself or shareholders themselves, the meeting shall be presided over by the representative selected by the convener(s).

While a Shareholders' General Meeting is holding, if the chairman of the meeting violates the rules of procedure, making continuance of the Shareholders' General Meeting impossible, with the consent of shareholders holding more than one half of the voting rights present at the meeting, the Shareholders' General Meeting may elect a person to serve as chairman of the meeting and the meeting shall continue.

Article 91. The resolutions adopted at the Shareholders' General Meeting shall be announced in accordance with the relevant provisions of the applicable laws and stock exchange where the Company's stock is traded.

Article 92. If the chairman of the meeting has any doubt concerning the result of the vote on any resolution, he or she may organize a recount of the number of votes cast. If the chairman of the meeting does not conduct a recount of the votes and an attending shareholder or proxy challenges the result of a vote announced by the chairman of the meeting, he or she has the right to demand a vote recount immediately following the announcement of the result, in which case the chairman of the meeting shall promptly organize a recount of the votes.

Article 93. In the event that the votes are counted at the Shareholders' General Meeting, the counting results shall be recorded in the minutes of the meeting.

The minutes of Shareholders' General Meeting shall be prepared by the secretary and be signed by directors, supervisors, secretary of the Board, the convener or their representatives and the host (chairman of the meeting) present at the meeting.

The adopted resolutions of Shareholders' General Meeting shall be kept as the Company's minutes of meetings. The records and minutes of meetings shall be written in Chinese. The minutes of meetings together with the sign-in register of attending shareholders and the instruments of appointment of proxies shall be kept at the Company's domicile for at least 10 years.

Article 94. Shareholders may examine photocopies of the minutes of meetings during the Company's office hours without charge. If any shareholder demands from the Company a photocopy of relevant minutes of meetings, the Company shall send such photocopies within seven days after receiving payment of reasonable charges.

CHAPTER 9 Special Voting Procedures for Class Shareholders

Article 95. Shareholders that hold different classes of shares shall be class shareholders.

Class shareholders shall enjoy rights and bear obligations in accordance with laws, administrative rules and regulations and these Articles of Association.

Article 96. In case that the Company intends to alter or abolish the rights of classified shareholders, the Stockholders' General Meeting shall pass it through a special resolution and respective meetings of stockholders convened by the affected classified shareholders shall pass it on pursuant to the Article 97 to Article 101 of these Articles of Association.

Article 97. The following situations shall be regarded as alternation or abolishment of the rights of a certain classified shareholder:

(1) the increase or decrease of the number of shares of such class, or increase or decrease of the number of shares of a class having voting rights, distribution rights or other privileges equal or superior to those of the shares of such class;

(2) the conversion of all or part of the shares of such class into shares of another class, or the conversion of all or part of the shares of another class into shares of such class or the grant of the right to such change;

(3) the removal or reduction of rights to accrued dividends or cumulative dividends attached to shares of such class;

(4) the reduction or removal of a dividend preference, or a property distribution preference during liquidation of the Company, attached to shares of such class;

(5) the addition, removal or reduction of share conversion rights, options, voting rights, transfer rights, preemptive rights to rights issues or rights to acquire securities of the Company attached to shares of such class;

(6) the removal or reduction of rights to receive amounts payable by the Company in particular currencies attached to shares of such class;

(7) the creation of a new class of shares with voting rights, distribution rights or other privileges equal or superior to those of the shares of that class;

(8) the imposition of restrictions or additional restrictions on the transfer or ownership of shares of such class;

(9) the issuance of rights to subscribe for, or convert into, shares of such class or another class;

(10) the increase of the rights and privileges of shares of another class;

(11) such restructuring of the Company as would cause shareholders of different classes to bear disproportionate liabilities under the restructuring;

(12) the amendment or deletion of the provisions of this Chapter.

Article 98. Shareholders of the affected class, whether or not otherwise having the right to vote at Shareholders' General Meeting, shall have right to vote at class shareholders' meetings in respect of any of the matters referred to in items (2) to (8) and items (11) to (12) of Article 97, except that interested shareholders shall not have the right to vote at class shareholders' meetings.

For the purposes of the preceding paragraph, the term "interested shareholders" shall have the following meaning:

(1) if the Company is to issue a buyback offer to all of the shareholders in the same proportion or is to buy back its own shares through open transactions on a stock exchange in accordance with Article 31 of these Articles of Association, the controlling shareholder as defined in Article 59 of these Articles of Association shall be an "interested shareholder";

(2) if the Company is to buy back its own shares by agreements outside a stock exchange in accordance with Article 31 of these Articles of Association, holders of shares to which such agreements relate shall be "interested shareholders";

(3) shareholders that, under a proposed restructuring of the Company, would bear liabilities in a proportion smaller than that of the liabilities borne by other shareholders of the same class, and shareholders that have an interest in a proposed restructuring of the Company that is different from the interest in such proposed restructuring of other shareholders of the same class, shall be “interested shareholders”.

Article 99. Resolutions of a class shareholders’ meeting may be passed only by two-thirds or more of the equity interests carrying voting rights that are represented at the class shareholders’ meeting in accordance with Article 98.

Subject to the applicable listing rules as amended from time to time, where any shareholder is required to abstain from voting on any resolution being considered at the class shareholders’ meeting or restricted to voting only for or only against any resolution being considered at the class shareholders’ meeting, any votes cast by or on behalf of such shareholder in contravention of such requirement or restriction shall not be counted.

Article 100. When the Company is to hold a class shareholders’ meeting, it shall issue a written notice 45 days prior to the meeting informing all the registered shareholders of that class of the matters to be considered at and the date and place of the meeting. Shareholders that intend to attend the meeting shall, within 20 days prior the day on which the meeting is to be held, serve a written reply on the Company stating that they will attend the meeting.

If the number of shares carrying the right to vote at the meeting represented by the shareholders intending to attend the meeting is not less than half of the total number of shares of that class carrying the right to vote at the meeting, the Company may hold the class shareholders’ meeting. If not, the Company shall, within five days, inform the shareholders once again of the matters to be considered at and the date and place of the meeting in the form of a public announcement. After such notification by public announcement, the Company may hold the class shareholders’ meeting.

Article 101. If a class shareholders’ meeting is to be called by issuance of a meeting notice, notice of such meeting need be delivered only to the shareholders entitled to vote thereat.

The procedure according to which class shareholders' meetings are held shall, to the extent possible, be identical to the procedure according to which Shareholders' General Meeting is held. Provisions of these Articles of Association relevant to procedures for the holding of Shareholders' General Meeting shall be applicable to class shareholders' meetings.

Article 102. Apart from other class shareholders, shareholders with domestic shares and shareholders with overseas listed foreign investment shares are regarded as different classified shareholders.

The special voting procedures for class shareholders shall not apply in the following circumstances:

(1) where, as approved by way of a special resolution of the Shareholders' General Meeting, the Company issues, either separately or concurrently, domestic investment shares and overseas listed foreign investment shares every 12 months, and the quantity of domestic investment shares and overseas listed foreign investment shares intended to be issued does not exceed 20 percent of the outstanding shares of the respective classes; or

(2) where the plan for the issuance of domestic investment shares and overseas listed foreign investment shares upon the establishment of the Company is completed within 15 months from the date of approval by the State Council's securities authority.

CHAPTER 10 Party Organizations (the Party Committee)

Article 103. The Company shall set up the Committee of the Communist Party of China of Aluminum Corporation of China Limited (the "**Party Committee**"), consisting of one secretary, one to two deputy secretary and several members. Eligible members of the Party Committee may serve as members of the Board of Directors, the Supervisory Committee and senior management through statutory procedures, while eligible Party members of the Board of Directors, the Supervisory Committee and senior management may also serve as members of the Party Committee pursuant to relevant provisions and procedures. Meanwhile, the Company shall also set up a disciplinary committee in accordance with the provisions, which shall consist of one secretary and several members.

Article 104. The Party Committee shall fulfil the following responsibilities in accordance with the Constitution of the Communist Party of China and other regulations as prescribed by the Party:

(1) To ensure and supervise the Company's implementation of policies and guidelines of the Party and the State, and implement major strategic decisions of the Central Committee of the Party and the State Council, as well as important work arrangements of the Party organizations of higher levels.

(2) To strengthen its leadership and gate keeping role in the process of selection and appointment of personnel, and adhere to the principle of the Party supervising the performance of officials while ensuring the lawful selection by the Board of Directors of the senior management and the lawful exercise of the power of the senior management in the employment of personnel.

(3) To research and discuss the reform, development and stability of the Company, major operational and management issues and major issues concerning employees' interests, and provide comments and suggestions; to support the Shareholders' General Meeting, the Board of Directors, the Supervisory Committee and the senior management in performing their duties in accordance with law, and support the employee representatives' meeting in carrying out its work.

(4) To undertake the main responsibility of comprehensive and strict Party management; to lead the Company's ideological and political work, the united front work, the spiritual civilization construction, the corporate culture cultivation as well as the work of groups such as the labor union and the Communist Youth League; to lead the construction of the Party's working style and its clean and honest administration, and support the discipline inspection committee in earnestly performing its supervisory responsibilities.

(5) To strengthen the Company's grassroots Party organizations and their team building, give full play to the role of the Party branches as strongholds and to the role of the Party members as pioneers and fine examples, and unite and lead officials and employees to devote themselves into the reform and development of the Company.

(6) To handle other important matters within the scope of duties of the Party Committee.

CHAPTER 11 Board of Directors

Article 105. The Company shall establish a Board of Directors. The Board of Directors is the permanent authority and management decision- making body of the Company, which is subject to the supervision of the Supervisory Committee and all the shareholders, and is responsible for and report to the Shareholders' General Meeting. Through improving the Company's law-based governance, authorization and delegation, compliance and internal control, risk management and control, and internal supervision and monitoring system, the Board gives full play to the responsibilities of determining strategies, making decisions and preventing risks.

Article 106. The Board of Directors shall be composed of 9 directors. The outside directors (herein meaning those directors who do not hold office in the Company) shall represent not less than 50 percent of the members of the Board of Directors, of which at least 3 directors shall be independent directors (herein meaning those directors who are independent to the shareholders and do not hold office in the Company).

The Board of Directors shall include one chairman and one vice chairman (if needed).

As needed, under the Board of Directors there shall be such special committees as an Audit Committee, a Nomination Committee, a Remuneration Committee, a Development and Planning Committee, and an Occupational Health and Safety and Environment Committee. The Audit Committee shall be composed entirely of independent directors, of whom at least one shall be a financial or accounting professional. The Remuneration Committee and the Nomination Committee shall consist of a majority of independent directors.

Article 107. The directors of the Company shall be natural persons. Directors need not hold shares of the Company.

Article 108. Directors shall be elected by the Shareholders' General Meeting and serve terms of three years (from the date of being elected to the date that the new Board of Directors is elected by the Shareholders' General Meeting). At the expiration of their terms, directors may continue to serve as such if reelected, but independent directors may not serve more than six years in succession.

The list of candidates for directors shall be submitted as a motion to the Shareholders' General Meeting. Other candidates for directors except for independent directors shall be nominated by the Board of Directors, the Board of Supervisors and a shareholder alone or shareholders together holding at least 3 percent of the Company's shares, and shall be elected by the Shareholders' General Meeting of the Company.

A written notice of the intention to nominate a candidate for election as a Director and a notice by such candidate of his/her willingness to be elected shall be given to the Company 7 days before the date of the general meeting.

The outside directors shall have sufficient time and the necessary knowledge and ability to perform their duties. The Company must provide necessary information to outside directors for performing their duties. Among them, the independent non-executive directors may directly report to the Shareholders' General Meeting, the State Council authorities in charge of securities and other relevant departments.

Executive directors shall deal with matters authorized by the Board of Directors.

Article 109. The procedure prior to electing the Company's non-independent directors shall be as follows:

(1) the consent of the nominee shall be obtained before the nominator nominates him or her for the position of non-independent director; the nominator(s) shall be fully aware of such details of the nominee as his or her occupation, educational background, title, career details, all of his or her concurrent positions, etc. and provide the written documents about the above-mentioned information to the Company. The candidates shall make a written commitment to the Company that they agree to accept the nomination and promise that the publicly disclosed information about candidates is true and complete, and to guarantee that they will earnestly perform their duties if being selected.

(2) in case the candidates for non-independent directors are nominated before the convening of the board meeting, if there are relevant provisions in the applicable laws, administrative regulations and rules and/or the relevant listing rules, the written materials about the nominees described in item (1) of this Article shall be announced together with the resolution of the Board of Directors in accordance with such provisions.

(3) if a shareholder alone or shareholders together holding at least 3 percent of the voting rights in the Company put(s) forth an extempore motion for the election of an independent non-executive director, the written notice of the intention to nominate a candidate for the position of independent non- executive director and of the nominee indicating his or her willingness to accept the nomination as well as relevant written materials on the nominee and his or her commitment as mentioned above in item (1) shall be delivered to the Company 10 days before the date of the Shareholders' General Meeting. No such written notice shall be sent prior to the date immediately following the date when the notice of the meeting for election of relevant director is sent or later than 7 days before the convening of the Shareholders' General Meeting for considering the election of such director.

Article 110. In the case where the Company's sole shareholder and persons acting in concert interest hold 30% or above of the total shares of the Company, the cumulative voting system may be implemented for the election of directors and supervisors at a Shareholders' General Meeting, namely when more than two directors or supervisors shall be elected at the Shareholders' General Meeting, each share held by the shareholder who participates in the voting carries a number of voting rights equivalent to the number of directors or supervisors to be elected, and a shareholder may cluster or disperse his or her voting rights.

Article 111. The Chairman of the Board and the Vice Chairman of the Board shall be elected and removed by more than half of all the directors. The Chairman of the Board and the Vice Chairman of the Board shall serve terms of three years and may serve consecutive terms if reelected.

Article 112. The Board of Directors shall be accountable to the Shareholders' General Meeting and exercise the following functions and powers:

(1) to convene Shareholders' General Meetings and to report on its work to the Shareholders' General Meeting;

(2) to implement the resolutions of the Shareholders' General Meeting;

(3) to decide on the business plans and investment plans of the Company;

(4) to formulate the annual financial budgets plans and final accounts plans of the Company;

(5) to determine the Company's annual financing plan;

(6) to formulate the profit distribution plans and plans for making up losses of the Company;

(7) to formulate plans for the Company's debt and financial policies, the increase or reduction of the registered capital of the Company and plans for the issuance of corporate bonds or other securities;

(8) to draft plans for major acquisitions or disposals of the Company, purchase of shares of the Company, or the merger, division, split or dissolution of the Company;

(9) to make decision on the security not subject to the approval of the Shareholders' General Meeting, in accordance with the laws, the administrative regulations and rules, as well as these Articles of Association;

(10) to review and approve the Company's annual social responsibility and environmental, social and governance report (Environmental, Social and Governance Report under the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited, hereinafter the "**ESG Report**"); to decide on the Company's major environmental, social and governance matters within the scope of authorization of the Shareholders' General Meeting;

(11) to decide on such matters as the Company's investments in third parties, purchase and sales of assets, asset mortgages, entrustment of financial services, connected transactions, external donations, to the extent authorized by the Shareholders' General Meeting;

(12) to decide on the establishment of the Company's internal management organization;

(13) to appoint or dismiss the Company's President and secretary to the Board of Directors; to appoint or dismiss Senior Vice Presidents, Vice Presidents, chief financial officer and General Counsel of the Company based on the recommendations of the President; to decide on the remuneration, rewards and punishments of senior management, and to implement contractual management in accordance with the labour contract;

(14) to decide on the establishment of the Company's branches;

(15) to formulate amendments to these Articles of Association;

(16) to formulate the basic management systems of the Company;

(17) to formulate equity incentive plans, employee stock ownership plans or other share-based compensation (such as allotment or share options) granted to employees;

(18) to make decision on the Company's other major affairs and administrative affairs, and to sign other important agreements, except for the matters to be considered at the Shareholders' General Meeting in accordance with the provisions of the Company Law and these Articles of Association;

(19) to make decision on the matters in relation to buyback of shares of the Company under the circumstances set forth in items (5) and (6) of the Article 30;

(20) other functions and powers provided for in these Articles of Association or granted by the Shareholders' General Meeting.

