



2022

China Minmetals

SUSTAINABILITY

REPORT



China Minmetals 2022 Sustainability Report

Address of the headquarters: Tower A, Minmetals Plaza, No.3 Chaoyangmen North Avenue, Dongcheng District, Beijing, China (100010)
 Tel : 0086-10-60169896
 Fax: 0086-10-60169831
 Email: xwc1@minmetals.com

You may also read the PDF version of the Report in Chinese and English as well as the dynamic information related to CSR activities of the Corporation under "Sustainability" on the homepage of the China Minmetals' official website.
 Official website: <http://www.minmetals.com.cn>



Environmental considerations for the publication of the report

Paper: printing paper in compliance with FSC certification and ECF certification
 Ink: soybean oil ink for lesser air pollution
 Designed by: Beijing Pengtu Culture and Art Communication Co., Ltd.

About This Report

Reporting Period	This report covers the period from January 1 to December 31, 2022, and some parts may also involve significant years in the Corporation history.
Reporting Cycle	The Corporation publishes sustainability reports annually and this report is the 16th since 2007.
Reporting Scope	This report covers the information of the headquarters and subsidiaries of China Minmetals Corporation. Given the business attributes of subsidiaries are varied, there will be slight differences in the boundary and scope of specific topics and explanations will be provided in corresponding paragraphs of this report.
References	For readability, China Minmetals Corporation is referred to as "China Minmetals", "the Corporation", "the Company" and "we".
Preparation Basis	The report is prepared in compliance with the requirements of the Guideline on Fulfilling Social Responsibility by Central State-owned Enterprises released by the State-owned Assets Supervision and Administration Commission of the State Council (SASAC of the State Council), and in accordance with the Sustainability Reporting Standards (2021) issued by the Global Sustainability Standards Board (GSSB). It also refers to the Guidance on Social Responsibility (ISO 26000:2010), And the State Administration for Market Regulation, the Standardization Administration Chinese national standard GB/ T36000-2015 Guidance on Social Responsibility, the Ten Principles of the United Nations Global Compact, and Guidelines for Social Responsibility in Outbound Mining Investments issued by China Chamber of Commerce of Metals, Minerals & Chemical Importers & Exports.
Data Sources	This report is available in both Chinese and English. Please contact us for a hard copy. You may also find the PDF version of this report in both languages as well as the updates related to CSR activities of the Corporation under "Sustainability" on the homepage of the China Minmetals' official website.
Report Availability	This report is available in both Chinese and English. Please contact us for a hard copy. You may also find the PDF version of this report in both languages as well as the updates related to CSR activities of the Corporation under "Sustainability" on the homepage of the China Minmetals' official website.
Contact Us	Tower A, Minmetals Plaza, No.3 North Chaoyangmen Avenue, Dongcheng District, Beijing, China (100010) Tel: 0086-10-60169896 Fax:0086-10-60169831 Email: xwc1@minmetals.com Website: http://www.minmetals.com.cn

Statement

The China Minmetals Sustainability Report 2022 is to disclose the Company's activities and performance in value creation, innovation, health and safety, environment protection, employee growth, partnership and social harmony. Stakeholders are the most important resource for the Corporation's sustainable development. We adhere to the principle of "cherishing stakeholders and endeavoring to create unlimited value for them", and strive to disclose to the stakeholders the information about our CSR practices and performance as much as possible in an accurate, truthful and objective manner. By doing so, we hope to achieve the most effective communication with our stakeholders on an equal, comprehensive and in-depth basis, so as to enhance mutual trust and cooperation for common progress.

A third-party assurance engagement on this report has been performed by TUV NORD (Hangzhou) Co., Ltd. The statement of assurance is attached hereto as an appendix.

China Minmetals Corporation
June 2023



CONTENTS

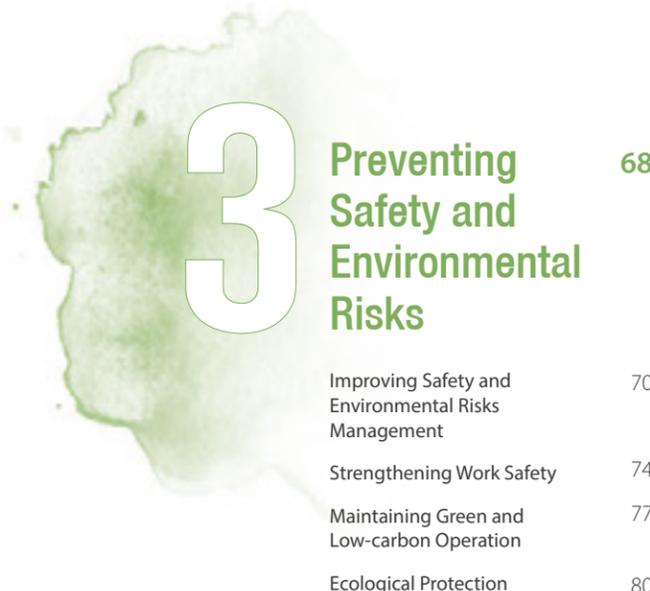
Chairman's Letter	2
CEO's Message	4
About Us	6
Sustainability Management	13
Corporate Culture	13
CSR Communication	13
Materiality Analysis	14
Stakeholder Engagement	15
Progress in the 2030 Agenda for Sustainable Development	16
Spotlight 1: Building on a Decade of Endeavors for New Achievements	18
Strategic Development in a New Journey	18
Leapfrog Development to Create a New China Minmetals	20
Innovative Development to Reshape the Corporate	24
Cultural Development to Build Consensus	27
Spotlight 2: Supporting Rural Vitalization for Common Prosperity	28
Optimizing Assistance System	29
Robust Industrial Development	31
Better Life for People	34



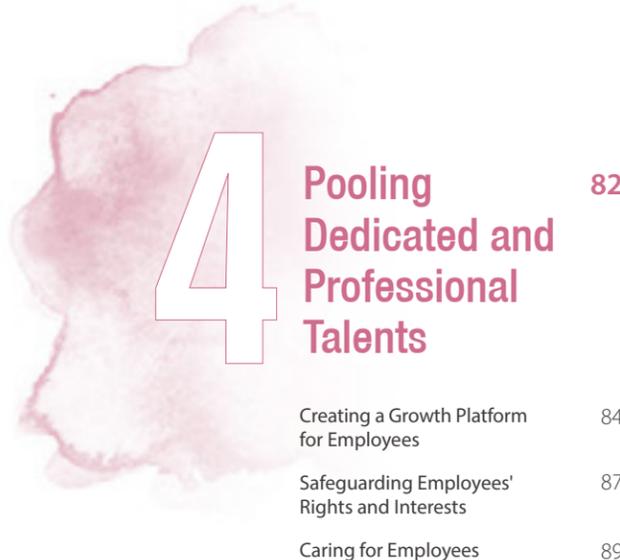
1	Sharpening Core Competitiveness	36
	Metals and Minerals	38
	Engineering Construction	42
	Emerging Industries	50
	Finance and Real Estate	54



2	Shaping New Driving Forces for Reform and Development	56
	Optimizing Management	58
	Leading by Technology	62
	Propelling Digital Development	65



3	Preventing Safety and Environmental Risks	68
	Improving Safety and Environmental Risks Management	70
	Strengthening Work Safety	74
	Maintaining Green and Low-carbon Operation	77
	Ecological Protection	80



4	Pooling Dedicated and Professional Talents	82
	Creating a Growth Platform for Employees	84
	Safeguarding Employees' Rights and Interests	87
	Caring for Employees	89



5	Undertaking Responsibility and Mission to Make Contributions	92
	Promoting People's Well-being	94
	Building a Win-Win Industrial Chain	101
	Overseas Community Development	104

Appendix	
Outlook 2023	108
Sustainability Performance	109
Assurance Statement	110
Content Index	112
Feedback Sheet	114

Chairman's Letter



Weng Zuliang

Party Group Secretary and Chairman

In his report to the 20th National Congress of the Communist Party of China, Xi Jinping, general secretary of the CPC Central Committee, drew a grand blueprint for advancing the rejuvenation of the Chinese nation on all fronts through a Chinese path to modernization. It was pointed out that the essential requirements of Chinese modernization were as follows: upholding the leadership of the Communist Party of China and socialism with Chinese characteristics, pursuing high-quality development, developing whole-process people's democracy, enriching the people's cultural lives, achieving common prosperity for all, promoting harmony between human and nature, building a community of a shared future for mankind, and creating a new form of human civilization. State-owned enterprises played an important role to promote modernization and safeguard the common interests of the people. They must practice the new development philosophy to ensure sustainable socio-economic progress.

In 2022, China Minmetals followed and implemented important speeches and instructions made by General Secretary Xi Jinping. As we ushered in the 20th National Congress of the CPC, we studied its report and delivered the decisions made by the CPC Central Committee and the State Council. We practiced the "five core principles", rolled out "five action plans", and built "China Minmetals with five characteristics". With an enterprising spirit, all China Minmetals employees worked harder and prevailed over daunting challenges, achieving notable progress in reform, development, and the Party building. This further enhanced our role as a pillar and ballast in national economy.

In 2022, we made our contributions to achieving steady and sound economic growth. Under the goal of stabilizing growth, we outperformed all annual business objectives. To cement industrial foundations, we took greater initiative and shaped "mineral species portfolio and reserves" to acquire resources for the metal and mining business and shaped a "technology + product" pattern for metallurgical construction. We continued to lead the low-carbon and intelligent development for China's steel industry, foster strategic emerging industries to form a "tree" with lush branches and leaves, and promote the step-by-step development of new energy materials, cemented carbide, and environmental protection industries. The three-year action plan for SOE reform was successfully concluded, which improved our management and governance. The Central Research Institute of China Minmetals was established and put into operation, and the "digital corporate brain" empowered the Company efficiency and stimulated vitality.

In 2022, we made our contributions to national stability and the peaceful life of people. China Minmetals toughened measures in implementing work safety responsibilities, carried out full-coverage and penetrating campaigns for comprehensive governance, and rectified economic responsibility audits by learning from typical examples and sought both temporary and permanent solutions. We served economic development and the improvement of people's life with annual taxes and fees paid amounting to RMB 25.4 billion. Putting people first, we supported pandemic prevention and control in different places and the earthquake relief efforts in Luding County, Sichuan Province. High-quality and high-standard services were offered to the Beijing 2022 Olympic Winter Games and a total of RMB 90 million was donated to ensure lasting effects of poverty alleviation and rural vitalization in regions to which we provided targeted assistance. As a responsible global corporate citizen, we sought to prosper with governments, communities, and employees, localized employment and procurement, complied with international safety, health, and environmental protection standards, respected local traditions and culture, and engaged in non-profit activities to create a better future.

As the drumbeat of the new era is heard, we are sailing on our course steadily and pushing ourselves further toward a new journey. In 2023, the second year key to the implementation of the "14th Five-Year Plan" (2021-2025), guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, We will fully implement the guiding principles of the Party's 20th National Congress and the Central Economic Work Conference, the requirements of the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), and adhere to the general principle of pursuing progress while ensuring stability. We will faithfully put the new development philosophy into practice, pursue high-quality development, and become more proactive in strategy-making and development. Efforts will be accelerated in building a world-class enterprise with global competitiveness in the metal and mining industry, which will contribute to making a good start for building a modern socialist country in all respects.

CEO's Message



Guo Wenqing

Chief Executive Officer, Deputy Party Group Secretary

2022 is a pivotal year in the history of the Party and the state, China Minmetals fully served the implementation of the "14th Five-Year Plan", made brilliant accomplishments at a high level. Following the guidance reflected in General Secretary Xi Jinping's important speeches and his important instructions, we delivered the decisions made by the Party Central Committee and the State Council completely with a focus on the study and publicity of the 20th National Congress of the CPC. We coordinated efforts in stabilizing growth, fighting COVID-19 pandemic, maintaining safety, and preventing risks. These actions produced annual revenues of nearly RMB 900 billion, an excellent record that vividly showed China Minmetals was a pillar and ballast of national economy.

We demonstrate first-class performance and a greater ability to create value. As industrial foundations get strengthened, we witness steady output and revenues of the metals and minerals business, stronger support provided by engineering construction, price and supply stability of trade and logistics, and the smooth transformation of the finance and real estate business. The complementary "four beams and eight columns" business system has pushed the Company's revenues and total profits to a new record, making us ranked 58th in the Fortune Global 500 list. The stability and sustainability generated by high-quality development have been reflected in our first-class performance.

We improve corporate governance to make management more effective. We promote the "three lists and one process", including the "three major and one large" list, list of decisions made by the headquarters, list of procedures and issues under key control in a top-down manner, optimize the organizational structure and boundaries of rights and responsibilities between the parent companies and subsidiaries, and streamline management. Extra attention is paid to costs, engineering projects, safety and environmental protection, equity investment, and other detail. We seek more opportunities while control costs, improve efficiency, and achieve an unprecedented level in internal business collaboration. With a streamlined and improved governance system, we have fulfilled the three-year action plan for SOE reform and the improvement plan of following world-class management standards.

We accelerate technological innovation to sharpen our core competitiveness. We put into operation the technological innovation system of "Central Research Institute of China Minmetals + Key Disciplines of a Technology-oriented Enterprise" and make plans to foster five creators of original technology. So far, we have been granted access to 22 national key projects and 45 national optimized technology platforms, with more than 52,000 valid patents. In 2022, the commercialization of technology brought in RMB 36 billion with the benefits of technology and innovation realized one after another, making us even more strongly competitive in the market.

We ensure safety and environmental protection and always keep the bottom line in mind. The concept of safety and green development is embedded into the whole process of development and the responsibility awareness of "always keeping our guard up" guarantees solid progress in work safety campaigns. We pay more efforts to rectify problems found in the ecological and environmental supervision by the central authorities and steadily lower the energy consumption and carbon intensity per RMB 10,000 of output, lending greater support to the green and sound development of the Company.

We provide services to improve people's lives, which highlights our strength in fulfilling social responsibility. When COVID-19 outbreaks were at a critical moment, a total of 64,000 person-times from 13 subsidiaries completed 132 pandemic prevention projects and we went all out, day in and day out, to combat the virus in Shanghai. Our quality and considerate services to the Beijing 2022 Olympic Winter Games have been spoken highly of by the organizing committee. We promote the effective transition from poverty alleviation to rural vitalization and help those most in need in the Luding earthquake-stricken area, which fully demonstrates the mission of a central SOE and conveys our lofty ideal of "putting people first and life first".

Arduous as the journey ahead might be, we will exert ourselves to tackle daunting challenges. The year 2023, the first year to fully implement the decisions made at the 20th National Congress of CPC, also marks the second year of implementing the "14th Five-Year Plan". United around the CPC Central Committee with comrade Xi Jinping at its core, we will uphold the general principle of seeking progress while maintaining stability, concentrate efforts on the main business, consolidate the management foundation, and focus on high-quality development to carry out what has been decided in the 20th National Congress of the CPC. We will accelerate efforts to build a world-class enterprise with global competitiveness in the metal and mining industry. With higher-quality and sustainable development, we will contribute to making a good start for building a modern socialist country in all respects.

王文清

About Us

Company Profile

Headquartered in Beijing, China Minmetals Corporation (China Minmetals), an important state-owned enterprise with metals and minerals as its core business, is directly subordinated to China's central government and a pilot state-owned capital investment company.

China Minmetals has undergone three major stages over the past seven decades of development. Since its founding in 1950 to the reform and opening-up (1978), China Minmetals, as a professional trading company, was the main trader for importing and exporting metals, minerals, hardware, and building materials in the PRC. After the reform and opening up, China Minmetals explored a diversified and industrialized development path in the market economy, and was among the first Chinese companies to "go overseas". In the 21st century, China Minmetals embarked on strategic transformation through restructuring and merger and acquisition in the metal and mining industry. In 2015, China Minmetals carried out strategic restructuring with MCC Group, a Fortune Global 500 company, becoming one of the first companies in the world to build a holistic ecosystem covering resource acquisition, prospecting and exploration, design and construction, mining

and mineral processing, smelting and processing, and trade and logistics, with better performance in business scale, business type, and risk resistance.

Currently, China Minmetals has built a "Four Beams and Eight Columns" business system: the "Four Beams" refers to metals and minerals, metallurgical construction, trade and logistics, as well as finance and real estate; the "Eight Columns" are mineral development, metallic materials, new energy materials, metallurgical engineering, basic construction, trade and logistics, financial services, and real estate development.

In the new era, following the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, all employees of China Minmetals will abide by world-class standards, adhere to the leading role of independent innovation, take a problem-oriented approach, and strive for better quality and victories. Leveraging our role as a state capital investment company in the metal and mining industry, we will make unremitting efforts to build a world-class enterprise with global competitiveness in the metal and mining industry.

China Minmetals owns eight listed companies

Publicly listed on the Shanghai Stock Exchange and Hong Kong Stock Exchange	MCC (601618.SH, 1618.HK)	
Publicly listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange	Zhuzhou Smelter Group (600961.SH) Minmetals Capital (600390.SH) Minmetals Development (600058.SH)	China Tungsten Hightech (000657.SZ) Changyuan Lico (688779.SH)
Publicly listed on the Hong Kong Stock Exchange	Minmetals Resources (1208.HK)	Minmetals Land (0230.HK)

As of the end of 2022

Exceeded RMB

1 trillion
Total assets

8
Listed companies



In 2022

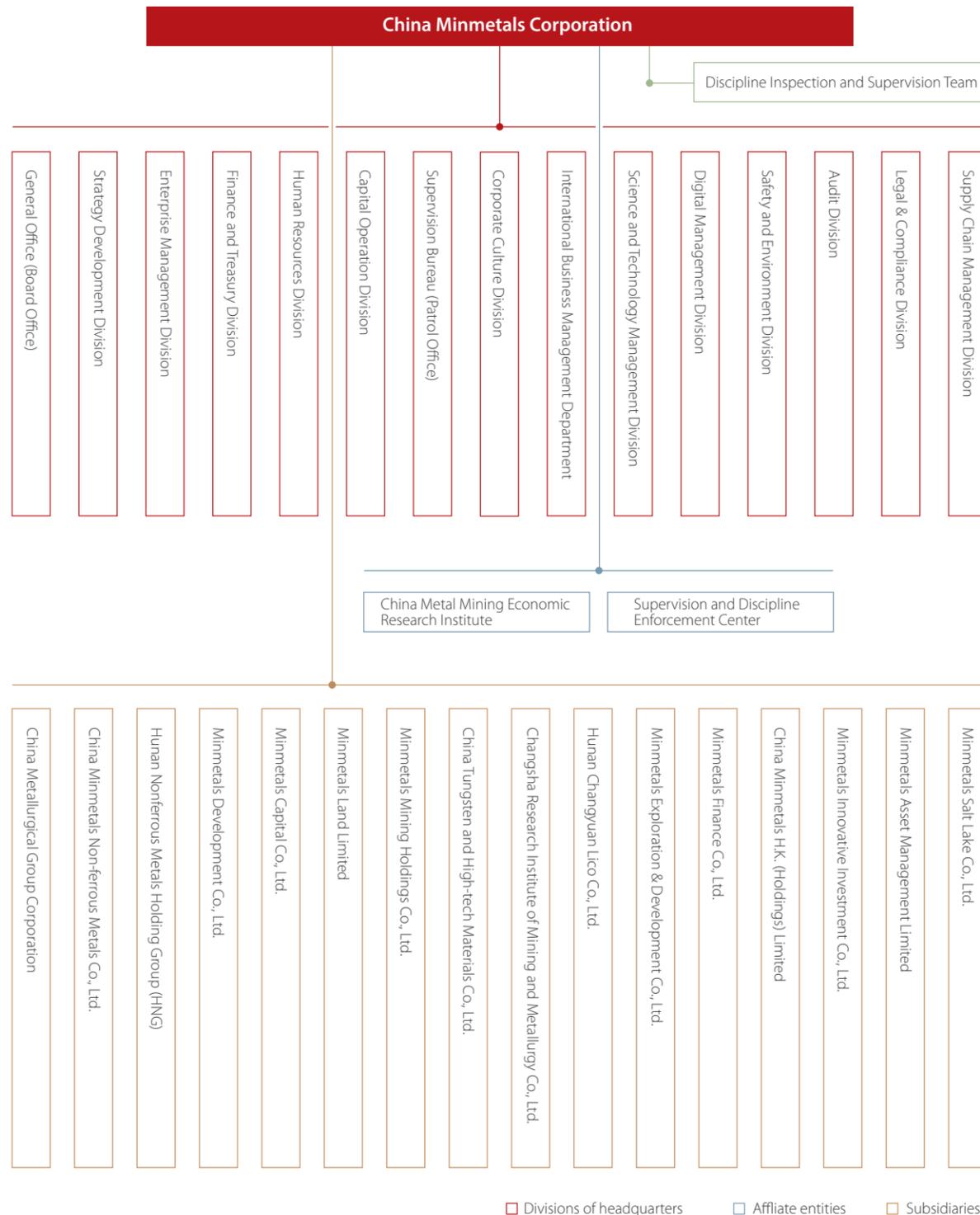
About RMB
898.3 billion
Revenues

About RMB
26.9 billion
Total profits

58th
Fortune Global 500 ranking



Organizational Structure



Corporate Governance

In the modernization of national governance system and governance capacity, China Minmetals has identified its position and created an open "China Minmetals Model" of modern corporate system with Chinese characteristics.

Improving governance system

Intending to build an "efficient China Minmetals", we continue to improve the modern SOE governance with Chinese characteristics, fully implement the "two major political principles" of adhering to the Party's leadership over SOEs and building a modern enterprise system, and clarify the boundaries of rights and responsibilities between the Party organization, the board of directors, and the management based on the Company's Articles of Association and the "three lists and one process" mechanism. We urge that duties concerning decision-making, implementation,

and supervision should be performed in accordance with laws and regulations.

All 140 secondary and third-level subsidiaries have established and standardized the operation of their boards of directors, which fulfill their responsibilities in decision-making and risk prevention. A total of 29 key subsidiaries under reform and more than 80 qualified backbone subsidiaries have improved the "three lists and one process" mechanism.

As of the end of 2022, the Company headquarters had held



Strengthening risk control

To build a Safe China Minmetals, we continue to improve the risk management system and promote the full coverage of the "1+N" risk management system. First, based on the risk management structure and policies, we establish a risk management system covering all levels of subsidiaries and institutionalize risk management in major business fields with comprehensive risk management regulations as the core. Second, centering around "1+N whole-process control", we establish a whole-process management and control system featuring "thorough risk identification and assessment - clarified responsibilities under guidance - continuous tracking via quarterly meetings - dynamic monitoring with management reports - enhanced special investigations - comprehensive summary of annual reports". Third, with the "five major risk management mechanisms" put in place, we implement the risk assessment mechanism, risk monitoring mechanism, risk reporting mechanism, risk inspection mechanism, and violation accountability mechanism at each directly managed subsidiary to eliminate disruptive risk events and ensure that risks are measurable, controllable, and affordable.



Party Building

In his report to the 20th National Congress of the CPC, general secretary Xi Jinping points out that on the journey forward, we must firmly adhere to five major principles, the most important of which is to uphold and strengthen the Party's overall leadership. With an in-depth understanding of the guiding principles of the 20th National Congress of the CPC, China Minmetals implements the general requirements of the Party building in the new era, exercises an all-out effort to enforce strict Party discipline, and advances the great new project of the Party building in the new era, which lends strong support to our efforts in building the world-class enterprise with global competitiveness in the metal and mining industry.

Studying and implementing the guiding principles of the 20th CPC National Congress

In 2022, China Minmetals prioritized and concentrated efforts on studying, promoting, and implementing the guiding principles of the 20th National Congress of the CPC, thus elevating Party building to a new level. Deeply aware of the significance of the "Two Establishes" (establishing the core status of general secretary Xi Jinping in the whole Party and establishing the guiding position of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era), Party organizations at all levels of the Company bear in mind matters of national significance, strengthen their commitment to the Four Consciousnesses, the Four-sphere Confidence, and the Two Upholds, and spare no effort in comprehensive study and implementation. We also strengthen ideological guidance as well as responsibility and work implementation to make our contributions to the new development journey of the Party and the country.

CASE Watching the live broadcast of opening ceremony of the 20th National Congress of the CPC

On October 16, 2022, about 47,000 Party members, cadres, and employees at 3,037 venues in China Minmetals watched the live broadcast of the 20th National Congress of the CPC to learn what was conveyed in the meeting immediately.



Watching the live stream of the 20th National Congress of the CPC (main venue)

Theory publicity on a large scale

Representatives of China Minmetals participate in the 20th National Congress of the CPC study session held by the Central Publicity Group in the state-owned assets and SOE system. As a delegate to the 20th National Congress of the CPC, Weng Zuliang, Chairman and Party Group Secretary of China Minmetals, gives a lecture on the guiding principles of the 20th National Congress of the CPC with the theme of "fully studying, understanding, and implementing the guiding principles of the 20th National Congress of the CPC and striving to become a world-class enterprise with global competitiveness in the metal and mining industry". At the same time, members of the Party group publicize the guiding principles of the 20th National Congress of the Party in communities.



Weng Zuliang, Chairman and Party Group Secretary of China Minmetals gives a lecture



Weng Zuliang, Chairman and Party Group Secretary of China Minmetals visits the China Mining Innovation Center and communicates the message about the guiding principles of the 20th National Congress of the CPC to frontline researchers



Party organizations at all levels study original texts, the report to the 20th Party Congress word by word, and important speeches made by general secretary Xi Jinping around and during the 20th National Congress of the CPC. In addition, we also study the reports to the 18th and 19th CPC National Congress and the Constitution of the CPC, which offers both general and specific perspectives to help us understand the guiding principles of the 20th CPC National Congress. Given daily reality, we dig deeper into general secretary Xi Jinping's important remarks on the reform and development of SOEs and Party building to improve our political judgment, awareness, and execution.



