



2021 Sustainability Report



China Minmetals

China Minmetals 2021 Sustainability Report

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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 the tag of "Social Responsibility" on the homepage of the CMC official website.

Official website: <http://csr.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: Pengtu Design

About This Report

Reporting Period	This report covers the period from January 1 to December 31, 2021, and some parts may concern significant years in the development of the Corporation.
Reporting Cycle	The Corporation publishes the sustainability report annually and this report is the 15th sustainability report since 2007.
Reporting Scope	This report covers the information related to the headquarters and subsidiaries of China Minmetals Corporation. In view of the different business of subsidiaries, there will be slight differences in the boundary and range 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 GRI Sustainability Reporting Standards (GRI Standards) issued by the Global Sustainability Standards Board (GSSB). It also refers to the international standard Guidance on Social Responsibility (ISO 26000:2010), 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	All data contained herein are from the Corporation's official documents, statistics reports and financial statements as well as its sustainability practice information collected by sustainability information management system of the Corporation and reviews by the functional divisions and subsidiaries.
Report Availability	This report is available in both Chinese and English. Please contact us for a hard copy. You may also view the PDF version of this report in Chinese and English as well as the dynamic information related to CSR activities of the Corporation under "Social Responsibility" on the homepage of the China Minmetals' official website.

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Statement

Centering on the sustainability philosophy of "cherishing limited resources and pursuing sustainable development", the China Minmetals Sustainability Report 2021 is to convey the message to the public that we are committed to creating the greatest value for stakeholders, and to make known what we have done and achieved to build a valuable, innovative, safe, green, happy, win-win and harmonious image. Stakeholders are the most important resources for the Corporation's sustainable development. We adhere to the main theme of "cherishing stakeholders and making every effort 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, to enhance mutual trust and cooperation with them for common progress.

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

China Minmetals Corporation
 May 2022



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Message from the Chairman



Party Group Secretary and Chairman of
China Minmetals Corporation

Weng Zuliang

The China Minmetals Sustainability Report 2021 has been officially released. This report is the faithful recollections of the unity and bravery of all China Minmetals employees demonstrated in our unyielding fight against the lingering COVID-19 pandemic and the world is undergoing profound changes unseen in a century in the past volatile year. On behalf of China Minmetals, I would like to express hearty appreciation to friends from various sectors who have long cared for and supported the Company's reform and development through this report.

We believe that as a central state-owned enterprise (SOE), we should not only strengthen systematic thinking ability, but also shoulder political, economic and social responsibilities. We should think in big picture terms and contribute to national development; strengthen business performance and lead industrial development; and devote to public undertakings and win society-wide recognition. Looking back at 2021, all China Minmetals staff pressed ahead with these goals with perseverance and tenacity. In 2021, we resolutely implemented the major decisions of Chinese President Xi Jinping, the CPC Central Committee and the State Council, and achieved new breakthroughs in reform and development as well as in Party building. While fighting COVID-19, we harvested satisfactory business revenue, making a strong start on the 14th Five-Year Plan to celebrate the centenary of the CPC as a responsible SOE.

Upholding the foundation of the Company, we stayed committed to the mission of scaling up the real economy, and unremittingly strengthened, expanded, and increased returns on state capital. We demonstrated our responsibility to prosper the Company in pursuit of high-quality development to improve its quality, sustainability and stability. We upgraded corporate governance, and rolled out the three-year action plan of SOE reform in line with the guidelines of building modern enterprise system with Chinese characteristics. We stimulated the momentum of strong corporate development through independent sci-tech and innovation in the fields such as mining development, and low-carbon metallurgy. We cemented the foundation of the Company through earnest Party building. The glorious history of the CPC injected in us the power and wisdom to wholeheartedly adhere to the "two establishments" and "two upholds".

Bearing in mind the top priorities of the country, China Minmetals resolutely implemented the guidelines of Chinese President Xi Jinping on the Beijing 2022 Winter Olympics (Beijing 2022), especially his speech made during the visit to the National Sliding Center. We successfully completed the construction, operation and maintenance of numerous Beijing 2022 venues and supporting facilities and helped deliver an extraordinary game for the world. We actively performed social responsibilities and timely deployed manpower to

fight floods in Zhengzhou and Qilian. For decades, we supported six targeted assistance counties and provided partner assistance to one county as a part of our efforts in rural vitalization. Seeing the satisfying outcomes of the assistance projects, the officials and people from the seven counties were grateful for our help.