Resolutions by the Board of Directors on the matters referred to in the preceding paragraph shall be passed by the affirmative vote of not less than one half of all of the directors with the exception of resolutions on the matters referred to in items (7), (8), (9), (15), (17) and (19), which shall require the affirmative vote of at least two-thirds of all of the directors for adoption.

If a director has a connected relationship with an enterprise involved in a matter on which a resolution is to be made at a meeting of the Board of Directors, he or she may not exercise his or her right to vote regarding such resolution, nor may he or she exercise the voting right of another director as such director's proxy thereon. Under circumstance set forth above, such a Board meeting may be held only if more than one half of the directors without a connected relationship are present, and the resolutions made at such a Board meeting shall require adoption by more than one half of the directors without a connected relationship. As for the aforementioned items, which shall require the affirmative vote of at least two-thirds of all of the directors for adoption, and shall require adoption by at least two-thirds of the directors without a connected relationship. If the Board meeting is attended by less than three directors without a connected relationship, the matter shall be submitted to the Shareholders' General Meeting for consideration.

A resolution by the Board of Directors on a connected transaction shall enter into effect only once the independent non-executive directors have signed the same.

The Company shall formulate the rules for chief legal adviser, under which the chief legal adviser shall present and give legal opinions at the meeting of the Board of Directors whenever legal issue is involved in proposals for consideration and approval thereat.

Article 113. Before making decision on significant matters of the Company, the Board of Directors shall seek advice of the Party Committee.

Article 114. With the authorization made by the Board of Directors, the Chairman of the Board may exercise part of functions and powers of the Board when the Board is not in session. The content of the authorization made by the Board of Directors shall be clear and specific.

Article 115. When the Board of Directors intends to dispose of fixed assets and the sum of the expected value of the consideration for the proposed disposal and the value of the consideration for disposal of fixed assets made in the four months immediately preceding the proposed disposal exceeds 33 percent of the value of the fixed assets shown in the last balance sheet placed before the Shareholders' General Meeting, the Board of Directors may not dispose of or agree to the disposal of the fixed assets without the approval of the Shareholders' General Meeting.

For the purposes of this Article, the term "disposal of fixed assets" shall include the assignment of certain interests in assets but exclude the provision of fixed assets as security.

The validity of transactions whereby the Company disposes of fixed assets shall not be affected by the breach of the first paragraph of this Article.

Article 116. The investments (including venture capital) or the acquisition made by the Company valued at no more than 25 percent of the Company's audited total assets (or total market value) as at the most recent period shall be decided upon by the Board of Directors. The investments or acquisitions beyond the approval authority of the Board of Directors shall be reviewed by relevant experts and professionals organized by the Board of Directors and be reported to the Shareholders' General Meeting for approval.

In case the market development, M & A, the investment in new areas shall be decided by the Board of Directors, the projects whose investment or M & A of assets amounted to more than 10 percent of the total assets shall be provided with the professional advices from the social counseling agencies, as the important basis for the decisions made by the Board of Directors.

Article 117. The Chairman of the Board of the Company shall exercise the following functions and powers:

(1) to preside over Shareholders' General Meetings and to convene and preside over meetings of the Board of Directors;

(2) to organize the implementation of the duties of the Board of Directors; to examine the implementation of resolutions of the Board of Directors;

(3) to sign bond certificates issued by the Company;

(4) other functions and powers granted by the Board of Directors.

The Vice Chairman of the Board of the Company shall assist the Chairman of the Board in his or her work. If the Chairman of the Board is unable to perform his or her duties or fails to perform his or her duties, his or her duties shall be performed by the Vice Chairman of the Board; if the Vice Chairman of the Board is unable or fails to perform these duties, a director elected by at least one half of the directors shall perform such duties.

Article 118. Meetings of the Board of Directors shall be held at least four times a year. Meetings of the Board of Directors shall be convened by the Chairman of the Board by giving a notice to all directors and supervisors 14 days before the meetings are held.

The Chairman of the Board shall convene an interim meeting of the Board of Directors within 10 days without being limited by the aforementioned meeting notice period if:

(1) it is proposed by shareholders representing at least 10 percent of the voting rights;

(2) it is proposed by at least one-third of the directors;

(3) it is proposed by at least one-half of the independent directors;

(4) it is proposed by the Board of Supervisors;

(5) it is proposed by the President of the Company.

The meeting of the Board of Directors in principle shall be held at the Company's domicile.

The meeting of the Board of Directors shall be held in Chinese; an interpreter may be required to bilingual impromptu translation if necessary.

The Company's outside directors shall meet with other directors annually on a regular basis without the presence of the Company's management, in order to understand the Company's operation.

Article 119. The meetings of the Board of Directors shall be noticed by way as follows:

(1) If the Board of Directors has specified the time and place of the regular board meeting in advance, no service of notice is required.

(2) If the Board of Directors has not specified the time and place of the regular board meeting in advance, the Chairman of the Board shall, at least 14 days in advance, inform the directors and supervisors the time and the place of the board meeting by way of telegraph, telex, fax, courier, registered mail or by specially designated person, except as otherwise provided in Article 122 of these Articles of Association.

(3) The notice shall be written in Chinese, if necessary, the English version can be attached, including the agenda for the meeting. Any director may waive the right of receiving the notice of board meeting.

Article 120. The Board of Directors shall give a prior notice to all the executive and outside directors of any material matter to be resolved by the Board of Directors within a period required by Article 123 of these Articles of Association and provide sufficient materials with respect to such matter in strict accordance with relevant procedures. The directors may require additional materials with respect thereto. If at least one-quarter of the directors or at least two outside directors believe that the motion before the Board of Directors is unclear or unspecific, the meeting materials are insufficient or other such reason, they may jointly propose that the holding of the meeting of the Board of Directors or discussion of the motion in question be postponed to a later time. In such circumstances the Board of Directors shall accept the proposal.

Notice of a meeting shall be deemed to have been given to any director who attends the meeting without protest against, before or at its commencement, any lack of notice.

Any regular or extraordinary meeting of the Board of Directors may be held by way of telephone conference or similar communication equipment so long as all directors participating in the meeting can clearly hear and communicate with each other. All such directors shall be deemed to be present in person at the meeting.

Article 121. Meetings of the Board of Directors may be held only if not less than half of the directors (including any alternate director appointed pursuant to Article 122 of the Articles of Association) attend. Each director shall be entitled to one vote. Resolutions of the Board of Directors must be adopted by the affirmative vote of the majority of all the directors. When the numbers of votes for and against are equal, the chairman of the meeting shall be entitled to one additional vote.

Article 122. Meetings of the Board of Directors shall be attended by the directors in person. If a director is unable to attend a meeting for any reason, he or she shall appoint another director in writing to attend the meeting on his or her behalf. Such instrument of appointment shall specify the names of the proxy, the matters, and the scope of authorization and the term of validity.

If a director fails to personally attend a meeting of the Board of Directors and to appoint another director to attend the meetings on his or her behalf on two consecutive occasions, he or she shall be deemed unable to perform his or her duties and the Board of Directors shall propose to the Shareholders' General Meeting that he or she be replaced.

The director attending the meeting on behalf of the absent director shall exercise the director's right to the extent authorized. If a director fails to attend a meeting of the Board of Directors and has not appointed a proxy to attend the meeting on his or her behalf, he or she shall be deemed to have waived his or her right to vote at such meeting.

The reasonable expenses incurred by the directors who attend meetings of the board shall be borne by the Company. These expenses include the traffic expenses covering the distance between the place where a director is located and the place where a meeting is held (in the event that these two places are not the same), the fees of room and board during the term of the meeting, the rent of the place of the meeting and the local traffic expenses.

Article 123. The Board of Directors may agree to accept a written motion instead of convening the meeting of the Board of Directors. The draft of the motion shall be served in person, by mail, telegram and fax to each director. In case that the Board of Directors has distributed the motion to all directors, the number of directors who sign on the motion reaches the quorum required by laws and the motion has been submitted to the Secretary of the Board by the abovementioned ways, the resolution shall become the resolution adopted by the Board of Directors, without convening the meeting of the Board of Directors.

Article 124. The Board of Directors shall keep minutes of the meeting of the Board of Directors and its decisions on the matters examined without the convening of a meeting in Chinese. The directors attending the meeting shall have the right to make descriptive records of their speeches at the meeting. The opinions of the independent (non-executive) directors shall be clearly listed in the resolutions of the board of directors. The minute of each meeting of the Board of Directors shall be provided to all directors for review as soon as possible. Any director who wants to make amendment of supplement to the minute shall report the amendment to the Chairman of the Board in written form within one week upon the receipt of the minute. The directors and recorder attending the meeting shall sign on the finalized minute of the meeting. The minutes of meetings of the Board of Directors shall be kept at the Company's domicile and sent to each director in full copies as soon as possible. The minutes of meetings shall be kept for at least 10 years.

The directors shall be liable for the resolutions of the Board of Directors. If a resolution of the Board of Directors is in violation of laws, administrative regulations or these Articles of Association, thereby causing the Company to sustain a material loss, the directors who took part in the resolution shall be liable to the Company for damages. However, if a director is proved to have expressed his or her opposition to and vote against such resolution when it was put to the vote, and such opposition is recorded in the minutes of the meeting, such director may be exempted from such liability.

Article 125. Any written resolution not formed and signed by directors in line with the statutory procedures shall not have the legal effect of the resolution of the Board, even if every director has expressed his or her opinion in different ways.

Where a resolution of the Board of Directors is in violation of laws, administrative regulations and rules, the Company's Articles of Association or the resolution of the Shareholders' General Meeting, thereby causing serious losses to the Company, the directors who cast an affirmative vote shall be directly liable to the Company for damages. However, where a director can prove that he or she expressed his or her opposition to such resolution when it was put to be voted, and that such opposition was recorded in the minutes of the meeting, the director may be relieved from such liability; where a director abstains from voting, or is absent and does not appoint others to attend, the director may not be relieved from such liability; where a director has expressed his opposition to such resolution but does not cast a negative vote, the director also may not be relieved from such liability.

Article 126. Subject to relevant laws and administrative regulations, the Shareholders' General Meeting may remove any director by an ordinary resolution (without prejudice to any claim for damages that such director may have under any contract) before the end of his or her term of office.

Article 127. Directors may tender their resignations before the expiration of their terms of office. To resign, a director shall submit a written resignation to the Board of Directors. The independent director provide information on any circumstances related to his or her resignation or any circumstances to which he or she believes the attention of the Company and its creditors must be drawn.

If the resignation of a director causes the number of occupied seats on the Board of Directors to fall below the statutory minimum, his or her written resignation shall enter into effect only upon the new director taking up the vacancy left by his or her resignation. The Board of Directors shall convene an extraordinary Shareholders' General Meeting as soon as possible to elect a director to fill the vacancy left by the resignation of the director. Until the Shareholders' General Meeting has passed a resolution on electing a director, the powers of the resigning director and the remaining directors shall be subject to reasonable restrictions.

If the resignation of an independent director causes the number of independent directors or the number of occupied seats on the Board of Directors to fall below the statutory minimum, the incumbent director shall continue to perform his or her duties as an independent director in accordance with laws, administrative regulations and these Articles of Association until the incoming director assumes his or her position. The Board of Directors shall convene a Shareholders' General Meeting within two months to re-elect the independent directors; if the Board of Directors fails to convene a shareholders' general meeting, the independent directors may not perform their duties.

Except in the circumstance specified in the preceding paragraphs, a director's resignation shall be effective upon his or her written resignation being served on the Board of Directors.

CHAPTER 12 Independent Directors

Article 128. The independent director shall loyally perform his or her duties, safeguard the interests of the Company and especially pay attention that the lawful rights and interests of the Company's shareholders of public shares are not harmed.

The independent director shall perform his or her duties and responsibilities independently, without interference from the major shareholder(s) or the actual controller of the Company, or other entities or individuals that have a material interest with the Company and its major shareholder(s) or the actual controller.

Article 129. The candidates for the Company's independent director shall be nominated by the Company's Board of Directors, Board of Supervisors and shareholders who alone or together hold at least 1 percent of the outstanding shares of the Company and shall be decided through election by the Shareholders' General Meeting.

(1) The consent of the nominee shall be obtained before the nominator nominates him or her for the position of independent director; the nominator(s) shall be fully aware of such details of the nominee as his or her occupation, educational background, title, career details, all of his or her concurrent positions, etc., and shall be liable to provide such written materials to the Company. The candidate shall make a written commitment to the Company, agree to accept the nomination, promise that the publicly disclosed information about candidates is true and complete, and to guarantee that they will earnestly perform their duties if being selected.

(2) The nominator(s) shall express his/her/their opinions on the nominee's qualifications for holding the position of independent director and his or her independence; if otherwise provided in accordance with the applicable laws and regulations and/or relevant listing rules, the nominee shall make a public statement to the effect that no relationship exists between himself or herself and the Company that could affect his or her making independent and objective judgments.

(3) If the candidate for the independent director is nominated before the board meeting is convened, if otherwise provided in accordance with provisions in the applicable laws and regulations and/or the listing rules or other securities laws and regulations, the written materials of the nominee described in item (1) and (2) of this Article shall be announced together with the resolution of the Board of Directors in accordance with such provisions.

(4) If a shareholder alone or shareholders together holding at least 3 percent of the voting rights in the Company or the Board of Supervisors put(s) forth an extempore motion for the election of an independent director, the written notice of the intention to nominate a candidate for the position of independent director and of the nominee indicating his or her willingness to accept the nomination as well as relevant written materials and commitment on the nominee as mentioned in above in item (1) and (2) of this Article shall be delivered to the Company at least 15 working days before the date of the Shareholders' General Meeting.

(5) Prior to the holding of a Shareholders' General Meeting at which an independent director is to be elected, if otherwise provided in the applicable laws and regulations and/or relevant listing rules, the Company shall simultaneously submit the relevant materials on all the nominees to the State Council authorities in charge of securities, where the Company is located and/or the agency of the CSRC and the stock exchange on which Company shares are listed. If the Board of Directors of the Company has objections concerning the relevant details of a nominee, the Company shall additionally submit the written opinion of the Board of Directors. The nominees against whom the CSRC has objections shall not be the candidate for the independent director. At the time the Shareholders' General Meeting to elect an independent director is held, the Board of Directors of the Company shall elaborate on whether the CSRC had any objections against the candidates for the post of independent director.

Article 130. A person holding the position of independent director shall satisfy the basic conditions set forth below:

(1) having the qualifications to hold the position of directors of the Company in accordance with laws, administrative regulations and these Articles of Association;

(2) having the independence required by relevant laws, administrative regulations, departmental rules and the listing rules;

(3) having a basic knowledge of the operation of listed companies and being familiar with relevant laws, administrative rules, regulations and rules (including but not limited to the applicable accounting standards);

(4) having at least five years of experience in law, economics, accounting, finance, management, non-ferrous metals industry or other work experience required for performing the duties and responsibilities of an independent director;

(5) other conditions stipulated in these Articles of Association.

Article 131. The independent director must be independent. Unless otherwise provided in the applicable laws, regulations and/or the relevant listing rules, the following persons may not serve as independent directors:

(1) persons holding a position in the Company or a subsidiary thereof and their lineal relatives and major social relations (the lineal relatives refer to the spouse, parents and children; the major social relations refer to the brothers and sisters, father-in-law and mother-in-law, daughter-in-law, son-in-law, the spouses of brothers and sisters, as well as the spouse's brothers and sisters);

(2) natural person shareholders who directly or indirectly hold at least 1 percent of the outstanding shares of the Company or who rank among the top ten shareholders of the Company, and their lineal relatives;

(3) persons who hold positions in entities that directly or indirectly hold at least 5 percent of the outstanding shares of the Company or that rank among the top five shareholders of the Company, and their lineal relatives;

(4) persons who hold positions in the actual controller of the Company and its subsidiaries;

(5) persons who provide financial, legal, consulting and other services to the Company and its controlling shareholder or their respective subsidiaries, including all members of the project team, reviewers at all levels, persons who sign the report, partners and main responsible persons of the intermediary institutions that provide services;

(6) a person who serves as a director, supervisor or senior management officer in an entity that has material business dealings with the Company and its controlling shareholder or their respective subsidiaries, or a person who serves as a director, supervisor or senior management officer in the controlling shareholder(s) of such entity;

(7) persons who, at any time during the immediately preceding period of one year, have fallen into any of the six categories listed above;

(8) other persons that the securities regulatory authority, stock exchanges specify are not independent or may not serve as an independent director.