CASE China Minmetals' online Party school put into operation

To deeply understand the guiding principles of the 20th National Congress of the CPC and fully implement Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, China Minmetals launched the China Minmetals online Party school (Minmetals e-learning) platform. After the platform was initiated, the first learning activity concerned the guiding principles of the 20th CPC National Congress interpreted by experts invited to give lectures. In the meantime, under the theme of studying, promoting, and implementing the guiding principles of the 20th CPC National Congress, a special column was set up. Through live broadcasts, online training courses, Q&A, and other forms, the guiding principles of the 20th CPC National Congress was better understood. In total, the platform served 2.76 million learners, with an average learning length of 21.78 hours.



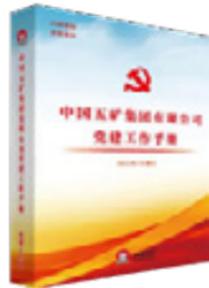
The Company's official website, China Minmetals Newspaper, "Smart Party Building" APP, and other media platforms have set up special pages and columns about the 20th National Congress of the CPC, fostering an enabling atmosphere to see that the guiding principles of the 20th CPC National Congress can be well understood and translated into practice.

Strengthening primary Party organizations

We embed Party organizations and work into the "Four Beams and Eight Columns" Business System, strengthen primary Party organizations, and enhance the "three teams". We also improve the primary-level Party building system and develop the campaign of "flying the Party flag and polishing the Party emblem".

CASE Promoting the campaign of "flying the Party flag and polishing the Party emblem"

The Party Group of China Minmetals issued the *Notice on Promoting the Campaign of "Flying the Party Flag and Polishing the Party Emblem" and Coordinating Business Development, COVID-19 Prevention, and Work Safety*. It guided subsidiaries at all levels to create "sub-brands" and "sub-campaigns" of Party building that met their realities and coordinate efforts on all fronts to shape a three-dimensional matrix of China Minmetals' Party building brand. Following the requirements, Party organizations at all levels and all Party members took a problem-oriented approach, copied proven practices, and deepened "Party building +" and joint development activities. Primary Party organizations were urged to promote the four projects of "Party pioneer post", "Party member responsibility area", "Party pioneer team", and "Party pioneer project" to integrate Party building into production and operation.



July 2022, China Minmetals Corporation Party Building Work Manual was revised and released



Minmetals International's award ceremony of the "I am a Pioneer for reinvigorating the country through mining" under the campaign of "flying the Party flag and polishing the Party emblem"

Improving Party conduct and clean governance

With a toughened stance, China Minmetals explores full-cycle management in its unwavering efforts against corruption. We make coordinated efforts to enhance deterrence so that employees do not dare to be corrupt, formulate stringent regulations so that employees are not able to be corrupt, and raise awareness so that employees do not want to be corrupt. In 2022, we carried out the first inspections and cross-inspections by higher-level discipline inspection commissions in five third-level subsidiaries, extending Party governance to the primary level with a message of stricter governance.

China Minmetals' directly affiliated discipline inspection commission

Deterrence to see no one dares to be corrupt

When handling problems, we are strict and meticulous but also considerate. We also try our best to prevent problems and stimulate the enthusiasm of employees. We strengthen supervision over the selection and employment of personnel, ensure reply to opinions on Party conduct and clean governance, engage in talks with Party members and cadres on clean conduct, and urge them to improve their political ability, keep in mind the original aspiration, and strictly exercise self-discipline.

Mechanisms to see no one is able to be corrupt

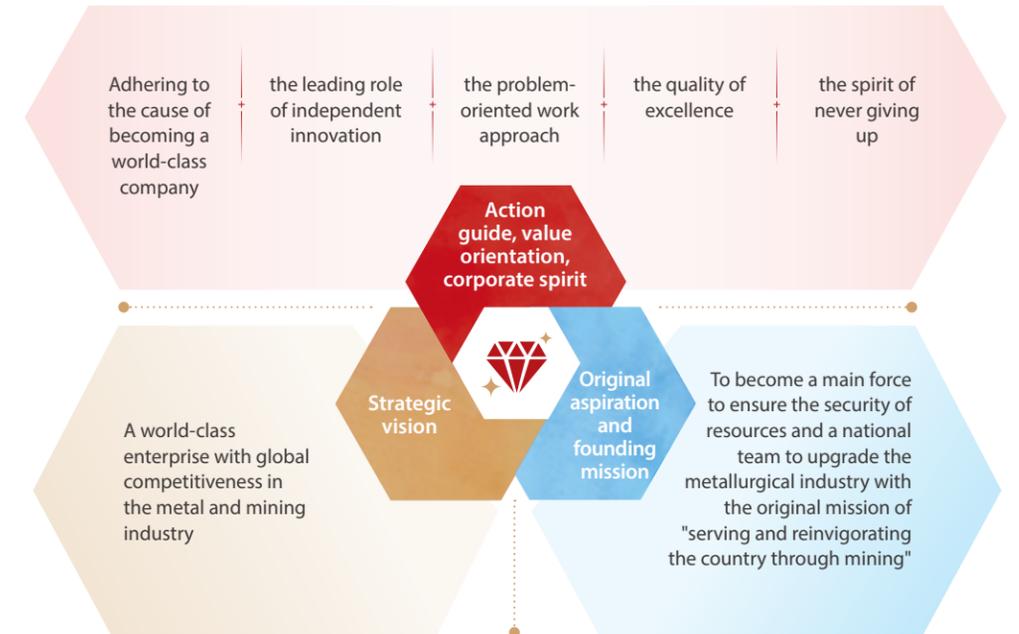
We carry out special inspections and rectifications of overseas corruption problems and strengthen the prevention and control of corruption risks in overseas investment. China Minmetals are among the first companies to address governance issues such as "providing illegal client entertainment" and review problems such as "inside jobs". We have formulated and improved 50 policies and ensured that identified problems are rectified and cases are investigated with accountability delivered.

Awareness to see no one wants to be corrupt

We roll out special activities of "raising political awareness, observing discipline, and strengthening conduct", and formulate the Negative List of Key Concerns. Symposiums are held for functional leaders at the headquarters of the Company under the theme of "strictly maintaining political integrity and cautiously taking the first step in clean governance", and collective integrity talks are conducted on "strengthening the education, management, and supervision of young employees in a strict and down-to-earth manner". We continue to foster an atmosphere that enables employees to respect the boundary and stick to the bottom line to build a culture of integrity.

Sustainability Management

Corporate Culture



CSR Communication

China Minmetals is committed to building an effective CSR communication mechanism to deeply understand and respond to the expectations and demands of stakeholders. In this way, we strive to facilitate all stakeholders to participate in the Company's decision-making process and operation, thus ensuring their rights to know, supervise, and participate for joint development. In 2022, China Minmetals won the special award of "Valuable News for SOEs" and the State-owned Assets Report honor of excellent communication station of the SASAC.

China Minmetals has established a sustainability reporting mechanism and released 16 sustainability reports. On this basis, qualified subsidiaries are encouraged to publish their independent reports, overseas performance reports, and sustainability reports of major projects, forming a three-dimensional reporting model of the Company, subsidiaries, and project-oriented reports.



China Minmetals Sustainability Report 2021 won the GoldenBee Excellent CSR Report 2022 • Evergreen Award with Three Stars.



Materiality Analysis

Upholding the principles of materiality, completeness, and stakeholder engagement, we solicit the opinions of internal and external stakeholders according to the Global Sustainability Standards Board's GRI Standards 2021 and improve and clarify the content and process of the report against the sustainability disclosure of world-class mining counterparts. After identifying and assessing the importance of topics, we determine the scope of topics and the degree of disclosure to ensure the disclosure of the Company's sustainability management, practices, and performance are more accurate and comprehensive.

1. Protection of employee rights and interests
2. Career training and development
3. Responsible supply chains
4. Rural vitalization
5. Community engagement and development
6. Anti-unfair competition
7. Rights of indigenous peoples/Community relations management
8. Quality and safety of products
9. Promoting low-carbon transition in the industry
10. Tailings ponds management
11. Addressing climate change
12. Ecological environment protection
13. Ensuring resource security
14. Technology innovation
15. Consumer's rights and privacy protection
16. Employees occupational health and safety
17. Digital transformation
18. Corporate governance
19. Compliance and risk management
20. Intellectual property protection



Stakeholder Engagement

Given the Company's operation and business practice, China Minmetals innovates in stakeholder communication and interaction, identifies key topics of social responsibility, and responds to the expectations and demands of stakeholders to improve our CSR performance and achieve joint development with stakeholders.



Progress in the 2030 Agenda for Sustainable Development

	<p>SDG 1 Eradicate poverty in all its forms worldwide</p>	<p>We continue to provide assistance to six targeted assistance counties, one paired assistance county, and many other assistance villages.</p>
	<p>SDG 2 Eradicate hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	<p>In the targeted assistance areas, we cultivate Yiliang Rhizoma Gastrodiae, Yanhe peaches and pears, Dejiang Sichuan peppercorns, Weixin food processing, Huayuan "rice-fish-fungus" and other unique agricultural projects.</p>
	<p>SDG 3 Ensure healthy lifestyles and promote well-being for people at all ages</p>	<p>We build four rural vitalization demonstration sites in Gaopo Village (Zhenxiong County), Lianghe Community (Yiliang County), Aiqun Village (Yanhe County), and Shibadong Village (Huayuan County).</p>
	<p>SDG 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	<p>We carry out a variety of training programs to develop outstanding professionals and special educational support campaigns such as the "Mining Center" vocational education and the "loving packages" campaign.</p>
	<p>SDG 5 Achieve gender equality and empower all women and girls</p>	<p>We remain committed to equal employment and treat employees from different backgrounds equally.</p>
	<p>SDG 6 Ensure availability and sustainable management of water and sanitation for all</p>	<p>We carry out projects such as building a beautiful village in Yinchang Village (Chishuiyuan Town), improvement of cultural tourism in Nazhizhai (Gaopo Village), reconstruction of flood-damaged roads in Muzhuoji Town, the improvement of public services in the resettlement area of Nanmuyuan, and the improvement of the outdoor public space in Otian Village.</p>
	<p>SDG 7 Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<p>We consolidate the new energy and anode and cathode materials of energy storage batteries and build an industrial ecosystem of "resources-materials-battery recycling".</p>
	<p>SDG 8 Promote lasting, inclusive and sustainable economic growth, full and productive employment and decent work for all</p>	<p>We accelerate the efforts to build a world-class enterprise and achieve record-high business performance. We continue to increase the share of industrial assistance funds in six targeted assistance counties, invest 60% of the total assistance funds in 16 industrial assistance projects, and help attract RMB 33.749 million of investment.</p>

	<p>SDG 9 Build disaster resistant infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>	<p>We continue to promote prefabricated, green, and intelligent construction and build a technology R&D and innovation platform. We successfully completed the construction of multiple venues, operation and maintenance, and supporting facilities for the Beijing 2022 Olympic Winter Games, as well as 132 pandemic prevention projects.</p>
	<p>SDG 10 Reduce inequality within and among countries</p>	<p>We support the development of our host communities, such as their economic, educational, medical, agricultural, sports, and other development.</p>
	<p>SDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable</p>	<p>We enhance efforts in projects such as affordable housing projects and green buildings and carry out environmental governance projects, such as sewage treatment, trash burning, and ecological restoration.</p>
	<p>SDG 12 Ensure sustainable consumption and production patterns</p>	<p>Focusing on the low-carbon, intelligent, and high-end development trend of the industry, we develop low-carbon technologies, processes, and equipment and build smart mines, factories, and construction sites. We continue to engage in consumption-based assistance with agricultural products worth RMB 33.737 million purchased from areas lifted out of poverty in 2022. We also participate in the Central SOE Assistance-to-farming Week to help rural people increase their income.</p>
	<p>SDG 13 Take emergency action to combat climate change and its impacts</p>	<p>Serving the implementation of China's 30-60 Decarbonization Goal, we vigorously develop energy-saving and emission-reduction technologies in metal mining, steel metallurgy, and engineering construction. We give full play to the technical consulting capabilities of the research institute under MCC on the 30-60 Goal. Under the joint framework of "overall planning by the headquarters + MCC's professional undertaking", we guide subsidiaries to meet their energy conservation and carbon reduction goals in an orderly manner.</p>
	<p>SDG 14 Conserve and sustainably utilize the oceans, seas and marine resources for sustainable development</p>	<p>We complete the world's first 1000-meter-deep integrated linkage experiment of self-propelled deep-seabed polymetallic nodule mining, which promotes deep-sea resource exploration experiments. We carry out deep-seabed mining technology research and finish the 2022 voyage mission in the polymetallic nodule contract area.</p>
	<p>SDG 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	<p>We advance the prevention and control of environmental pollution, strengthen ecological restoration and biodiversity conservation, and continue the fight for a beautiful environment.</p>
	<p>SDG 16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>	<p>We address compliance issues in business operations and advance the campaign of "better compliance year", further deepening the compliance management pattern with China Minmetals characteristics. We engage in all aspects of the work to improve Party conduct and clean governance and promote the system to ensure that employees do not dare to be, are not able to be, and do not want to be corrupt.</p>
	<p>SDG 17 Strengthen execution and revitalize global partnership for sustainable development</p>	<p>We grow together with industry partners, maintain sound, fair, and transparent relations, and jointly promote the sustainable development of the industry.</p>

SPOTLIGHT
1

Building on a Decade of Endeavors for New Achievements

For the last ten years in the new era, China Minmetals has faithfully implemented the important speeches made by general secretary Xi Jinping on the reform and development of SOEs and Party building, become more proactive in strategy-making and development, and remained committed to our original mission of "serving and reinvigorating the country through mining". We completely follow the new development philosophy, improve the modern corporate system with Chinese characteristics, intensify efforts in developing the main businesses, and forge ahead on the journey of high-quality development. As a result, we have improved our performance significantly, gradually becoming a world-class "mining aircraft carrier" and writing a glorious chapter of development that serves the Party, the state, and the people.

Strategic Development in a New Journey

Lead by a new mindset governance mindset, China Minmetals always maintains strategic sharpness, confidence, and determination, stays on its strategic course, and accelerates the efforts to build a world-class enterprise. The Company's performance has reached a record high, with revenues, total profits, and net profits up by 10.6%, 13.5%, and 13.8% respectively last year.

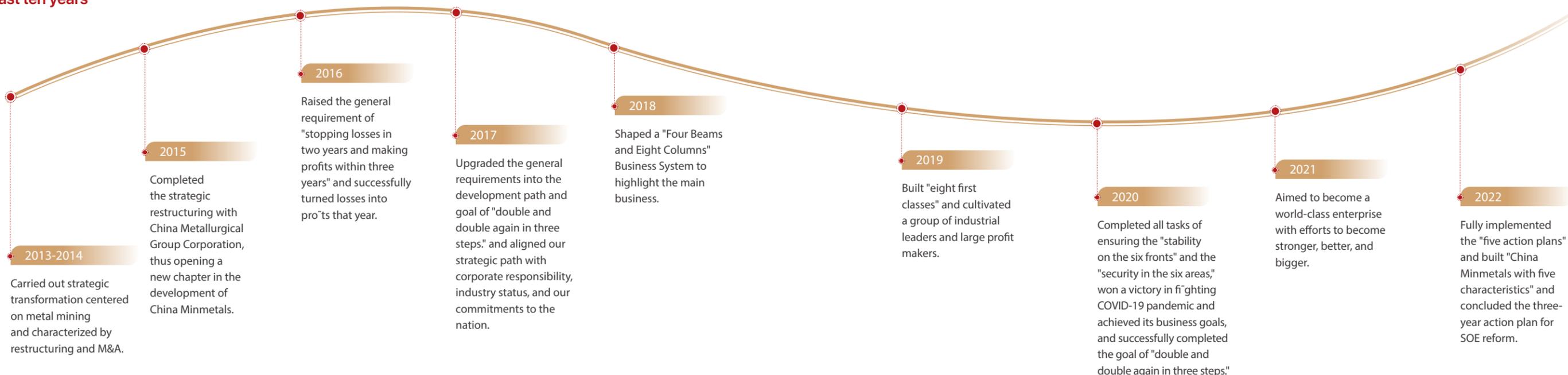


The Company has been rated for multiple times an **A-level** company in the annual assessment of business performance and tenure assessment of the person in charge of the central SOE.

Over the past decade, China Minmetals has completed the strategic restructuring with MCC Group, become a pilot state capital investment company, and made progress in the development of world-class mines and major national level projects. We have solidly fostered several strategic emerging industries and debottlenecked technology breakthroughs, which produced remarkable reform outcomes and injected strong impetus into building a world-class enterprise with global competitiveness in the metal and mining industry.



Strategic roadmap in the last ten years



Leapfrog Development to Create a New China Minmetals

Over the last decade, especially since the restructuring with MCC Group, also a Fortune Global 500 company, in 2015, China Minmetals has pooled together our respective strengths in mining and metallurgical construction. As a result, we have become one of the first companies in the world to build a comprehensive industrial ecosystem covering resource acquisition, prospecting and exploration, design and construction, mining and mineral processing, smelting and processing, and trade and logistics, seeing better performance in business scale, business type, and risk resistance.

Metals and minerals

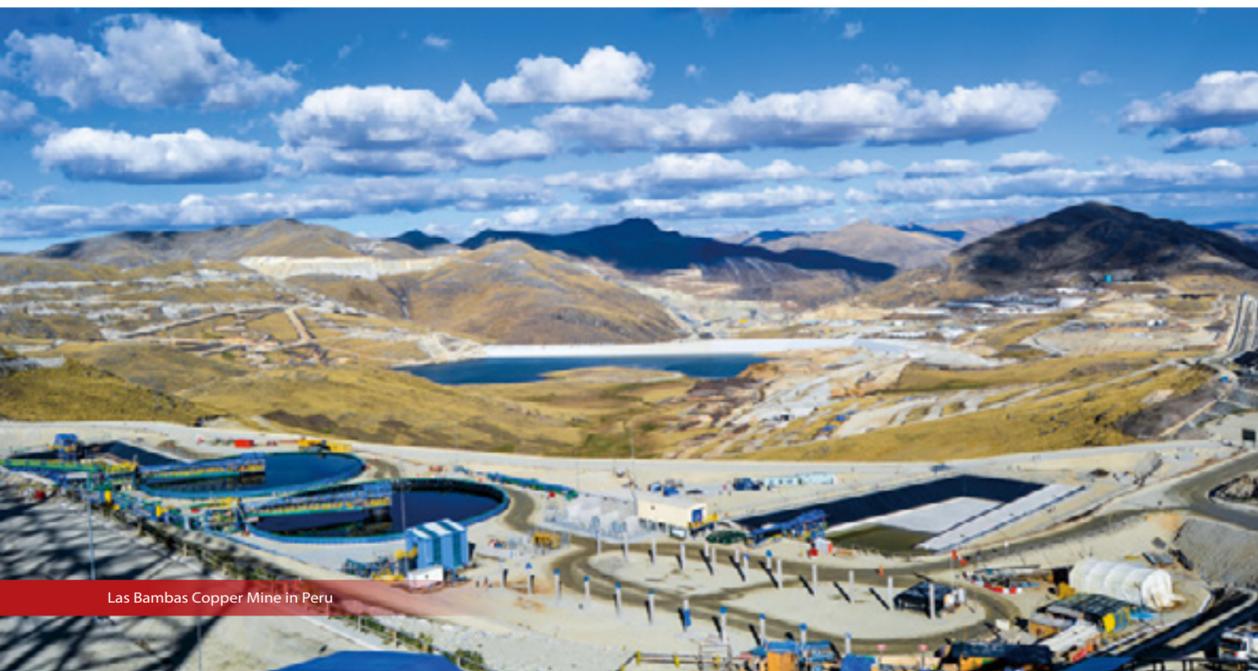
With metals and minerals as the core businesses that are designed to go overseas, we tap into our potential gained from the restructuring to engage in the whole value chain of the metals and minerals industry with a series of strategies.

China Minmetals owns some world-class high-quality mines with great prestige, such as Las Bambas Copper Mine in Peru, Dugald River Zinc Mine in Australia, Ramu Nickel Cobalt Mine in Papua New Guinea, and Hunan Shizhuyuan Nonferrous Metals Co., Ltd. It only took six months for Las Bambas Copper Mine from trial production to commercial operation as scheduled. The successful development of Dugald River Zinc Mine in Australia, one of the world's top ten

zinc mines, marks that China Minmetals has reached the world-class level of independent design, build and operate super-large metal mines in complex overseas markets.

We enhance the metals and minerals businesses by increasing reserves, production, and efficiency while reducing costs and improving the mine development and operation system. China Minmetals' commodities cover more than 70% of China's strategic mineral catalogue. We concentrate efforts on base metals such as copper, iron, nickel, tungsten, and zinc as well as emerging minerals such as lithium and graphite, and level up the coverage, support, control, and influence of strategic minerals.

Major projects in the field of metals and minerals



Las Bambas Copper Mine in Peru



Ramu Nickel Cobalt Mine in Papua New Guinea



Among the top in the world

Las Bambas Copper Mine in Peru
Dugald River Zinc Mine in Australia
Ramu Nickel Cobalt Mine in Papua New Guinea



World's first-tier producer

Copper, lead, zinc, nickel, beryllium, antimony



Global leading producer

Tungsten, bismuth, crystalline graphite, antimony, cemented carbide



China's first-tier producer

Iron, lithium, cobalt, indium, scandium, fluorite, cathode materials



Dugald River Zinc Mine in Australia



Saindak Copper-Gold Mine in Pakistan

Engineering construction

Having undertaken the planning, survey, design, and construction projects of major large and medium-sized steel enterprises in China, we have built up core technical advantages and design and construction capabilities covering all links. In addition, we play an active role in large and medium-sized greenfield steel design and construction projects outside of China. Meanwhile, tapping into our high-tech construction expertise developed from years of practice in metallurgical construction, we have made successful transitions with excellent performance in transportation infra-

structure, high-end housing, municipal environmental protection projects, theme parks, and other aspects.

Over the last decade, we have independently completed key projects at home and abroad, such as Baosteel Zhanjiang Iron & Steel Co., Ltd. plant, Formosa Plastics Vietnam Ha Tinh Steel Plant, Malaysia-China Kuantan Steel Plant, National Sliding Center, Chengdu 2021 FISU World University Games Dong'an Lake Project, Xiong'an New Area Infrastructure Project, etc.

Major engineering construction projects



National Sliding Center Project



Chengdu 2021 FISU World University Games Dong'an Lake Project



Baosteel Zhanjiang Iron & Steel Co., Ltd. Plant Project



Xiong'an Rongxi No. 1 Rongxi Concrete Batching Station Project



Formosa Plastics Vietnam Ha Tinh Steel Plant Project

Trade and logistics

The Company boasts a global trade network for procurement and marketing across the world with the market share of our metal and mineral products exceeding other domestic competitors. We have reshaped the resource trading system by building physical trade projects such as Caofeidian International Ore Trading Center, Dongguan Mayong, Shanghai Luojing, and Wuxi industrial parks.



Minmetals Logistics raw material storage area

Major trade and logistics projects



Minmetals Logistics China-Europe Railway Express



Caofeidian Iron Ore Mixing Center

Finance and real estate

4

Licensed financial institutions where China Minmetals is the controlling shareholder

RMB **901.9** billion
Financial assets under management

One of the influential listed state-owned financial holding companies in the industry

In terms of our real estate business, we have shifted from a developer to a city operator, creating premium projects such as towns with unique features and industrial real estate. The steady development and sustained profitability of the finance and real estate business have strongly complemented the cyclical metal and mining industry.

Major finance and real estate projects



Beijing MCC Dexian Royal Mansion



Beijing WukuangJunlan Hotel



Minmetals Capital Company Limited



Zhuhai Hengqin MCC Shengshi International Plaza

Innovative Development to Reshape the Corporate

“China Minmetals Model” – a modern corporate system with Chinese characteristics

Fully implementing the “two major political principles” of adhering to the Party’s leadership over SOEs and building a modern enterprise system, China Minmetals integrates Party leadership into corporate governance, namely in all links of decision-making, implementation, and supervision. We translate top-level design and policies into specific matters, processes, and lists, ensure that Party building goes hand in hand with corporate reform and development, and leverage the political and organizational advantages of the Party to build up our competitiveness for development.

Clarifying the legal status of the Party organizations in the Company’s governance structure

In 2016, China Minmetals included a separate chapter on the “Party Group” in the articles of association, which regulates the setup, responsibilities, tasks, and decision-making procedures of major issues of the Party Group. Since 2017, the Party Group has taken the inclusion of Party building into the articles of association as an important indicator for five consecutive years and incorporated the indicator into annual Party building responsibility assessments, urging subsidiaries at all levels to ensure implementation.

So far, except under exceptional circumstances, all subsidiaries have included Party building in their articles of association, where the overall requirements for Party building are clarified.

Improving the “cross appointment” leadership system

China Minmetals implements a “cross appointment” leadership system that allows Party committee leaders of directly managed subsidiaries to hold executive or board positions and vice versa. All 16 directly managed subsidiaries have ensured that Party committee secretaries and CEOs who also serve as deputy Party secretaries make it into the board of directors, and made steady progress to send full-time deputy secretaries to the board of directors. All qualified management members have joined the management team of the Party committee and the number of Party committee members is set following the restriction on the number of management positions. At the same time, we take into account the scale and governance structure of subsidiaries, set different categories of “multiple hats on one person” (responsible for business and also Party work), and add the position of full-time deputy secretaries in larger subsidiaries that have more employees on the payroll and the Party member list.

Currently, nearly 90 percent of the Party organization secretaries and CEOs who also serve as deputy Party secretaries of third-level subsidiaries have entered the board of directors, and most of the management members have joined the management team of Party organizations.

Building a decision-making system that clarifies the boundary of rights and responsibilities and facilitates operation

With an emphasis on formulating a list of matters for preliminary discussions by the Party Committee (Party Group) of SOEs, China Minmetals clarifies the rights and responsibilities of the Party Committee (Party Group), the board of directors, the board of supervisors, managers, and other governance entities. We intend to institutionalize the preliminary discussion of Party organizations as a prerequisite for the board of directors and managers to make decisions on major business issues, conscientiously implement the process, and gradually make full-coverage decision lists with the adoption of digital means.