2022 holds the key to China Minmetals' full fledged implementation of the 14th Five-Year Plan. We will follow the guiding principles of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and deepen the guidelines of Chinese President Xi Jinping on SOE reform and Party building to make steady progress and implement the new development concept. We will roll out "five action plans" and build "China Minmetals with five characteristics" to build a world-class powerhouse with global competitiveness in the metals and minerals industry. We will perform economic, political and social responsibilities through stronger development to contribute to the 20th CPC National Congress with more outstanding achievements.

Message from the General Manager



General Manager and Deputy Party Group Secretary of
China Minmetals Corporation
Guo Wenqing

The year 2021 marked not only the centenary of the Communist Party of China but also the brilliant achievements made by China Minmetals. In 2021, China Minmetals earnestly studied the speeches and guidelines of Chinese President Xi Jinping, implemented the decisions of the CPC Central Committee and the State Council, and followed the strategic guidance of the 14th Five-Year Plan to grasp development opportunities, and maintain stable growth while improving quality and efficiency. We consolidated our main businesses and built our brand, boasting for a brilliant start of “over one trillion yuan of business revenue and two-fold increase in five years”, to celebrate the centenary of the CPC with concrete efforts and unparalleled records.

In 2021, our operating performance hit another record high with business revenue spiking, profit index hitting history high, and operation quality and efficiency improving in an all-round way. We saw burgeoning developments in the production and sales of the metal mining industry, the new material sector, and engineering construction. The metallurgical construction and operation continued to lead the intelligent, green, low-carbon and efficient development of China's steel industry, and the market influence of infrastructure construction and emerging industries increased significantly. The three-year action plan of SOE reform was effectively implemented with multiple highlights in sci-tech innovation, and in efficient management and control.

2021 also marked the sixth anniversary of China Minmetals' strategic restructuring. Over the past six years, China Minmetals made steady progress and explored a new path for high-quality restructuring and development. Our business performance repeatedly reached record highs, and our operating revenue, total profit and net profit have increased for six consecutive years. Our standing in the Fortune Global 500 jumped from 323rd to 65th, winning society-wide recognition.

In 2021, we put forward our general development strategy during the 14th Five-Year Plan, which is to become “a main force to ensure the security of resources and a national team to upgrade the metallurgical industry”. We took “optimizing the four beams and eight columns business system and aligning main and subordinate businesses” as the strategic path, and “never delaying and never slacking” as work style to achieve the goal of “over one trillion yuan of business revenue and two-fold increase in five years”. To this end, we will stay confident, stay resilient and work toward our goals in a down-to-earth manner.

2022 holds the key to the start of the 14th Five-Year Plan as well as the development of the Party and the country. We will follow the guiding principles of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and speed up high-quality development of the main businesses and enhance the competitiveness of the “four beams and eight columns” business system. We will strengthen brand building, upgrade market development, deepen reform and innovation for sustainable development. We will tighten management and control, and eliminate major risks to become a world-class powerhouse with global competitiveness in the metals and minerals industry in greeting the 20th CPC National Congress.

郭文清

About Us

Company Profile

China Minmetals Corporation (China Minmetals), headquartered in Beijing, was established as the result of a strategic restructuring of two Fortune Global 500 companies – the former China Minmetals and China Metallurgical Group Corporation (MCC Group). China Minmetals, an important state-owned backbone enterprise with metals and minerals as its core business, is directly managed by the central government and a pilot enterprise of state-owned capital investment companies.

In the course of more than 70 years' development, China Minmetals has undergone three main stages. From the State inception to the reform and opening-up, China Minmetals, as a professional trading company, was the main channel for the import and export of metals, minerals, hardware and building materials in New China. 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 global". In the 21st century, China Minmetals embarked on strategic transformation through restructuring and merger

and acquisition in the metal mining industry. In 2015, China Minmetals carried out strategic restructuring with MCC Group, a Fortune Global 500 company, and led the world in building a holistic industry chain 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.