Article 132. If an independent director fails on two consecutive occasions to personally attend a meeting of the Board of Directors or the number of their non-attendance at board meetings in person accounts for more than one-third of the number of board meetings during the said year, the Board of Directors shall request that the Shareholders' General Meeting replace him or her. An independent director may not be removed without cause before the expiration of his or her term, unless any of the circumstances set forth in Article 122, Clause 2, or the circumstance mentioned in the preceding paragraph or a circumstance under which a person may not hold the position of director specified in the laws, administrative regulations and rules, as well as these Articles of Association, arises. If an independent director is removed before the expiration of his or her term, the Company shall disclose his or her removal as a matter for special disclosure. If the removed independent director is of the opinion that the Company's grounds for removing him or her are not justified, he or she may make a public statement to that effect.

Article 133. In addition to the functions and powers granted to directors under the Company Law, other laws, administrative regulations and rules, as well as these Articles of Association, independent directors shall have the following special functions and powers:

(1) the material connected transactions (as determined based on the criteria issued by the competent regulator from time to time) shall be reviewed by the Board of Directors or the Shareholders' General Meeting in accordance with laws, regulations and/or the relevant listing rules; in case there are relevant provisions in the applicable laws, regulations and/or the relevant listing rules, it shall be submitted to the Board of Directors for discussion after being approved by not less than 50 percent of the independent directors in accordance with such provisions. A resolution by the Board of Directors on a connected transaction shall enter into effect only once the independent directors have signed the same. Before rendering their judgment, independent directors may engage an intermediary organization to issue an independent financial consultant report for use as a basis for rendering their judgment;

(2) proposing the engagement or dismissal of an accounting firm to the Board of Directors;

(3) proposing to the Board of Directors the calling of an extraordinary Shareholders' General Meeting;

(4) proposing the calling of meetings of the Board of Directors;

(5) independently engaging intermediaries to express professional opinions when necessary at the expense of the Company;

(6) openly soliciting shareholders' voting rights before the holding of a Shareholders' General Meeting;

(7) directly reporting to the Shareholders' General Meeting, CSRC and other relevant departments.

An independent director shall obtain the consent of at least half of the independent directors before exercising the aforementioned functions and powers in items (2), (3), (4), (6), and (7) and shall obtain the consent of all independent directors before exercising the aforementioned functions and powers in item (5).

The expenses incurred by independent directors in independently engaging external auditors and consultants, and carrying out audit and consulting for the specific matters of the Company shall be borne by the Company.

Article 134. In addition to performing the duties and responsibilities mentioned above, independent directors shall express their independent opinions to the Board of Directors or the Shareholders' General Meeting on the following matters:

(1) the nomination or removal of directors;

(2) the engagement or dismissal of senior management staff;

(3) the remuneration of the Company's directors and senior management staff;

(4) matters which may, in an independent director's opinion, harm the rights and interests of small and medium shareholders;

(5) major financial transactions that occur between the Company and the shareholders or its affiliates;

(6) the failure by the Board of Directors to prepare a plan for the distribution of profits in cash;

(7) other matters specified in the applicable laws and regulations, as well as these Articles of Association.

Concerning the aforementioned matters, independent directors shall express one of the following opinions: consenting opinions; qualified opinions, and the reasons therefor; opposing opinions, and the reasons therefor; disclaimer of opinion, and an explanation of the impediments.

Article 135. The independent director shall attend the meeting of the Board of Directors on time, understand the Company's production and operation, and actively investigate and obtain the conditions and information required by making decisions. The independent director shall submit the annual report of all independent directors to the Shareholders' General Meeting of the Company and to elaborate on the performance by the independent directors of their duties and responsibilities.

Article 136. The Company shall establish the work system of independent directors; the Secretary to the Board of Directors shall actively cooperate with the independent directors to perform their duties and responsibilities. The Company shall ensure that the independent directors enjoy the same right to know as other directors, timely provide relevant materials and information to the independent directors, regularly report the Company's operation and organize the independent directors to make field survey if necessary.

CHAPTER 13 Secretary to the Board of Directors

Article 137. The Company shall have a Secretary to the Board of Directors. The Secretary to the Board of Directors shall be a member of the senior management staff of the Company and the Board of Directors shall establish the working office of the Board Secretary, if necessary.

Article 138. The Secretary to the Board of Directors shall be a natural person with the necessary professional knowledge and experience. He or she shall be appointed by the Board of Directors.

His or her main duties shall be as set forth below:

(1) to assist the directors with their handling of the day-to-day business of the Board of Directors; to provide the directors with, remind the directors of, and ensure that the directors are aware of, the domestic and foreign regulators' regulations, policies and requirements in respect of the operation of companies; and to assist the directors and the President in their compliance with domestic and foreign laws, these Articles of Association and other relevant regulations when they are exercising their functions and powers;

(2) to be responsible for organizing and preparing the documents of the Board of Directors and the Shareholders' General Meeting; to duly keep meeting minutes; to ensure that decisions made at meetings are made in accordance with statutory procedure and to keep abreast of the implementation of the resolutions of the Board of Directors;

(3) to be responsible for arranging and coordinating the disclosure of information, coordinating the relationship with investors and enhancing the transparency of the Company;

(4) to participate in arranging capital market financing;

(5) to handle relations with intermediary organizations, regulators and the media, and to coordinate public relations.

The scope of the duties and responsibilities of the Secretary to the Board of Directors shall be as set forth below:

(1) to arrange and make preparations for meetings of the Board of Directors and Shareholders' General Meeting, to prepare meeting materials, to arrange relevant meeting affairs, to be responsible for meeting minutes, to ensure the accuracy of such minutes, to keep meeting documents and minutes, to actively keep abreast of the implementation of relevant resolutions; to report major issues encountered in the course of implementation to the Board of Directors and to provide recommendations in respect thereof.

(2) to ensure that the material matters on which the Board of Directors of the Company has reached decisions are carried out in strict accordance with the prescribed procedure; at the request of the Board of Directors, to participate in and arrange for advice and analysis of matters on which the Board of Directors is to make decisions and put forward pertinent opinions and recommendations; to handle, upon appointment, the day to day work of the Board of Directors and its relevant committees.

(3) as the contact person between the Company and the securities regulator, to be responsible for arranging for the preparation and timely delivery of the documents requested by the regulator and to be responsible for accepting the relevant tasks assigned by the regulator and arranging for their completion.

(4) to be responsible for coordinating and arranging information disclosures by the Company and the establishment of a sound information disclosure system, to attend all Company meetings relating to information disclosure and to be aware at all times of the Company's material business decisions and relevant information and data.

(5) to be responsible for the work associated with maintaining the confidentiality of the Company's price sensitive information and to formulate a practical and effective confidentiality system and measures; where Company price sensitive information is leaked for any reason, to take the necessary remedial measures, to timely explain and clarify the same and inform the regulator of the place where Company shares are listed abroad and the CSRC.

(6) to be responsible for the coordination and organization of the market promotion, coordinating the visiting reception, dealing with the investor relations, maintaining the relationship with the investors, intermediaries and the media, coordinating to answer the public's questions, ensuring that the investors may obtain the information disclosure matters of the Company in time; to be responsible for the promotion and propaganda activities of the Company inside and outside China, preparing summary reports on the market promotion and activities such as major inviting, and organizing the relevant matters of report to the CSRC.

(7) to be responsible for the management and conservation of the Company's register of shareholders, register of directors, the materials about the number of shares held by major shareholders and director equity records, as well as the list of creditors of the Company's outstanding debentures.

(8) to assist the directors and the President in their compliance with domestic and foreign laws, these Articles of Association and other relevant regulations when they are exercising their functions and powers; when he or she becomes aware that the Company has adopted or could adopt a resolution that violates relevant regulations, he or she is under obligation to timely make the same known and has the right to truthfully report the same to the CSRC and other regulators.

(9) to coordinate the provision of necessary information and data to the Company's Board of Supervisors and other review organizations when they are performing their monitoring functions and to assist in the investigations on the performance by the Company's Financial Controller, the Company's directors and the President of their fiduciary duties.

(10) to perform other functions and powers granted by the Board of Directors and other functions and powers required by laws of the place where Company shares are listed or by relevant rules of the Stock Exchange.

Article 139. Directors or other senior management staff of the Company may concurrently hold the office of Secretary to the Board of Directors. No accountant of an accounting firm engaged by the Company may concurrently hold the office of Secretary to the Board of Directors.

If the office of Secretary to the Board of Directors is held by a director of the Company and a certain act is to be done by a director and the Secretary to the Board of Directors separately, the person who concurrently holds the offices of director and Secretary to the Board of Directors may not perform the act in both capacities.

Article 140. The Secretary to the Board of Directors shall comply with the relevant provisions of these Articles of Association to perform his or her duties diligently.

The Secretary to the Board of Directors shall assist the Company in compliance with China's relevant laws and the rules of the Stock Exchange where the Company's shares are listed.

CHAPTER 14 President of the Company

Article 141. The Company has a President, who shall be engaged or dismissed by the Board of Directors.

The Company shall have one Senior Vice President, several Vice Presidents and one Chief Financial Officer, one General Counsel to assist the President's work. The Senior Vice President, Vice President, Chief Financial Officer and General Counsel shall be nominated by the President and engaged or dismissed by the Board of Directors.

The President, Senior Vice President, Vice President, Chief Financial Officer, secretary to the Board and General Counsel of the Company constitute the management of the Company. The management is the executive body of the Company for operation, implementation and management enhancement, and is subject to the management of the Board and the supervision of the Supervisory Committee.

A director can be engaged as the part-time President or other senior management staff; however, the number of the directors serving as the part-time President or other senior management staff shall not exceed one half of the Company's total number of directors.

Article 142. In principle, the President shall serve terms of three years and may serve consecutive terms if reappointed.

Article 143. The President shall be accountable to the Board of Directors and exercise the following functions and powers:

(1) to be in charge of the production, operation and management of the Company, to organize the implementation of the resolutions of the Board of Directors;

(2) to arrange for the implementation of the Company's annual business plans and investment plans;

(3) to draft the plan for establishment of the Company's internal management organization;

(4) to draft the plan for establishment of management organization of the Company's branch offices;

(5) to formulate the Company's basic management system and the Company's market-oriented selection and employment, labour employment and salary distribution system;

(6) to formulate the business management system and regulations of the Company;

(7) to request the Board of Directors to engage or dismiss the Company's Senior Vice President, Vice President, Chief Financial Officer and General Counsel;

(8) to engage or dismiss management personnel other than those to be engaged or dismissed by the Board of Directors;

(9) to propose the holding of interim meetings of the Board of Directors;

(10) other functions and powers granted by the Company's Articles of Association or the Board of Directors.

Article 144. The President of the Company shall timely report on the execution and performance of material contracts of the Company, on the application of funds and on profits and losses to the Board of Directors or at the request of the Board of Supervisors. The President shall ensure the truthfulness of such reports.

Article 145. The President of the Company shall report to the Board of Directors on the signing and execution of material contracts, application of funds, as well as profit and loss as requested by the Supervisory Committee. The President shall ensure the trueness of the report.

Article 146. In the exercise of his or her functions and powers, the President and other senior management staff shall not change the resolutions of the Shareholders' General Meeting and the Board of Directors or exceed the scope of authorization.

Article 147. In the exercise of his or her functions and powers, the President and other senior management staff shall perform a fiduciary duty and an obligation of diligence in accordance with the laws, administrative regulations and rules, as well as these Articles of Association.

Article 148. The President and other senior management staff may tender his or her resignation to the Board of Directors in written form three months in advance; the department manager may tender his or her resignation to the President in written form two months in advance.

CHAPTER 15 Board of Supervisors

Article 149. The Company shall have a Board of Supervisors. The Board of Supervisors is a regular supervisory department established by the Company. It is responsible for supervising the Board of Directors and its members, as well as other senior management staff to prevent them from abusing their powers, or infringing the legal interests of shareholders, the Company, and employees of the Company.

Article 150. The Board of Supervisors shall consist of five supervisors. The external supervisors (refer to those supervisors who do not hold office in the Company, the same below) shall represent not less than 50 percent of the members of the Board of Supervisors. The number of the supervisors who represent the employees shall be not less than one-third of the number of supervisors. The term of office of a supervisor shall be 3 years. A supervisor may serve consecutive terms if re-elected upon the expiration of his or her term.

The Board of Supervisors shall have one chairman. The appointment and dismissal of the Chairman of the Board of Supervisors shall be subject to the affirmative vote of at least two- thirds of the members of the Board of Supervisors.

The chairman of the Board of Supervisors shall organize the performance of the duties of the Board of Supervisors.

Article 151. The members of the Board of Supervisors include three shareholder representative Supervisors (including qualified outside Supervisors, the same below) and two employee representative Supervisors who represents the employees. The shareholder representative Supervisor shall be elected by the Shareholders' General Meeting; the employee representative Supervisor shall be elected by the employee representative congress.

The Board of Supervisors shall, according to its needs, establish its offices to be responsible for the daily work of the Board of Supervisors.

Article 152. The list of candidates for the position of supervisors who represent the shareholders shall be put in the form of a motion before the Shareholders' General Meeting for resolution. The candidates for the supervisors who represent the shareholders shall be nominated by the Board of Directors, the Board of Supervisors and a shareholder alone or shareholders together holding at least 3 percent of the Company's shares, and shall be elected and removed by the Shareholders' General Meeting of the Company. The procedures for electing supervisors shall refer to the procedures for electing non-independent directors in Article 109 of these Articles of Association and the provision of adopting the cumulative voting system for electing directors or supervisors in Article 110 of these Articles of Association.

Article 153. The Company's Directors and senior management staff may not concurrently serve as supervisors.

Article 154. The meeting of the Board of Supervisors shall be convened at least once every six months. The chairman of the Board of Supervisors shall convene and preside over meetings of the Supervisory Board. If the chairman of the Supervisory Board is unable or fails to perform his or her duties, a supervisor jointly selected by at least one half of the supervisors shall convene and preside over a meeting.

The notice for convening a meeting of the Board of Supervisors shall be served to all supervisors 7 days before the meeting in written form.

Article 155. If a supervisor fails to personally attend a meeting of the Board of Supervisors and to appoint another supervisor to attend the meetings on his or her behalf on two consecutive occasions, he or she shall be deemed unable to perform his or her duties and shall be replaced by the Shareholders' General Meeting and the employee representative congress.

Article 156. The supervisor may tender his or her resignation before the end of his or her term. The provisions concerning the duration and resignation of the directors in CHAPTER 11 of these Articles of Association are also applicable to the supervisors.

Article 157. The Board of Supervisors shall be accountable to the Shareholders' General Meeting and exercise the following functions and powers in accordance with laws:

(1) to supervise and examine the Company's financial affairs; to review the report prepared by the Board of Directors periodically and submit the audit opinions in written form (the written review opinions shall state whether the report preparation and review procedures are in compliance with relevant regulations and whether the content is true, accurate and complete);

(2) to review the Company's annual ESG report and provide written review opinions;

(3) to supervise the directors and senior management in the performance of their Company duties and to propose the removal of directors or senior management staff who violate laws, administrative regulations or breach these Articles of Association or resolutions of the Shareholders' General Meeting;

(4) if an act of a director or of senior management is detrimental to the Company's interests, to require him or her to correct such act and, if necessary, report to the Shareholders' General Meeting or the relevant competent authorities of the State;

(5) to verify financial information such as financial reports, business reports, profit distribution plans, etc. that the Board of Directors intends to submit to the Shareholders' General Meeting and, if in doubt, to be able to appoint, in the name of the Company, a registered accountant or practicing auditor to assist in reviewing such information;

(6) to conduct an investigation and, if necessary, engage professional organizations, such as accounting firms and law firms, to assist it in its work in the event that it discovers any irregularities in the Company's operations;

(7) to propose the holding of Extraordinary Shareholders' General Meetings and, in the event that the Board of Directors fails to perform its duty of convening and presiding over a Shareholders' General Meeting, to convene and preside over such a meeting in accordance with the law;

(8) to put forward proposals at Shareholders' General Meetings;

(9) to propose the interim meeting of the Board of Directors;

(10) to negotiate with or to file a suit according to law against any directors or senior management who have violated the laws, administrative regulations or the Articles of Association in performing their duties and caused losses to the Company on behalf of the Company;

(11) Other duties as prescribed in the laws, administrative regulations and rules, as well as the Articles of Association and authorized by the Shareholders' General Meeting.