Decision-making lists

In January 2017, the *Measures for the Management of the Decision-making Authority of the Party Group Meeting, the Board of Directors Meeting, and the General Manager’s Office Meeting (Trial), the List of Decision-making Authority*, and the “*Three Majors and One Large*” List were formulated, clarifying that major business matters should be discussed by the Party Group in advance, and then by the board of directors and managers before any decisions were made. These documents answered the question of “what and how” in preliminary discussions of the Party Group in major business management matters and updated the “three lists and one process” mechanism.

Digitalized decision-making

With the help of digital means, the decision-making list of the headquarters is translated into more than 400 electronic approval processes, all of which are embedded in the OA system of electronic official documents. Meetings, signing, and document release have their corresponding decision-making processes and the preliminary discussion procedures of the Party Group are digitally managed, ensuring that in each link of the decision-making process, the person in charge, authority, and responsibility are clarified.

Full coverage till third level subsidiaries

We issue Opinions on Further Strengthening Party Leadership in Improving Corporate Governance Among Subsidiaries and apply the “three lists and one process” mechanism to directly managed subsidiaries and third-level important backbone subsidiaries. The preliminary discussion procedure of Party organizations is implemented gradually and embedded in the “general supervision” system through the assessment of the Party building responsibility system, which guarantees that the Party committee can play an effective role.

Fruitful innovation achievements

Following the fundamental principle that technology should serve global frontiers, economic growth, major national demands, and people’s life and health, we improve support measures, accelerates the progress in fostering creators of original technology, and strengthen the research of key technology to consolidate the foundation of technological self-reliance and self-improvement and strive to be the vanguard of innovation in the industry and the nation.

Since 2013, the Company has registered



China Minmetals guides technology-oriented subsidiaries to specialize in their key research areas so that they can complement each other. We have put in place a multi-level technology funding system composed of special technology projects, innovation funds, entrepreneurship and innovation funds, and PE funds and established a sustained and stable technology investment mechanism, shaping a high-level cycle of science and technology, industry, and finance.

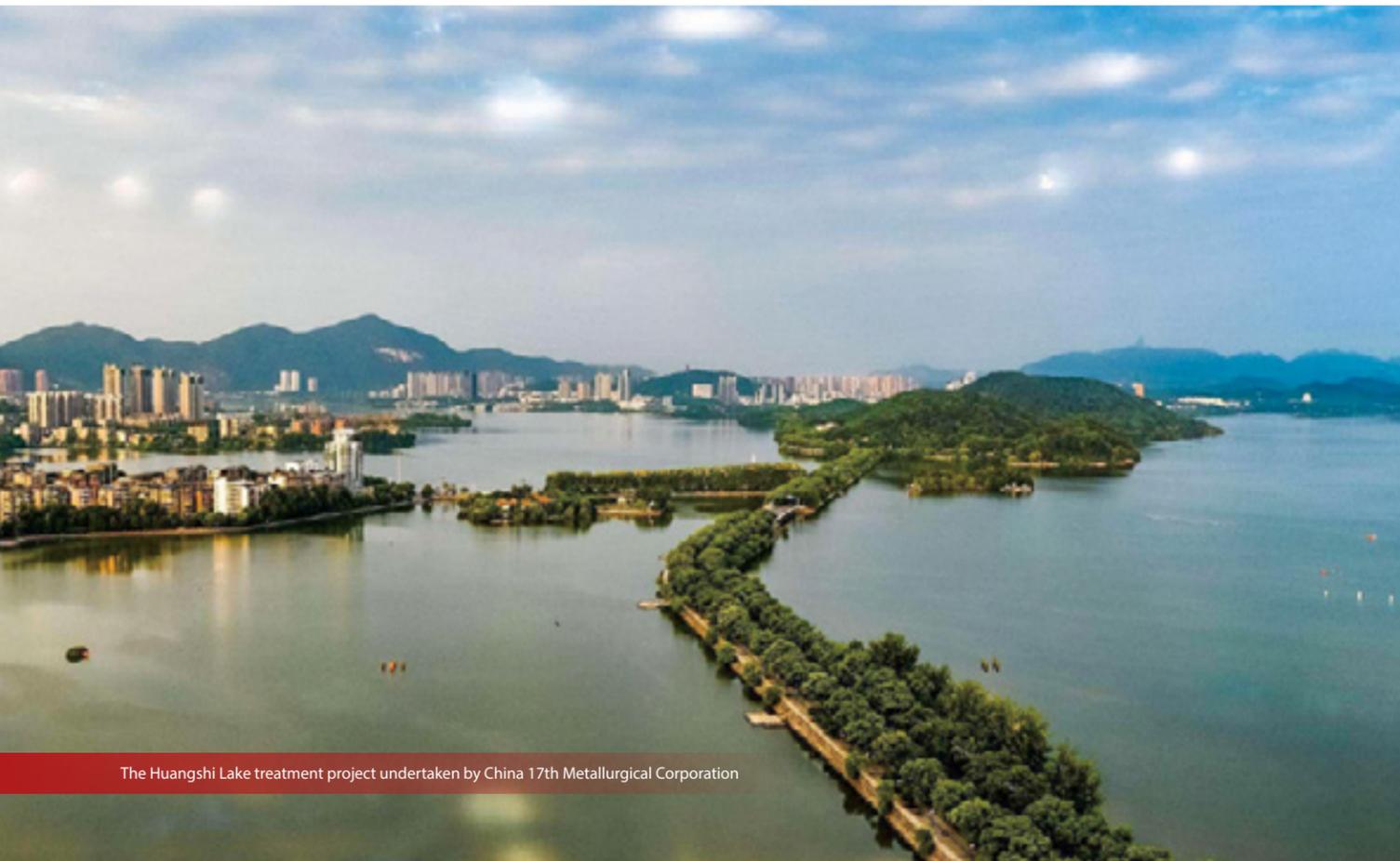
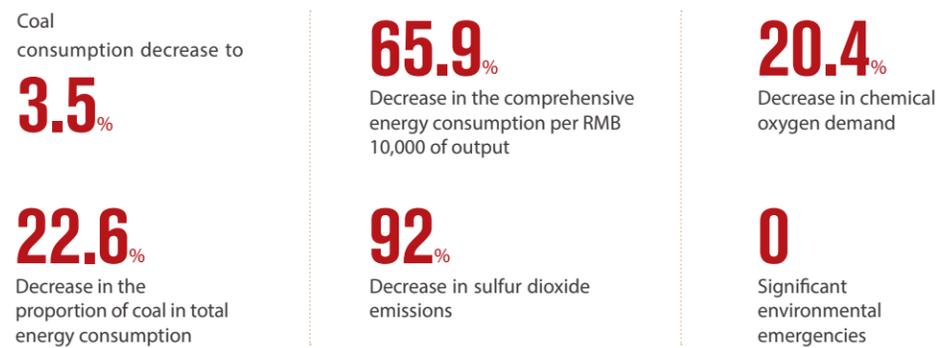
CASE Supporting self-dependent innovation in the electronic chip industry

Polysilicon is an important raw material for integrated circuits, and the silicon-based materials produced by ENFI are “thirteen 9s,” or 99.9999999999999999% pure, making the crystals almost perfect for qualified chips. China Minmetals has taken the lead in achieving stable production of polysilicon amounting to 100 tons in China and broken the monopoly held by other countries in technologies such as high-purity silicon tetrachloride and electronic grade trichlorosilane. This strongly supports the self-dependent innovation and Chinese electronic chip industry.

Higher level of work safety and environmental protection

We prioritize work safety as well as low-carbon and eco-friendly development, we focus on China's 30-60 Decarbonization Goal and the new 'dual circulation' development paradigm. We explore new standards, technologies, energy, green and digital development, and other fields, help other industries to go intelligent, efficient, green, and low-carbon, and offer a better life to people, contributing to China's high-quality and sustainable development. Intensifying efforts on work safety, we solidly advance the three-year special campaign for work safety, employ technologies to improve work safety level, strictly prevent accidents and injuries, and strengthen project safety control. We are determined to win the battle of pollution prevention and control, meet the energy conservation and environmental protection targets set by the SASAC, and continue to improve the intrinsic safety and environmental protection of the Company.

Changes in environmental data from 2013 to 2022



The Huangshi Lake treatment project undertaken by China 17th Metallurgical Corporation

Cultural Development to Build Consensus

China Minmetals promotes the development of corporate culture through cultural integration, formulates and releases the first policy in corporate culture management, which guarantees the development of corporate culture and in-depth integration within the whole Company. At the same time, we strengthen branding, establish a science-based and orderly brand structure of the parent company and subsidiaries, and improve the sense of brand identity and sense of belonging, which in turn enhances our soft power for high-quality development.

Deeply integrating corporate culture

Attaching great importance to the integration of corporate culture, China Minmetals upholds the principles of "four musts" and "four ensures".



We have put in place an innovative corporate culture trinity framework featuring "core cultural concepts, special cultural concepts, and subsidiary cultural spirit", implemented the important speech made by general secretary Xi Jinping during his visit to National Sliding Center, and summarized "five core principles". These principles, as the guidance and spirit in our efforts to build a world-class enterprise, rally the actions of China Minmetals to deeply integrate corporate culture.

Rising brand prominence

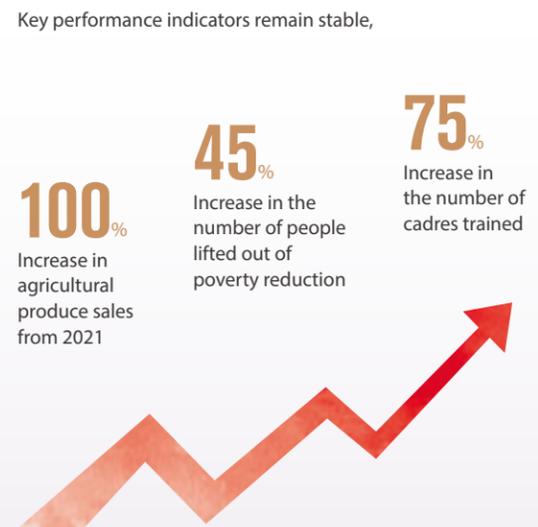
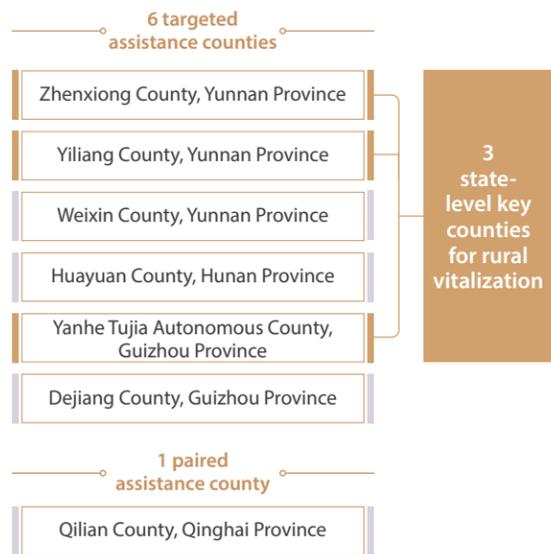
Following the overall requirements of building, preserving, and promoting the brand, China Minmetals has solidly advanced special campaigns in five aspects including brand building, operation, communication, management, and protection to cement the foundation and the soft power for corporate development.



SPOTLIGHT
2

Supporting Rural Vitalization for Common Prosperity

It is pointed out in the report to the 20th National Congress of the CPC that, "the most challenging and arduous tasks we face in building a modern socialist China in all respects remain in our rural areas." Rural vitalization, a lengthy process, engages vast rural areas and all rural residents for vitalization in all aspects. Given the major strategic needs of China, China Minmetals adheres to the three principles of "accuracy, distinction, and efficiency", with a high degree of political awareness and responsibility. We solidly advance assistance programs in six targeted assistance counties and one paired assistance county, consolidate what has been achieved in poverty alleviation, and promote rural vitalization on all fronts.



Optimizing Assistance System

Deeply understanding general secretary Xi Jinping's important speeches and instructions on the work concerning agriculture, rural areas, and farmers as well as rural vitalization, we conscientiously implement the decisions made by the Party Central Committee and the State Council, continue with assistance responsibility, support, policies, and supervision, and maintain a high-level leadership and work system. We strengthen the top-level design of rural vitalization, make annual plans in time, and hold special meetings.

Improving organizational support

The task force for targeted and paired assistance of China Minmetals is led by the Chairman and Party Group Secretary, supported by the CEO and Deputy Party Group Secretary in charge of rural assistance as the deputy team leaders. Seven relevant headquarters functions are engaged as members and the task force is based in the Party Affairs Department.

In 2022



4 Sessions held by the central team of the Party Group and the "First Topic" of the Party Group meeting to convey the guiding principles of general secretary Xi Jinping's important speeches and instructions on the work concerning agriculture, rural areas, and farmers as well as rural vitalization

5 Meetings held by the Party Group, the board of directors, the chairman, and the CEO's office on targeted and paired assistance

In 2022

RMB **55.371** million (in total)
Directly invested as assistance funds to 7 counties

RMB **52.671** million
Invested as assistance funds to 6 targeted assistance counties

RMB **2.7** million
Invested as assistance funds to the paired assistance county



RMB **440** million
Invested

1,714
Primary cadres trained

679
Rural vitalization leaders trained

2,423
Professional and technical personnel trained

RMB **21.0618** million
Agricultural products purchased from targeted assistance counties

RMB **7.981** million
Agricultural products sold by China Minmetals to help targeted assistance counties

Strengthening process control

In 2022, the Company's executives led a team to all targeted assistance and paired assistance counties to inspect the operation and maintenance of assistance projects, investigate the declared projects on "five-dimension vitalization" by each county, and visit cadres designated to temporary positions. Meanwhile, we intensified supervision of the construction and operation of targeted assistance projects and rural vitalization, producing six research and supervision reports.



Fostering assistance forces

Adhering to the principle of “sending the best talent and rotating personnel”, China Minmetals selects politically qualified, excellent, and experienced cadres who maintain sound conduct and a strong sense of discipline, and ten of such cadres have been appointed to temporary positions at seven counties, including one serving as a member of the county's standing committee of the Party and deputy county head, six deputy county heads, and three first secretaries stationed in villages.

We send more careness to cadres designated to temporary positions. During the Spring Festival, we pay special visits to them and their families, during which we see how these cadres' life and work is going and send them consolatory letters and special allowances. We also ensure support measures such as allowances and life insurance coverage to alleviate their worries so that they can fully devote to the cause of rural vitalization.

Injecting the strength of Party building

Seizing the opportunity of Party building, China Minmetals brings together Party building resources and pairs up Party building activities, thus giving full play to the respective advantages of Party organizations. We strengthen primary Party organizations, bring out new concepts and organization methods in primary Party building, and build branches in the front line of rural vitalization so that the Party flag can fly at the forefront and Party branches as fortresses are made more prominent.

In 2022



CASE Pairing up with the Party branch of Aiqun Village for Party building activities

In November 2022, the Party branches of Minmetals China Nonferrous Metals Co., Ltd, Minmetals Exploration, and MCC Guizhou paired up with the Party branch of Aiqun Village in Heishui Town for Party building activities, where they exchanged Party building practices and helped primary Party branches improve their organization, shaping a new pattern of Party building featuring “Party building guidance, resource sharing, joint contribution and mutual assistance, and win-win development”.



Robust Industrial Development

Giving full play to our strengths in management, capital, technology, and industrial development, we shore up, extend, and strengthen local industries and apply the industrial assistance model of “central SOE investment + rural cooperative operation + increasing the income of registered households in poverty + company-led product purchase + clear income distribution to foster internal drivers of the Company”, driving the integrated development of primary, secondary, and tertiary industries.

Promoting industrial assistance

China Minmetals continues to increase the proportion of industrial assistance funds. In 2022, a total of 60% of assistance funds were invested to 16 industrial assistance projects. We focus on “one county, one product” to develop industries that increase people's incomes and foster agricultural projects with unique characteristics, such as Yiliang Rhizoma Gastrodiae, Yanhe peaches and pears, Dejiang Sichuan peppercorns, Weixin food processing, Huayuan “rice-fish-fungus”. For six consecutive years, we have offered “futures + insurance” financial assistance with China Minmetals characteristics to see farmers, enterprises, and industries thrive together.

In 2022



CASE Industrial cooperation drives the development of the new energy industry in Huayuan County

Tapping into the technical expertise and commercialization experience in the field of new energy materials, Changsha Research Institute of Mining and Metallurgy helps Huayuan County develop the new energy material industry, which injects new momentum for the County in rural vitalization. Both sides carry out in-depth and all-around cooperation in the fields of new energy, new materials, experimental testing, photovoltaic energy storage, etc., and jointly build a new energy industry cooperation base. Changsha Research Institute of Mining and Metallurgy has sent an expert team to assist the company Hunan Zhaoke in developing 3200mA, 3500mA, and other high-capacity batteries, optimizing the process of cylindrical cell production lines, promoting the high-quality development of Hunan Zhaoke lithium battery manufacturing project, and providing technical support to build the Hunan Zhaoke Phase II lithium battery project. In addition, Changyuan Lico also offers anode materials. On September 4, 2022, the New Energy Industry Cooperation Base between Changsha Research Institute of Mining and Metallurgy and Hunan Zhaoke was inaugurated in the Huayuan Industrial Development Zone.



New Energy Industry Cooperation Base between Changsha Research Institute of Mining and Metallurgy and Hunan Zhaoke is unveiled

Launching consumption-driven assistance

Based on more than 700 trade union organizations, China Minmetals carries out consumption-driven assistance by purchasing agricultural products worth RMB 33.737 million from areas lifted out of poverty in 2022.

Seeing the bumper harvest from the projects to which we offer assistance, the Company requires subsidiaries to purchase local agricultural products such as Shibadong Village kiwifruit and Dejiang navel orange to improve sales efficiency. In addition, we participate in the assistance-to-rejuvenate-agriculture week activities held among central SOEs, during which we order two affiliated e-commerce platforms to engage in online business, realizing sales of RMB 1.492 million. In 2022, we helped sell agricultural products worth RMB 8.097 million from areas lifted out of poverty, helping rural residents to increase their incomes.

In 2022

Over **700**

Trade union organizations we rely on

RMB **33.737** million

Value of agricultural products purchased from areas lifted out of poverty

RMB **8.097** million

Value of agricultural products sold by China Minmetals for areas lifted out of poverty

Promoting the development of local tourism

China Minmetals taps into the tourism resources with ethnic minority characteristics in targeted assistance counties. For example, for three years in a row, we have invested assistance funds to help Huayuan County to develop the tourism industry at the Shibadong Village, which has been rated as a 5A scenic spot. We also help make Gaopo Village of the Yi nationality in Zhenxiong County a destination of homestay tourism by integrating elements of rural production, rural life, and ecology. We contribute to the development planning of the peaches and pears base in Heishui Town and transform the base from a purely agricultural production base into an agricultural and cultural tourism park, effectively promoting the integrated development of primary and tertiary industries in Heishui Town.



Lizizhai in Shibadong Village, Huayuan County

CASE Helping the Heishui Town peach and pear base make industrial development planning

Given the current situation of the peach and pear base in Heishui Town, CISDI Beautiful Country and Smart City Technology Research Institute, based on the local peach and pear industry, focuses on rural entertainment, nature tourism, and regional culture. By combining the elements of Wujiang culture, Tujia culture, farming culture, peach and pear culture, and ecological culture, the Institute plans to build a modern smart agriculture demonstration park integrating industrial demonstration, tourism, ecological experience, accommodation and food services, education and research, and agricultural technology training – “Happy Peach and Pear” Agricultural Demonstration Park in Heishui Town, Guizhou Province. Centering around the park, CISDI Beautiful Country and Smart City Technology Research Institute makes the overall rural vitalization planning for Heishui Town to foster a base of agricultural modernization with local characteristics, a production base of high-quality agricultural products, and a natural getaway for Yanhe County residents. This creates a model for the SOE-town coordinated development and empowers rural vitalization on all fronts.



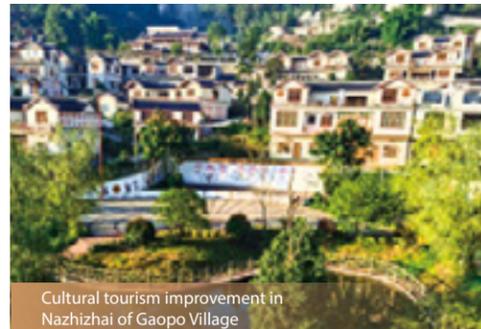
Industrial development plan of the peach and pear base in Heishui Town

Better Life for People

China Minmetals invests more funds to make comprehensive planning, improves the infrastructure in assistance counties, and builds rural vitalization demonstration projects to create beautiful rural living environment. Additionally, we step up efforts in the allocation of educational resources and carry out basic education activities such as talent training, the "Mining Center" vocational educational support campaign, and the "loving packages" campaign.

Improving infrastructure

In response to people's urgent expectations, China Minmetals concentrates on several beautiful village infrastructure projects, including the beautiful village project in Yinchang Village of Chishuiyuan Town, the cultural tourism improvement in Nazhizhai of Gaopo Village, the reconstruction of flood-damaged roads in Muzhuoji Town, the improvement of public services in Nanmuyuan resettlement area, and the improvement of outdoor public space in Otian Village. We have built four rural vitalization demonstration sites, including Gaopo Village in Zhenxiong County, Lianghe Community in Yiliang County, Aiqun Village in Yanhe County, and Shibadong Village in Huayuan County to improve the rural living environment and public services so that people lifted out of poverty can have a greater sense of belonging and happiness.



Cultural tourism improvement in Nazhizhai of Gaopo Village



Basketball Court in the Lianghe Community of Yiliang County



Intelligent demonstration complex of Miao ethnic style in Shibadong Village, Huayuan County

Training excellent talent

Given the features of industries developed in targeted and paired assistance counties, China Minmetals conducts targeted and practical talent training. In 2022, 15% of our donations were invested in education, helping Zhenxiong County and Yiliang County to improve the infrastructure and facilities of primary and secondary schools. We have built the "first-class" demonstration kindergarten, Zhenxiong Kindergarten, in Yunnan Province and continue the "Mining Center" vocational educational support campaign and the "loving packages" campaign.

To carry out the "Mining Center" vocational educational support campaign innovatively, we cooperate with the Panzhihua Technician College, which once produced a world welding champion, and provide outstanding but financially challenged students with three years of free vocational education, subsidies, and job opportunities.

In 2022, students of the first "Mining Center" vocational education program graduated successfully.

There were, **7** Students admitted to universities

32 Students offered a job

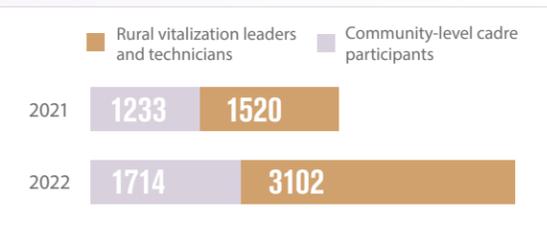
20 Students who have joined the team of the national skill competition



The "Mining Center" vocational education program helps students prepare for competitions

CASE Carrying out a variety of trainings to unleash the potential of talents

China Minmetals carried out targeted and practical training covering 4,816 participants in 2022. Among them, 1,714 community-level cadre participants engaged in training activities concerning community-level Party building, rural vitalization policies, and the development of collectives. We also offered crop breeding technology, e-commerce sales, financial operations, and agricultural project management for 3,102 rural vitalization leaders and technicians.



CASE Zhenxiong County Kindergarten becomes a "first-class" demonstration kindergarten in Yunnan Province

With the help of the Beijing Wusetu Kindergarten affiliated with China Minmetals, the Zhenxiong County Kindergarten in Yunnan Province was advanced to be the "first-class" demonstration kindergarten in Yunnan Province in November 2022, leaping from a township ordinary kindergarten to a provincial professional kindergarten.

The past three years witnessed the efforts of Beijing Wusetu Kindergarten in formulating educational assistance plans while accommodating the reality of the Zhenxiong County Kindergarten in mind. A path of targeted help, effective content, and diversified forms was determined. Beijing Wusetu Kindergarten sent a team of professional teachers to offer guidance in outdoor games, regional games, teaching and research, training, promotion materials, etc., helping local teachers to renew their ideas and standardize teaching behavior for better educational quality.



Upgraded outdoor activity area of Zhenxiong County Kindergarten



Beijing Wusetu Kindergarten's field exchange activities with Zhenxiong County Kindergarten



SHARPENING CORE COMPETITIVENESS

As a national team member in mining industry, China Minmetals always bears in mind national causes and fulfills its responsibilities to the state. Committed to our original mission of “serving and reinvigorating the country through mining”, we enhance our core competitiveness in the main business, make greater advances in “five action plans”, and accelerate efforts to reshape and improve the value of our industrial foundations. We act proactively to expand market shares and continue our efforts to shore up, strengthen, and extend the value chain to improve our competitiveness.

Metals and Minerals

Resource security underpins the modernization of the national security system and capabilities. China Minmetals continues to improve the acquisition and integration of global resources and make major breakthroughs in resource sustainability by shaping "mineral species portfolio and reserves".