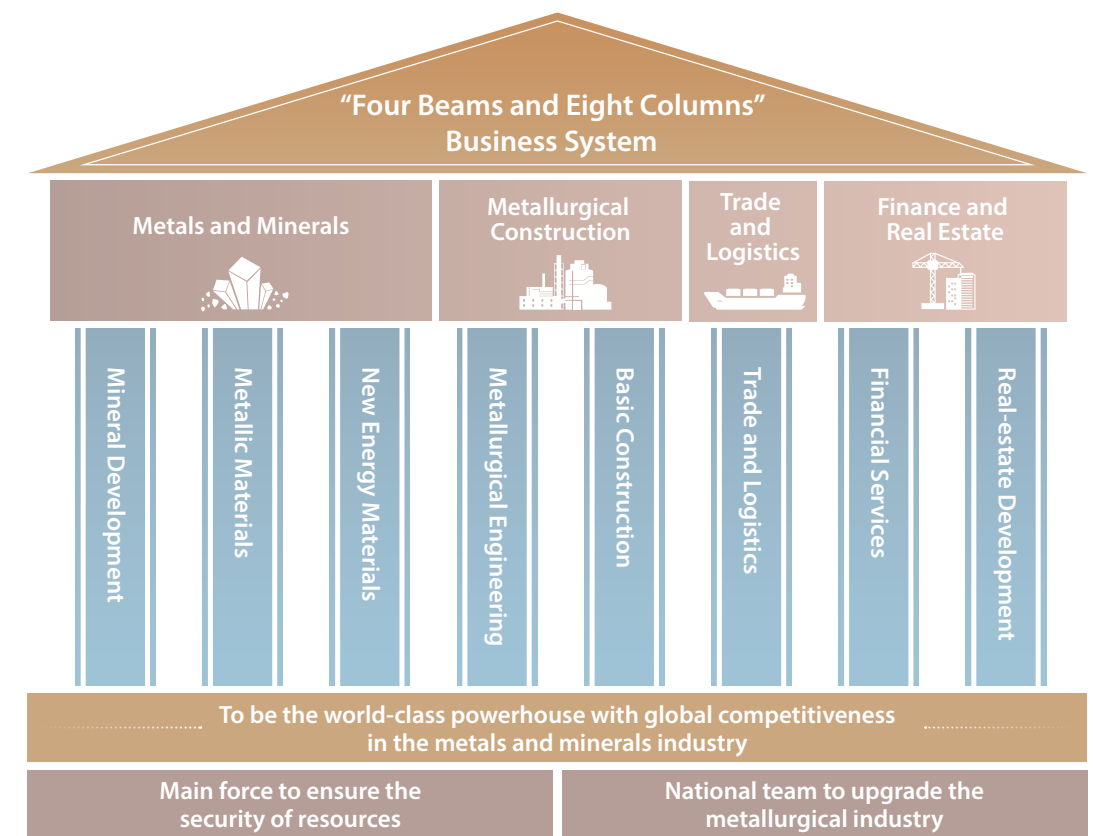
In the new era, following the the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, China Minmetals will abide by the philosophy of "cherishing limited resources and pursuing sustainable development". We will benchmark against world class counterparts, lead by example, carry out independent innovation, uphold a problem-oriented mentality, and strive for better quality. As a state-owned enterprise, we will make unremitting efforts to build a world-class powerhouse with global competitiveness in the metals and minerals industry.

In 2021

- Total assets: RMB 1.0039 trillion
- Business revenue: RMB 850.2 billion
- Total profit: RMB 26.47 billion
- Ranked in the Fortune Global 500: 65th

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	Minmetals Capital (600390.SH) Zhuzhou Smelter Group (600961.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)



With "becoming the world-class powerhouse with global competitiveness in the metals and minerals industry" as strategic vision, and "being a main force to ensure the security of resources and a national team to upgrade the metallurgical industry" as mission, China Minmetals owns a "four beams and eight columns" business system with metals and minerals, metallurgical construction, trade and logistics, and finance and real estate as the "four beams"; and mineral development, metallic materials, new energy materials, metallurgical engineering, basic construction, trade and logistics, financial services, and real-estate development as the "eight columns".

Organizational Structure



Corporate Governance

China Minmetals deeply integrates strengthening Party leadership with improving corporate governance, and formulates “three lists and one process” mechanism. The Party Group plays an essential role in “leading the direction, managing the overall situation, and driving implementation” in a systematic way based on regulations. We further clarify the power and accountability of the Party Group and other governance bodies, as well as the decision-making process. We also strengthen the building of the Board of Directors to ensure the majority of external directors, and specify the functions and powers of the Board.