The Board of Supervisors shall give advice for the accounting firm engaged by the Company. It may appoint a separate accounting firm in the Company's name to independently review the Company's finances if necessary and directly report to the State Council authorities in charge of securities and other relevant departments.

The outside supervisors shall independently report the integrity and diligence performance of the Company's senior management staff to the Shareholders' General Meeting.

Supervisors may attend meetings of the Board of Directors in a non-voting capacity and raise questions and make suggestions in respect of matters that are the subject of resolutions of the Board of Directors.

Article 158. The Board of Supervisors may require, if necessary, the Company's relevant directors, senior management, the internal and external auditors to attend the meetings of the Board of Supervisors and answer the issues concerned.

Article 159. Resolutions of the Board of Supervisors shall require the affirmative vote of at least two-thirds of the members of the Board of Supervisors for adoption.

Article 160. The minutes of the meeting shall be kept as the Company's records of meetings by the Board of Supervisors. The supervisors and recorder attending the meeting shall sign on the finalized minute of the meeting. The minutes of meetings of the Board of Supervisors shall be kept as the Company's important files. The minutes of meetings shall be kept for at least 10 years.

Article 161. When the Board of Supervisors exercises its functions and powers with the engagement of the lawyers, accountants, auditors and other professionals, the reasonable expenses incurred and reasonable expenses incurred by supervisors in attending meetings of the Supervisory Committee are borne by the Company.

Article 162. The supervisors shall faithfully fulfill its oversight responsibilities in accordance with the laws and administrative regulations and rules, as well as these Articles of Association.

CHAPTER 16 Qualifications and Obligations of the Directors, Supervisors, President and Other Senior Management Staff of the Company

Article 163. None of the following persons may serve as a director, supervisor, President or other senior management staff of the Company:

(1) persons without capacity or with limited capacity for civil acts;

(2) persons who were sentenced to criminal punishment for the crime of corruption, bribery, misappropriation of property or diversion of property or for disrupting the order of the socialist market economy, where not more than five years have elapsed since the expiration of the period of punishment; or persons who were deprived of their political rights for committing a crime, where not more than five years have elapsed since the expiration of the period of deprivation;

(3) persons who served as directors, or factory directors or presidents, who bear personal liability for the bankruptcy liquidation of their companies or enterprises, where not more than three years have elapsed since the date of completion of the bankruptcy liquidation;

(4) persons who served as the legal representatives of companies or enterprises that had their business licenses revoked for breaking the law, where such representatives bear individual liability therefor and not more than three years have elapsed since the date of revocation of the business license;

(5) persons with comparatively large debts that have fallen due but have not been settled;

(6) persons whose cases have been placed on the docket and are being investigated by the judicial authorities because they violated the criminal law, and such cases are still pending;

(7) national civil servants and the public institutions' staff that are subject to the similar management of the national civil servants;

(8) persons who may not serve as leaders of enterprises by virtue of laws;

(9) persons who are non-natural persons;

(10) persons ruled by a competent authority to have violated securities-related regulations, where such violation involved fraudulent or dishonest acts and not more than five years have elapsed since the date of the ruling;

(11) a person who has been given penalties of prohibition against entering the securities market from the CSRC, where the term of such penalties has not expired;

(12) persons who may not serve as a director, supervisor, President or other senior management staff of the Company by virtue of laws and regulations of the State and the Listing Rules.

As for the current directors, under the above circumstance set forth above, the Board of Directors shall immediately stop relevant directors from performing their duties since the date of knowing the situation occurred, and advice the Shareholders' General Meeting to replace such directors. As for the President, the Board of Directors shall immediately stop relevant President from performing his or her duties since the date of knowing the situation occurred, and convene the meeting of the Board of Directors to dismiss such President. As for the current supervisors, under the above circumstance set forth, the Board of Directors shall immediately stop relevant supervisors from performing their duties since the date of knowing the situation occurred, and advice the Shareholders' General Meeting or the employee representative congress to replace such supervisors.

Article 164. No director may act on behalf of the Company or the Board of Directors in his or her own name unless these Articles of Association specify that he or she may do so or he or she is lawfully authorized to do so by the Board of Directors. A director shall declare his or her position and capacity in advance if, when such director is acting in his or her private capacity, a third party would reasonably assume him or her to be acting on behalf of the Company or the Board of Directors.

Article 165. The validity of an act of a director, the President or other senior management staff of the Company on behalf of the Company shall not, vis-à-vis a bona fide third party, be affected by any non-compliance in his or her holding of such office, election or qualification.

Article 166. In addition to obligations imposed by laws, the administrative rules and regulations as well as the listing rules of the stock exchanges on which shares of the Company are listed, the Company's directors, supervisors, President and other senior management staff shall owe each shareholder the following obligations in the exercise of the functions and powers granted to them by the Company:

(1) not to cause the Company to exceed the scope of business stipulated in its business license;

(2) to act honestly in the best interest of the Company;

(3) not to deprive the Company of its property in any way, including (but not limited to) any opportunities that are advantageous to the Company;

(4) not to deprive shareholders of their individual rights and interests, including (but not limited to) rights to distributions and voting rights, unless pursuant to a restructuring of the Company submitted to and adopted by the Shareholders' General Meeting in accordance with these Articles of Association of the Company;

(5) the obligations required by the laws of the place where Company shares are listed and relevant provisions of the stock exchange.

Article 167. The Company's directors, supervisors, President and other senior management staff shall have an obligation, in the exercise of their rights or discharge of their obligations, to perform their acts with the care, diligence and skill that a reasonably prudent person should exercise in comparable circumstances, including but not limited to the relevant Professional Moralities and Code of Conduct for employees developed by the Company.

Article 168. The Company's directors, supervisors, President and other senior management staff must, in the performance of their duties and responsibilities, abide by the fiduciary principle and shall not place themselves in a position where their personal interests and their duties may conflict. This principle shall include but not be limited to the fulfillment of the following obligations:

(1) to act honestly in the best interest of the Company;

(2) to exercise powers within the scope of their functions and powers and not to exceed such powers;

(3) to personally exercise the discretion vested in him or her and not allow himself or herself to be manipulated by another person and, unless permitted by laws, administrative regulations or with the informed consent of the Shareholders' General Meeting, not to delegate the exercise of his or her discretion;

(4) to accord equal treatment to shareholders of the same class and fair treatment to shareholders of different classes;

(5) not to conclude a contract or enter into a transaction or arrangement with the Company except as otherwise provided in these Articles of Association or with the informed consent of the Shareholders' General Meeting;

(6) not to use Company property for his or her own benefit in any way without the informed consent of the Shareholders' General Meeting;

(7) not to use his or her functions and powers as a means to accept bribes or other forms of illegal income, and not to illegally appropriate Company property in any way, including (but not limited to) any opportunities that are advantageous to the Company;

(8) not to accept commissions in connection with Company transactions without the informed consent of the Shareholders' General Meeting;

(9) to abide by these Articles of Association, to perform his or her duties faithfully, to protect the interests of the Company, and not to use his or her position, functions and powers in the Company to seek personal gain;

(10) not to compete with the Company in any way without the informed consent of the Shareholders' General Meeting;

(11) not to divert Company funds, not to deposit Company assets or funds in accounts opened in his or her own or in another name; not to lend Company funds to others, and not to use Company property as security for the debts of other individuals without the consent of the Shareholders' General Meeting or Board of Directors;

(12) without the informed consent of the Shareholders' General Meeting, not to disclose confidential information relating to the Company that was acquired by him or her during his or her tenure; and not to use such information except in the furtherance of the interests of the Company; however, such information may be disclosed to a court or other competent government authorities if:

   i. provided for by laws;

   ii. required in the public interest;

   iii. required in the personal interest of such director, supervisor, President or other senior management staff of the Company.

Income derived by the directors, President and other senior management staff in breach of this Article shall belong to the Company; and they shall be held liable for damages if, as a result of violating a regulation, they cause the Company to sustain a loss.

Article 169. All directors, supervisors and the secretary to the board of directors shall attend the Shareholders' General Meeting of the Company, and the President and other senior management shall be present at the meeting. The directors, supervisors, President and senior management staff shall provide explanations in response to the queries and suggestions made by shareholders at a Shareholders' General Meeting.

The directors, President and senior management staff shall provide true information and data to the Board of Supervisors and not interfering with the Board of Supervisors or supervisors in the exercise of their functions and powers.

Article 170. A director, a supervisor, the President or other senior management staff of the Company may not incite the following persons or organizations ("**connected persons**") to do what such director, supervisor, President or other senior management staff may not do:

(1) the spouse or a minor child of such director, supervisor, President or other senior management staff of the Company;

(2) a trustee of such director, supervisor, President or other senior management staff of the Company or of any person referred to in item (1) hereof;

(3) a partner of such director, supervisor, President or other senior management staff of the Company or of any person referred to in items (1) and (2) hereof;

(4) a company over which such director, supervisor, President or other senior management staff of the Company, alone or jointly with any person referred to in items (1), (2) and (3) hereof or any other director, supervisor, President or other senior management staff of the Company, has de facto control;

(5) a director, a supervisor, the President or other senior management staff of a company being controlled as referred to in item (4) hereof.

Article 171. If a director, a supervisor, the President and other senior officer tender his or her resignations or his or her term of office expires, the fiduciary obligation of the Company's directors, supervisors, President and other senior management staff do not necessarily cease with the termination of their tenure. A director, the supervisor, the President and other senior officer's obligation to maintain the confidentiality of the Company's trade secrets shall survive the end of his or her term, until such secrets enter the public domain. The term of survival of his or her other obligations shall be decided upon according to the principle of fairness, the time elapsed between the director's departure from office and the occurrence of the event, and the circumstances and conditions of the termination of his or her relationship with the Company.

Article 172. A director, a supervisor, the President or other senior officer who causes the Company to sustain a loss as a result of a violation of a law, administrative regulations and rules, department rules or a breach of these Articles of Association by him or her during the performance of his or her Company duties shall be liable for damages.

A director, a supervisor, the President or other senior officer who causes the Company to sustain a loss due to his or her unauthorized departure from office prior to the end of his or her term shall be liable for damages.

Article 173. A director, a supervisor, the President or other senior management staff of the Company may, by informed decision of the Shareholders' General Meeting, be relieved from liability for a specific breach of his or her obligations, except in circumstances as specified in Article 58 of the Articles of Association.

Article 174. If a director, a supervisor, the President or other senior management staff of the Company is, directly or indirectly, materially interested in a contract, transaction or arrangement concluded or planned by the Company (excluding his or her engagement contract with the Company), he or she shall disclose the nature and extent of his or her interest to the Board of Directors at the earliest opportunity, whether or not the matter is normally subject to the approval of the Board of Directors.

A director may not vote on any contract, transaction or arrangement in which he or she or any close associate connected to him or her (as defined in the applicable securities listing rules amended from time to time) has a material interest and which is to be approved by the Board of Directors or any other proposals related thereto. Additionally, he or she may not count in the quorum for the meeting.

Unless the interested director, supervisor, President or other senior management staff of the Company has disclosed such interest to the Board of Directors as required under the first paragraph hereof and the matter has been approved by the Board of Directors at a meeting in which he or she was not counted in the quorum and had refrained from voting, the Company shall have the right to void the contract, transaction or arrangement, unless the other party is a bona fide party acting without knowledge of the breach of obligation by the director, supervisor, President or other senior management staff concerned.

A director, a supervisor, the President or other senior management staff of the Company shall be deemed to be interested in any contract, transaction or arrangement in which a connected person of that director, supervisor, President or other senior management staff is interested.

Article 175. If a director, a supervisor, the President or other senior management staff of the Company gives a written notice to the Board of Directors before the conclusion of the contract, transaction or arrangement is first considered by the Company stating that, by reason of the contents of the notice, he or her is interested in the contract, transaction or arrangement that may subsequently be made by the Company, such director, supervisor, President or other senior management staff of the Company shall be deemed for the purposes of the preceding Articles of this Chapter to have declared his interest, to the extent stated in the notice.

Article 176. The Company may not in any manner pay tax on behalf of its directors, supervisors, President or other senior management staff.

Article 177. The Company may not directly or indirectly provide a loan to, or loan guarantees for, its directors, supervisors, President and other senior management staff or those of its parent company, or provide loans to or loan guarantees for connected persons of the above-mentioned persons.

The provisions of the preceding paragraph shall not apply to the following circumstances:

(1) the provision by the Company of a loan to or a loan guarantee for a subsidiary of the Company;

(2) the provision by the Company of a loan, loan guarantee or other moneys to a director, a supervisor, the President or other senior management staff of the Company under an engagement contract approved by the Shareholders' General Meeting, so as to enable him to meet the expenses incurred for the purposes of the Company or for the performance of his or her Company duties;

(3) the provision by the Company of a loan or a loan guarantee to a relevant director, a supervisor, the President or other senior management staff of the Company or to a connected person thereof on normal commercial terms, if the ordinary scope of business of the Company includes the lending of money or the provision of loan guarantees.

Article 178. A loan provided by the Company in breach of the preceding Article shall be immediately repaid to the Company by the recipient of the loan, regardless of the terms of the loan.

Article 179. A loan guarantee provided by the Company in breach of the first paragraph of Article 177 shall be unenforceable against the Company, unless:

(1) the loan was provided to a connected person of a director, a supervisor, the President or other senior management staff of the Company or of its parent company, and at the time the loan was advanced the lender did not know the relevant circumstances;

(2) the collateral provided by the Company has been lawfully sold by the lender to a bona fide purchaser.

Article 180. For the purposes of the preceding Articles of this Chapter, the term "guarantee" shall include an act whereby the guarantor assumes liability or provides property to guarantee or secure the performance of obligations by the obligor.

Article 181. Following the approval of the Shareholders' General Meeting, the Company may purchase liability insurances for the directors, supervisors, President and other senior management staff, unless the liability is caused by the violation of the laws, administrative regulations and rules, as well as these articles of association by the Company's directors, supervisors, the President or other senior management staff.

Article 182. If a director, a supervisor, the President or other senior management staff of the Company breaches his or her obligations to the Company, the Company shall, in addition to any rights and remedies provided by laws or administrative rules and regulations, have the right to:

(1) require the relevant director, supervisor, President or other senior management staff to compensate for the losses sustained by the Company as a consequence of his or her dereliction of duty;

(2) rescind any contract or transaction concluded by the Company with the relevant director, supervisor, President or other senior management staff and contracts or transactions with a third party (where such third party is well aware or should know that the director, supervisor, President or other senior management staff representing the Company was in breach of his or her obligations to the Company);

(3) require the relevant director, supervisor, President or other senior management staff to surrender the gains derived from the breach of his or her obligations;

(4) recover any moneys received by the relevant director, supervisor, President or other senior management staff that should have been received by the Company, including (but not limited to) commissions;

(5) require the relevant director, supervisor, President or other senior management staff to return the interest earned or possibly earned on the moneys that should have been given to the Company.

Article 183. The Company shall conclude written contracts with each director and supervisor of the Company concerning his or her remuneration. Such contracts shall be approved by the Shareholders' General Meeting before they are entered into. The aforementioned remuneration shall include:

(1) remuneration in respect of his or her service as a director, supervisor or senior management staff of the Company;

(2) remuneration in respect of his service as a director, supervisor or senior management staff of a subsidiary of the Company;

(3) remuneration for other services provided toward the management of the Company or a subsidiary thereof;

(4) the payment by way of compensation for his or her loss of office or retirement to the aforementioned directors and supervisors in respect of redundancy or retirement.

A director or supervisor may not sue the Company for benefits due to him or her on the basis of the aforementioned matters, except under a contract as mentioned above.

Article 184. The Company shall specify in the contract concluded with a director or supervisor of the Company concerning his or her remuneration that in the event of a takeover of the Company, a director or supervisor of the Company shall, subject to prior approval of the Shareholders' General Meeting, have the right to receive the compensation or other moneys obtainable for loss of office or retirement. For the purposes of the preceding paragraph, the term "a takeover of the Company" shall mean either of the following:

(1) anyone making a purchase offer to all of the shareholders;

(2) anyone making a purchase offer with a view to the offeror becoming a controlling shareholder as defined in the Article 59 of these Articles of Association.