As of the end of 2022

38

Mines at home and abroad

15

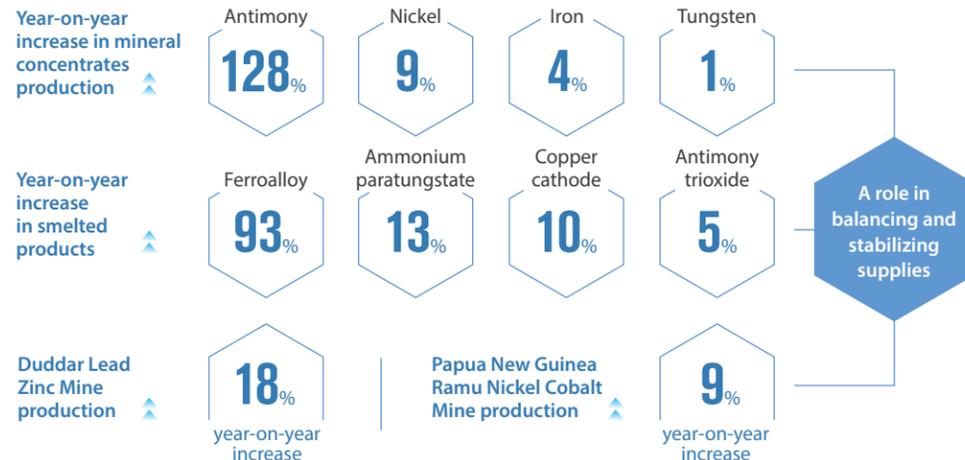
Overseas mines

Minerals developed include copper, lead, zinc, nickel, tungsten, antimony, molybdenum, iron, manganese, chromium, and other non-ferrous and ferrous metals

Enriching metal mineral species varieties

In response to national strategies, we initiate the metal mineral species variety action plan. Based on current general minerals, we formulate a roadmap for developing key minerals, including their reserves and production targets to cement the foundation. We scale up the development of bulk minerals, build a large-scale and world-class mineral portfolio that is sustainable and lowcost, and strive to establish an efficient mine construction, development, and operation system. The Company offers more copper, zinc, nickel, iron, and other minerals, improves the degree of resource self-sufficiency, and concentrates efforts on resource quantity. In addition, China Minmetals develops and incubates strategic emerging minerals, such as tungsten, lithium, beryllium, and antimony, improves industry concentration, and strives to shoulder significant responsibilities in the supplies of national strategic minerals.

Mineral production remains stable



Production expansion projects progress smoothly

The reconstruction or expansion of the Chentaigou Iron Mine, Longjiang Graphite Mine, and DRC Kinsevere Mine, as well as the ongoing project of brine mining in the China Minmetals Salt Lake II ore bed are making steady progress, the Las Bambas 3rd Ball Mill Project has been completed and delivered, and the lease of Saindak Copper-Gold Mine has been renewed for another 15 years.

CASE The expansion project of Saindak Copper-Gold Mine begins

On November 23, 2022, the 275 mineral processing and capacity expansion project of MCCT Saindak Copper-Gold Mine was launched, a key project for MCCT to build a benchmark mining enterprise in Pakistan. It was an essential project upholding the four objectives of "increasing resources, expanding scale, training talent, and emphasizing efficiency" and serving the strategic pattern of developing "two major businesses and one supplementary sector". When completed, the project would effectively elevate mining efficiency, stimulate local mining, mineral processing, and related industries, and play a key role in polishing Pakistan's industrial image and improving local infrastructure and people's living standard.

CASE Kinsevere Mine reconstruction and Expansion Project commences

The Kinsevere Expansion Project at the Company's Kinsevere mine in the Democratic Republic of the Congo was launched on April 1, 2022, with a total investment between USD 550-600 million. The project would build new facilities including a flotation plant, roasting system, and cobalt recovery system, and would explore and process copper sulfide and cobalt resources. The project is expected to produce cobalt in 2023 and copper cathode from sulfide ore in 2024, extending the service life of Kinsevere beyond 2035. When completed, the project can produce 80,000 tons of cathode copper and 4,000 tons to 6,000 tons of cobalt in cobalt hydroxide each year, which will lay a solid foundation for the mine's future development.



Kinsevere Mine

Taking strategic steps in resource exploration

We prospect for minerals both at home and abroad. In China, our focus is on potential high-quality mines of iron, tungsten, and copper in major metallogenic belts. Outside of China, we concentrate on the copper, nickel, and chrome projects under construction in resource-rich countries.

In 2022, side and deep prospecting in Las Bambas, Rothbury, Kangjiawan, Shuikoushan, Huangshaping, and Luzhong Mining produced satisfying results, increasing the resources of copper, iron, tungsten, gold, and other minerals by varying degrees.

Formulating exploration and prospecting plans with the goal of "increasing resources, reserves, and production", tapping into the potential of existing mines, and extending the service life of mines.

Improving the supporting mechanism for exploration and prospecting, increasing budget, technology, and brainpower investments, and setting assessment rules to fully stimulate the enthusiasm of all parties.

Promoting the exploration and prospecting of deep-sea resources, serving the new round of national prospecting strategic actions, focusing on the progress in key metallogenic belts, and striving for potential exploration projects.

CASE Implementing the 2022 voyage mission in the polymetallic nodule contract area

China Minmetals carried out the 2022 voyage mission (China Da Yang 73rd voyage) at the exclusive exploration mining area of the international seabed. During the mission, the polymetallic nodule enrichment system and abundance assessment system independently developed by the Changsha Research Institute of Mining and Metallurgy were tested in the ocean for the first time, successfully obtaining polymetallic nodules to the deck. In addition, the projects "Key Technologies for Overall Design and System Integration of 5000-meter Mining System for Deep-sea Polymetallic Nodules" and "Development of Multifunctional Acquisition Equipment for Efficient Green Deep-sea Polymetallic Nodules and Sea Trials in Mining Areas" were approved as National Key R&D Projects and granted special funds.



China Da Yang 73rd voyage (China Minmetals Polymetallic Nodule Contract Area 2022 voyage) returns safe and sound

CASE A major breakthrough achieved in the side and deep prospecting project of the Kangjiawan mining area

Minmetals Exploration studied side and deep prospecting in the Kangjiawan mining area of Shuikoushan, Hunan Province, finding that the large inverted anticline in the deep south of the mining area would be the second prospecting area. It took a few months to drill 47 holes, 87% of which contained minerals. In the southern and northern inverted wings of Kangjiawan, a continuous and rich ore body was discovered for the first time. In 2022, Kangjiawan added 3.3 million tons of lead-zinc polymetallic ore, raising the overall ore reserves of Shuikoushan to over 5 million tons, which effectively alleviated the imminent resource depletion of the century-old mine and was of great significance to a new round of prospecting strategic breakthroughs in China.

Upgrading trade and logistics

Trade and logistics are the foundation and conventional competitive strengths of China Minmetals. As an industry leader, we seek transformation and development and contribute to a modern circulation system.



Shaping an image of a key trader that shoulders the responsibility of stabilizing commodity supply and price

Leveraging our strengths in brand, capital, and channels, we contribute greatly to reshaping international metal and mineral trading mechanisms and rules and reflecting the appeals of the Company and the state. We undertake national strategic material reserve mission and expand commercial reserves to regulate market at critical times. Through long-term agreements and equity participation, we strengthen cooperation with overseas mining enterprises and stabilize supplies to ensure the security of the domestic metal and mining supply chain.



Seeking to be a new-type trader with accelerated actions to build a new model

With the help of Internet, digital means, and effective organizational models, we integrate all links such as bill of lading, warehousing, and transportation to achieve systematic and effective operation, set China Minmetals' standards and specifications, and form our unique advantages.

CASE Minmetals standard fines listed as the deliverable brand of iron ore futures by the Dalian Commodity Exchange (DCE)

On December 7, 2022, the mixed mineral product Minmetals standard fines produced by China Minmetals Caofeidian Company were qualified as deliverables, making Minmetals standard fines one of the deliverable brands of iron ore futures and the only mixed iron ore product available for the delivery of futures contracts in China. So far, China Minmetals has built an iron ore futures business system featuring the industry's leading via-the-exchange delivery of standard product futures, over-the-counter delivery of non-standard products, Minmetals independent delivery business, and services of "spot + futures, exchange + over-the-counter, delivery warehouse + deliverable".



China Minmetals Caofeidian Company ore mixing center

Engineering Construction

Seizing opportunities brought by the favorable policy of stabilizing growth, China Minmetals has tilted towards big markets and big customers, consolidated our leadership in iron and steel metallurgy, and increased the proportion of high-tech and comprehensive projects. In 2022, 10 projects (including those in which we participate) won the China Construction Engineering Luban Prize and 23 projects (including those in which we participate) received the National Quality Engineering Award, the number registering a record high and polishing the image of "Built by China".

Promoting green and smart metallurgical construction

Prioritizing green and smart development, China Minmetals serves China's 30-60 Decarbonization Goal, vigorously implements the innovation-driven strategy, and produces industry-leading core technologies and products that are green and intelligent with unique metallurgical construction projects, injecting strong impetus into the transformation of conventional industries and the development of the national metallurgical construction industry in the new era.

Completing a domestic ultra-large-scale and long-process special steel production base

In October 2022, Linyi Steel Group's project with an annual production of 2.7 million tons of special steel was completed and commissioned. The project was undertaken by CERI, with the support of Wuhan Surveying Geotechnical Research Institute of MCC, China First Metallurgical Group Co., Ltd., MCC Tiangong, China Metallurgical Construction Engineering Group Co., Ltd., MCC 20, and MCC 22. As a large-scale and long-process special steel production base newly built in China in the past decade, the project was an important step to implement the development plan of building an advanced steel manufacturing industrial base in Shandong Province. It also set a precedent in the metallurgy industry to have a single engineering company undertake a whole project and build a full-process special steel base at one time, which was of great significance to boosting the economic growth of Linyi City and fostering new growth drivers.



Building a high-end and green RMB100-billion coastal steel industrial park

Since 2022, the main units of the Zhongtian Construction Group's green and high-quality steel project designed and built by MCC Group have been commissioned one after another. As a high-end and green RMB100-billion coastal steel industrial park in Jiangsu Province, the first phase of the project, when meeting production targets, can generate annual revenues of more than RMB 100 billion and create 80,000 jobs. Adopting the innovative EPCM model, MCC Group provides all-around, full-process, and full-lifecycle services for project construction and employs self-owned core processes and equipment to see that whole-production-line indicators can reach the top level. This shows our outstanding ability to lead the steel industry to be self-reliant and helps Zhongtian Construction Group's green and high-quality steel project build a green and intelligent bar and wire rod manufacturing base that holds a leading position at home and abroad.



Nangang No. 2 blast furnace completed and commissioned

On April 16, 2022, the Nangang No. 2 blast furnace energy-saving transition project undertaken by China 19th Metallurgical Corporation finished the 47.23-meter horizontal movement of a 38.88-meter and 8,100-ton blast furnace, realizing the world's first overall movement of a blast furnace with its foundation. The No. 2 blast furnace, the largest one owned by Nangang Group, should undergo technical transformation after 16 years of service, an important step in Nangang Group's environmental protection and technical upgrading in the new era. The adopted technology allowing the blast furnace's movement with its foundation greatly shortened the overhaul and demonstrated how to save the energy use and upgrade the technology used in blast furnaces for steel enterprises in China.



The first phase of the Vietnam Hoa Phat Dung Quat Integrated steel complex project was commissioned

The No.6 60MW waste-heat-to-power project of Vietnam Hoa Phat Dung Quat Integrated Steel Complex contracted by CCEPC was connected to the grid on July 20, 2022. The six generators of the first-phase Vietnam Hoa Phat Dung Quat Integrated Steel Complex Project were put into operation. The project adopted high-temperature and high-pressure technology for power generation and made full use of the waste heat from coke ovens and the surplus gas of blast furnaces to generate electricity, which could meet 70% of the electricity demand of the Hoa Phat Dung Quat Integrated Steel Complex. When it comes to desulfurization and dust removal, advanced semi-dry desulfurization technology based on circulating fluidized bed was adopted to meet Vietnam's local gas emission standards, minimize pollution, and achieve both environmental and economic benefits.

Forging industrial foundation

In response to the state requirements on the development of the steel structure business, China Minmetals, building on our technical strengths accumulated in steel metallurgy, continues to expand business, build industrial plants, science and technology parks, industrial parks, and huge housing complex, and accelerate adjustments of the regional industrial structure.



Zhengzhou New Development Kailin Square project

1

The Zhengzhou New Development Kailin Square Project undertaken by Shanghai Baoye Group is both a provincial and municipal key project in Henan Province. The project, adjacent to Zhengzhou East Railway Station, covers an area of about 630,000 square meters. In December 2022, its main structure was accepted and approved. When completed, the project will become a garden-style headquarters gathering famous companies and a future new business center and smart business industrial park bearing influence on the urban cluster in central China.



Kaifa Plaza (Phase I) project

2

The Kaifa Plaza (Phase I) project, a major project in Shenzhen City of Guangzhou Province, undertaken by China First Metallurgical Group Co., Ltd. is located in Futian District, including three industrial R&D buildings A, B, and C. On July 20, 2022, with the completion of the 47-story Tower A, the construction of the three towers of the Kaifa Plaza (Phase I) project finally concluded. Once completed, the project will become an urban comprehensive community featuring industrial agglomeration, commercial activities, supporting dormitories, public facilities, and other functions. It will accelerate the upgrading of the CBD in Futian District and shape a new landmark of the future urban axis.



Western Financial Innovation Center project

3

The Western Financial Innovation Center project undertaken by MCCS, a key project in Sichuan Province, is located in the core area of Chengdu Eastern New Area CBD, with a total construction area of about 367,000 square meters. It includes financial headquarters offices, conference space, commercial service centers, starred hotels, a library, an art gallery, etc., covering fields such as civil engineering, mechanical and electrical installation, curtain walls, fine decoration, and artificial intelligence. In August 2022, the fourth phase of the project was completed and accepted, and it is expected to be fully delivered in 2023. Once completed, the project will become a financial platform to serve the overall construction and industrial development of the New Area and shape an industrial ecosystem with the financial industry at the core and multiple industries integrated. Western Financial Innovation Center will serve as a new engine for Chengdu Eastern New Area to promote the development of the Chengdu-Chongqing economic circle.



Steel structure of the zero-carbon industrial park in Erdos Mengsu Economic Development Zone

4

The steel structure of the new energy base project of the zero-carbon industrial park in the Erdos Mengsu Economic Development Zone undertaken by MCC (Shanghai) Steel Structure Technology Co., Ltd. officially started on August 15, 2022. The project mainly includes a B101 monocrystalline slicing workshop and an A202 battery workshop, with a construction area of about 86,000 square meters. Once completed, it will offer important support for Erdos to build a new energy industrial cluster of "wind, photovoltaic, energy storage and hydrogen", accelerate the construction of a zero-carbon pilot zone and a green hydrogen city in northern Xinjiang, and expand the development of new energy industry.



Xiamen New Convention and Exhibition Center project

5

As an important convention and exhibition center in Fujian Province, Xiamen New Convention and Exhibition Center is a strategic project for Xiamen's convention and exhibition industry to achieve high-quality development and Xiamen's cross-island development. Its Section II undertaken by Shanghai Baoye Group, the largest section of the project, has a total construction area of 538,200 square meters. On August 20, 2022, the steel structure of the project was completed. After the whole project is concluded, it will host large-scale domestic exhibition tours and improve the scale and influence of local exhibition brand.



Improving infrastructure construction

Infrastructure plays an important role in supporting and driving the formation of a modern industrial system. China Minmetals has successively built projects of rail transit, highways and bridges, and comprehensive utility tunnels, expanded business scale, and accomplished several landmark high-quality projects.



New Phnom Penh International Airport

The general contracting project of designing and constructing the airside area of the New Phnom Penh International Airport in Cambodia, undertaken by Shanghai Baoye Group, is one of the key projects of China-Cambodia production capacity cooperation. It also embodies cooperation between the two countries under the Belt and Road Initiative and the Rectangular Strategy proposed by the Cambodian government. In 2022, the water-stabilized layer of the pavement project P304 started construction, paving an area of 1.2 million square meters, and the pavement structure complied with the AC 150/5370-10H standard stipulated by the US Federal Aviation Administration. After the completion of the project, New Phnom Penh International Airport will serve as an important transportation hub for Cambodia to host the 32nd Southeast Asian Games.



Underground comprehensive development of Keyuan Avenue and the Line 13 utility tunnel

The underground comprehensive development of Keyuan Avenue and the Line 13 utility tunnel has been listed as a key project of Shenzhen for three consecutive years. Jointly undertaken by MCC South China and MCC20, the project will effectively alleviate traffic congestion and the shortage of slow traffic facilities in the Science and Technology Park area, and create a future-oriented three-dimensional creation street featuring the style of Silicon Valley Avenues in the Guangdong-Hong Kong-Macao Greater Bay Area. It will be regarded as a large-scale comprehensive development project integrating urban rail transit and underground space in the world. On July 18, 2022, the second phase of the first section was enclosed for construction, marking the project entering a critical stage.



Hong Kong's new landmark cross-bay link project

In December 2022, the Hong Kong Tseung Kwan O Cross Bay Link Project, the first offshore bridge project undertaken by MCC International in Hong Kong, was commissioned. The Tseung Kwan O Cross Bay Link is about 35.8 meters wide and 1.8 kilometers long, of which about 1 km is a marine viaduct connecting Tseung Kwan O with the Lam Tin Tunnel. It is the first marine viaduct in Hong Kong with carriageways, footpaths, cycle tracks, and a sightseeing platform and will become a new landmark cross-bay building in Hong Kong after it opens to traffic.



Tuojiang Super Bridge of Jinjianren Expressway

As a landmark building of Chengdu's eastward development, the Tuojiang Super Bridge of Jinjianren Expressway, undertaken by MCCS, is the world's widest bridge and the world's super-large space-asymmetric-curved-single tower twisted-cable-plane cable-stayed bridge and owns the world's extra-high inclined bridge tower. In October 2022, the bridge erected the bridge deck. After completion, it will effectively connect Huaizhou New City, Jianzhou New Town, and Airport New City, becoming another important passage to Chengdu Tianfu International Airport and contributing to the development of the Chengdu-Chongqing economic circle.



Johor Bahru-Singapore Rapid Transit System (RTS) Link

On April 19, 2022, the consortium of MCC Construction Research Institute Singapore and XinMao Electrical Engineering Co., Ltd. officially signed a contract for the supply of strong and weak electricity and the installation of communication and safety systems (T275R) for Johor Bahru-Singapore RTS Link. The project includes tunnels, viaducts, stations in both countries, and electricity and communications systems for CIQ (customs, immigration, quarantine) facilities. Scheduled to commence construction in 2022, the project will benefit people in Singapore and Malaysia by facilitating their commute for an hourly capacity of 10,000 passengers.



Facilitating a better modern life

As a housing contractor with professional expertise and China's leading expert in comprehensive urban development solutions, China Minmetals takes "serving the fundamental interests of the people" as the principle and engages in urban renewal, urban parks, theme parks, and other projects to realize people's expectations for better lives.



Lanzhou Olympic Sports Center project

1

On May 25, 2022, the Lanzhou Olympic Sports Center project undertaken by MCC17 was completed and accepted. The project, whose scale ranks among the top in China, overcomes challenges in the geological complexity of the Yellow River coast, the stadium's cantilever canopy, the installation of the bidirectional twisted steel truss, and the installation of the 90-meter small rise-span ratio suspend-dome structure of the comprehensive hall, creating a new record in China for one company to independently undertake the construction of an Olympic stadium, and also the shortest construction period for large stadium in China.



The phase I 960,000-m² resettlement houses of the Baoding urban village renovation ABO project

2

On December 29, 2022, led by MCC17 and jointly built by CERI, Wuhan Surveying Geotechnical Research Institute of MCC, and MCC2, the 960,000-m² resettlement houses for the renovation of the Baoding urban village renovation ABO project were fully delivered. The project, a key project in Hebei Province for the benefit of people, is regarded as the "community of quality life" in the Beijing-Tianjin-Hebei world-class city cluster. It includes 11 resettlement areas, 122 high-rise residential buildings, and 23 supporting facilities, with a total construction area of 3.085 million square meters. After completion, it will gradually improve the living environment of 19,758 Baoding residents of 5,857 households at 13 villages in the Baoding High-tech Zone.



Shenzhen Second Children's Hospital project

3

Shenzhen Second Children's Hospital project is undertaken by Shanghai Baoye Group, with a construction area of 309,000 square meters. The project was designed according to China's green building two-star standard and was built in a frame-shear wall structure. It consists of a medical complex building and supporting facilities, which could offer 1,500 beds. In 2022, the main structure was completed, which would alleviate the current shortage of pediatric medical resources in Shenzhen and balance the local health resource allocation.



Mandai Raiforest Park project in Singapore

4

The Mandai Rainforest Park in Singapore, constructed by MCC Construction Research Institute, is the first tropical rainforest theme park in the world. Its design focuses on animal habitats with adventure and game elements, wildlife rehabilitation centers, aviaries, camping facilities, etc., aiming to create a hub for nature education and research in Southeast Asia, leading the development of Asia as a natural and ecological destination, representing the harmonious coexistence between human and nature.



The world-class large spherical building - Sun Hotel project

5

The Sun Hotel project in Huzhou City of Zhejiang Province, undertaken by MCC5, resembles the shape of the sun sitting on the edge of Taihu Lake, with a height of 98.1 meters and a sphere diameter of 97.8 meters, making it the world-class large spherical building. Sun Hotel has 13,300 steel components, 15,558 meters of structural welds, and 44,308 sets of high-strength bolts. It is a hollow sphere whose diameter approaches 100 meters with no core tube support, spreading all load on the steel shell in a complex structure. On May 12, 2022, the dome lifting of the hotel's main building was successfully completed.

Emerging Industries

Strategic emerging industries are new pillars and contending areas in the modern industrial system. Attaching great importance to cultivating, expanding and singling out such industries, China Minmetals consolidates cemented carbide and new energy materials, and scales up businesses of inspection, testing and certification and energy conservation and environmental protection to constantly optimize our industrial system.

Industrial chain of cemented carbide

As the backbone enterprise of smelting copper, lead, zinc and other base metals in China, China Minmetals boasts a leading capacity for smelting lead and zinc. Our "torch brand" products enjoy global reputation, and our antimony oxide output at the top of the list in the world. In the field of tungsten industry, China Minmetals owns a complete tungsten industrial chain integrating mining, smelting, processing and trade. Our annual tungsten smelting accounts for 10% of the national ammonium paratungstate (APT) production capacity, and cemented carbide occupies more than 25% of the domestic market. We produce cutting tools, IT tools, cemented carbide bars and many other leading products.

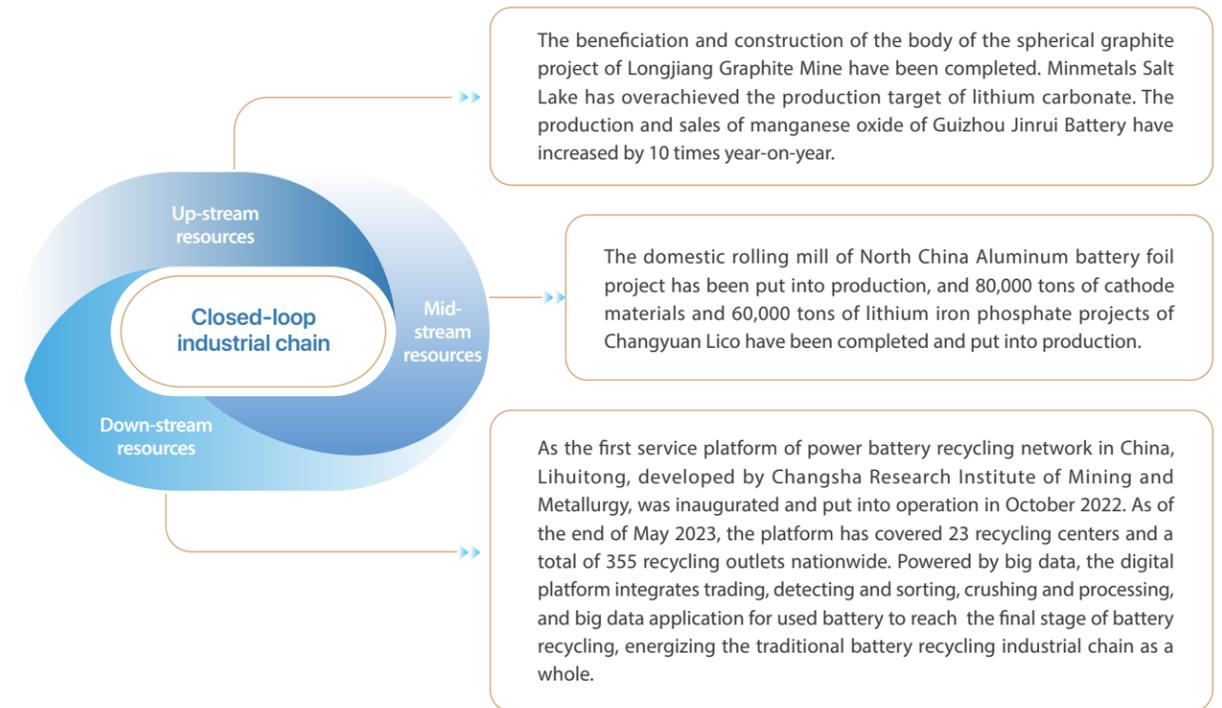
The company's metal materials are marching towards high-end development. Our precision cutting tool production lines for aerospace, medical equipment, and automotive components have been completed and put into operation, and our beryllium industry project has entered trial production. We have made huge breakthroughs in the technologies of producing aluminum scandium intermediate alloys, and our nano high-temperature sensors have filled domestic testing gaps. The production of CNC blades and micro drill bits has increased by 20% and 2.4% respectively year-on-year. Products such as very small diameter milling cutter and drilling needle have been applied by COMAC and Shenzhou spaceships, samples of which are displayed in the central area of the "Forging Ahead in the New Era" exhibition, awaiting the review by CPC leaders and state officials.



China Minmetals Tungsten's very small diameter milling cutter and drilling needle at the "Forging Ahead in the New Era" exhibition

Industrial chain of new energy materials

Relying on the professional platform of the new energy materials industry, China Minmetals integrates high-quality resources in various ways by building a closed-loop industrial chain of "resources - materials - battery recycling" to build China's first and world's leading operator of new energy battery materials industry.



CASE Becoming a leading global supplier of crystalline graphite raw materials

Relying on the fine resources in Hegang, Minmetals Graphite is building a low-carbon, green, intelligent mine and a high-quality natural graphite resource utilization industrial chain of "resources + technology" to set up a world-class natural graphite industrial base. In 2022, the mine with an annual output of 6 million tons of ore, the graphite beneficiation plant with an annual output of 200,000 tons of refined powder, and the spheroidization plant with an annual output of 50,000 tons of spherical graphite have all entered trial production. The project which produces 50,000 tons of high-purity graphite and 50,000 tons of natural graphite negative electrode materials is right underway.