We promoted the building of Board of Directors at 206 subsidiaries and put forward guidelines in this regard. We selected 30 subsidiaries to fulfill the functions of the Board, and urged them to formulate a “three majors and one large” list, the coverage of which reached 100%.

Party Building

China Minmetals earnestly implemented the guiding principles of Chinese President Xi Jinping’s speeches on July 1st and at the Sixth Plenary Session of the 19th CPC Central Committee and the spirits of the National Party Building Conference of SOEs. We ensured implementation through “five-step closed loop” mechanism, strengthened Party building through “five parallel working mechanisms”, improved Party building and business operation through “five integration” mechanisms to further align reform and development. We aim to develop into a world-class powerhouse with global competitiveness in the metals and minerals industry through high quality Party building.

“Five parallel working mechanisms”

- Establish long-term mechanisms through institutionalized means.
- Deepen the implementation of Party building through detailed lists.
- Promote work efficiency through standardized methods.
- Innovate Party building through brand building.
- Expand Party building through information based platforms.

“Five integration” mechanisms

- Integration from the strategic level to ensure systematic alignment. We actively involve ourselves in the development of the Party and the country and shoulder due political responsibilities as a “national team to upgrade metallurgical industry”.
- Integration from the system level for lawful operation. We specify the procedures before decision-making for major issues, and clarify the relationship between the Party Group and other corporate governance bodies.
- Integration from the operational level for institutional consistency. We set up demonstration posts and accountability areas for Party members, and encourage Party members to work hard, lead by example and strive for excellence.
- Integration from the assessment level for unified incentives. We assess employees in a comprehensive way, taking into account both business performance and performance in Party building.
- Integration from the corporate culture level for uniformity of ideology.



Theoretical foundation

- We consolidated theoretical foundation through leading study, themed seminars, educational videos, and online learning.
- We organized onsite sessions for Party members on the centenary of the founding of the CPC to consolidate their political faith.
- We resolutely integrated the spirits of Chinese President Xi Jinping's speech on July 1st and the guidelines of the Party Group at a higher level into the whole process of our work to strengthen responsibilities.

Organization development

- We formulated the *2021 Key Focus of Organization Work* which lays down the requirements and main tasks of related work.
- We standardized Party branch building through annual work plan, education and management of Party members and team building of Party branches.
- We improved the working mechanism of talent management under the leadership of the Party through upgrading the "cross appointment" leadership governance system.