If the relevant directors or supervisors have failed to comply with this Article, any sums received by themselves shall belong to those persons that have sold their shares as a result of their acceptance of the aforementioned offer, and the expenses incurred in the pro rata distribution of such sums shall be borne by the relevant directors or supervisors and may not be paid out of such sums.

CHAPTER 17 Financial and Accounting Systems, Distribution of Profits, Auditing and General Counsel System

Article 185. The Company shall formulate its own financial and accounting systems in accordance with laws, administrative regulations and China's accounting standards formulated by the State Council's department in charge of finance.

Article 186. The Company shall adopt the Gregorian calendar year as its fiscal year, which shall commence on January 1 and end on December 31 of the same Gregorian calendar year.

The Company shall adopt the Renminbi as its bookkeeping base currency and its account books shall be kept in Chinese.

The Company shall prepare financial reports at the end of each fiscal year. Such reports shall be audited by an accounting firm in accordance with the laws.

Article 187. The Board of Directors of the Company shall place before the shareholders at each annual Shareholders' General Meeting such financial reports as relevant laws, administrative regulations and normative documents promulgated by the local government and the authorities-in-charge require the Company to prepare. Such reports shall be subject to verification.

Article 188. The financial reports of the Company shall be made available for inspection by shareholders 20 days prior to an annual Shareholders' General Meeting. Each shareholder of the Company shall have the right to obtain a copy of the financial reports referred to in this Chapter.

The Company will send the aforementioned financial reports to each holder of H shares by prepaid mail at the recipient's address shown in the register of shareholders at least 21 days prior to an annual Shareholders' General Meeting.

Subject to the laws, regulations and listing rules of the place where Company's shares are listed, the aforementioned financial reports may be provided to shareholders by other means as specified in Article 236 of these Articles of Association.

Article 189. The financial statements of the Company shall be prepared not only in accordance with PRC accounting standards and regulations but also in accordance with international accounting standards or the accounting standards of the place outside the PRC where shares of the Company are listed. If there are material differences in the financial statements prepared in accordance with these two sets of accounting standards, such differences shall be stated in the notes to such financial statements. For purposes of the Company's distribution of after-tax profits of a given fiscal year, the lesser of the amounts of after-tax profits shown in the aforementioned two kinds of financial statements shall govern.

Article 190. The Company shall publish four financial reports every fiscal year, namely an Q1 financial report within 30 days after the end of the first three months of the fiscal year, an interim financial report within 60 days after the end of the first six months of the fiscal year, an Q3 financial report within 30 days after the end of the first nine months of the fiscal year and an annual financial report within 120 days after the end of the fiscal year.

Article 191. The Company's financial and accounting reports shall be prepared in accordance with relevant laws, administrative regulations and departmental rules.

Article 192. The Company may not keep account books other than the statutory account books.

Article 193. The basic principles of profit distribution policy of the Company are as follows:

(1) taking full account of return to investors and distributing dividend to shareholders per annum in proportion to the distributable dividend realized for the year concerned;

(2) maintaining the continuity and stability of the Company's dividend distribution policy, while at the same time take care of the interest of the Company in the long term, the interest of the shareholders as a whole, as well as the sustainable development of the Company;

(3) giving priority to dividend distribution in cash.

Article 194. When the Company distributes its after-tax profits for a given year, it shall allocate 10 percent of profits to its statutory common reserve. The Company shall no longer be required to make allocations to its statutory common reserve once the aggregate amount of such reserve reaches at least 50 percent of its registered capital.

If the Company's statutory common reserve is insufficient to make up losses from previous years, the Company shall use its profits from the current year to make up such losses before making the allocation to its statutory common reserve in accordance with the preceding paragraph.

After making the allocation from its after-tax profits to its statutory common reserve as well as statutory public welfare fund, the Company may, subject to a resolution of the Shareholders' General Meeting, make an allocation from its after-tax profits to the discretionary common reserve.

After the Company has made up its losses and made allocations to its common reserves, the remaining profits of the Company shall be distributed in proportion to the shareholdings of its shareholders. Shares of the Company that are held by the Company itself shall not participate in the distribution of profits.

Article 195. Before making up its losses and made allocations to the statutory common reserve, the Company shall not distribute dividends or distribute profits to shareholders. The Company's dividend does not bear any interest, unless the Company fails to distribute relevant dividends to the shareholders.

Article 196. The capital common reserve shall include the following funds:

(1) the premiums obtained from the issue of shares above par;

(2) other revenue required by the State Council's finance authority to be included in the capital common reserve.

Article 197. The Company's common reserves (referring to the statutory reserve fund, any fund and capital fund) shall be used to make up the Company's losses, to expand the Company's production and operations or, through conversion into capital, to increase the Company's capital. However, the capital common reserve will not be used to make up the Company's losses.

When funds in the statutory common reserve are converted into capital by the Company through the resolution at the Shareholders' General Meeting, the new shares shall be issued according to the original proportion of shares held by the shareholders, or the par value of shares shall be increased. However, in case that the statutory common reserve are converted into capital, the remaining of the reserve shall not be less than 25 percent of the registered capital of the Company before the conversion.

Article 198. Dividend distribution policies of the Company are to be specified as follows:

(1) dividend shall be distributed in the following manner: the Company may distribute dividends in cash, in shares or in a combination of both cash and shares. Subject to conditions, interim profit distribution may be made by the Company.

(2) specific circumstances for and proportions of cash dividend of the Company: save in exceptional circumstances, if the Company's profit for the year and its cumulative undistributed profit are positive, the Company may distribute dividend in cash and the profit to be distributed in cash per annum will not be less than 10 percent of the distributable profit realized for that year, or that the total profit to be distributed in cash in the past three years will not be less than 30 percent of the average annual distributable profit realized in the past three years.

The exceptional circumstances refer to the following:

i. where the auditing firm issues a non-standard unqualified audit report on the financial report of the Company for the year; and

ii. where the Company has major investment plan or significant cash expenditure (fund raising projects excepted).

(3) Conditions for distributing dividends in shares by the Company:

where the Company's business is in a sound condition, and the Board of Directors considers that the stock price of the Company does not reflect its share capital size and distributing dividend in shares will be favorable to all shareholders of the Company as a whole, provided that the above conditions of cash dividend are fully met, the Company may propose dividend distribution in shares;

(4) Upon occurrence of any illegal appropriation of the Company's funds by the shareholders, the Company shall deduct the cash bonus to be paid to such shareholders to make up for the funds appropriated by such shareholders.

Article 199. Procedures for considering the profit distribution plan of the Company:

(1) The profit distribution plan of the Company shall be drawn up by the management before being submitted to the Board of Directors and the supervisory committee of the Company for consideration. The Board of Directors shall thoroughly discuss the rationality of the profit distribution plan and form a specific resolution before submitting it to the general meeting for consideration. In considering the profit distribution plan, the Company shall make Internet voting accessible to the shareholders.

(2) Where the Company does not distribute cash dividend by reason of the exceptional circumstances in Article 198 above, the Board of Directors shall explain the specific reasons for not distributing cash dividends, the exact purpose for the retained profit and the estimated investment return, and upon the independent Directors having expressed their opinions thereon, submit such proposal to the general meeting for consideration, and disclose the same in the media designated by the Company.

Article 200. Implementation of the profit distribution plan of the Company: After the profit distribution plan has been resolved at a general meeting, the Board of Directors shall complete dividend (or share) distribution within two months after the holding of such meeting.

Article 201. Alteration of the Company's profit distribution policy:

In case of force majeure events such as war, natural disasters, or changes to the Company's external operational environment resulting in material impact on its production and operation, or relatively significant changes to the Company's operational position, the Company may adjust its profit distribution policy.

The Board of Directors shall conduct specific discussion over adjustment to the Company's profit distribution policy, provide detailed reasons for such adjustment, form a written report to be considered by independent Directors, and then submit to the general meeting for approval by way of a special resolution. In considering alterations to the profit distribution policy, the Company shall make Internet voting accessible to the shareholders.

Article 202. Dividends and other payments by the Company to holders of domestic investment shares shall be distributed and paid in Renminbi, whereas those to holders of overseas listed foreign investment shares shall be denominated and declared in Renminbi and paid in HK Dollars. The foreign currency for the cash dividends and other payments by the Company to holders of overseas listed foreign investment shares and other holders of foreign investment shares shall be handled in accordance with state regulations on foreign exchange control.

Article 203. Unless otherwise provided in relevant laws and Administrative regulations, where cash dividends and other amounts are paid in HK Dollars, the average selling price of the relevant foreign exchange posted by the People's Bank of China for the Gregorian calendar week immediately preceding the date of declaration of the dividends or other payment shall be used as the exchange rate.

Article 204. Subject to the paragraph 2, Article 61 and the item (19), paragraph 1, Article 112 of these Articles of Association, the Board of Directors may decide to distribute the interim dividend or special dividend.

Article 205. When distributing dividends to shareholders, the Company shall withhold and turn over the tax payable on the dividend income of shareholders based on the amount distributed and in accordance with PRC tax laws.

Article 206. The Company shall appoint receiving agents for holders of overseas listed foreign investment shares to collect on behalf of the relevant shareholders the dividends distributed and other moneys payable in respect of overseas listed foreign investment shares.

The receiving agents appointed by the Company shall meet the requirements of the laws of the place, or the relevant regulations of the stock exchange, where shares are listed.

The receiving agents appointed by the Company for the holders of overseas listed foreign investment shares listed on the SEHK shall be trust companies registered under the Trustee Ordinance of Hong Kong.

Under the premise of obeying the laws of China, the Company has the right to forfeit the unclaimed dividends, subject to the expiry of the applicable relevant limitation period.

Article 207. The Company shall implement an internal auditing system and appoint dedicated auditing personnel to carry out internal auditing and supervision of the Company’s financial revenues and expenditures, and economic activities.

Article 208. The Company’s internal auditing system and the responsibilities of its auditing personnel shall be implemented after the approval thereof by the Board of Directors. The person in charge of auditing shall be accountable and report to the Board of Directors.

Article 209. The Company has implemented the general counsel system, and has one General Counsel to play the role of General Counsel in legal review and control in operation and management, so as to promote the legal operation and compliance management of the Company. The General Counsel is a member of the senior management of the Company and is subject to the appointment or dismissal by the Board.

CHAPTER 18 Engagement of Accounting Firms

Article 210. The Company shall engage an independent accounting firm that complies with relevant provisions of PRC laws to audit the annual financial reports and review other financial reports of the Company, make verification of net assets and provide other consulting-related services.

Article 211. The term of engagement of an accounting firm engaged by the Company is one year, which shall commence upon the adjournment of the annual Shareholders' General Meeting of the Company and end upon the adjournment of the next annual Shareholders' General Meeting. The accounting firm could be re- appointed if the term is expired.

Article 212. An accounting firm engaged by the Company shall have the following rights:

(1) the right of access to the account books, records or vouchers of the Company and the right to require directors, the President and other senior management staff of the Company to provide relevant information and explanations at any time;

(2) the right to require the Company to take all reasonable measures to obtain from its subsidiaries the information and explanations necessary for the accounting firm to perform its duties;

(3) the right to attend shareholders' meetings in a non-voting capacity, to receive notice of or other information concerning any meetings of or concerning which shareholders have a right to receive notice or other information, and to be heard at any shareholders' meetings on any matter which relates to it as the accounting firm of the Company.

Article 213. If the position of accounting firm becomes vacant, the Board of Directors may following the approval of the Audit Committee appoint an accounting firm to fill such vacancy before a Shareholders' General Meeting is held. However, if there are other accounting firms holding the position of accounting firm of the Company while such vacancy persists, such accounting firms may continue to act.

Article 214. The Shareholders' General Meeting may by ordinary resolution decide to dismiss any accounting firm prior to the expiration of its term of engagement, notwithstanding anything in the contract between the accounting firm and the Company, but without prejudice to such accounting firm's right, if any, to claim damages from the Company in respect of such dismissal.

Article 215. The remuneration or method of determining the remuneration of an accounting firm shall be decided upon by the Shareholders' General Meeting. The remuneration of an accounting firm engaged by the Board of Directors shall be determined by the Board of Directors after being approved by the Audit Committee and shall be reported to the Shareholders' General Meeting for approval.

Article 216. The engagement, dismissal or non-renewal of engagement of an accounting firm shall be decided upon by the Shareholders' General Meeting. If there are relevant provisions in the applicable laws, administrative regulations and rules and/or the relevant listing rules, the Company shall disclose such provisions of the Shareholders' General Meeting on relevant newspapers or periodicals, and describe the reasons for replacement if necessary, as well as report them to the State Council authorities in charge of securities and Chinese Institute of Certified Public Accountants for record.

Article 217. Where a resolution at a Shareholders' General Meeting is to be passed to appoint as accounting firm an accounting firm other than an incumbent accounting firm, to fill a casual vacancy in the office of accounting firm, or to reappoint an accounting firm engaged by the Board of Directors to fill the vacancy in the office of accounting firms or to remove an accounting firm before the expiration of its term of office, matters shall be handled in accordance with the following provisions:

(1) the motion of engagement or dismissal shall be sent, before issuance of the notice of the Shareholders' General Meeting, to the accounting firm proposed to be appointed or the accounting firm proposing to leave its post or the accounting firm that has left its post in the relevant fiscal year; leaving includes leaving by removal, resignation and retirement.

(2) if the accounting firm leaving its post makes representations in writing and requests their notification to the shareholders, the Company shall (unless the representations are received too late):

i. in any notice of the resolution given to shareholders, state the fact of the representations having been made by the accounting firm that is leaving its post;

ii. serve a copy of the representations as an attachment to the notice on the shareholders by the method specified in these Articles of Association.

(3) if the accounting firm's representations are not sent under item (2) of this Article, the relevant accounting firm may, in addition to its right to be heard, require that the representations be read out at the Shareholders' General Meeting.

(4) an accounting firm that is leaving its post shall be entitled to attend:

i. the Shareholders' General Meeting at which its term of office would otherwise have expired;

ii. any Shareholders' General Meeting at which it is proposed to fill the vacancy caused by its removal;

iii. any Shareholders' General Meeting convened on its resignation.

The resigned accounting firm shall make a statement on the matters of his work as a former accountant at the above meeting and receive all notices of, and other information relating to, any such meeting, and to be heard at any such meeting which it attends on matters which concern it as former accounting firm of the Company.

Article 218. When the Company dismisses or does not renew the engagement of an accounting firm, it shall give notice to the accounting firm 10 days in advance. The accounting firm shall have the right to present its views before the Shareholders' General Meeting. If the accounting firm believes that the Company's grounds for the dismissal or non-renewal of engagement of it are not justified, it shall appeal to the State Council authorities in charge of securities and Chinese Institute of Certified Public Accountants. In case the accounting firm tenders the resignation, it shall describe to the Shareholders' General Meeting whether there is any improper matter.

The accounting firm shall place the resignation notice at the Company's domicile to resign its position. The notice shall be effective on the date placing the notice at the Company's domicile and the date specified in the notice, whichever is later. The notice shall include the following statements:

(1) believing that the resignation does not involve any statement that shall be described to the Company's shareholders or creditors; or

(2) any such conditions that shall be described. Where a notice is deposited under the preceding paragraph, the Company must within 14 days send a copy of the notice to the competent authority. If the notice contained a statement as mentioned in the preceding paragraph, the Company shall make a copy of such statement available at its offices for inspection by shareholders. The Company shall additionally send a copy of the aforementioned statement to each holder of H Shares by prepaid mail at the recipient's address shown in the register of shareholders. Subject to the laws, regulations and listing rules of the place where Company shares are listed, a copy of the aforementioned statement may alternatively be provided to holders of H Shares by other means as specified in Article 240 of the Articles of Association.

If there is any statement that shall be described in the resignation notice submitted by the accounting firm, the accounting firm may require the Board of Directors to convene an extraordinary Shareholders' General Meeting and listen to its explanations about the resignation.

CHAPTER 19 Merger and Division of the Company

Article 219. The Company may carry out mergers or divisions in accordance with the laws.

Upon The merger or division of the Company, the Company's Board of Directors shall take necessary measures to protect the lawful rights and interests of the shareholders who oppose the proposal for the merger or division of the Company.