Mineral processing production line of China Minmetals' graphite project in Hegang, Heilongjiang



The expansion project of positive electrode materials for automotive lithium-ion battery of Changyuan Lico

CASE Changyuan Lico increases the production of positive electrode materials for automotive lithium-ion batteries

Nearly RMB 9 billion worth expansion project of positive electrode materials for automotive lithium-ion battery of Changyuan Lico were conducted in two phases. As of now, the first phase of the project which marks an annual production capacity of 40,000 tons has been put into operation by the end of 2021 and hit the production goal in 2022. The second phase, involving 40,000 tons per year ternary cathode material and 60,000 tons per year lithium iron phosphate cathode material production lines, has been commissioned by the end of 2022, and put into operation in April 2023. The project was coined as one of the top ten industrial projects in Hunan Province in 2022 and one of the top ten leading industrial projects in Changsha. As the project concludes and unleashes more production capacity, it furthers the intensive development of the advanced energy storage materials industry in Changsha, Zhuzhou and Xiangtan, and builds Changsha into a national center for advanced manufacturing and science and technology innovation.

CASE MCC officially kick-starts the second phase of the new materials project

On October 16, 2022, MCC officially kick-started the second phase of the new materials project which produces ternary cathode precursor materials for lithium-ion batteries, and integrates the whole industrial chain from raw materials to precursors, cathode materials, battery assembly and vehicle manufacturing. In response to the national strategy of coordinated development of Beijing, Tianjin and Hebei, MCC Ramu New Energy Technology unleashed its potentials in mineral resources and power li-ion battery cathode materials, and joined hands with shareholders, such as Gotion High-tech, BYD and Caofeidian Development Investment Group in developing the project. Since 2022, MCC Ramu has promoted the concept of "extreme manufacturing" in all aspects, bringing its quarterly production rate to over 150%. The number stabilized with booming production and sales performance. Its precursor production ranked the fifth in China, battery grade nickel sulfate production ranked the third in China, and scandium oxide production and sales ranked the top in China. After the conclusion of the second phase, the production of NCM811 high nickel li-ion battery ternary cathode precursor materials has reached 48,000 tons/year, and that of high-purity scandium oxide has reached 20 tons/year for phase one and phase two combined.

New industries of energy conservation and environmental protection

Under the background of green, low-carbon and high-quality development, China Minmetals has been deeply involved in ecological environmental protection and new energy by customizing solutions for comprehensive environmental governance in municipal areas to propel green development.

CASE The ICC system improves the intelligent management of the environmentally friendly energy industry

ENFI China's AI combustion control system of the ICC refuse incinerator, powered by the AI technology, was successfully applied to the No. 3 boiler of Ganzhou Incineration Power Plant invested and constructed by ENFI China in 2022, achieving the fully automatic intelligent operation of the incinerator for the first time in China. By adjusting and optimizing the combustion accuracy, the ICC system significantly reduces the workload of operators, limits boiler load fluctuations, minimizes environment conscious materials, and improves thermal load capacity. The operating indicators of the power plant fully meet the requirements of environmental protection, safety, stability, and efficiency.

CASE Successful development of the integrated urban drainage treatment equipment with shock resistance

In June 2022, the integrated urban drainage treatment equipment with shock resistance developed by MCC Huatian officially passed third-party water quality testing. The equipment, which is small, highly integrated and mobile, customizes daily sewage treatment capacity according to customer demands, and improves decentralized rural sewage treatment, river emergency response, and centralized domestic sewage treatment. The technologies for this equipment have been applied to the PPP project for comprehensive treatment of water environment in the central urban area of Ma'anshan and the EPC+O project for water quality improvement in Suixi River Basin of Suixi County, to help solve the problems of water pollution and water shortage.

CASE Jiujiang central urban area water environment comprehensive treatment phase II project

The water environment comprehensive treatment phase II project in the central urban area of Jiujiang City in Jiangxi Province contracted by MCC Tiangong includes a series of sub projects, such as the treatment of Lujialong Lake outfall, the treatment of Lujialong Lake outfall, the treatment of water environment of the two lakes, the centralized disposal of sludge, the reconstruction and restoration of the existing pipelines, and the urban intelligent water system. After completion, the project will effectively solve the problem of water pollution in Jiujiang, and effectively improve the water quality of the two lakes and the surrounding areas. The sludge and kitchen waste treatment and disposal project will recycle and reuse the collected garbage to build an "ecological Jiujiang". In 2022, the project ushered in the comprehensive construction stage and won the honorary title of "the first batch demonstration sites of work safety in Jiujiang City in 2022".



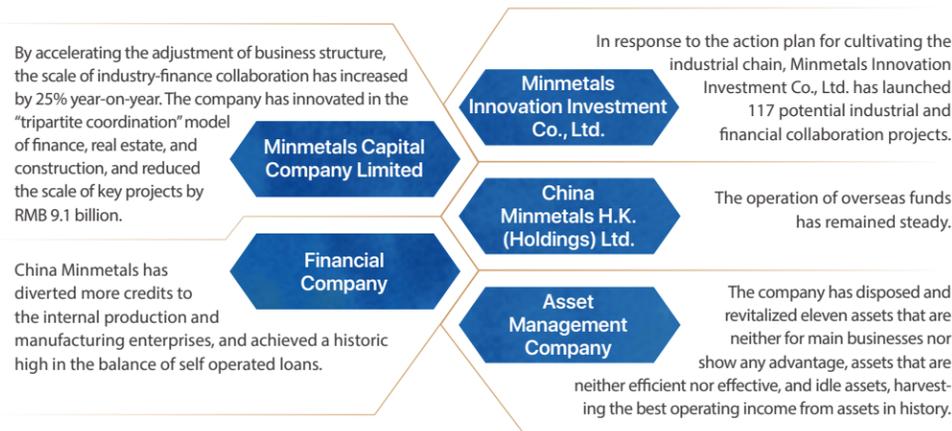
Jiujiang central urban area water environment comprehensive treatment phase II project

Finance and Real Estate

Guided by the principles of "industrial finance, a solid bottom line, technology empowerment, and integrated services", China Minmetals serves the real economy by building a professional financial institution integrating industrial investment and capital operation to become a first-class industrial finance holding platform, an innovator in industrial finance services, and a benchmark for the integration between industry and finance of SOEs.

Specializing in investment and finance transformation

As one of the three state-owned financial service providers approved by the SASAC, China Minmetals focuses on finance transformation and upgrading by enhancing our core competitiveness. We have developed standardized service models for industrial finance, green finance, and technology finance to drive the development of the real economy, stimulate our main businesses, and upgrade the technologies for the industry.



CASE Establishing the China Minmetals Research Institute for Finance

In September 2022, China Minmetals established the Research Institute for Finance, and issued a white paper on industrial finance and the Minmetals Securities Index for China. Focusing on industries and the upstream and downstream of the industrial chain, such as metal mining, new energy, and new materials, the research institute systematically conducts industrial finance researches from the "macro, industry, and enterprise" levels, forming four research clusters "large cycle", "technology manufacturing", "business control", and "strategic configuration" to underpin industrial upgrading and transformation of financial holding management, and share valuable industrial and financial research outcomes with the industry.



Securing people's livelihood and upgrading real estates

China Minmetals is one of the first batch of sixteen SOEs designated by the SASAC of the State Council as a real estate based company. In recent years, Minmetals Land and MCC Real Estate have developed high-end residential series, such as Ruyuan, Jiuxitai, Wanyuetai, Xitang, and Montego Bay, and refined urban residential projects, such as Wanjing, Jincheng, Lanyue, and Shijia series, as well as characterist town projects represented by Hastadt Town projects.

Adhering to the principle of "housing is for living in, not for speculation", China Minmetals adopts the strategy of steady development, prioritizes quality and efficiency, and develops in an appropriate scale. We continue to improve the comprehensive development and operation service capacities according to the idea of "brand + product series + replicable model" to transform into an urban comprehensive service operator and provider, and build an excellent central SOE real estate brand.

Honors in 2022

Minmetals Land won

- "2022 Real Estate Enterprise with Outstanding Performance"
- "2022 China's Top 100 Real Estate Enterprises with Brand Influence"
- "2022 China's Real Estate Enterprises with Distinguish Social Contribution"
- "2022 Real Estate Enterprises with Investment Value (Top 20)"
- "2022 Exemplary Real Estate Enterprises"

MCC Real Estate won

- "2022 China Top 100 Real Estate Developers"
- "2022 China Top 100 Robust Real Estate Enterprises (Top 10)"
- "2022 China Top 100 Profitable Real Estate Enterprises (Top 10)"
- "2022 China Real Estate Social Responsibility Enterprise"
- "2022 China Real Estate Enterprises with Outstanding Products"
- "2022 Outstanding Enterprises in Real Estate Operations with Chinese Characteristics - Urban Development Operator"
- "2021-2022 Annual China Benchmark Real Estate Enterprises for Poverty Alleviation"

CASE Minmetals Land strengthens culture-based real estate

In 2022, based on the concept of "happiness", Minmetals Land proposed a new tagline of "Minmetals, building your loving home", and upgraded the framework in three dimensions of product, service, and community. Minmetals Land has refined corresponding brand proposals and implemented measures to build an "immersive happy experience" which provides customers with more proactive, professional, and thoughtful on-site and after-sales property management services.

CASE MCC Real Estate focuses on green and healthy living conditions

Based on the concept of green development, and the principle of healthy living conditions, the MCC Real Estate Product Technology and Service System 3.0 won the China Real Estate Association's Science and Technology Award due to technologies, such as "Chinese craftsmanship, 8+N living supporting facilities, MCC's property management services, ecological garden landscape, and functional decoration and innovative building". The system showcases our pursuit of value in building a high quality and high standard living environment. This system, obtaining 58 national patents, has been applied in projects such as Tianjin MCC Dexian Huafu, Qinhuangdao MCC Dexian Mansion, and Guangzhou MCC Yijingtai.



SHAPING NEW DRIVING FORCES FOR REFORM AND DEVELOPMENT

Reform is crucial for embracing new opportunities and leading innovation. With the goal of building a world-class metal mineral group with global competitiveness, we aim to build "China Minmetals with five characteristics", promote high-quality development through in-depth reform, and develop original technologies to power the company's development.

Optimizing Management

Deepening SOE reform

In the past three years

10

typical models that can be replicated and promoted were developed

60

important institutional norms were improved

14

national level specialized, refined, special and new "little giant enterprises" and single product champion enterprises in the manufacturing industry were cultivated

2022 marked the decisive year of the three-year action plan for SOE reform. Firmly adhering to the decisions made by the CPC Central Committee and the State Council, China Minmetals has built the "China Minmetals Model", accomplished the key tasks of the three-year action plan for SOE reform with high quality, and met all the quantitative indicators in the assessment. We were awarded grade A in the assessment of the key tasks of the three-year action plan for SOE reform in 2021. Our "double hundred enterprises" and "science and reform enterprises" have obtained one benchmark, two excellent, and five good ratings in the special assessment by the SASAC. In 2022, ACRE Coking and Refractory Engineering Consulting Corporation and WSGRI Engineering and Surveying Incorporation were shortlisted as "science reform demonstration enterprises".

CASE Driving enterprise innovation and development through the "science reform action plan"

As one of the first batch of "science reform enterprises" of the SASAC of the State Council, Capital Engineering and Research Incorporation (CERI) seized the reform window to adopt measures of "three reinforcements, three focuses, and three promotions", achieving 40% increase in gross profit year-on-year, and 110% increase in net profit year-on-year according to the "two benefits and four rates" indicator system assessed by the SASAC of the State Council, significantly improving the profitability. The operating profit margin has increased by 0.1 percentage points compared to the previous year, R&D investment has increased by 20%, and total labor productivity has increased by 25%. CERI's reform was included in the *Reform and Innovation: Science Reform Demonstration Cases* of the SASAC. In 2022, CERI was recognized as an excellent enterprise in the 2021 Special Assessment of Science Reform Enterprises.

CASE Minmetals Salt Lake shortlisted as a national specialized, refined, special and new "little giant enterprise"

Minmetals Salt Lake, a lithium and potassium commodities based company, was established by China Minmetals for its strategic cooperation with Qinghai Province. The company now owns 13,000 tons/year lithium carbonate and supporting recycling devices, 300,000 tons/year potassium chloride devices, and main products such as battery grade potassium carbonate, potassium chloride, and tripotassium phosphate. Minmetals Salt Lake actively upgrades



Minmetals Salt Lake's R&D team

the technologies for the devices to promote the production of the lithium carbonate industry, effectively extend the industrial chain, scale up lithium phosphate products, and create the "China Minmetals Model" of salt lake resource development in the unexplored Gobi Desert. In 2022, Minmetals Salt Lake harvested a revenue of RMB 5.3 billion and a total profit of RMB 4.2 billion, successfully shortlisted as a national specialized, refined, special and new "little giant enterprise".

Benchmarking against world-class counterparts

In response to the decision of the CPC Central Committee to accelerate the construction of world-class enterprises, China Minmetals strictly follows the requirements of the SASAC of the State Council for benchmarking against world-class enterprises, and formulates the *Implementation Plan of China Minmetals for the Construction of World-class Enterprises* to upgrade management by enhancing quality, efficiency and growth, and march towards the strategic vision of becoming a world-class metal mining enterprise. Among them, three management benchmarks have been included in the SASAC's *Benchmark Enterprises, Projects and Models of Key SOEs in the Management Improvement Action Plan*. The benchmark enterprise Jinzhou's *Technology Innovation and Lean Management Powered Development: Jinzhou's Experience* was included in the 2022 SOE online training course of the SASAC's Education and Training Center for Officials and Entrepreneurs.

CASE China Minmetals Tungsten's Jinzhou Company strives to be the "first in the global micro drilling industry"

Towards the goal of being the "first in the global micro drilling industry", China Minmetals Tungsten's Jinzhou Company has worked tirelessly to refine management, and enhance efficiency and profits through management by fully exploiting its potentials, and deepening management through TPM (total productive maintenance), TPI (total productivity innovation), Six Sigma, TCC (teams culture circle). We have seen steady progress in full participation, independent management, lower cost and more efficiency. We have also improved total productivity, product quality and cost competitiveness to drive high quality development. Over the past five years, thanks to the proposal of upgrading the production line, Jinzhou harvested over RMB 40 million in revenue, over RMB 9 million in QC activities, and over RMB 10 million in the Six Sigma project; and saved over RMB 140 million in TPI cost, increasing the per capita operating income and labor productivity of the headquarters by 43.66% year-on-year.



CASE Minmetals Non-Ferrous benchmarks against world-class enterprises for better management capabilities

Minmetals Non-Ferrous has launched a benchmarking campaign in three aspects. First, system optimization for foundational management. We have set up a long-term value optimization system and formed a quick-response work method by learning advanced concepts from other industries to steer mining production and operation towards more refined management. Second, data empowerment for dynamic management. We have set optimization goals with Power BI to improve the quality and efficiency of sites. Third, mechanism guarantee for deep application. We have compiled the Quality Requirements for Long Term Value Optimization to strengthen the management and analysis of mine production and operation quality. In addition, we have initiated mine cost benchmarking, and lean mine production and operation cost management to lower cost and enhance efficiency. By integrating benchmarking and competitiveness enhancement, we have ensured effective, normalized, and standardized benchmarking management. MMG's Las Bambas Mine has been recognized as a key SOE management benchmark by the SASAC of the State Council, becoming the only overseas mining enterprise being awarded.

Strengthening compliance management

China Minmetals further promotes the special governance action of compliance management issues in business operations and the “compliance management year” campaign to build a more comprehensive system and standardize key areas and links for compliance management. With our efforts, the culture of compliance has been widely recognized, and the compliance management with Minmetals characteristics has been deepened, fully unleashing the role of compliance management in preventing and resolving major risks as well as in establishing a modern governance system and enhancing the comprehensive strength of enterprises.



Strengthening the framework of compliance management

We have established a Compliance Management Executive Committee responsible for coordinating and promoting annual compliance management through regular meetings.

The leader in charge of the compliance management work of the department serves as the compliance administrator to organize compliance management of the department and promote the deep integration of compliance management and business.



Optimizing compliance management operation mechanism

We have vigorously mainstreamed legal and compliance review into the rules, control lists, and approval processes by introducing the position of General Counsel and indentifying items reviewed by General Counsel in the approval process in 85 subsidiary enterprises.

We have formulated a compliance risk identification list, job compliance responsibility list, and process control list for pilot projects of labor employment and capital operation.

We have conducted compliance reviews in business management through policy making, decision making, contract signing, and project operations to support decision making and legal supervision in risk resolution projects, achieving 100% legal compliance review.



Improving the compliance management system

We have revised the *China Minmetals Compliance Management Measures* to clarify the compliance management framework, operation, and guarantee mechanism.

We have developed special compliance guidelines, revised the Chinese and English versions of the *Integrity and Compliance Manual (2022)*, and formed a “1+8” compliance management system.

We have compiled the *List of Compliance Obligations for Mining Enterprises* which covers 359 obligations in seven major areas to guide the compliance operation of affiliated enterprises.



Cultivating a culture of rule of law and compliance

The headquarters, relying on the “China Minmetals Rule of Law Public Course” platform, has organized four special training sessions on compliance, promoting enterprises at all levels to incorporate compliance training into the “Eighth Five Year Plan” for legal education. Over 200 compliance training sessions were organized throughout the year.

We have carried out the “Compliance Management Month”, prepared the “Compliance System Manual”, displayed compliance case boards, and organized more than 200 compliance promotions in total.



Conducting compliance risk investigation

We have compiled the *Checklist for All Levels, Fields, and Dimensions of Compliance Risks* to urge affiliated enterprises to carry out self inspection and rectification, and consolidate the inspection results through special supervision. As of the end of 2022, 82% of rectification has been achieved.

Tightening cost control

Cost competitiveness lies in the core in the competition of world-class mining enterprises. China Minmetals emphasizes production and operation management, constantly improves cost management and control, and seeks ways to reduce costs and increase efficiency in an all-round and multi-angle way to comprehensively enhance sustainable value creativity and promote stable operation and high-quality development.

CASE Minmetals Mining launches a special action to cut costs and increase efficiency

Fully integrating the management of budget, production process, and assessment, Minmetals Mining rolled out a special action to “enhance core competitiveness and further reduce cost” in 2022. The efforts have cut costs for procurement and production consumption, and boosted efficiency for sales and management cost control.

The main mines have also seen satisfying profits, with Anhui Development Mining, Beiminghe Iron Mine, and Luzhong Mining respectively earning total profits of RMB 1.204 billion, RMB 563 million, and RMB 478 million, underpinning the company’s robust development.



Anhui Development Mining’s intelligent mines control room

Leading by Technology

Following the concepts that frontier science and technology should be integrated with the major national strategic needs and economic and social development goals, China Minmetals innovates in the organization and operation of scientific researches, broadens and widens science and technology development, increases investment in scientific researches, and strengthens researches on key technologies to consolidate independent scientific and technological development, leading national and industrial innovation.

In 2022



Recognized by the State-owned Assets Supervision and Administration Commission of the State Council as one of the 2019-2021

“Enterprises with Outstanding Contributions to Technological Innovation”

45

national level technology platforms

36

RMB billion of

annual revenue from the commercialization of scientific and technological achievements

1

patent

won the 23rd China Patent Gold Award

2

patents

won the 23rd China Patent Excellence Award

Building technology platforms

China Minmetals now owns 45 national science and technology platforms, of which the “International Joint Research Center for Seabed Mineral Resources Development” has passed the assessment of the Ministry of Science and Technology with flying colors. The two national engineering research centers for silicon-based material preparation technology and industrial environment protection have successfully completed the strategic transformations. Two newly approved national enterprise technology centers are both gaining traction in strategic scientific and technological competitiveness.

Reforming management systems

China Minmetals has established a virtual system for key disciplines featuring “Central Research Institute + technology-based enterprises” to build a new research and development institution characterized by transparency, asset-light operation, knowledge sharing and cross-industry exchanges. The system, powered by innovative scientific research organization and operation, drives the in-depth integration of technology, industry and finance, and the transfer and transformation of scientific and technological achievements and technical service capabilities to avoid homogeneous competition, improve research and development efficiency, and achieve staggered and coordinated development. We have reformed special science and technology organizations, recognized outstanding ones, and set up youth science and technology fund projects to encourage young talents to carry out researches on the application of cutting-edge and original technologies.



China Minmetals' Central Research Institute

Commercializing research outcomes

More than one hundred achievements of the company have won awards at provincial and ministerial levels and from key industrial associations. Dozens of achievements have been included in the SASAC, Ministry of Natural Resources, and Ministry of Industry and Information Technology's Science and Technology Promotion Catalogue. The total number of effective patents has exceeded 52,000, and 28 enterprises have been recognized as National Intellectual Property Demonstration Enterprises. In 2022, the annual revenue from the commercialization of scientific and technological outcomes totaled RMB 36 billion, welcoming a sound development of market and revenue based technologies.

CASE

The commercialization of scientific and technological outcomes totals over RMB 1.3 billion, winning the 23rd China Patent Gold Award

The “online high-pressure water jet sandblasting surface cleaning system” developed by Changsha Research Institute of Mining and Metallurgy has overcome key technical problems which hinder the mass application of high-pressure water jet sand blasters in industries, uneven supply of abrasives, and inability to recycle water and abrasives, achieving a technological revolution from “intermittent offline” operation to “continuous online” operation. The system, which removes oxides, paints or dirt off of metal surfaces, is widely used for cleaning metal profiles in the form of pipes, strips, plates, wires, and components. The low cost, practical, and green patented system has been applied in over 100 units (sets) in more than ten provinces and cities across China, gaining a total revenue of over RMB 1.3 billion, and winning the 23rd China Patent Gold Award.



The “online high-pressure water jet sandblasting surface cleaning system” developed by Changsha Research Institute of Mining and Metallurgy

Building scientific research teams

In line with major national strategies, China Minmetals highlights the "high-grade, high-precision and advanced" technologies, and optimizes the effectiveness of allocating scientific and technological resources such as people, finance and materials to support the growth of scientific and technological talents. Giving full play to the leading role of chief scientists and chief technical experts, we speed up the pace of introducing high-level talents through the national overseas talent introduction project.

CASE Promoting the "chief talent system"

China Minmetals has formulated the Interim Measures for the Management of Chief Scientists and Chief Technical Experts of China Minmetals to build a leading scientific and technological talent team in different fields. We guarantee greater autonomy in research planning and technical route selection, fully respect the authority of the talents, and provide all-round support for the chief experts in salary, welfare, Party group liaison, talent recommendation, and scientific and technological resources. In 2022, we selected and employed the first batch of chief talents, including four chief scientists and eight chief technical experts.

Developing original technologies

China Minmetals focuses on building five original technologies of deep sea, iron and steel metallurgy, new energy and cutting-edge materials, strategic metal materials, and industrial digitalization. We have launched twenty major mineral development projects, twenty major metallurgical projects, and made breakthroughs in ten major metal materials, ten major new energy materials, and ten major infrastructure technologies. We shift from finding projects to building projects.

As of the end of 2022, three key scientific research projects of the SASAC of the State Council have been successfully concluded. We have conquered a number of bottleneck technologies, such as the preparation of high-performance silicon-based negative electrode materials, intelligent identification of ore properties, and deep well pressure relief mining. We now own polysilicon production technology, and key technologies for building efficient super large blast furnaces, and have completed the world's first 1,000 meter integrated linkage test on submarine self-propelled polymetallic nodule mining system, and the world's first hot test of super electric arc furnace steel plant. Relevant technologies have reached the advanced world level.

CASE MCC CISDI develops a super electric arc furnace

The intelligent green super electric arc furnace, a third generation scrap preheating electric arc furnace independently developed by MCC CISDI, is equipped with new IGBT flexible direct current technology, continuous scrap steel preheating technology, continuous scrap steel feeding technology, dioxin treatment, waste heat recovery technology, and intelligent steelmaking technology. The technologies make it possible to quickly respond to energy supply for smelting in the furnace, short-circuit overcurrent impact, and shorten the smelting cycle to less than thirty minutes, with power consumption as low as 250kWh/t to 300kWh/t, and the electrode consumption at 0.6kg/t~0.8kg/t, greatly increasing production efficiency, while reducing power and electrode consumption.



The intelligent green super electric arc furnace independently developed by MCC CISDI

Propelling Digital Development

Digital transformation is an important grip for modernizing the governance system and capacity. With the idea of "connection, sharing and empowerment", China Minmetals builds a "digital brain", and constantly innovates in and optimizes the governance methods to provide strong support for high-quality corporate development.

Building a "digital brain"

In line with the strategy of "building a digital China Minmetals through information empowerment", we have formulated the digital development plan set for the "14th Five Year Plan" period and drew up a three-year action plan for digital transformation to coordinate the construction of the "digital enterprise brain" and break new ground for digital development.

CASE Speeding up the construction of a "digital brain"

China Minmetals has accelerated the construction of platforms in the fields of logistics, supply chain flow, capital flow, bill flow, contract flow, and talent flow under the treasury system and procurement management platform. We have built forty digital application scenarios which include 275 management elements, 565 indicators, and 233 management models, effectively achieving the closed-loop management, and promoting "one screen for overall management" and "one view for all matters".



CASE The procurement monitoring platform improves quality and efficiency

China Minmetals has started building a procurement monitoring platform which guarantees "standardized, intelligent, and closed-loop procurement supervision". The platform, which monitors procurement status, issues early warnings of hidden hazards, identifies problems, and sends instructions, captures non-compliant behaviors, such as bidding suppression, complementary bidding, and illegal reviews. Once irregularities are identified, the system automatically sends off warnings and immediately responds. Since its launch, the platform has shared data with relevant enterprises in real time, spurring corporate development through timely risk detection and problem solving.

Deepening the digitization of industries



Data and application scenarios are invaluable resources for development. Boasting the advantages of the massive data pool and rich application scenarios, China Minmetals has made breakthroughs in intelligent mines, intelligent construction, and intelligent factories, and accelerated industrial transformation and upgrading through digital technology.