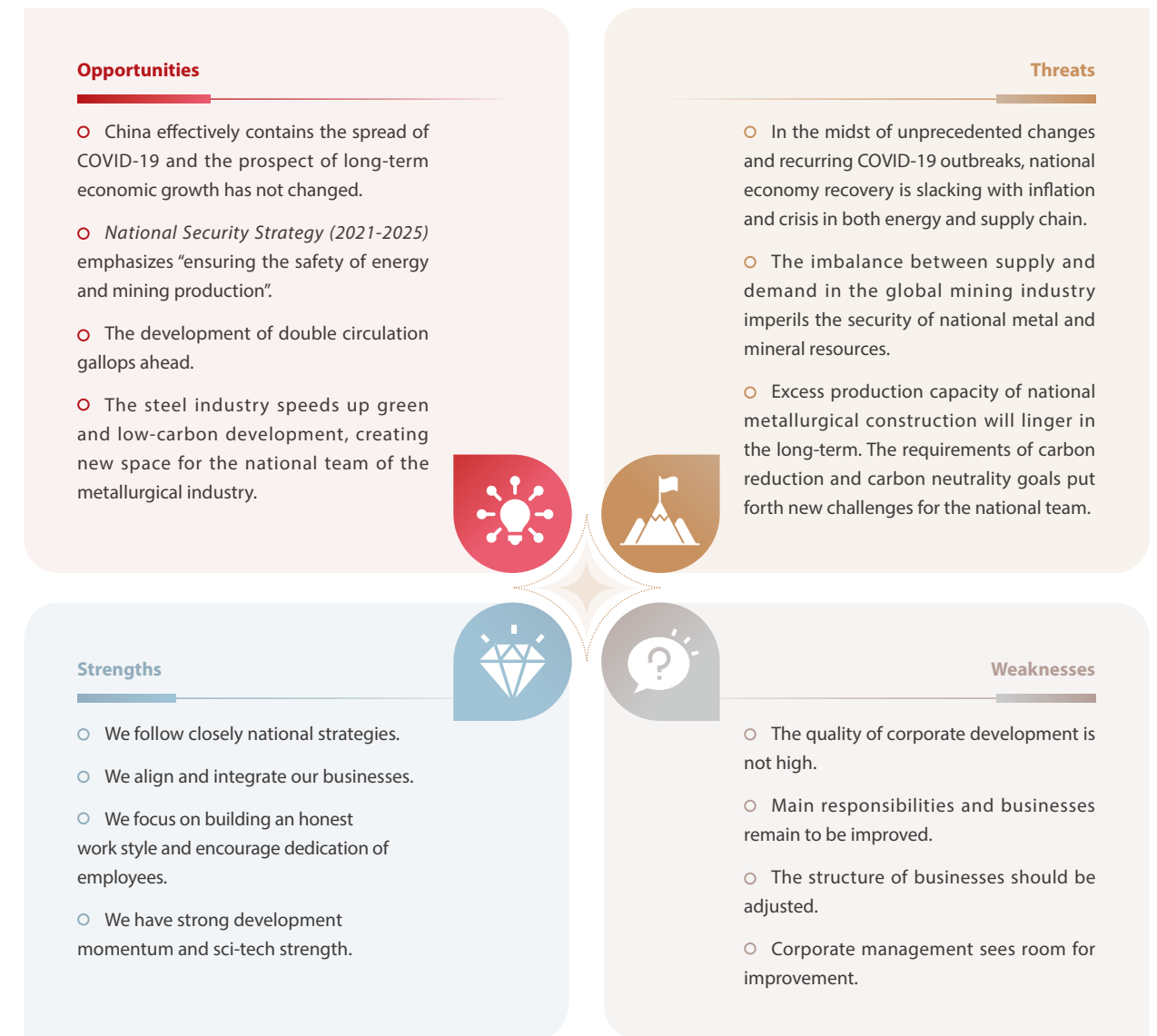
Conduct improvement

- We organized education sessions on the Party history and reviewed the inspection results of Party building of SOEs.
- We set up assessment standards on rectification and put forward the *Management Mechanisms of the Assessment of Inspection and Rectification* to deepen disciplinary inspection.
- We deepened "4+2" special rectification to build a sound environment of integrity. We inspected 203 units and improved 1,138 systems regulations.

System building

- We established "three lists and one process", including "three major and one large" list, list of decisions made by the headquarters, list of procedures and issues under key control. We integrated the overall Party leadership into decision-making, implementation, and supervision to ensure the Party Group lead the direction, manage the big picture, and promote implementation.

Sustainability Context



Our Actions

Under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, China Minmetals fully implements the guiding principles of Chinese President Xi Jinping on SOE reform and development and on Party building, the guiding principles of the 19th CPC National Congress and the plenary sessions of the 19th CPC Central Committee. We resolutely stand by the "two establishments" and "two upholds" and make progress while ensuring stable development. We fully implement the new development concepts in a complete, accurate, and comprehensive way to speed up high-quality development and strive to become a world-class powerhouse in the metals and minerals industry. We will contribute to stable macro-economic growth and steady social development through better and stronger development, as our effort to welcome the 20th CPC National Congress.