Shareholders that oppose the proposal for the merger or division of the Company shall have the right to require the Company or shareholders that are in favor of such proposal to purchase their shares at a fair price.

The contents of resolutions approving the merger or division of the Company shall be compiled in a special document for inspection by shareholders. Holders of overseas listed foreign investment shares shall additionally be served copies of the aforementioned document by mail.

Article 220. A merger involving the Company may take either the form of a merger by absorption or the form of a merger by new establishment.

If the Company is involved in a merger, the parties to the merger shall enter into a merger agreement. The parties to the merger shall prepare a balance sheet and a property list. Within 10 days from the date of adoption of the merger resolution, the Company shall notify its creditors and within 30 days it shall make an announcement in the newspapers. A creditor may, within 30 days from the date of receipt of the written notice or, if he did not receive a written notice, within 45 days from the date of the announcement, require the Company to pay its debt to him in full or to provide commensurate security.

When the Company is merged, the claims and debts of each party to the merger shall be succeeded to by the Company surviving the merger or the new company established subsequent to the merger.

Article 221. If the Company is divided, its property shall be divided accordingly.

When the Company is divided, a division agreement shall be signed by all parties involved in the division and it shall prepare a balance sheet and a property list. Within 10 days from the date of adoption of the resolution on the division, the Company shall notify its creditors and within 30 days it shall make an announcement in the newspapers.

The post-division companies shall be jointly and severally liable for the pre-division debts of the Company, unless provided otherwise in a written agreement on debt repayment reached between the Company and a creditor prior to the division.

Article 222. If a change occurs in the Company's registered particulars due to its merger or division, the change shall be registered with the Company's registrar in accordance with the laws. If the Company is dissolved, de-registration of the Company shall be carried out in accordance with the law. If a new company is established, registration of the establishment of such company shall be carried out in accordance with the laws.

CHAPTER 20 Dissolution and Liquidation of the Company

Article 223. The Company shall be dissolved and liquidated in accordance with the laws if:

(1) the Shareholders' General Meeting resolves to dissolve the Company;

(2) dissolution is necessary as a result of the merger or dissolution of the Company;

(3) the Company is legally declared bankrupt because it is unable to pay its debts as they fall due;

(4) the Company has its business license revoked, is ordered to close down or is shut down in accordance with the law for breaching laws and administrative regulations;

(5) serious difficulties arise in the operation and management of the Company and its continued existence would cause material loss to the interests of the shareholders and such difficulties cannot be resolved through other means, in which case shareholders holding at least 10 percent of all shareholders' voting rights may petition a People's Court to dissolve the Company.

Article 224. If the Company is dissolved pursuant to item (1), (3), (4) or (5) of the preceding Article, it shall establish a liquidation committee and liquidation shall commence within 15 days from the date on which the cause for dissolution arose. The liquidation committee shall be composed of persons determined by the Board of Directors or the Shareholders' General Meeting by ordinary resolution. If the Company fails to establish the liquidation committee and carry out the liquidation within the time limit, its creditors may petition a People's Court to designate relevant persons to form a liquidation committee and carry out the liquidation.

Article 225. If the Board of Directors decides that the Company should be liquidated (otherwise than because of a declaration of bankruptcy), the notice of the Shareholders' General Meeting convened for such purpose shall include a statement to the effect that the Board of Directors has made full inquiry into the position of the Company and that the Board is of the opinion that the Company can pay its debts in full within 12 months after the commencement of liquidation.

The functions and powers of the Board of Directors shall terminate immediately upon the adoption by the Shareholders' General Meeting of a resolution to carry out liquidation.

The liquidation committee shall take instructions from the Shareholders' General Meeting, and not less than once a year make a report to the Shareholders' General Meeting on the committee's receipts and expenditures, the business of the Company and the progress of the liquidation. It shall make a final report to the Shareholders' General Meeting when the liquidation is completed.

Article 226. The liquidation committee shall notify creditors within a period of 10 days from the date of its establishment and make announcements of the liquidation in the newspapers within 60 days. Claims shall be registered by the liquidation committee. During the claim declaration period, the liquidation committee may not pay any debts to creditors.

Article 227. The liquidation committee shall exercise the following functions and powers during liquidation:

(1) to inventory the Company's property, and to prepare a balance sheet and property list;

(2) to notify creditors by notice and public announcement;

(3) to dispose of unfinished business of the Company relating to the liquidation;

(4) to make full payment of taxes owed and of taxes incurred during the liquidation process;

(5) to liquidate claims and debts;

(6) to dispose of the Company's property remaining after the debts are paid in full;

(7) to represent the Company in civil actions.

Article 228. After the liquidation committee has inventoried the Company's property and prepared a balance sheet and property list, it shall formulate a liquidation plan and submit such plan to the Shareholders' General Meeting or the competent authority for confirmation.

After payment of the liquidation expenses, the Company's property remaining shall pay in the following order: (i) the wages of the employees; (ii) social insurance premiums and statutory compensation; (iii) the taxes owed; (iv) bank loans, Company bonds and other Company debts.

The remaining assets after the disposal of the Company's property in accordance with the preceding provision, the shareholders shall distribute them according to the type and proportion of shares held by them:

(1) in case of preferred shares, they shall be distributed to the shareholders of the preferred shares according to the par value of the preferred shares; in case the shares fail to repay for the preference shares, they shall be distributed according to the proportion of shares held by the shareholders of the preference shares;

(2) be distributed by the Company to the shareholders in proportion to the shares they hold. During liquidation, the Company shall not engage in any business activities unrelated to the liquidation.

Article 229. If the Company is liquidated due to dissolution and the liquidation committee, having inventoried the Company's property and prepared a balance sheet and property list, discovers that the Company's property is insufficient to pay its debts in full, it shall apply to the Peoples Court for a declaration of bankruptcy.

After the People's Court has ruled to declare the Company bankrupt, the liquidation committee shall turn over the liquidation matters to the People's Court.

Article 230. Following completion of the liquidation of the Company, the liquidation committee shall prepare a liquidation report, as well as revenue and expenditure statement and financial account books in respect of the liquidation period, and, after verification thereof by a PRC certified public accountant, submit the same to the Shareholders' General Meeting or the competent authority for confirmation.

Within 3 0 days from the date of confirmation of the aforementioned documents by the Shareholders' General Meeting or the competent authority, the liquidation committee shall submit the same to the company registrar, apply for cancellation of the Company's registration and publicly announce the Company's termination.

CHAPTER 21 Procedures for Amending the Company's Articles of Association

Article 231. The Company may amend its Articles of Association in accordance with laws, administrative regulations and its Articles of Association.

Article 232. The Company's Articles of Association shall be amended in the following manner:

(1) the Board of Directors shall pass a resolution to draw up a proposal on amendment of the Company's Articles of Association or the shareholders shall propose to amend the Company's Articles of Association;

(2) the foregoing proposal shall be furnished to the shareholders in writing and a Shareholders' General Meeting shall be convened to examine the contents of the proposal;

(3) the contents of the amendments submitted to the Shareholders' General Meeting for resolution shall be approved by a special resolution.

Article 233. The Company shall amend the Articles of Association if:

(1) provisions of the Articles of Association conflict with the Company Law or administrative regulations after such laws are amended;

(2) a change occurs in the Company's situation and such change is inconsistent with the matters stated herein;

(3) the Shareholders' General Meeting decides to amend the Articles of Association.

Article 234. If an amendment to these Articles of Association involves matters provided for in the Mandatory Provisions of Articles of Association of Companies That List Overseas, it shall become effective upon approval by the authority that is authorized by the State Council to examine and approve companies.

Article 235. If an amendment to these Articles of Association involves a registered particular of the Company, registration of the change shall be carried out in accordance with the laws. If an amendment to the Articles of Association involves a matter which is required by the laws, the administrative rules and regulations to be disclosed, an announcement shall be made in accordance with regulations.

CHAPTER 22 Notices and Announcements

Article 236. Notices (for the purposes of this Chapter, the term "**notice**" includes the notice of the meetings issued by the Company to its shareholders, Company communications and other written materials) of the Company shall be given or provided by one or more of the following means: (1) by hand; (2) by mail; (3) by way of a public announcement; (4) other means recognized by the securities regulator of the place where Company shares are listed and by the stock exchange or specified in these Articles of Association.

As for the Company's notice sent by way of a public announcement; such announcements must be published in the designated newspapers (if any) and/or other designated media (including websites) of the securities regulatory bodies and the stock exchange where the Company's shares are listed.

As for the Company's methods to send or provide notice to the shareholders of H shares in accordance with the Hong Kong Listing Rules, subject to other documents specified in the laws, regulations and listing rules of the place where Company shares are listed, the Company may issue or give corporate communications to holders of H shares by electronic means or publication of information on a website.

The term "**corporate communication**" means any document issued or to be issued by the Company for the information or action of holders of any Company securities. Such communications include but are not limited to:

(1) annual reports, including reports of the Board of Directors, the Company's annual accounts together with the auditor's reports and (where applicable) summary financial reports;

(2) interim reports and (where applicable) summary interim reports;

(3) notices of meetings;

(4) listing documents;

(5) circulars; and

(6) proxy forms.

Article 237. For a Company notice given by hand, the person on whom it is served shall sign (of affix his or her seal to) the acknowledgement slip, and the date on which he or she signed in receipt shall be the date of service; for a Company notice given by way of a public announcement, the first day of publication shall be the date of service.

When the notice is served by post, the notice shall be deemed as served 48 hours after the clearly stating the address, prepaying the postage, placing the notice in the envelope and inserting the envelope containing the notice in the mailbox.

Article 238. A meeting and the resolutions adopted thereat shall not be invalidated due to the accidental omission to give notice of the meeting to, or the non-receipt of notice of the meeting by, a person entitled to receive notice.

CHAPTER 23 Dispute Resolution

Article 239. The Company shall comply with the following rules for dispute resolution:

(1) If any dispute or claim that concerns Company affairs and is based on rights or obligations provided for in these Articles of Association, the Company Law or other relevant laws arises between a holder of overseas listed foreign investment shares and the Company, between a holder of overseas listed foreign investment shares and a director, a supervisor, the President or other senior management staff of the Company or between a holder of overseas listed foreign investment shares and a holder of domestic investment shares, the parties concerned shall submit the dispute or claim to arbitration. When a dispute or claim as described above is submitted to arbitration, the dispute or claim shall be submitted in its entirety, and all persons (being the Company or shareholders, directors, supervisors, the President or other senior management staff of the Company) that have a cause of action due to the same facts or whose participation is necessary for the resolution of such dispute or claim shall submit to arbitration. Disputes regarding the definition of shareholders and the register of shareholders may be resolved by means other than arbitration.

(2) A dispute or claim submitted to arbitration may be arbitrated, at the option of the arbitration applicant, by either the China International Economic and Trade Arbitration Commission in accordance with its arbitration rules or the Hong Kong International Arbitration Centre in accordance with its securities arbitration rules. After the arbitration applicant has submitted the dispute or claim to arbitration, the other party must submit to the arbitration institution selected by the applicant. If the arbitration applicant opts for arbitration by the Hong Kong International Arbitration Centre, either party may request arbitration to be conducted in Shenzhen in accordance with the securities arbitration rules of the Hong Kong International Arbitration Centre.

(3) Unless otherwise provided by laws or administrative regulations, PRC laws shall apply to the resolution by arbitration of disputes or claims referred to in item (1).

(4) The award of the arbitration institution shall be final and binding upon each party.

CHAPTER 24 Supplementary Provisions

Article 240. The Company's Articles of Association are written in Chinese and English. If there is any discrepancy between the two versions, the Chinese version of the Articles of Association shall prevail.

Article 241. The power to interpret these Articles of Association shall vest in the Board of Directors of the Company. The power to amend these Articles of Association shall vest in the Shareholders' General Meeting.

Article 242. For the purposes of these Articles of Association, the term "**accounting firm**" shall have the same meaning as the term "**auditor**".

The “Other Senior Management Staff” in these Articles of Association includes but not limited to “Senior Vice President”, “Vice President”, the “Chief Financial Officer”, the “Secretary to the Board” and “General Counsel” and so forth.

The “**Executive Director**” in these Articles of Association refers to the director working in the Company.

The “**Actual Controller**” in these Articles of Association refers to the person who has actually control over the actions of the Company via investment, agreement or other arrangement although he or she might not be the shareholder of the Company.

The “**Close Associate**” in these Articles of Association shall have the same meaning as defined in Rule 19A.04 of the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited.

The “**Secretary to the Board**” in these Articles of Association shall have the same meaning as the “Company Secretary” under the Rules Governing the Listing of Securities on The Stock Exchange of Hong Kong Limited.

Exhibit 2.4

Description of rights of each class of securities registered under Section 12 of the Securities Exchange Act of 1934 (the "Exchange Act")

American depositary shares ("**ADSs**"), each representing 25 H Shares of Aluminum Corporation of China Limited (the "**Company**", "**we**" or "**our**"), were listed and traded on the New York Stock Exchange until September 1, 2022, and, in connection with such listing (but not for trading), the H Shares, listed and traded on the Hong Kong Stock Exchange, were registered under Section 12(b) of the Exchange Act until November 20, 2022. On September 1, 2022, our ADSs were delisted from the NYSE, and on November 20, 2022, the registration of our H Shares under section 12(b) of the Exchange Act was terminated. Our ADSs are now traded in the over-the-counter market, and our H Shares are now deemed to be registered under Section 12(g) of the Exchange Act pursuant to Rule 12g-2 under the Exchange Act. In light of the delisting, we subsequently delivered a termination letter to the depositary for our ADSs, for the termination of our ADS program on March 30, 2023. Accordingly, our ADS program will be terminated on June 30, 2023. H Shares underlying the ADSs represented by the American Depositary Receipts ("**ADRs**") are held by The Bank of New York Mellon, as depositary, and ADR holders will not be treated as holders of the H Shares.

Capital terms used but not defined herein shall have the meanings given to them in our annual report on Form 20-F for the year ended December 31, 2022, to which this description of securities is an exhibit and which is referred to as "this annual report" herein.

H Shares

The following is a summary of the general terms and provisions of our H Shares and does not purport to be complete and is subject to and qualified in its entirety by reference to our Articles of Association, as amended, and to the applicable laws and regulations. A copy of our Articles of Association is filed as Exhibit 1.1 to this annual report.

Preemptive Rights (Item 9.A.3 of Form 20-F)

Not applicable.

Type and Class of Securities and Transferability of H Shares (Item 9.A.5 of Form 20-F)

Type and Class of Securities

Each H Share has RMBl.00 par value. Certificates of H Shares are issued in registered form. Both domestic shares and H Shares are ordinary shares. The numbers of our domestic shares and H Shares that were issued and outstanding as of December 31, 2022 are provided on the cover of this annual report.

Transferability of H Shares

H Shares for which the share capital has been paid in full may be transferred freely in accordance with the Articles of Association, but unless otherwise approved or filings being completed according to PRC law, H Shares may generally be traded directly only among investors who are legal or natural persons resident outside of the PRC and may not be sold directly to investors resident within the PRC. There are no restrictions under PRC law or our Articles of Association on the ability of investors who are not PRC residents to hold H Shares.

According to our Articles of Association, the Board may refuse to recognize any instrument of transfer without giving any reason unless such transfer is carried out in compliance with the following conditions:

(1) payment of HK.$2.50 per instrument of transfer or higher charge as agreed at such time by the Hong Kong Stock Exchange has been made to the Company for the purpose of registering the instrument of transfer and other documents relating to or which may affect the title to the shares;

(2) the instrument of transfer only involves H Shares;

(3) the stamp duty payable on the instrument of transfer as required by Hong Kong law has been paid;

(4) relevant share certificates and evidence that the transferor has the right to transfer such shares as reasonably required by the Board have been provided;

(5) if the shares are to be transferred to joint holders, the number of registered joint holders may not exceed four; and

(6) the relevant shares are not encumbered by any Company lien.

See also “Limitations on the rights to own securities” under ‘‘Item 10. Additional Information - B. Memorandum and Articles of Association” of this annual report.

Limitations or Qualifications (Item 9.A.6 of Form 20-F)

Holders of domestic shares and H Shares are deemed to be shareholders of different classes for some matters. See “Voting Rights” and “Actions necessary to change the rights of holders of our shares or holders of a class of shares” under “Item 10. Additional Information - B. Memorandum and Articles of Association” of this annual report.