Building intelligent mines

Powered by the new generation digital technologies of the Internet of Things, cloud computing, artificial intelligence and digital twins, China Minmetals explores intelligent mines operation in mine development, mining, transportation, ore dressing, safety guarantee, ecological protection, and production management to build safe, green, efficient, and intelligent mines. Minmetals Mining has gained success in remotely controlling electric scrapers, which allows unmanned closed-loop management of underground operation sites, effectively reducing safety risks.



Building intelligent steel factories

The steel industry is a highly automated process-based industry, with intelligence becoming a new trend for its development. The Zenith Steel (Nantong)'s "Centralized and Intelligent Demonstration Factory for Iron-making" by MCC CISDI and Lingang Company of Yongfeng Group's "Advanced Special Steel Full-process Intelligent Manufacturing Demonstration Factory" by Shandong Iron and Steel Group have been successfully shortlisted as the "2022 Intelligent Manufacturing Demonstration Factories".



Building intelligent projects

China Minmetals has upgraded the capital construction industry with information technologies of cloud computing, big data, Internet of Things, BIM, and GIS, covering the whole process from design and consultation to construction, operation and maintenance. The technologies help build a digital driven system for intelligent construction and promote the quality and efficiency of engineering construction. In 2022, the MCC Group won twelve first-class achievement awards, fourteen second-class achievement awards, and ten third-class achievement awards in the Sixth BIM Competition for Building Engineering.

Promoting digital industrialization

Focusing on new generation information technologies like big data, the Internet of Things, and artificial intelligence, China Minmetals works hard to tackle scientific and technological problems and improve innovation capacity. We facilitate the development of new industries, new business forms and new models of the digital economy by developing digital technologies, products, services, infrastructure and solutions.

CASE Shortlisted as one of the "Top 10 Digital Solutions" at the 5th Digital China Construction Summit



The "Intelligent Blast Furnace Solution" developed by WISDRI Engineering and Research Incorporation visualizes fluxing agents, airflow, furnace type, furnace temperature, and safety by displaying real-time changes in the furnace throughout the entire production process. The solution, which evaluates the operation and safety covering various parts of the furnace, timely optimizes and controls related processes, and continuously upgrades the entire life cycle, achieving "intelligent identification, analysis, decision-making, and execution". WISDRI Engineering and Research Incorporation's "Intelligent Blast Furnace Solution" was the only project in the metallurgical industry that won the "Top 10 Digital Solutions" at the 5th Digital China Construction Summit.

CASE The Kamoakakula Copper Mine Phase II Project in Congo developed by China ENFI put into operation ahead of schedule

Kamoakakula Copper Mine is a world-renowned copper mine. The second phase of its development project, undertaken by China and foreign countries, will produce 19 million tons of ore and over 800,000 tons of copper annually after completion, making Kamoakakula Copper Mine the second largest copper mine in the world. The designed production capacity of the second phase is 3.8 million tons of ore per year. If the project ends early, it will hit the ceiling of the copper production target (which stands at 340,000 tons) for 2022. During construction, China ENFI, relying on its independently developed "MIM + digital integration solution", visualizes all deliverables and the entire life cycle of the project, ensuring the efficiency of the project through "digital empowerment".



The Kamoakakula Copper Mine Phase II Project

CASE WSGRI Engineering and Surveying Incorporation builds a geographic information and intelligent application product system

WSGRI Engineering and Surveying Incorporation has independently developed a cloud information platform with an intelligent digital infrastructure, which mobilizes intelligent applications for various industries, such as intelligent factories, cities, and parks. These technologies and platforms have been used in large-scale steel enterprises, including Baosteel, Baowu, Masteel, Zhanjiang Steel Base, and Fangchenggang Steel Base, facilitating their digital-based development and intelligent steel manufacturing.



Shaoguan Steel Group's intelligent fire control system

CASE Minmetals Development innovates in and upgrades the industrial chain and supply chain for bulk commodities through digital empowerment

Committed to building an integrated digital total factor industrial ecosystem for bulk commodities, Minmetals Development launched the IoTeng, a digital and intelligent platform which provides customers with integrated services of warehousing, processing, transportation, supply chain finance, index, and technology in 2021. The project, integrating business flow, logistics, information flow and capital flow, propels the innovation and coordination of the industrial chain, stimulates innovative growth, and empowers the digital transformation and upgrading of the industrial chain and supply chain of bulk commodities society-wide. In 2022, the system won over ten awards, including "Typical Case of Digital Transformation of Listed Companies in 2021" and "Outstanding Case of Digital Innovation of State-owned Enterprises in 2022".



PREVENTING SAFETY AND ENVIRONMENTAL RISKS

Safety and development are mutually reinforcing. The building of ecological civilization holds the key to corporate development. Adhering to the requirements of the CPC Central Committee and the State Council, China Minmetals puts economic and social development on parallel tracks, and coordinates development and safety to maintain peace and stability in the society.

安全第一 预防为主 综合治理

西岭沟尾矿库

Improving Safety and Environmental Risks Management

Shouldering the responsibility for safe development, China Minmetals leads a new development path with new requirements. We consolidate safety and environment responsibilities with ironclad determination and rules, and strengthen our environmental protection endeavors to build a higher level of "safe Minmetals".

Strengthening safety and environment responsibilities



Committed to safe development and environmental protection, the Company decentralizes safety and environment responsibilities to different levels, and incorporates related major issues into the "three lists and one process" decision-making mechanism. By implement the leadership guarantee of safety production responsibility in construction and mining fields, the Company tightens the responsibilities for safety and environmental protection at all levels.



The Company strengthens the handling of accident accountability, as penalties will be imposed whenever a major accident occurs and warning interviews will be conducted with the main persons in charge of relevant accident units. By reviewing historical accidents, subsidiaries are urged to learn lessons from the accident.



The Company puts forward strict work safety disciplines, such as the "ten disciplines" and "three regular accident handling measures", setting clear safety red lines. In response to the regulatory challenges of hazardous operation, the Company installs surveillance cameras to deter such behaviors and typical workplace accidents. Falling accidents fell by 44% year-on-year.



China MCC22 Group's intelligent inspection system conducting on-site safety inspections

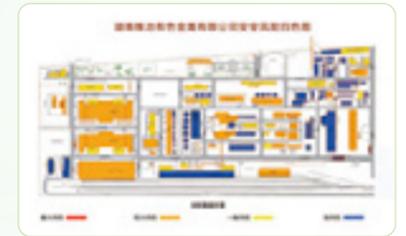
Preventing safety risks

RMB **11** billion
Annual investment in safety and environmental protection

The Company has formulated the Guidelines for the Dual Prevention Mechanisms which urges construction and mining enterprises to standardize work processes, establish warning models, and strengthen risk classification and control. The Company has organized two special training sessions for over 18,000 participants.

CASE Hunan Nonferrous Metals implements stratified safety risk control

Hunan Nonferrous Metals has carried out an in-depth on-site safety rating which stratifies risks into four levels of "red, orange, yellow, and blue" with each level aligned with specific control measures to promote the "dual prevention", and the "one map, one table, one list, and one plan" mechanisms. In 2022, the list of major risk control was issued three times, decreasing the number of accidents by 50% year-on-year with zero accident of serious injury or above and seven minor injuries. Work safety remained stable.



CASE Conducting three major battles against safety risks

In 2022, the Company strengthened the safety management of tailings ponds, subcontractors, and special equipment to fight three major battles.

- Safety management of tailings ponds**

A preliminary risk monitoring and warning system for tailings ponds has been established, and all 286 issues and hidden hazards identified in 47 tailings ponds have been rectified in accordance with the principle of closed-loop management for each pond with one file.
- Safety management of subcontractors**

The Company has strengthened the safety control of subcontractors, and implemented a penalty system for dishonesty. Suppliers who are responsible for "major work safety accidents or above" will be put in the blacklist, removed from the procurement platform, and permanently denied access to business.
- Safety management of special equipment**

Committed to the safe handling of lifting machinery, the MCC Group improves the responsibility system for special equipment and inspections by third-party intermediaries. In 2022, a full-coverage inspection was conducted on 9,301 tower cranes and construction elevators in use, and 9,975 inspections on special equipment were carried out by third-party organizations, effectively eliminating hazards.

The Company has strengthened the risk prevention mechanism for early warning and prediction. In 2022, a total of 617 warnings for earthquakes, extreme weather, and other events were issued, effectively facilitating the flood diversion of Minmetals Salt Lake in the autumn and the emergency response to the earthquake on September 5th in Luding, Sichuan.

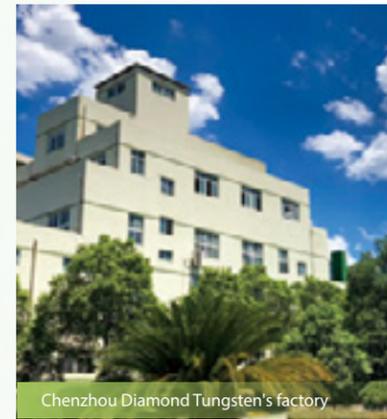
The Company has launched emergency drills and improved the ability to respond to unexpected risks. In 2022, enterprises at all levels conducted a total of 1,463 emergency drills, with approximately 41,000 audience, effectively improving the response ability to unexpected accidents. The Company has also enhanced communication and cooperation with China Anneng Group and other professional organizations in the fields of emergency risk prevention, treatment, rescue, and training to achieve the effective coordination of emergency rescue forces.

Managing environmental risks

Putting environmental risk prevention and control in the crosshairs, China Minmetals organizes risk investigations in key areas of environmental risk prevention and control and in standard operation of environmentally friendly facilities to tighten the control of risks at the source. We have launched special risk assessment and review for key projects, and resolutely eliminated imported ecological environmental risks, playing a key role in environmental risk prevention and control. After the ecological and environmental protection supervision by the CPC Central Committee, we have made rectifications accordingly, and deepened the rectification results in a targeted manner with one policy for each enterprise.

CASE Chenzhou Diamond Tungsten treats unorganized waste gas emissions

Upholding the principles of scientific, precise, and high standard pollution control, Chenzhou Diamond Tungsten collects and treats unorganized exhaust gas through measures of source control, multi-stage absorption, and terminal waste gas treatment. By comprehensively managing various ammonia storage tanks and outlets, the concentration of ammonia in the exhaust gas has been contained far below the national emission standard. The company has renovated a six-stage series counter-current alkali absorption system to ensure that there is no odor at the main outlet of hydrogen sulfide that has been adjusted to 25 meters away from the workshop outlet, bringing the concentration of hydrogen sulfide emissions close to zero, which is less than 2% of the national standard.



Chenzhou Diamond Tungsten's factory

Building a safety and environmental protection team

Pressing ahead with building a safety and environmental protection team, the Company has set up a team of 75 experts for special safety and environmental protection inspections. 34 subsidiaries of the MCC Group have formulated and implemented the allowance system for work safety personnel, and subsidized safety engineering certificate holders. In addition, 207 outstanding contingent workers have been recruited as permanent employees to enhance the sense of belonging of safety management personnel.

Tightening safety education

The Company strengthens safety education and training to improve the awareness of and the skills of work safety, organizing activities such as "Work Safety Lecture Hall" and "Work Safety Month". In 2022, enterprises at all levels vigorously carried out comprehensive safety education and training activities for all employees through lectures and field visits. Through online and offline interactions, exams, and exchanges and competitions, the Company encourages employees to learn more about work safety.

115,177

Education and training sessions throughout the year

1,620,068

Participants

Safety education sessions during the 2022 Work Safety Month	Number of sessions	Number of participants
"Safety Volunteers in Action"	460	7,155
Collecting stories on "Safety for A Better Life"	1,653	8,715
"Delivering Safety From Door to Door"	399	10,978
"Lectures on Safety" and "Online Expert Consultation"	729	28,588
Emergency drills	3,019	99,553
"How Much Do You Know about the New Safety Law" and "Fun Test of Rescue Skills"	3,915	117,283
Emergency rescue drills and skills training	4,614	151,697
Watching work safety videos and visiting special exhibitions	10,129	225,856
Making advertisements, posters, short videos, and voice prompts	32,072	229,163

CASE MCC Ramu successfully holds the 2022 Papua New Guinea Mining Safety Week

In response to the Mining Safety Week proposed by the Mineral Resources Authority, MCC Ramu Nickel Limited organized work safety activities in its base in Papua New Guinea in May 2022. Through nine activities, such as poster designing contest, work safety writing contest, singing contest, traffic regulations promotion, and mobile equipment safety inspection and operation test, participants have developed a deeper understanding of occupational health, work safety, and safe operations to help them further identify risks, tighten risk control, and maintain stable operation.



CASE Las Bambas fatigue and drowsiness management plan

Safety first is a daily mindset for the Las Bambas team. A site Fatigue Management Plan assesses known risks that can lead to employees feeling tired or drowsy. Teams are trained to identify potential risks to promote a safe and injury-free workplace. Of equal importance to physical wellbeing, the site monitors for potential psychological stress. To mitigate individual risks, several measures are deployed, including occupational exams, self-assessment cards, modifying work zones and by implementing fatigue detection systems. A specially designed cap fitted to employees' heads is an important fatigue detection device that is worn during shifts. In the 2022 year, MMG's Total Recordable Injury Frequency (TRIF) rate was 1.25, ranking first in safety performance among members of the ICMM.



Las Bambas team designed cap that can detect fatigue level for employees

Strengthening Work Safety

In 2022, China Minmetals worked hard to conclude the three-year special action plan for rectifying work safety weak spots and the annual action plan for improving work safety. Through these regular, comprehensive, and thorough action plans, we have seen satisfying results in digital work safety and risk prevention.

Saindak Copper-Gold Project in Pakistan won the first "Outstanding Practice of Overseas Security" Award. Its MMG safety performance ranked top among the members of the International Council on Mining and Metals. Throughout the year, there was no work safety accident in thirteen enterprises directly affiliated to China Minmetals. Among them, Hunan Nonferrous Metals was again recognized as the Outstanding Organization of Work Safety in Hunan Province, and the 23rd Metallurgical Construction Group and Nanchang Cemented Carbide were awarded the Advanced Collectives of the "Ankang Cup".

In 2022

China Minmetals strives to build safe construction sites

24

The number of projects awarded the "National Standardized Work Safety Site"

262

The number of projects awarded the "Provincial Standardized Work Safety Site"

233

The number of projects awarded the "Municipal Standardized Work Safety Site"

Strengthening supervision and inspection

China Minmetals has carried out in-depth supervision and inspection of prominent seasonal risks related to work safety throughout the year under the three-year action plan of work safety rectification and the "fifteen measures". Under the theme of "eliminating hidden hazards and ensuring science-based risk prevention", we launched the "consolidation action" in accordance with the principle of problem-oriented and targeted efforts to analyze problems at all levels, promoting the improvement of the safety management system.

From February to September in 2022

By way of self-inspection, enterprise review, group supervision and random inspection, we carried out special inspections on environmental protection facilities, lifting operations, "fifteen measures" implementation, explosive devices management, and highway tunnel construction, strengthening the safety management of high-risk points.

From October to early November in 2022

We carried out safety inspections during the 20th National Congress of the Communist Party of China through "self-inspection and self-correction at all levels, regional grid based security inspection, and 'mobile' supervision and inspection" to ensure work safety across the board.

Throughout 2022

Enterprises at all levels conducted 60,823 safety inspections and identified 363,549 hidden hazards. As of the end of 2022, the completion rate of rectification has reached 99.5%, witnessed by the steady improvement of on-site safety management.

Identifying and eliminating hazards

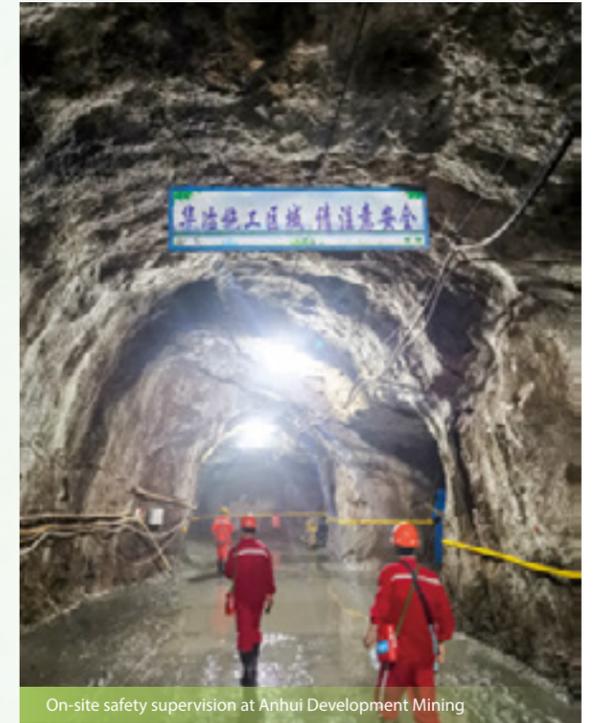
The Company continues to promote the "four level hidden hazard investigation and management" mechanism at enterprise, factory, mine workshop, and team levels to discover and manage various hidden risks. By keeping a safety hazard ledger, a rectification responsibility ledger, and an institutional measures ledger, the Company ensures the quality of rectification.

CASE China Minmetals Tungsten enhances safety and environment management

China Minmetals Tungsten has carried out targeted rectifications and singled out 352 buildings (structures) that need to be rectified. Currently, plans have been formulated for houses that should be demolished, closed down, and repaired, and rectification measures have been underway. According to the checklist of the "Criteria for Determining Major Work Safety Hazards in Metal and Non-metal Mines", twenty major hazards were identified, and as of the end of 2022, seventeen major hazards have been eliminated. Regarding the procurement, transportation, loading and unloading, storage, collection, use, and return of explosive devices, safety inspections were carried out item by item, and a total of 27 problems and hidden hazards were found and then rectified.

CASE Conducting continuous on-site safety supervision

Minmetals Mining continues to upgrade its safety supervision team to investigate four-level hidden hazards through uninterrupted on-site safety supervision over five mines in operation, including Anhui Development Mining. By the end of 2022, the company has carried out twenty special safety supervisions, involving 2,852 people (103 leaders in charge, 686 middle managers, 775 grassroots managers, and 1,288 on-site operators). During the 188 days of supervision, 1,870 rectification were completed for 1,879 hidden hazards identified in 268 supervision logs, covering 330 shifts, and 1,676 people. Through continuous safety monitoring, the company has identified management loopholes, proposed solutions, and supervised rectification, effectively promoting the safety management level.



On-site safety supervision at Anhui Development Mining

Empowering safety through technology

The Company strengthens the digital empowerment of work safety management with specific business characteristics and scenarios. Aiming at preventing and resolving major safety and environmental risks, a top-down management platform has been put into place targeting "major risks, key projects, major hazards, and major accidents" to realize visualized management, proactive warning, collaborative governance, and precise control.

The MCC Group has worked hard to manage and control risks in dangerous large-scale projects, and for special equipment. Meanwhile, Minmetals Mining and Hunan Nonferrous Metals have improved the "six systems" of mines, and Minmetals Development has highlighted park management, and vehicle transportation, witnessing some early results of safety risk management and control through digital technologies.

CASE A work safety monitoring and early warning system for tailings ponds completed

Emphasizing major risks of safety management and control, China Minmetals established a risk monitoring and early warning system for tailings pond with visualized management, proactive early warning, collaborative governance, and precise control of work safety risks.

CASE Vigorously promoting intelligent construction to build a safe enterprise

Among the 46 management scenarios for the first batch of the "digital brain" construction plan of Hunan Nonferrous Metals, there are 27 about safety and environmental protection. The RMB 100 million plan improves digital safety warning, prevention, and control capabilities. Major mining enterprises have invested over RMB 70 million in purchasing modern mechanical equipment, and upgrading main fans, water pumps, and elevating conveyors. The MES system of Zhuzhou Smelter Group has been listed as a benchmark for intelligent manufacturing in non-ferrous smelting and processing enterprises by the Ministry of Industry and Information Technology, and the safety information management platform and automation control system of Hunan Nonferrous Chenzhou Fluorine Chemistry has been listed as a pilot project for "industrial Internet + hazardous chemicals" by the Ministry of Emergency Management.

CASE Building intelligent construction sites to create a new ecosystem of safety supervision

The Changsha Minmetals Plaza Project, developed by the 23rd Metallurgical Construction Group, is equipped with large-scale concrete temperature measurement equipment, 3D laser scanning robots, environment monitors, automatic sprinkler systems, intelligent meters, vehicle identification systems, video conferencing systems, unmanned aerial vehicle tilt photogrammetry technology, integrated VR machines for safety, BIM displays, and 720 panoramic views to collect real-time data, identify risks, and conduct online and offline supervision. The project realizes dynamic and visualized management of safety, and reduces the difficulty of risk control.



The intelligent construction site system for the 23rd Metallurgical Construction Group's Changsha Minmetals Plaza Project

Maintaining Green and Low-carbon Operation

Firmly standing by the idea of "lucid waters and lush mountains are invaluable assets", China Minmetals implements the national "carbon peaking and carbon neutrality" goal, and vigorously develops energy saving and emission reducing technologies in the fields, such as metal mining, steel metallurgy, and engineering construction. In 2022, the comprehensive energy consumption and pollutant emissions per RMB 10,000 output value maintain a steady decline.

In 2022, affiliated enterprises promoted green development

Baifang Copper Mine in Shuikou Mountain has been built into a green mine. Chentaigou Iron Mine and China Minmetals' graphite project were under construction in accordance with green mine standards.

Jinzhou Company, Nanchang Cemented Carbide, Ganbei Tungsten, and Jinchi Energy Materials were recognized as national "Green Factories".

Forty construction projects of the MCC Group passed green construction evaluation.

ACRE Coking and Refractory Engineering Consulting Corporation's coke desulfurization and denitrification process was coined as a typical case of green and low-carbon practice among the SOEs under the State-owned Assets Supervision and Administration Commission of the State Council.

Low-carbon operation

In order to orderly promote the "carbon peaking and carbon neutrality" goals and complete energy conservation and carbon reduction goals, the Company set up a work promotion team at the headquarters to guide its subordinate enterprises to achieve energy conservation and carbon reduction goals in an orderly manner in accordance with the mechanism of "coordinated promotion at the headquarters and professional undertaking by the MCC Group" by leveraging the technical consulting expertise of its research institutes.

CASE The MCC Group's "carbon peaking and carbon neutrality" action plan

In order to thoroughly implement the major national strategies on carbon peaking and carbon neutrality, the MCC Group has formulated an action plan for energy conservation and carbon reduction from 2022 to 2024, which defines the content and goals for energy and carbon reduction in the next three years. The company refined specific measures to lead the metallurgical industry to achieve intelligent, green, low-carbon and efficient development, and facilitate the steel and non-ferrous metallurgy industry and infrastructure to achieve the "carbon peaking and carbon neutrality" goal.





Zhuzhou Smelter Group's Zinc Smelting Project

CASE Making targeted efforts to create a "green" zinc benchmark

Zhuzhou Smelter Group's Zinc Smelting Project adopts large-scale equipment, including a world-class 152 square meter roasting furnace, a single series 300,000 ton leaching, and an OTC solution deep purification system, and has built and put into operation an intelligent factory platform covering DCS, MES, and ERP levels, becoming a leading enterprise in energy efficiency recognized by the Ministry of Industry and Information Technology. Compared to the industrial threshold of energy consumption quotas, the project consumes 109,713.6 tons of standard coal less annually, reducing carbon dioxide emissions by approximately 302,800 tons, equivalent to planting 825 hectares of trees and forests every year. In 2022, the Zhuzhou Smelter Group was awarded the title of "Annual Leading Green Development Enterprise in China's Nonferrous Metals Industry".

Pollution prevention and control

China Minmetals has intensified efforts to prevent and control environmental pollution, implementing targeted pollution control in a precise, scientific and legal manner throughout the process to safeguard the beautiful environment.

CASE Tackling the difficulty of heavy metal and hazardous waste disposal

China Minmetals launched the special projects of "comprehensive technologies of antimony trioxide purification and cobalt and nickel slags extraction", and "collaborative disposal and utilization of mining metallurgy and urban solid wastes". We have developed a number of key technologies and core equipment, overcome the technical problems of efficient detoxification and clean utilization of toxic components to dispose of polymetallic hazardous wastes, and established the integrated demonstration project of collaborative utilization of multiple hazardous wastes in one million ton copper, lead and zinc comprehensive smelting base to improve existing standard specifications, and prevent and control solid wastes.

Green construction

Upholding the concept of green development in construction, China Minmetals applies a large number of innovative technologies, and promotes the green and sustainable development of the construction industry. In 2022, forty projects were rated as green construction projects by China Association of Construction Enterprise Management. Among them, four construction projects, namely the Donganhu District where the main venue of MCC5's sports meeting lies, Chuangyi Road (formerly known as No. 122 Xinglong Road), Western Financial Innovation Center, Tianfu Art Park's Wenbo Square, were rated as "Three Star Projects".

CASE Launching a rooftop greening project for public landmark buildings in Chengdu

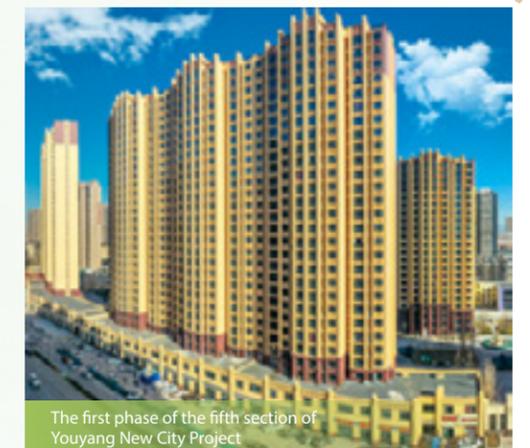
In the Tianfu Art Park Project, the China MCC5 Group has reduced structural load and soil erosion, and enhanced the convenience of installation and maintenance by using fiber-reinforced solidified soil. The company has launched a rooftop greening project for public landmark buildings, renovating a total area of 21,870 square meters.