Other Rights (Item 9.A.7 of Form 20-F)

Not applicable.

Rights of the Shares (Item 10.B.3 of Form 20-F)

See “Dividend Policy” under “Item 8. Financial Information”, and “Dividend rights”, “Voting rights”, “Directors’ qualifying shares”, “Rights to share profits”, “Rights to share surplus in the event of liquidation”, “Redemption provisions; sinking fund provisions and liability to further capital calls”, and “Provisions discriminating against any existing or prospective shareholder as a result of owning a substantial number of shares” under “Item 10. Additional Information - B. Memorandum and Articles of Association” of this annual report.

Requirements for Amendments (Item 10.B.4 of Form 20-F)

See “Actions necessary to change the rights of holders of our shares or holders of a class of shares” under “Item 10. Additional Information - B. Memorandum and Articles of Association” of this annual report.

Conditions Governing the Manner in which Annual General Meetings and Extraordinary General Meetings of Shareholders are Convoked (Item 10.B.S of Form 20-F)

See “Conditions governing the manner in which annual general meetings and extraordinary general meetings of shareholders are convoked” under “Item 10. Additional Information — B. Memorandum and Articles of Association” of this annual report.

Limitations on the Rights to Own Shares (Item 10.B.6 of Form 20-F)

See "Limitations on the rights to own securities" under "Item 10. Additional Information — B. Memorandum and Articles of Association" of this annual report.

Provisions Affecting Any Change of Control (Item 10.B.7 of Form 20-F)

See "Provisions having an effect of delaying, deferring or preventing a change in control" under "Item 10. Additional Information — B. Memorandum and Articles of Association" of this annual report.

Ownership Threshold (Item 10.B.B of Form 20-F)

See "Provisions having an effect of delaying, deferring or preventing a change in control" under "Item 10. Additional Information — B. Memorandum and Articles of Association" of this annual report.

Differences Between the Law of Different Jurisdictions (Item 10.B.9 of Form 20-F)

General

We are a PRC joint stock company, which is a corporate entity organized under the Company Law of the PRC. Under the PRC company law, the registered capital of a joint stock company is divided into shares of equal par value. The PRC company law differs from laws applicable to United States corporations and their shareholders. Set forth below is a summary of certain significant differences between the provisions of the PRC company law applicable to us and the comparable provisions of the laws applicable to companies incorporated in the United States and their shareholders (for this purpose we refer to Delaware corporate law). Such summary does not purport to be complete and is subject to and qualified in its entirety by reference to our Articles of Association, as amended, and to the relevant laws and regulations.

Shareholders' approval by written consent

PRC law does not provide shareholders of joint stock companies with rights to approve corporate matters by written consent.

Under Delaware law, unless otherwise provided in the certificate of incorporation, any action which is required or permitted to be taken at any shareholders' meeting may be taken without a meeting, subject to various conditions.

Amendments of articles of association

Under PRC law, an amendment of the articles of association must be approved by an affirmative vote of two-thirds of shareholders attending a shareholders' meeting. Amendments with respect to the Mandatory Provisions for Companies Listing Overseas (the "**Mandatory Provisions**") only become effective after approval by the relevant governmental department authorized by the PRC State Council and the CSRC.

Under Delaware law, with certain exceptions, shareholder approvals must be obtained for any amendment to the certificate of incorporation. Board approvals are also required for any amendment to the certificate of incorporation, but no governmental approval is generally required.

Powers and responsibilities of directors

Under PRC law, the board of directors is responsible for specified actions, including the following functions and powers of a joint stock company:

- convening shareholders' meetings and reporting its work to shareholders at these meetings;
- implementing shareholders' resolutions;
- determining the company's business plans and investment proposals;
- formulating the company's annual financial budgets and final accounts;
- formulating the company's profit distribution plans and loss recovery plans;
- formulating proposals for the increase or decrease in the company's registered capital and the issue of debentures;
- formulating plans for the merger, division, dissolution or change of the form of the company;
- deciding on the company's internal management structure and formulating its basic management system;
- appointing or removing the company's general manager and deciding on the remuneration of the general manager; appointing and removing deputy general manager and company personnel in charge of financial matters based on the recommendation of the general manager and deciding on the remuneration of the deputy general manager and company personnel in charge of financial matters; and
- exercising other power conferred by the article of associations of the company.

In addition, the Mandatory Provisions provide that the board of directors has the authority to formulate any proposal to amend the articles of association and to exercise any other power conferred by a decision of the shareholders' meeting and that the issuance of bonds must be approved by the shareholders in a general meeting by way of a special resolution.

Under Delaware law, the business and affairs of a Delaware corporation are managed by or under the direction of its board of directors. Their powers include fixing the remuneration of directors and borrowing power, except as otherwise provided by statute or in the certificate of incorporation or bylaws of the corporation.

Powers and responsibilities of supervisors

Under PRC law, a PRC joint stock company must have a board of supervisors consisting of shareholder representatives and one or more employee representatives. Supervisors attend board meetings as non-voting observers. Directors, officers and company personnel in charge of financial matters may not serve as supervisors. The supervisors perform and exercise the following functions and powers:

- examining the company's financial affairs;
- monitoring compliance with laws, regulations, the articles of association of the company and the shareholders resolutions by the directors and members of senior management of the company; and suggesting removing the directors and members of senior management who violate these laws, regulations, the articles of association of the company and the shareholders resolutions;

- requiring corrective action from directors and members of senior management whose actions are contrary to the interests of the company;

- proposing the holding of extraordinary shareholders' meetings and convening and presiding over shareholders' meetings where the board of directors does not exercise its duties as prescribed in the law;

- proposing new items to be inserted in the agenda of the shareholders' meeting;

- bringing lawsuits against directors or members of senior management, if they violate laws, regulations or the articles of association of the company; and

- exercising and performing other powers and functions provided for in the company's articles of association.

In addition, the Mandatory Provisions provide that supervisors of overseas listed joint stock companies are entitled to examine the financial information, including financial statements, operation reports and plans for profit distribution, to be submitted by the board of directors to the shareholders' meetings; and authorize, in the company's name, public certified accountants or licensed auditors to assist in the re-examination of such information, should any doubt arise in respect thereof. The fees and expenses of attorneys and other professionals incurred by the supervisors in connection with the discharge of their duties are to be paid by the company.

Delaware law makes no provision for a comparable corporate institution.

Duties of directors and supervisors

Under PRC law, directors and supervisors of a joint stock company are required to comply with relevant laws and regulations and the company's articles of association. A director or supervisor who contravenes any law, regulation or the company's articles of association in the performance of his duties shall be personally liable to the company for any loss incurred by the company. Directors or supervisors are required to carry out their duties honestly and diligently, and protect the interests of the company. They are also under a duty of confidentiality to the company and prohibited from divulging confidential information concerning the company, except as permitted by relevant laws and regulations or by a decision of a shareholders' meeting. Without the approval of shareholders' meetings, they may not use their position and authority in the company to seek personal gain or directly or indirectly engage in the same business as the company or in any other business detrimental to the interests of the company; otherwise, they are required to forfeit any profits from these activities to the company.

Under Delaware law, the business and affairs of a corporation are managed by or under the direction of its board of directors. In exercising their powers, directors need to satisfy their fiduciary duty to the corporation and its shareholders, including the duty of care and the duty of loyalty.

Limitations on transactions with interested directors and supervisors

Under PRC law, directors and supervisors of a joint stock company may not enter into any contracts or transactions with the company unless permitted by the articles of association or approved by the shareholders with full knowledge. A company may not provide any guarantees to shareholders or any de facto control person of the company unless such guarantees are approved by a majority of shareholders present at the shareholders' meeting, excluding the shareholder who will be provided such guarantees. Under the Mandatory Provisions, a director or supervisor is required to disclose to the board of directors any transaction with the company in which he has a direct or indirect interest or in which there is a material conflict of interest between the company and himself. A director is not entitled to vote or be counted for quorum purposes in any board decision on any such transaction. A company may set aside any interested transaction which did not comply with these requirements, unless the other party to such transaction was honestly unaware of the breach of obligations by the interested director or supervisor. A company may not loan or provide any guarantees to directors or supervisors (including persons related to them), except for the loans made in accordance with employment contracts approved by the shareholders' meeting regarding expenses incurred for the company or performing the duties of such director or supervisor, or unless the company's business scope allows for the provision of loans and guarantees and such loans or guarantees are made under regular commercial terms.

Under Delaware law, an interested transaction is not voidable solely for the reason that the transaction is interested if (1) the material facts as to the interested director's relationship or interests are disclosed or are known to the board of directors and the board of directors in good faith authorizes the transaction by the affirmative vote of a majority of the disinterested directors, (2) such material facts are disclosed or are known to the shareholders entitled to vote on such transaction and the transaction is specifically approved in good faith by vote of shareholders or (3) the transaction is fair as to the corporation as of the time it is authorized, approved or ratified. Under Delaware law, the interested director could be held liable for a transaction in which such director derived any improper personal benefit.

Election and removal of directors

Under PRC law, the term of office of directors of a joint stock company must be specified in the articles of association, but may not exceed three years. Directors may be re-elected. Directors can be removed by a valid resolution of a shareholders' meeting duly convened. PRC law does not contemplate a classified board of directors.

Under Delaware law, directors of a Delaware corporation can be removed from office with or without cause by the holders of a majority of shares then entitled to vote at an election of directors, provided that, except where the certificate of incorporation of the Delaware corporation otherwise provides, a member of a classified board may be removed by shareholders only for cause, and in a corporation with cumulative voting, if less than all of the directors are removed, no director may be removed without cause if the votes cast against the director's removal are sufficient to elect the director if cumulatively voted at an election of directors. The Court of Chancery may remove a director who has been convicted of a felony or found by a court to have committed a breach of the duty of loyalty in connection with his or her duties to the corporation following application by the corporation or derivatively in the right of the corporation by any shareholder. The court may order the removal only if it determines that the director did not act in good faith in performing the acts resulting in the prior conviction or judgment and that removal is necessary to avoid irreparable harm to the corporation.

Dividend payments

Under PRC law, proposals for distribution of profits are formulated by the board of directors and submitted for shareholder approval at a shareholders' meeting. Dividends may be distributed in the form of cash or shares.

Under Delaware law, the board of directors of a Delaware corporation may declare dividends out of distributable earnings and profits without the approval of the shareholders.

Limitations on the rights to own securities

Under PRC law, foreign-invested shares such as our H Shares and ADSs generally can be held only by foreign shareholders and other shareholders from the regions of Hong Kong, Macao and Taiwan. However, since November 2014, mainland investors can trade H Shares through the Stock Connect scheme.

Under Delaware law, there are no limitations on the rights to own securities based on nationality or residency.

Amalgamations and business combinations; appraisal rights

Under PRC law, amalgamations and divisions involving joint stock companies are required to be approved by shareholders voting at a shareholders' meeting. The Mandatory Provisions require an amalgamation or division involving the company to be approved by an affirmative vote of two-thirds of the votes present at the shareholders' meeting called to consider the transaction. Any opposing shareholder may request the company or the consenting shareholders to purchase its shares at a fair price.

Under Delaware law, with certain exceptions, a merger, consolidation or sale of all or substantially all the assets of a corporation must be approved by the board of directors and holders of a majority of the outstanding shares entitled to vote. A shareholder objecting to the merger is entitled to appraisal rights pursuant to which the shareholder may receive cash in the amount of the fair value of the shares held by such shareholder (as determined by a court) in lieu of the consideration the shareholder would otherwise receive in the transaction.

Transactions with significant shareholders

Under Delaware law, a business combination between a Delaware public corporation and an interested shareholder which takes place at any time during a period of three years commencing with the date the interested shareholder became an interested shareholder would need prior approval from the board of directors or a supermajority of the other shareholders of the corporation, unless the corporation opted out of the relevant Delaware business combination statute. Under Delaware law, an interested shareholder of a corporation is someone who, together with its affiliates and associates, owns more than 15% of the outstanding common shares of the corporation. No such business combination statute or regulation applies to PRC joint stock companies.

Shareholders' lawsuits

Under PRC law, the article of associations of PRC companies listed in Hong Kong shall provide that most disputes involving a holder of H shares are to be resolved by final and binding arbitration.

Class actions and derivative actions generally are available to shareholders under Delaware law for, among other things, breach of fiduciary duty and corporate waste.

Limitations on liability and indemnification of directors and officers

PRC law does not provide for any specific limitations on liability or indemnification of directors or officers.

Under Delaware law, a corporation may indemnify a current director or officer of the corporation against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in defense of an action, suit or proceeding by reason of such position if (1) the director or officer acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation and (2) with respect to any criminal action or proceeding, the director or officer had no reasonable cause to believe that his conduct was unlawful. A corporation may not retroactively impair or eliminate indemnification or advancement rights by amending the corporation's certificate of incorporation or bylaws after the occurrence of the act or omission that gives rise to indemnification or advancement rights, unless the provision contains, at the time of the act or omission, an explicit authorization of such elimination or limitation.

Shareholders' rights of inspection of corporate records

Under PRC law, shareholders are entitled to inspect the articles of association, register of shareholders, corporate bond counter foils, minutes of shareholders' meetings and board meetings and reports of the financial accounts of the company. In addition, the Mandatory Provisions provide that, after paying reasonable fees, shareholders are entitled to inspect the company's shareholder list, certain personal information on the directors, supervisors and officers, the company's capital position and certain information regarding share repurchases conducted by the company during the most recent fiscal year.

Delaware law permits any shareholder of a Delaware corporation to examine or obtain copies of or extracts from the corporation's shareholder list and its other books and records for any purpose reasonably related to such person's interest as a shareholder.

Changes in Capital (Item 10.B,10 of Form 20-F)

See "Conditions governing changes in registered capital" under "Item 10 – Additional Information – B. Memorandum and Articles of Association" of this annual report.

American Depositary Shares (Items 12.D.1 and 12.D.2 of Form 20-F)

The Bank of New York Mellon (previously known as The Bank of New York), as depositary (the "**Depositary**"), executes and delivers the ADSs. Each ADS represents ownership interests in 25 H Shares (or the right to receive 25 H Shares) deposited with the Hong Kong office of The Hongkong and Shanghai Banking Corporation Limited, as custodian (the "**Custodian**"). Each ADS will also represent securities, cash or other property deposited with the Depositary and not distributed to ADR holders. The Depositary's principle executive office is located at 240 Greenwich Street, New York, NY 10286, which is also the current corporate trust office of the Depositary. The Custodian's office is located at 17/F, Tower 3, HSBC Centre, 1 Sham Mong Road, Kowloon, Hong Kong, China.

The ADSs will be evidenced by ADRs delivered by the Depositary. An ADR may evidence any number of ADSs. You may hold ADRs either directly or indirectly through your broker or other financial institution. If you hold ADRs directly, you are an ADR holder. This description assumes that you hold your ADRs directly. If you hold the ADRs indirectly, you must rely on the procedures of your broker or other financial institution to assert the rights of ADR holders described in this Section. You should consult with your broker or financial institution to find out what those procedures are.

Because the Depositary will actually hold the H Shares underlying the ADSs represented by the ADRs, you must rely on it to exercise the rights of a shareholder. The obligations of the Depositary are set out in a deposit agreement among us, the Depositary and you, as an ADR holder. The deposit agreement, the ADSs and the ADRs are generally governed by New York law.

The following is a summary of the deposit agreement. Because it is a summary, it does not contain all the information that may be important to you. For more complete information, you should read the entire deposit agreement and the form of ADR The deposit agreement has been filed with the SEC as an exhibit to a Registration Statement on Form F-6 (File No. 333-144380) for the Company, which was filed on July 6, 2007. A specimen of the ADR was also filed as Exhibit 2.1 to our annual report on Form 20F/A (File No. 001-15264), which was filed with the SEC on October 9, 2012.

Share Dividends And Other Distributions

The Depositary has agreed to pay to you the cash dividends or other distributions it or the Custodian receives on H Shares or other deposited securities, after deducting its fees and expenses. You will receive these distributions in proportion to the number of H Shares your ADSs represent.

Cash

The Depositary will convert any cash dividend or other cash distribution we pay on the H Shares into U.S. dollars, if it can do so on a reasonable basis and can transfer the U.S. dollars to the United States. If that is not possible as a result of the existence of foreign exchange controls prohibiting such conversion, or if any approval from the government is needed and cannot be reasonably obtained, the agreement allows the Depositary to distribute the Renminbi only to those ADR holders to whom it is possible to do so. It will hold the Renminbi it cannot convert for the account of the ADR holders who have not been paid. It will not invest the Renminbi, and it will not be liable for the interest.

Before making a distribution, any withholding taxes that must be paid will be deducted. See “Item 10. Additional Information — E. Taxation” of this 20-F. The Depositary will distribute only whole U.S. dollars and cents and will round fractional cents to the nearest whole cent. If the exchange rates fluctuate during a time when the Depositary cannot convert the Renminbi, you may lose some or all of the value of the distribution.

Shares

The Depositary may, after consultation with us and to the extent practicable, and will if we so request, distribute additional ADSs representing any H Shares that we distribute as a dividend or free distribution, if we furnish it with satisfactory evidence that it is legal to do so. The Depositary will only distribute whole ADSs. It will sell H Shares which would require it to issue a fractional ADS and distribute the net proceeds in the same way as it would do with a cash distribution. If the Depositary does not distribute additional ADSs in such circumstances, then each outstanding ADS will also represent the new H Shares (and thereafter the ratio of H Shares per ADS will be adjusted accordingly).

Rights to Purchase Additional H Shares

If we offer holders of our H Shares any rights to subscribe for additional H Shares or any other rights, the Depositary may, after consultation with us, or will if we so request, make these rights available to you, if we furnish it with satisfactory evidence that both the rights and the securities to which such rights relate are exempt from registration with respect to a distribution or are covered by an effective registration statement if registration is required, and the Depositary determines in its discretion that it is lawful and feasible to make such distribution. If the Depositary determines in its reasonable discretion that it is not lawful or feasible to distribute such rights to ADR holders, it may sell the rights and distribute the proceeds in the same way as it would do with a cash distribution. The Depositary may allow rights that are not distributed or sold to lapse. In that case, you will receive no value for them. If the Depositary makes rights available to you, upon instruction from you, it will exercise the rights and purchase the H Shares on your behalf. The Depositary will then deposit the H Shares and deliver additional ADSs to you. It will only exercise rights if you pay it the exercise price and any other charges and fees that the rights and the deposit agreement require you to pay.

U.S. securities laws may restrict the sale, deposit, cancellation, and transfer of the ADSs issued after exercise of rights. For example, you may not be able to trade those ADSs freely in the United States. In this case, the Depositary may issue the ADRs with legend or under a separate restricted deposit agreement which will contain the same provisions as the deposit agreement, except for changes needed to put the restrictions in place.

Other Distributions.

The Depositary will, after consultation with the Company, send to the extent practicable to you anything else that we distribute on deposited securities in any manner that the Depositary reasonably deems equitable and practicable. If in its opinion the distribution cannot be made proportionately among the holders entitled thereto, or if it deems such distribution not to be feasible, the Depositary may adopt such method as it may reasonably deem equitable and practicable for the purpose of effecting such distribution, including to sell what we distributed and distribute the net proceeds, in the same way as it would do with a cash distribution. Or the Depositary may decide to hold what we distributed, in which case the outstanding ADSs will also represent the newly distributed property.

The Depositary is not responsible if it decides that it is unlawful or impractical to make a distribution available to any ADR holders. We have no obligation to register additional ADSs, ADRs, shares, rights or other securities under the Securities Act. We also have no obligation to take any other action to permit the distribution of additional ADSs, ADRs, shares, rights or anything else to ADR holders. This means that you may not receive the distributions that we make on our shares or any value for them if it is illegal or impractical for us to make them available to you.

Deposit, Withdrawal and Cancellation

How does the Depositary deliver ADSs?

The Depositary will deliver ADSs if you or your broker deposit H Shares or evidence of rights to receive H Shares with the Custodian. Upon payment of its fees and expenses and of any taxes or governmental charges, such as stamp taxes or stock transfer taxes or fees, the Depositary will register the appropriate number of ADSs in the names that you request and will deliver the ADRs representing such ADSs at its corporate trust office to the persons you request. The Depositary will not, however, knowingly accept shares for deposit that cannot be traded freely in the United States in accordance with U.S. securities laws or if we instruct the Depositary that the deposit of such H Shares would violate any provision of the Articles of Association of the Company or U.S. securities laws.

How do ADR holders cancel an ADR and obtain H Shares?

You may turn in your ADRs at the Depositary's corporate trust office. Upon payment of its fees and expenses and of any taxes or governmental charges, such as stamp taxes or stock transfer taxes or fees, the Depositary will deliver (1) the H Shares underlying the ADSs represented by the ADRs and (2) any other deposited securities underlying the ADSs represented by the ADRs, to you or person(s) you designate at the office of the Custodian. Or, at your request, risk and expense, the Depositary will deliver the deposited securities at its corporate trust office. ADRs surrendered shall be canceled, and the Depositary is authorized to destroy the ADRs so canceled.

Voting Rights

You may instruct the Depositary to vote the H Shares underlying your ADSs represented by the ADRs but only if we ask the Depositary to ask for your instructions. Otherwise, you will not be able to exercise your right to vote unless you withdraw the H Shares. However, you may not know about the meeting far enough in advance to withdraw the H Shares.

If we ask for your instructions, the Depositary will notify you of any upcoming vote and arrange to deliver our voting materials to you. The materials will (1) describe the matters to be voted on; (2) include a statement that the ADR holders as of the close of business on a specified record date will be entitled to instruct the Depositary to exercise the voting rights, subject to PRC law and the provisions of our Articles of Association; and (3) explain how you, by a certain date, may instruct the Depositary to vote the H Shares or other deposited securities underlying your ADSs as you direct. For instructions to be valid, they must be received by the Depositary on or before the date established by the Depositary. The Depositary will endeavor, as far as practical, subject to PRC law and the provisions of our Articles of Association. to vote or to have its agents vote the H Shares or other deposited securities as you instruct. The Depositary will only vote or attempt to vote as you instruct. However, if the Depositary does not receive your voting instructions, it will deem you to have instructed it to give a proxy to vote your shares to a representative designated by us, provided that no such proxy shall be given with respect to any matter as to which the Company informs the Depositary that (x) the Company does not wish such proxy given. (y) substantial opposition exists or (z) such matter materially and adversely affects the rights of holders of H Shares.

We cannot assure you that you will receive the voting materials in time to ensure that you can instruct the Depositary to vote your H Shares. In addition, the Depositary and its agents are not responsible for failing to carry out voting instructions or for the manner of carrying out voting instructions, provided that any such action or inaction is in good faith. This means that you may not be able to exercise your right to vote and there may be nothing you can do if your H Shares are not voted as you requested.

Payment of Taxes and Fees

You will be responsible for any taxes or other governmental charges payable on your ADSs or on the deposited securities underlying your ADSs. The Depositary may refuse to transfer your ADSs or allow you to withdraw the deposited securities underlying your ADSs until such taxes or other charges are paid. It may apply payments owed to you or sell deposited securities underlying your ADSs to pay any taxes owed, and you will remain liable for any deficiency. If it sells deposited securities, it will, if appropriate, reduce the number of ADSs to reflect the sale and pay to you any proceeds, or send to you any property, remaining after it has paid the taxes.

See “Item 12. Description of Securities Other Than Equity Securities — D. American Depositary Shares” of this annual report for the fees charged by the Depositary.

Changes Affecting Deposited Securities

If there is any change in the nominal value of the deposited securities, split-up, consolidation or any other reclassification of the deposited securities, or any recapitalization, reorganization, merger or consolidation or sale of assets affecting us or to which we are a party, any new securities that will be received by the Depositary or the Custodian in exchange for or in respect of the H Shares underlying the ADSs will be treated as new deposited securities under the deposit agreement and underlying the ADSs. The Depositary may also, and will if we so request, execute and deliver additional ADRs as in the case of a dividend in H Shares, or call for the surrender of outstanding ADRs to be exchanged for new ADRs specifically describing such new deposited securities.

Amendment and Termination

How may the deposit agreement be amended?

We may agree with the Depositary to amend the deposit agreement and the form of the ADRs without your consent for any reason. If an amendment adds or increases fees or charges (except for taxes and other governmental charges, registration fees, cable, telex or facsimile transmission costs, delivery costs or such other expenses), or prejudices any substantial right of ADR holders, it will not become effective for outstanding ADRs until 30 days after the Depositary notifies ADR holders of the amendment. At the time an amendment becomes effective, you are considered, by continuing to hold your ADRs, to agree to the amendment and to be bound by the ADRs and the deposit agreement as amended.

No amendment shall impair your right to surrender ADRs and receive the deposited securities underlying the ADSs represented thereby, except in order to comply with mandatory provisions of applicable law.

How may the deposit agreement be terminated?

The Depositary will terminate the deposit agreement if we ask it to do so. The Depositary may also terminate the deposit agreement if the Depositary has told us that it would like to resign and we have not appointed a new depositary bank within 90 days. In both cases, the Depositary must notify you at least 90 days before termination.

After termination, the holder of ADRs will, upon surrender of its ADRs and payment of the fee for the surrender and any applicable taxes or governmental charges, be entitled to delivery, to him or upon his order, of the deposited securities underlying the ADSs represented thereby. After termination, if any ADRs remain outstanding, the Depositary and its agents will be required to do only the following under the deposit agreement:

- sell rights and other property as provided in the deposit agreement;
- collect distributions on the deposited securities; and
- deliver H Shares and other deposited securities and related distributions and net proceeds upon cancellation of the ADRs.

One year after termination, the Depositary may sell any remaining deposited securities by public or private sale and hold the net proceeds it receives on the sale, as well as any other cash it is holding under the deposit agreement, for the pro rata benefit of the holders of the ADRs which have not theretofore been surrendered. It will not invest the money and has no liability for interest. After making such sale, the Depositary's only obligations will be to account for the money and other cash and with respect to indemnification to us. After termination our only obligations will be with respect to indemnification and to pay various amounts to the Depositary.

Limitations on Obligations and Liability to ADR Holders

- The deposit agreement expressly limits our obligations and the obligations of the Depositary. It also limits our liability and the liability of the Depositary. Among other things, we and the Depositary:
- are only obligated to take the actions specifically set forth in the deposit agreement without negligence or bad faith;
- are not liable if either of us or the Depositary is prevented or delayed by law or circumstances beyond our or its control from performing our or its obligations under the deposit agreement;
- are not liable if either of us or the Depositary exercises the discretion permitted under the deposit agreement;
- have no obligation to become involved in a lawsuit or other proceeding related to the ADRs or the deposit agreement on your behalf or on behalf of any other party; and
- may rely upon any documents we or the Depositary reasonably believes to be genuine and to have been signed or presented by the proper party, or rely upon the advice of or information from any person believed by us or it in good faith to be competent to give such advice or information.

In the deposit agreement, we and the Depositary agree to indemnify each other under certain circumstances. Disputes arising out of or relating to the deposit agreement shall be settled by arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association in the City of New York in English.

Requirements for Depositary Actions

Before the Depositary will deliver or register a transfer of an ADR, make a distribution on an ADR, or permit withdrawal of H Shares, the Depositary may require:

- payment of (i) stock transfer or other taxes or other governmental charges; (ii) transfer or registration fees charged by third parties for the transfer of any H Shares or other deposited securities; (iii) fees charged by the Depositary according to the deposit agreement;

- production of satisfactory proof of the identity and genuineness of any signature or other information it deems necessary or proper or as we may request;

- compliance with laws or governmental regulations relating to ADRs or ADSs or to the withdrawal of deposited securities; and

- compliance with requirements and procedures it may establish, from time to time, consistent with the deposit agreement, including the presentation of transfer documents.

The Depositary may refuse to deliver, transfer, or register transfers of ADRs generally when the transfer books of the Depositary, us or our share register are closed or at any time if the Depositary or we think it advisable to do so.

Your Right to Receive H Shares Underlying Your ADSs

You have the right to cancel your ADRs and withdraw the deposited securities underlying the ADSs represented thereby at any time, except:

- when temporary delays arise because: (i) the Depositary or we have closed its or our transfer books; (ii) the transfer of H Shares is blocked to permit voting at a shareholders' meeting; or (iii) we are paying a dividend on the H shares;

- when you or other ADR holders seeking to withdraw H shares owe money to pay fees, taxes and similar charges; or

- when it is necessary to prohibit withdrawals in order to comply with any laws or governmental regulations relating to the ADRs or ADSs or to the withdrawal of H Shares or other deposited securities.

This right of withdrawal may not be limited by any other provision of the deposit agreement.

Shareholder Communications; Inspection of Register of ADR Holders

The Depositary will make available for your inspection at its corporate trust office all reports and communications, including any proxy soliciting material, received from us that are both (i) received by the Depositary as a holder of deposited securities; and (ii) made generally available to holders of deposited securities by us. The Depositary will also, upon our request, send you copies of those reports and communications.

The Depositary will keep books, at its corporate trust office, for the registration and transfers of ADRs which at all reasonable times shall be open for inspection by the ADR holders, provided that such inspection shall not be for the purpose of communicating with ADR holders in the interest of a business or object other than the business of the Company or a matter related to the deposit agreement or the ADRs.

Ownership Disclosures and Restrictions

ADR holders and beneficial owners may be requested to provide information to us regarding the capacity in which they own their ADRs, the identity of any persons previously or currently interested in their ADRs and the nature of such interest. ADR holders and beneficial owners agree to provide such information to the extent that it is available and can be disclosed under applicable law.

EXHIBIT 8.1

List of Subsidiaries of Aluminum Corporation of China Limited as of December 31, 2022

A list of Aluminum Corporation of China Limited's principal subsidiaries is provided in Note 1 to consolidated financial statements included in this annual report following Item 19.

Exhibit 12.1

CERTIFICATION

I, ZHU Runzhou, certify that:

1. I have reviewed this annual report on Form 20-F of Aluminum Corporation of China Limited (the "Company");

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the Company as of, and for, the periods presented in this report;

4. The Company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the Company and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the Company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the Company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the Company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting; and

5. The Company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the Company's auditors and the audit committee of the Company's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the Company's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the Company's internal control over financial reporting.

Date: April 25, 2023
By: /s/ Zhu Runzhou
Name: Zhu Runzhou
Title: Executive Director and President

Exhibit 12.2

CERTIFICATION

I, GE Xiaolei, certify that:

1. I have reviewed this annual report on Form 20-F of Aluminum Corporation of China Limited (the "Company");

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the Company as of, and for, the periods presented in this report;

4. The Company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the Company and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the Company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the Company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the Company's internal control over financial reporting that occurred during the period covered by the annual report that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting; and

5. The Company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the Company's auditors and the audit committee of the Company's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the Company's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the Company's internal control over financial reporting.

Date: April 25, 2023
By: /s/ Ge Xiaolei
Name: Ge Xiaolei
Title: Chief Financial Officer and Secretary to the Board

Exhibit 13.1

CERTIFICATION

In connection with the annual report on Form 20-F of Aluminum Corporation of China Limited (the “Company”) for the year ended December 31, 2022 as filed with the Securities and Exchange Commission on the date hereof, I, ZHU Runzhou, Executive Director and President of the Company, certify, pursuant to Rule 13a-14(b) under the Securities Exchange Act of 1934, as amended (the “Exchange Act”), and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

(1) The annual report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the annual report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date:	April 25, 2023
By:	/s/ Zhu Runzhou
Name:	Zhu Runzhou
Title:	Executive Director and President

The foregoing certification is being furnished solely pursuant to Rule 13a-14(b) under the Exchange Act and 18 U.S.C. Section 1350 and will not be deemed “filed” for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section.

Exhibit 13.2

CERTIFICATION

In connection with the annual report on Form 20-F of Aluminum Corporation of China Limited (the "Company") for the year ended December 31, 2022 as filed with the Securities and Exchange Commission on the date hereof, I, GE Xiaolei, Chief Financial Officer and Secretary to the Board of the Company, certify, pursuant to Rule 13a-14(b) under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of my knowledge:

(1) The annual report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the annual report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 25, 2023
By: /s/ Ge Xiaolei
Name: Ge Xiaolei
Title: Chief Financial Officer and Secretary to the Board

The foregoing certification is being furnished solely pursuant to Rule 13a-14(b) under the Exchange Act and 18 U.S.C. Section 1350 and will not be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section.