The Tianfu Art Park Project

CASE Prefabricated buildings promotes low-carbon construction

The first phase of the fifth section of Youyang New City Project was developed by China MCC22 Group. The main body of the project consists of prefabricated buildings, with the highest assembly rate of each building standing at 63%. As one of the projects with the highest assembly rate under construction in Hebei Province, the project was rated as the National AA Prefabricated Building Demonstration Project. Through prefabricated construction, the project has reduced the use of wood by 80%, scaffolding and formwork by 50%, concrete by 7%, on-site garbage and dust by 80%, and water by 60% compared with cast-in-place structures, improving the quality and lifespan of buildings.



The first phase of the fifth section of Youyang New City Project

Ecological protection

Relying on the advantages in energy conservation and environmental protection, China Minmetals strengthens ecological restoration and management, and protects biodiversity to promote the harmonious coexistence of human and nature. We help cities and enterprises to carry out environmental governance to safeguard the beautiful planet.

CASE **Winning the bid for the Ecology Oriented Development Project of the Huangshi Section of the Yangtze River**

On August 12, 2022, China MCC17 Group won the bid for the Ecology Oriented Development (EOD) Project of the Huangshi Section of the Yangtze River, which includes ecological restoration and comprehensive improvement along Huangshi-Yangtze River shoreline, drinking water source protection in the Yangtze River, comprehensive lake treatment, comprehensive treatment and ecological restoration of the Dongfang Mountain, green material industrial park, the ecological industrial park, and the comprehensive energy project. After completion, the EOD project will comprehensively improve the quality of water ecology in the Huangshi Section of the Yangtze River, introduce green industries, such as resource recycling, industrial tourism, new energy, and health care tourism, drive regional environmental governance through industrial development, and improve ecological environment governance in the region in line with the national strategy "to step up conservation of the Yangtze River and stop its over development".



Renovating the sewage outfalls of the Yangtze River

CASE **Solving the problem of tailings ponds treatment through the soilless reclamation technology**

Shen Kan Engineering and Technology Corporation presses ahead with ecological environment governance of mines and land reclamation and greening to protect the natural environment in mining areas. The soilless reclamation technology is a practical and multidisciplinary technology which reuses resources, reduces costs, and deals with soil source for land reclamation. The technology, which also recycles water and continuously optimizes irrigation methods to further avoid drought and flooding, won the first prize in the 2022 China Association of Construction Enterprise Management's Innovative Application in Geotechnical Engineering.

CASE **Las Bambas team formulated environmental management plans and rescue and relocation protocols for amphibians and rodent species**

The conservation of biodiversity is embedded in Las Bambas, with environmental management plans and rescue and relocation protocols for amphibians and rodent species. Las Bambas has proudly pioneered this initiative in Peru. In 2021, the Forestry and Wild Fauna Service (SERFOR) granted Las Bambas approval to relocate the following species:

- Dark field mouse (*Akodon subfuscus*)
- Painted big-eared mouse (*Auliscomys pictus*)
- Aquatic frog (*Telmatobius jelskii*)
- Warty toad (*Rhinella spinulosa*)
- Marsupial frog (*Gastrotheca marsupiata*)
- Marbled frog (*Pleurodema marmoratum*)

All relocation activities were executed in compliance with SERFOR's Wild Fauna Management Regulation, and IUCN's criteria for translocations for conservation purposes.

CASE **Annual weed control plan carried out by the Dugald River Mine**

To combat their growth and spread, Dugald River's environment team has collaborated with the local site's landholder on an annual weed control program targeting the invasive weeds called Calotrope and Rubbervine. Additional resources outside of the mining lease help with vehicle and plant equipment inspections prior to site access by stemming the spread of noxious seeds. Dugald River's Land and Biosecurity Management Plan and Weed Control Program are informed by the local municipality's Biosecurity Plan.



The Dugal River Mine carried out annual weed control plan to assist local environmental protection



POOLING DEDICATED AND PROFESSIONAL TALENTS

Talent is the fundamental support for building a moderately prosperous society in all respects, and is the primary resource of enterprises. Thoroughly implementing the guiding principles of the 20th CPC National Congress, China Minmetals improves the quality of independent talents training in all aspects. We strive to create a fair and just promotion channel, provide a harmonious, safe and healthy workplace, and build a united and hardworking talent team, supporting the development of both the Company and employees of the Company.

Creating a Growth Platform for Employees

We deeply advance the Action Plan for Empowering the Group with Talent. With the focus on innovative, specialized and high-level talents, and driven by the reform of talent development mechanism, we consolidate the strategic position of talent-driven development, expand the team of high-level talents, and enhance the innovative vitality of talents. We continuously promote the talent mechanism innovation and system improvement, which provides a broad space for the growth of employees.

Diversified talent cultivation

At China Minmetals, cultivating technical and skilled personnel is regarded as an important support for industrial transformation and upgrading and high-quality development. Through a series of solid and effective measures, such as special training on professional skills and staff rotation and exchanges for improving the practical ability of cadres, we strive to build a team of talents with professional dedication, outstanding innovation abilities and excellent skills who are good at solving problems.

In 2022

1.2 million
Employees participants of trainings

In 2022



We held a talent work conference to clarify the goal of talent cultivation and implement the workforce development strategy in the new era.



We developed the digital HR system, and conducted a special survey on HR information system in nearly 120 tertiary or higher subsidiaries of the Company, building up the preliminary HR scenarios of the corporate brain.



We compiled and released the e-book Role Model, which records the glorious deeds of the Company's national model workers, setting off a fervor of learning from the model workers within the Company.

CASE Jointly launching high-level talent training with universities

Based on the strategic objectives and industrial layout, and following the overall plan of fostering five creators of original technology of the Company and the discipline building requirements of the Central Research Institute of China Minmetals, China Minmetals combines basic study with applied study, and cooperates with famous universities to promote the innovative training of outstanding engineers. The Company works with universities to launch targeted training programs, which strengthen the combination of theory and practice, and integrate engineering practice into the student training process. We aim to explore a long-term mechanism for industry-university-research cooperation between corporations and universities, and to build a "talent center" and "innovation highland" in the metal mining industry.

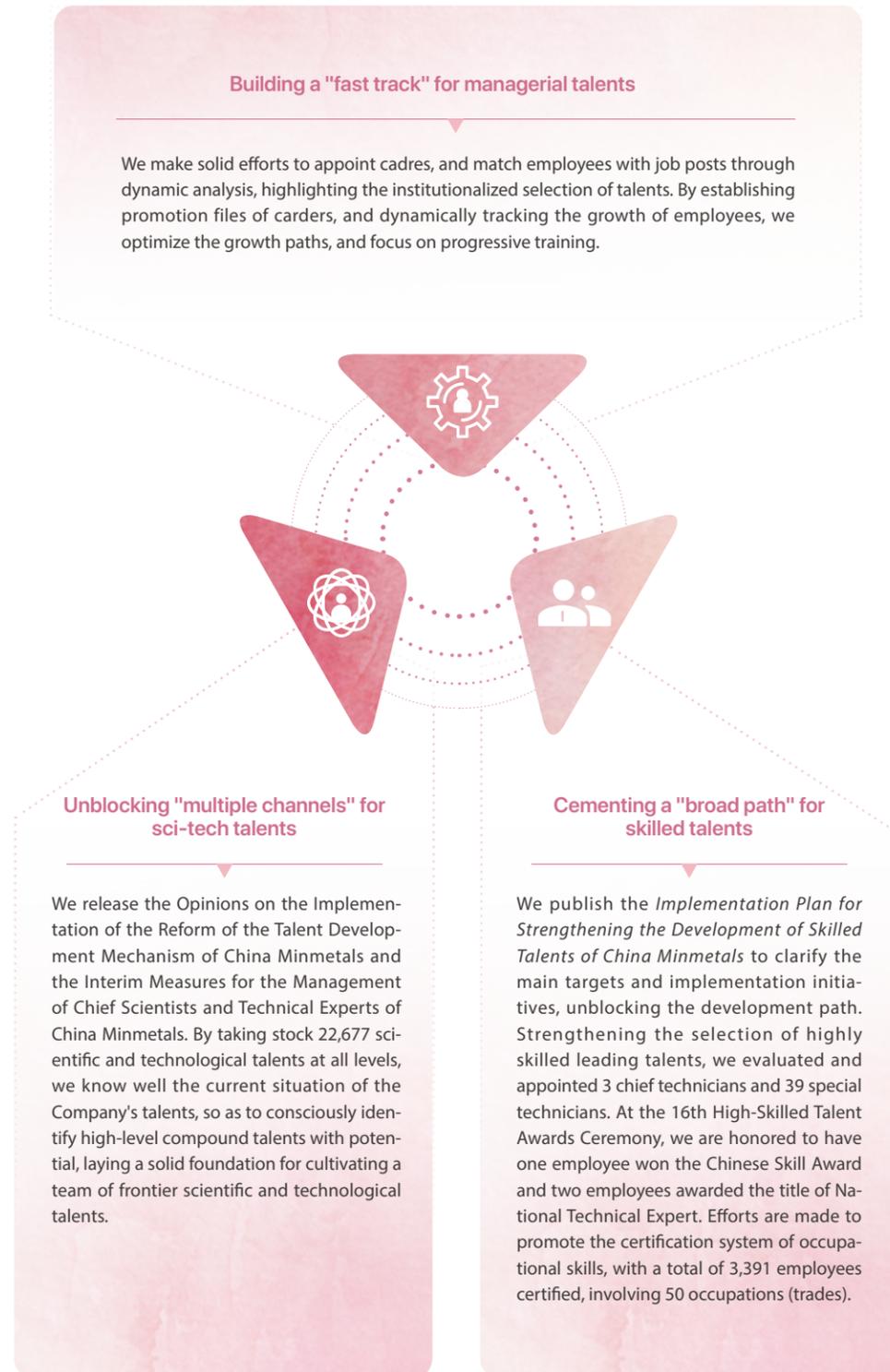
CASE The first state-level Class II vocational skills competition of China Minmetals held successfully

With the approval of the Ministry of Human Resources and Social Security of the People's Republic of China, China Minmetals successfully held the 2022 National Industry Vocational Skills Competition. There were three subjects in the contest, namely electrician, engineering surveyor and pincer. A total of 78 teams and 149 players from 40 subsidiaries of China Minmetals participated in the final, vividly interpreting the rigorous and dedicated craftsmanship and demonstrating the healthy image of industrial workers of central SOEs in the new era. The top 3 candidates in the overall individual results of each subject will be submitted to the Ministry of Human Resources and Social Security for approval to be awarded the title of "National Technical Expert".



Career path building

We insist on hiring and nominating suitable candidates and constantly optimizing talent resources allocation. We are committed to providing a broad development space for various types of professionals, creating a fair and just competition environment and improving the talent development system.



Safeguarding Employees' Rights and Interests

Rights and interests protection

China Minmetals attaches great importance to protecting the basic rights and interests of its employees. We strictly comply with the laws and regulations applicable to domestic and overseas projects, ban the use of child labor, and oppose all forms of forced labor and discrimination on the grounds of race, gender, age, etc., so as to provide equal development opportunities, and build a diversified talent system. In 2022, MMG Las Bambas was selected as one of the 100 best companies in attracting and retaining talents in Peru, ranking fifth among mining companies.

By the end of 2022

Over **174,000** total employees



In 2022

Over **13,000** newly recruited employees

Over **622,000** total number of migrant workers

Among which
Over **154,000** on-the-job employees
Over **36,000** female employees
Over **14,000** female managers

Among which
Over **6,000** fresh college graduates



CASE Launching "online campus recruitment" to expand recruitment channels

China Minmetals launched the 2023 online promotion for annual campus recruitment, which receives 87,000 clicks within 15 minutes. In 2022, the Company recruited more than 6,200 fresh college graduates, a year-on-year increase of 20%. We spared no effort to provide jobs for key groups such as college graduates and workers from poor areas, contributing to steady economic growth and stable employment rate.



Compensation and benefits

China Minmetals conducts scientific performance assessment and further consolidates the olive-shaped salary distribution structure by optimizing the pattern, relationship and mechanism of income distribution, thus providing a sample for state-owned enterprises helping achieve common prosperity in the whole society. The Company pays social insurance for its employees in strict accordance with national policies and regulations, and provides corporate pensions, supplementary medical care and other benefits according to the Company's own conditions, so as to build an assuring welfare system for employees.

In 2022, the Company built new corporate annuity plans in China Tungsten Hightech and other subsidiaries to expand the coverage from 75% to approximately 80%, further enhancing employees' sense of gain and security.

Democratic management

China Minmetals published the Action Plan of China Minmetals to Further Strengthen the Development of Staff Congress. We actively practice the concept of the whole-process people's democracy, continuously improve democratic management system of the Company with Staff Congress as the basic form, and fully protect employees' rights to information, to participation, to election and to supervision, safeguard legitimate rights and interests of our employee and steadily promoting the democratic management of the Company. In 2022, the Company held the 5th plenary session of the 1st Staff Congress and the annual congress of union members to listen to the report on the work and deliberate on a number of topics.

CASE Holding the 5th plenary session of the 1st Staff Congress and the annual congress of union members

On December 28, 2022, China Minmetals held the 5th plenary session of the 1st Staff Congress and the annual congress of union members. The meeting deliberated issues related to the Company's democratic management in 2022 and listened to the annual work report of the Company's labor union, further consolidating the democratic management system of the Company with the Staff Congress as the basic form. A total of 128 employee representatives attended the meeting.



The 5th plenary session of the 1st Staff Congress and the annual congress of union members

Caring for Employees

Ensuring physical and mental health

We inspect and rectify occupational disease prevention and reduce the number of employees exposed to hazardous positions to prevent occupational hazards. In the midst of the COVID-19 pandemic, we coordinated resources to provide necessary living materials to employees, arranged TCM treatment and recuperating and free clinic in the construction sites, and opened a psychological counseling service hotline for employees, safeguarding the physical and mental health of employees by taking concrete actions.



CASE Organizing online psychological counseling lecture

In May 2022, against the background of the severe COVID-19 prevention and control in many parts of China, Minmetals Development carried out practical activities to serve the people and enhance humanistic care. An online lecture with the theme of "How to take care of oneself and one's family emotions during the COVID" was held for all employees, and authoritative psychological trainers were invited to help employees and their families relieve the psychological pressure during the pandemic.

CASE Wining "Healthy Enterprise in Sichuan Province"

Paying great attention to employees' occupational health, Zigong Cemented Carbide Corp., Ltd. (ZGCC) develops programs on occupational health protection, occupational health examination and employee health check, organizes activities such as the "Healthy Man" selection and knowledge training on occupational diseases prevention and control, and carries out monthly online health training assessment and incident management for employees. Besides, it establishes psychological consultation rooms. All these efforts are meant to provide support for employees' physical and mental health. On April 26, 2022, ZGCC was awarded as "Healthy Enterprise in Sichuan Province".



ZGCC Health Cabin psychological counseling room



ZGCC signing up campaign for health, safety and environmental protection commitment

Caring activities

We visit employees during festivals, offer assistance to those in need and respond to their demands. We actively explore new ways to develop staff care system, and solve practical problems faced by employees such as school enrollment of their children, thus creating a warm and harmonious working atmosphere.

We care about employees' lives. The "Minmetals Bookstore" digital reading platform was built for enriching employee's spare time and increasing their spiritual motivation. Diversified sports and recreational activities such as football matches, online sports games, painting and calligraphy competitions, parent-child activities and music appreciation lectures are in place to further improve their sense of happiness.

CASE Organizing music appreciation lecture to enhance music appreciation ability

In March 2022, China Minmetals sent thoughtful holiday gifts to female employees and held a special lecture "Into the World of Music - Meaning of Art in Human Life", which can inspire employees to appreciate music, seek beauty, and become purveyors of beauty. The lecture lived online, attracting more than 3,000 audiences, and nearly 1,000 employees from subsidiaries watched the lecture.



CASE Launching the fellowship activity for eligible youth

In July 2022, the Youth League Committee of China Minmetals held the 6th "Meet Your Love in the Qixi Festival" in Beijing. The fellowship activity attracted 150 outstanding eligible young people from China Minmetals, the International Department of CPC Central Committee, the Ministry of Commerce, Xinhua News Agency, the State Taxation Administration, the People's Bank of China, and CAUPD, etc., showcasing the spirit of Minmetals young employees in their pursuit of happiness and a better life. The activity of "Doing a Favor for the Youth" was effectively put into practice.



Rich and colorful recreational and sports activities



UNDERTAKING RESPONSIBILITY AND MISSION TO MAKE CONTRIBUTIONS

Upholding the people-centered development ideology, China Minmetals is committed to serving people's livelihood and well-being. We have shouldered our due responsibilities in fighting the battle against COVID-19 and natural disasters, and demonstrated our work style in practicing public welfare activities and giving back to the society, establishing a responsible and dedicated brand image as a central SOE of China.

Promoting People's Well-being

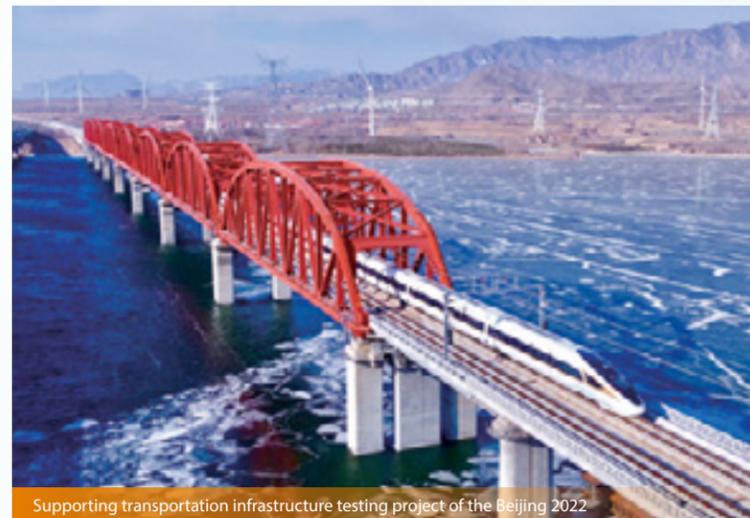
We have always taken the lead to assume the main responsibility when the Party and the people need it most. From the COVID-19 pandemic response to international events guarantee, we were working in a strict, dedicated and detailed manner. Caring for and providing quality and thoughtful service to the people, and going through thick and thin together, we strive to promote people's welfare to a higher level with a strong sense of responsibility and proactive practice.



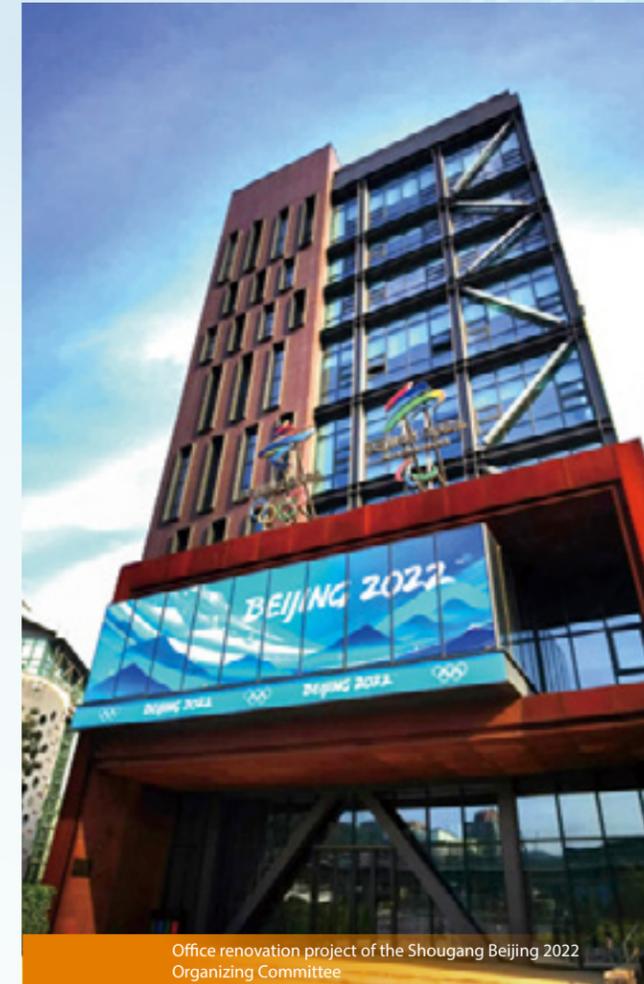
Temporary facilities project in Yanqing Zone of the Beijing 2022

Guaranteeing international events

In 2022, China successfully hosted the Beijing 2022 Winter Olympic and Paralympic Games (Beijing 2022), drawing wide attention both at home and from abroad. Facing the formidable mission of the Beijing 2022, China Minmetals successfully completed a number of venues, operation and maintenance, and supporting facilities projects for the Games, as well as the task of venue guarantee with high standards, making its contributions to a wonderful and extraordinary Beijing Winter Games to the world. After the event, we received a letter of appreciation from the Beijing 2022 Operation Command Centre of Yanqing Zone. The National Sliding Centre, dubbed the "Flying Snow Dragon" built by China Minmetals, was hailed by General Secretary Xi Jinping as a high-quality asset that benefits the people!



Supporting transportation infrastructure testing project of the Beijing 2022



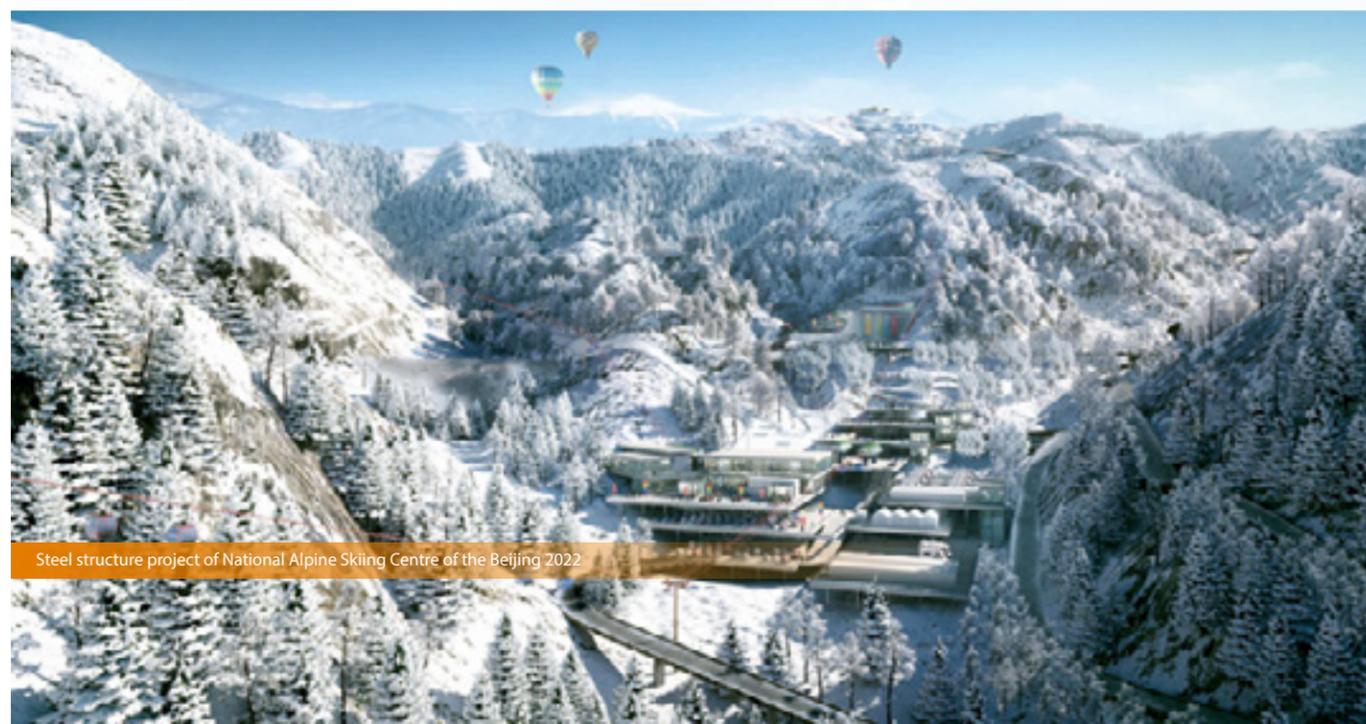
Office renovation project of the Shougang Beijing 2022 Organizing Committee



Integrated management and monitoring center project of service facilities in Yanqing Zone of the Beijing 2022



DoubleTree by Hilton Hotel in Badaling, Yanqing, Beijing



Steel structure project of National Alpine Skiing Centre of the Beijing 2022



National Sliding Centre project of the Beijing 2022

CASE **Guaranteeing the successful host of Beijing 2022 with quality services**

Shanghai Baoye Group organized an operation and maintenance team of more than 350 people, and successfully guaranteed tower broadcasting, medical cooperation, sunshade opening and closing, vehicle shuttling and other services at the National Sliding Center. The ice-making and repairing team was engaged in the maintenance of the steel sliding track every day, timely repairing and replenishing ice according to the athletes' sliding tracks and broken conditions of the ice surface. Both the People's Daily and its overseas edition have reported efforts of these "unsung heroes".



The Operation Maintenance Team is making and repairing ice



Shangri-La Hotel, Beijing serves foreign guests during the Beijing 2022

Shangri-La Hotel, Beijing, as one of the seven contracted hotels for the Winter Olympics accommodation in Haidian District, Beijing, is responsible for accommodating broadcasters, market development partners, national (regional) Olympic committees and a few news media. Shangri-La Hotel guaranteed high-standard services inside the closed loop in terms of accommodation, catering, transportation and environment, which was praised by the International Olympic Committee, the Canadian Olympic Committee, Nippon TV and other guests staying in the hotel.

CASE **Shanghai Baoye Group awarded the First Prize of China Award for Science and Technology in Construction**

Based on the key special project of "Science and Technology for Winter Olympics" of National Key R&D Program, Shanghai Baoye Group participated in the research and development of "Key Technology for Design, Construction, Operation and Maintenance of Winter Olympic Snow Venues under Complex Mountainous Conditions", and won the First Prize of 2022 China Award for Science and Technology in Construction.

This achievement fills in the current blank in the design and construction of Olympic-standard snow competition venues. Through scientific breakthroughs in the whole process of planning, design, and construction, Shanghai Baoye Group has developed the design, construction and operation system of sliding and alpine skiing venues, set up the harmonious coexistence technology system of Winter Olympic snow venues and facilities and the ecological environment, and put forward a series of innovative technologies such as the long-term utilization system of Winter Olympic heritage in the whole process of planning, design, construction, operation and maintenance. Upon evaluation by the appraisal committee composed of 13 experts, the technology has reached the international leading level and filled the gap in the field of winter Olympic snow-related engineering construction in China.



Assisting the fight against COVID-19

Since March 2022, the epidemic has been widespread across the country. In the face of the evolving pandemic prevention and control situation, China Minmetals made urgent planning and took swift action. The Company drafted elite engineering volunteers to rush to the front line and support pandemic prevention and control. A total of 64,000 employees from 13 subsidiaries completed 132 pandemic prevention and control projects with high quality, undertaking responsibilities and winning the battle in critical moments.

In 2022

The Company lowered or waived

RMB **169.74** million
Rentals for micro and small businesses in the service sector

RMB **23.9** million
Rentals for self-employed individuals

Helping micro and small businesses cope with the pandemic and tide over the difficulties together

CASE **Rush-building makeshift hospital to win the battle against COVID-19 in Shanghai**

Since the outbreak of the COVID-19 pandemic in Shanghai, China Minmetals' subsidiaries in Shanghai had worked tirelessly to fight against the virus. Upholding the concept of "putting the people first and putting life first", they actively undertook makeshift hospital construction, volunteering services, medical support and other tasks, firmly shouldering the responsibilities of central SOEs in the unexpected ordeal.

In Shanghai

China 5th Metallurgical Corporation donated about **35,000** kg vegetables

China 17th Metallurgical Corporation donated about **15,000** kg vegetables

China 22th Metallurgical Corporation donated about **15,000** kg vegetables and other supplies

Undertook

35 COVID response projects in Shanghai



With the construction area of

1,079,600 square meters

Providing about

131,400 beds



Lin'gang cabin hospital in Shanghai

Devoting into disaster relief and rescue

Making the most of its professional advantages, China Minmetals has devoted itself into disaster relief and rescue efforts, working together with the whole society to overcome difficulties.

CASE Giving full support to the earthquake relief in Luding County, Ganzi, Sichuan Province

On September 5, 2022, the 6.8 magnitude earthquake occurred in Luding County, Ganzi Prefecture, Sichuan Province. China Minmetals donated RMB 20 million to the affected area and assigned its subsidiaries in Sichuan to support the earthquake rescue efforts in Luding, Sichuan.

China 5th Metallurgical Corporation participated in the rescue work of many collapsed houses in Moxi Town, and drafted 40 engineering builders to carry out disaster relief in the surrounding areas. Working with other rescue forces from all over the country, they cleared rescue channels, investigated affected houses and evacuated and resettled local residents.



CASE Working against the clock to unblock the 27 km passage

In June 2022, torrential rains battered Rongshui County, Liuzhou City, Guangxi Zhuang Autonomous Region. The only secondary highway leading outside had landslides in several locations, bringing traffic to a standstill. The Rongan-Congjiang Expressway project department of CFMCC went to the scene immediately. The department deployed 9 excavators, 10 loaders and 20 rescue vehicles to clear about 12 km secondary road and 15 km township road, unblocking a total of 27 km passages to the severely affected areas, which bought precious time for the rescue operation.



Engaging in charity

Education, medical care, and elderly care are important issues related to people's wellbeing. We carry out a wide range of social welfare activities, and encourage employees to participate in diversified community services, so as to solve people's worries with practical actions.

CASE Caring those families in need and offering assistance

In response to the call of the local neighborhood, Minmetals Assests appealed for donations among employees to help children and youths from disadvantaged families and people with disabilities in Dongsi Sub-district, Dongcheng District, Beijing. This donation will be used to cover tuition and fees and living expenses during their study in schools.



The Charity Day of China activity in the Dongcheng District, Beijing

CASE Organizing emergency blood donations in 2022

In order to ensure safe and sufficient blood for clinical use in medical institutions, CFMCC organized emergency blood donations in 2022. 284 employees signed up for health examinations and 176 employees donated a total of 39,700 ml of blood, 13 employees of which donated 300 ml and 19 employees donated 400 ml.



Emergency blood donations in 2022 by CFMCC

CASE Night school for migrant workers reaps tangible results

Minmetals Land, together with Shanghai Baoye Group, opens night school for migrant workers in Chaoyang No. 1 project, Beijing. The digital construction center of the project department is used as the classroom. Equipped with teaching equipment, and lectures given by engineering managers of the project, the night school is guaranteed with classroom, equipment, and funds. In 2022, the night school for migrant workers organized nearly 20 professional training sessions, and carried out activities such as paired assistance, reading classic books, watching patriotic movies. 1,800 migrant workers participated in the training.



The night school for migrant workers launched by Minmetals Land and Shanghai Baoye Group

CASE Serving the grassroots communities in Hong Kong

On the occasion of the 25th anniversary of Hong Kong's return to the motherland, China Minmetals H.K. (Holdings) Ltd. took the lead in organizing the charity campaign of caring the elderly. Upholding the mission of walking hand in hand and supporting fellow Hong Kong residents, it purchased daily necessities and pandemic prevention materials and delivered them to more than 1,000 elderly people in the primary-level communities in Hong Kong.



Charity campaign of caring the elderly launched by China Minmetals H.K. (Holdings) Ltd.

Building a Win-Win Industrial Chain

We respect and protect the rights and interests of our partners. Through positive engagements with all stakeholders, and providing them high-quality services, we make concerted efforts to promote the sustainable development of the industrial chain.

Providing targeted services to customers

Focusing on "meeting customers' demands and improving effective supply", we uphold the spirit of craftsmanship, pursue excellence and make constant progress. We value the product quality as well as service quality, continuously strengthening our capability of customer services.

CASE Winning the 7th Hunan Provincial Governor Quality Award

Through comprehensive quality control, lean production and other advanced management methods, China Tungsten Hightech has completed the quality management system upgrading. The product quality of spiral hole bar and drilling needle material has reached the world advanced level, and technological breakthroughs have been made in the products such as high-performance ball tooth and wind and fire wheel series roller ring. In September 2022, Zhuzhou Cemented Carbide Group Co., Ltd., affiliated to China Tungsten Hightech, won the 7th Hunan Provincial Governor Quality Award at the Quality Conference of Hunan Province, which is the highest quality honor established by the People's Government of Hunan Province.



Awarding ceremony of the 7th Hunan Provincial Governor Quality Award

Building a digital supply chain

We build a digital supply chain based on the industrial chain. By amplifying the advantages of enterprises in different sectors of the supply chain, we achieve win-win results for all parties, playing an irreplaceable role in the industrial chain.

CASE Building the strongest "brain" through digital empowerment

Based on the overall goal of creating a "digital corporate brain", we take procurement management as a base point to create supply chain management system. Centering on the core functions of added value, efficiency improvement and risk prevention, we improve the supply chain management system in key areas and critical links, and remove barriers between different links with digital concepts and methods. As a result, we can realize data interconnectivity, and combine the information flow, logistics and capital flow into one channel, improving resources allocation efficiency in the whole supply chain and reducing risks of the whole supply chain.

We set up trade index indicators to guide the development direction of the industrial chain, which will make a difference in building the supply chain and improving efficiency, as well as increasing the value-added capability. A unified digital supply chain management platform is established to realize the whole process management of procurement and sales, suppliers and customers, warehousing and logistics, and contracts and ledgers, so as to increase values, improve efficiency, prevent risks and decrease costs in the supply chain. Ultimately, the industrial chain, supply chain, value chain and innovation chain are interconnected, interdependent and mutually reinforcing each other, forming a sound supply chain ecology.

Carrying out strategic cooperation

Government-enterprise cooperation >>

China Minmetals and the People's Government of Fujian Province and the People's Government of Hebei Province have had in-depth exchanges on strengthening cooperation between enterprises and government, further expanding the industrial development, and deepening cooperation in multiple fields in an effective and pragmatic manner.



China Minmetals cooperates with the People's Government of Fujian Province.

<< Enterprise-enterprise cooperation

China Minmetals cooperates with many enterprises, such as China Railway Construction (CRCC), China Certification & Inspection Group (CCIC), China Construction Bank and Shandong Gold Group, to establish closer partnership and jointly promote mutual benefit and win-win cooperation.



Weng Zuliang, Party Group Secretary and Chairman of China Minmetals meets with Wang Jianping, Party Committee Secretary and Chairman of CRCC.

University-enterprise cooperation >>

China Minmetals cooperates with well-known domestic universities to explore a long-term mechanism for industry-university-research cooperation with universities, and to make innovative efforts to cultivate outstanding engineers.



Weng Zuliang, Party Group Secretary and Chairman of China Minmetals is at a meeting with Weng Tieshi, member of the CPC Leading Group and Vice Minister of the Ministry of Education.

<< International cooperation

China Minmetals is the Chinese presiding enterprise of the China-Chile Entrepreneurs Committee. Based on the investment fields of China and Chile, the Company has expanded the bilateral economic and trade cooperation and communication mechanisms between the two parties. Through further policy and information interconnectivity, we tap into the potential of project cooperation, providing channel support and platform services for cooperation upgrading between Chinese and Chilean enterprises during the COVID-19 pandemic.



Guo Wengqing, General Manager and Deputy Party Group Secretary of China Minmetals, attends the online roundtable meeting of the China-Chile Entrepreneurs Committee.

Organizing industry meetings

We actively organize industry conferences and high-end forums. The first ESG forum in the metal mining industry of China was held successfully, where a regular communication mechanism between enterprises and the government was established, leading companies in the industry joint hands to address challenges faced by industry development, and frontier research results were shared. Through this forum, we promote in-depth cooperation and exchanges among multiple parties, so as to contribute wisdom and power to industry development.



China Minmetals hosts closed-door roundtable meeting and high-end forum on China's new energy materials industry chain.

CASE Successfully hosting the first ESG forum in the metal mining industry of China

On November 29, 2022, the ESG Construction High-end Forum in the metal mining industry, sponsored by China Minmetals and organized by the China Institution for Economic Research in Metal Mining was successfully held online. This forum is the first of its kind in the metal mining industry of China. Guests from government departments such as the Social Responsibility Bureau of SASAC, professional research institutes, consulting institutions and representative enterprises gathered online to pool wisdom and offer advice to promote the development of China's metal mining industry. More than 3,000 audiences attended the forum online.



Overseas Community Development

In overseas communities and our operating locations, we take the initiative to practice social responsibility, improve the livelihood of local people, and create and share the fruits of development, thus contributing to the realization of UN SDGs.

Community Prosperity

Based on the characteristics of local communities overseas, we are committed to delivering concrete and lasting benefits to the the locals by providing skills training in a wide range of business areas and creating a variety of jobs.

CASE Attaching great importance to overseas community building

Over the past two decades of operating the Saindak Copper-Gold Mine in Pakistan, China Metallurgical Group Copper and Zinc Co., Ltd. (MCCT) has actively fulfilled social responsibility, strengthened the foundation of China-Pakistan friendship and consciously practiced the idea of a "community with a shared future for mankind". For example, we have invested about USD 20 million in education, medical care, people's livelihood and disaster relief, etc., and made outstanding contributions to promoting local economic growth, stabilizing the frontier and safeguarding and improving people's livelihood. The Saindak Copper-Gold Mine has been praised by governments on both sides as "a model of China-Pakistan economic cooperation and people exchanges".



MCCT's water supply project for local people



NCMCC provides financial support for the construction of local schools

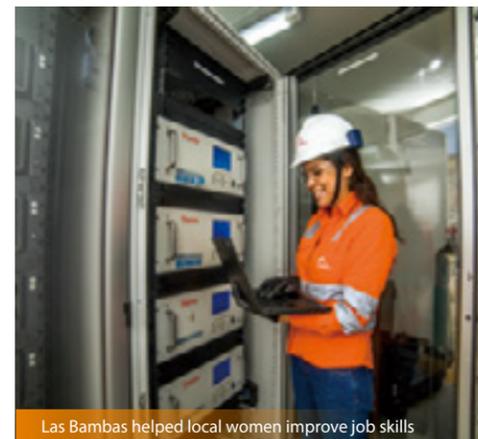
North China Metallurgical Construction Corporation (NCMCC) undertook the construction of the Duddar Lead Zinc Mine in Lasbela district, Balochistan, Pakistan. During this period, this project created 1,000 jobs directly and 3,000 more indirectly. Besides, the company actively supported the construction of local schools, like providing school supplies such as desks, chairs and stationery for the surrounding schools, repairing school buildings and providing free drinking water. It also regularly organized free medical consultations for local villagers, helped local villages to repair roads and installed solar street lights for over 10 villages. Most of the materials, like nearly USD 100 million of various materials, have been procured locally, driving the development of local industries such as grounding materials and building materials.

CASE Ramu NiCo and China Medical Team to PNG jointly provide healthcare services

From December 10 to 12, 2022, Ramu NiCo joined hands with the 12th China medical team to assist Papua New Guinea by holding large-scale free clinic in Matang, where the Ramu Nickel Cobalt Mine is located, improving health awareness among local residents and guiding people how to protect themselves from diseases scientifically. The company distributed more than 600 copies (boxes) of 22 kinds of medicines and medical equipment such as syringes for free. All these efforts were taken to improve local health conditions and protect people's lives and health, contributing to a closer friendship and cooperation and a community with shared future for China-Pakistan people.



Ramu NiCo and China Medical Team to PNG jointly provide healthcare services



Las Bambas helped local women improve job skills

CASE Las Bambas Women in Copper Program

A number of international studies are proving that gender diversity can directly contribute to companies' profitability. A more inclusive workforce that has higher work efficiency might also be a way to meet some of the mining industry's expectations and needs. Las Bambas is working to close gender gaps through its Women in Copper Program, equip outstanding female talents in the local community to master necessary job skills to be suitable for a variety of roles, learnings and insights are extended through training, seminars, advice from professional consultants and mining industry networking, with scope for promotion and leadership opportunities.

CASE Las Bambas Copper Mine implements the Andean crop project to ensure community food security

The Las Bambas Copper Mine implements the Andean crop project, which aims to end hunger, promote sustainable agriculture for community food security, increase household incomes, and create more jobs and sustainable development opportunities. According to the specific needs of different communities, the Las Bambas community team provides tailored technical support, establishes three agricultural associations to strengthen procurement positions, and holds agricultural expos to expand farm produce marketing channels. So far, 1,655 households in more than 17 communities have been involved in the project. The project has increased the yields of potatoes, barley and quinoa by 300%, 230% and 200% respectively and started growing garlic from scratch to 870 kg per hectare. The value per hectare of land has risen by 100%. The Las Bambas Andean crop project is a model of mining and agriculture reinforcing each other and is recognized as a demonstration agricultural project by the Chamber of Mines of Peru.



Las Bambas Copper Mine implements the Andean crop project to ensure community food security



Disaster Relief

In overseas communities, we implement effective measures in response to natural disasters and actively carry out rescue work and donations to help solve the urgent needs of overseas communities.

CASE Ramu NiCo plays an active role in disaster rescue to assist PNG

In September 2022, a 7.6-magnitude earthquake jolted Papua New Guinea. Ramu NiCo immediately activated the emergency response, sent personnel to the front line and organized the orderly evacuation. The company actively conducted disaster investigation, rescue work and emergency repair, and prevented disaster spreading and secondary disasters. In order to help the residents of the affected communities to resume normal life as soon as possible, Ramu NiCo visited villages and tribes to understand the disaster situation, discussed the relief and rescue plan, and urgently raised anti-earthquake materials to assist PNG communities.



Ramu NiCo conducts post-earthquake inspection of the project



CASE Southeast Asian Metallurgical Group of MCC Baosteel honored by VGCL

Taking the trade union as a bridge, the Southeast Asian Metallurgical Group of MCC Baosteel has played an active role in collecting employees' opinions and suggestions, protecting their legitimate rights and interests, improving the cohesion of the workforce, and ensuring the reform and development of the company. In 2022, "Harmony & Progress" sports festival, "Bearing Safety in Mind" knowledge competition, skills competition, staff care and other forms of activities were held to enhance the sense of honor and happiness of local employees and strengthen the cooperation and capacity of Chinese and Vietnamese teams. These activities also helped accelerate the localization process of overseas projects and promoted high-quality development of overseas projects. To this end, the Company was awarded the 2022 Outstanding Trade Union Award by Vietnam General Confederation of Labor (VGCL), becoming the only foreign enterprise to receive this honor in Ha Tinh.

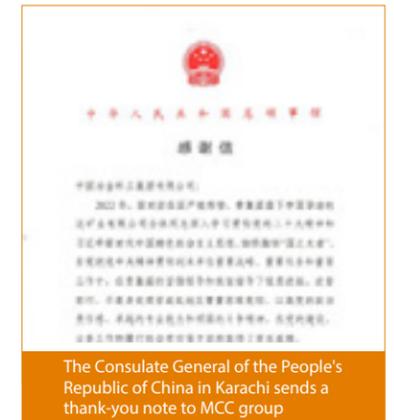


The Southeast Asian Metallurgical Group of MCC Baosteel is awarded the 2022 Outstanding Trade Union Award by the VGCL



CASE MCC Group fully supports the flood relief in Pakistan

In 2022, Pakistan was hit by a huge flood disaster. MCC Group put the affected people in Balochistan first and actively raised funds and materials to support the local flood relief. After the flood, the Company organized its employees to actively dredge, repair roads and networks and helped people in the surrounding communities, which forged the strong ties between China and Pakistan. In early 2023, the Consulate General of the People's Republic of China in Karachi sent a letter of appreciation to MCC Group in which they highly praised the Company's dedication to the local community in 2022.



The Consulate General of the People's Republic of China in Karachi sends a thank-you note to MCC group



MCC Group donates much-needed materials to Pakistan

Appendix

Outlook 2023

Facing the unprecedented changes in the world, China's development has entered a crucial period where strategic opportunities and risks and challenges coexist.

In the new era, China Minmetals will continue to adhere to the Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and comprehensively implement the guiding principles of the 20th National Congress of the Communist Party of China to push for high-quality development. We will take the initiative to develop core competitiveness, shape new driving forces to modernize the governance system and capacity, and build a world-class metal and mineral enterprise with global competitiveness to contribute to building a modern socialist country in all respects.



Sustainability Performance

Economic performance	2019	2020	2021	2022
Operating income (RMB 100 million)	6,104	7,039	8,502	8,983
Total taxes (RMB 100 million)	224	219	248	254
investment (RMB 100 million)	120	146	187	218
Number of new patents	4,278	6,778	8,477	9,598

Environmental performance	2019	2020	2021	2022
Year-on-year decline in energy consumption (%)	9.5	13.5	5.9	13
Year-on-year decline in COD emissions (%)	/	24.5	10	17.1
Year-on-year decline in SO ₂ emissions (%)	62.0	37.5	35	22.9
Number of environmental training sessions	9,003	7,674	6,001	5,328
Number of environmental training participants	250,000	210,000	232,594	276,321

Social performance	2019	2020	2021	2022
Number of employees	199,141	200,000	193,965	174,336
Number of female employees	39,828	32,699	>30,000	36,000
Work safety investment (RMB 10,000)	559,395	638,600	902,585	1,106,627
Number of employee training participants	421,655	608,382	1,234,518	1,196,793
Proportion of contracts executed (%)	100	100	100	100

Assurance Statement



Assurance Statement of Sustainability Report

TUV NORD(Hangzhou)Co., Ltd. ("TUV NORD" for short) has been commissioned by the management of China Minmetals Corporation ("China Minmetals" for short) to carry out an independent verification of the 2022 Sustainability Report ("report" for short).

China Minmetals is responsible for the collection, analysis, aggregation and presentation of information within the Report. TUV NORD implements this work within the scope of authority recognized in the agreement with China Minmetals (report verification). China Minmetals is the intended user of this statement.

This statement is based on China Minmetals 2022 Sustainability Report, and China Minmetals is responsible for the integrity and authenticity of the information and data in the report.

Verification Scope

This statement is based on below information:

- The economic, environmental, and social indicators disclosed in the sustainable development report from January 1, 2022 to December 31, 2022.
- Verification location: Tower A, Minmetals Plaza, No. 3, Chaoyangmen North Avenue, Dongcheng District, Beijing, the headquarter of China Minmetals, without visiting its subsidiaries and project locations.
- Data, cases, and management related information related to the company's sustainable development/social responsibility/ESG performance;
- We evaluate the collection, analysis, aggregation of the information and data.
- Due to the fact that economic data is audited by a third party, no duplicate audits will be conducted in this audit.

The on-site verification will be conducted from May 11th to 12th, 2023.

Assurance Methodology

Assurance process including following activities:

- Review the document information which provide by China Minmetals;
- Interview the person who collected the report information;
- View the related websites and media reports, verify the data and information through sampling method;
- Refer to GRI Sustainability Reporting Guideline(GRI Standards) on balance, comparability, accuracy, timeliness, clarity, reliability, and give the evaluation;
- Refer to AA1000AS (V3) Assurance methodology;
- Assurance activity is based on TUV NORD CSR report assurance management procedure.

Assurance Conclusion

China Minmetals sustainability Report provide an appropriate and objective view of the sustainability & social programs and performances in 2022. The data in report is reliable and objective, TUV NORD didn't find the system errors or substantial errors.

- Balance: The report objectively discloses the number of supplier blacklists and the number of safety hazards identified throughout the year, which has a certain degree of balance;
- Comparability: The report discloses the three-year performance of multiple indicators in the economic, social, and environmental fields in the form of a "sustainable development performance table", which is comparable;



- Accuracy: Through sampling review, it was found that the cases and data disclosed in the report are basically objective and accurate;
- Timeliness: The disclosure period of this report is 2022 sustainable development performance, and the company has issued reports regularly for sixteen consecutive years, with good timeliness;
- Clarity: The report uses various forms such as images, charts, and cases to make the information in the report easy to understand;
- Reliability: China Minmetals' social responsibility management team is responsible for collecting, recording, compiling, and analyzing the information and processes used in the preparation of the report. The sampled data during the verification process can provide traceability, to a certain extent, ensuring the quality and materiality of the information.

Suggestion for improvement

Through assurance and evaluation, we had following improvement suggestion on CSR practice and management:

- Suggest disclosing the relevant negative performance of the group and its subsidiary companies to improve the balance of the report;
- In the field of supplier management, it is possible to more comprehensively disclose the supplier management performance of subsidiary companies;
- Suggest disclosing the organization's energy consumption and pollutant emission density to facilitate the development of corresponding implementation plans based on their results.

Special statement

This statement excluding:

- The activity outside information reveal;
- The position, idea, faith, object, future developing direction, and promise which stated by China Minmetals.

Statement of Independence and Competence

TUV NORD Group is the world's leader in inspection, testing and verification, operating in more than 70 countries throughout the world and providing services which includes management systems and product certification; quality, environmental, social and ethical auditing and training; environmental; social responsibility and sustainability report assurance.

As one of the branches of TUV NORD Group, TUV NORD(Hangzhou)Co., Ltd. is independent, ensuring that there is no conflict of interest with China Minmetals or its branches and stakeholders during the verification process of implementing this Sustainability report. All information in this report is provided by China Minmetals, TUV NORD did not participate in the report preparation process.

TUV NORD(Hangzhou)Co., Ltd.

The team leader: Ms. Huang Li
Date :30th May.2023

The Authorized person: Mr. Song Haining
Date: 30th May.2023

Note: In case of any conflict between the Chinese and English versions of the statement, please refer to the Chinese version for accuracy.

Content Index

Chapters	GRI Index
About This Report	2-3
Chairman's Letter	2-22
CEO's Message	2-22
About Us	
Company Profile	2-1、201-1
Organizational structure	2-2
Corporate Governance	2-9、2-12、2-13
Party Building	205-2
Sustainability Management	
Corporate Culture	2-22
CSR Communi-cation	2-16
Materiality Analysis	3-1、3-2
Stakeholder Engagement	2-29
Progress in the 2030 Agenda for Sustainable Development	2-17
Spotlight 1: Building on a Decade of Endeavors for New Achievements	201-1、203-1
Spotlight 2: Supporting Rural Vitalization for Common Prosperity	203-1、203-2
Sharpening Core Competitiveness	
Metals and Minerals	2-6
Engineering Construction	2-6
Emerging Industries	2-6
Finance and Real Estate	2-6

Chapters	GRI Index
Shaping New Driving Forces for Reform and Development	
Optimizing Management	2-6
Leading by Technology	203-2
Propelling Digital Development	203-2
Preventing Safety and Environmental Risks	
Improving Safety and Environmental Risks Management	410-1、416-1
Strengthening Work Safety	416-1、416-2
Maintaining Green and Low-carbon Operation	302-3、302-4、302-5
Ecological protection	304-1、304-2、304-3
Pooling Dedicated and Professional Talents	
Creating a Growth Platform for Employees	404-2
Safeguarding Employees' Rights and Interests	2-7、401-1、401-2、405-1
Caring for Employees	403-3、403-5、403-6
Undertaking Responsibility and Mission to Make Contributions	
Promoting People's Well-being	203-1、413-1
Building a Win-Win Industrial Chain	413-1
Overseas Community Development	203-1、413-1、414-1
Appendix	
Outlook 2023	2-22

Feedback Sheet

Dear readers:

Thank you for reading the report. Any constructive suggestions to improve our CSR program and the quality of our sustainability reports are welcomed. Thank you for your support.

1. To China Minmetals, you are a/an:

customer government agency employee supplier (in its broad sense, including contractor)

environmental protection organization/NGO charity media the public others

2. Your overall impression of the sustainability report:

Very good Good Fair Poor Very poor

3. What do you think of this report?

	Very good	Good	Fair	Poor	Very poor
Information quality	<input type="checkbox"/>				
Structure	<input type="checkbox"/>				
Layout and design	<input type="checkbox"/>				
Readability	<input type="checkbox"/>				

4. What are the most important issues to you?

5. If you have any comments or suggestions on our CSR program and sustainability report, please specify.