Benchmarking against the 2030 Agenda for Sustainable Development

Progress in Implementing the SDGs

	SDG1 Eliminate all forms of poverty in the world	By the end of 2021, we had lifted six targeted assistance counties, one county in partner assistance relationship with China Minmetals and numerous local impoverished counties.
	SDG2 Eliminate hunger, achieve food security and improved nutrition and promote sustainable agriculture	In targeted assistance areas, we promoted the cultivation of mushrooms, and golden silk chrysanthemum, the breeding of ducks and pigs, and the processing of cured meat.
	SDG3 Ensure healthy lifestyles and promote the well-being of people of all ages	We established three rural vitalization demonstration projects.
	SDG4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	We launched "loving packages" campaign and the "Mining Center" vocational educational support campaign along with other training programs.
	SDG5 Achieve gender equality and empower all women and girls	We insisted on equal employment, treated employees of different backgrounds equally and fairly, and developed a cloud platform for whole-process talent selection and recruitment management.
	SDG6 Ensure available and sustainable management of water and sanitation for all	We carried out the shanty town reconstruction project of Cuijia Village in Yanhe County and the red star international residential project in Zhenxiong County. We established three rural vitalization demonstration sites in Gaopo Village in Guozhu Town in Zhenxiong County, Lianghe Community in Lianghe Town in Yiliang County, and Aiqun Village in Heishui Town in Yanhe County.
	SDG7 Ensure access to affordable, reliable, sustainable and modern energy for all	We expanded our businesses related to new energy, energy storage, and anode and cathode materials of batteries.
	SDG8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	We launched 14 "insurance + futures" targeted assistance programs, benefiting 62,501 households in 11 towns in 8 provinces (autonomous regions, municipalities) of Xijiang, Gansu, Shaanxi, Henan, Chongqing, Guizhou, Yunnan, and Hainan. Based upon the "four beams and eight columns" business system, we maintained steady growth in business revenue, driving national economy development.

	SDG9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	We participated in the construction of venues and supporting facilities of 18 ice and snow events of the Beijing 2022. We built quarantine wards and nucleic acid testing laboratories in overseas mines. We undertook a series of major projects, including the construction of ecological restoration areas to lay out new business sectors.
	SDG10 Reduce inequality within and among countries	We supported the development of overseas communities in places where our projects were located, and made every effort to help local communities develop the economy, education, healthcare, agriculture, sports, and other undertakings.
	SDG11 Build inclusive, safe, disaster-resilient and sustainable cities and human settlement	We widely used prefabricated buildings, and energy-saving equipment, and combined temporary construction facilities with permanent facilities to reduce repeated construction, contain environmental pollution at construction sites, and promote green construction.
	SDG12 Ensure sustainable consumption and production patterns	We accelerated efficient, intelligent, and green development. Through consumption-driven campaigns, we purchased unsalable agricultural products in impoverished areas, and facilitated the selling of agricultural products through trade fairs and online platforms.
	SDG13 Take urgent action to combat climate change and its impacts	We led green, low-carbon and high-efficiency development of the metallurgical industry in China, and enhanced the endogenous driving force for the green and low-carbon transformation and development of the steel industry. We carried out carbon emission data forecast from 2021 to 2030 to provide data support for our carbon peak action plan.
	SDG14 Conserve and sustainably utilize the ocean, seas and marine resources for sustainable development	We strengthened the exploration of international seabed mining areas, carried out research on deep-sea mining technology, developed the business of acid-free treatment of metal surfaces, accelerated the development of environmentally friendly deep-sea intelligent dredging technology and equipment, and developed businesses centering on the marine mining technology.
	SDG15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	We invested in the construction of the Qilian Mountain ecological protection monitoring system. Intensified our efforts in soil restoration, air pollution control, sewage treatment, and solid waste treatment, and participated in the treatment of waste slopes and vegetation restoration, contributing to environmental protection.
	SDG16 Promote peaceful and inclusive society for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	We strictly upheld existing laws and regulations, the United Nations Convention against Corruption, World Bank Group <i>Integrity Compliance Guidelines</i> and other international rules, earnestly implemented compliance requirements, resolutely resisted violations, and promoted compliance management, compliance operations, and individual compliance.
	SDG17 Strengthen the means of implementation and revitalize the global partnership for sustainable development	We grew together with industry partners, created a sound, fair and transparent market relationship, and complemented each other's advantages in cooperation for shared prosperity and development of the industry.

Sustainability Management

New Sustainability Model

China Minmetals has accelerated the integration of the UN 2030 Agenda for Sustainable Development and the diamond-shaped CSR model to create a sustainability model in the new era, and contributed to the realization of the UN Sustainable Development Goals.

About the Model

Implication: The diamond-shaped model epitomizes China Minmetals' relentless pursuit of sustainable development and firm commitment to creating the greatest possible integrated value for the economy, the society, and the environment.

Rationale: "Maximum integrated value for the economy, the society, and the environment = Maximum positive impact on stakeholders - Minimum negative impact on stakeholders"

Elements of the Model

Core values: Cherishing limited resources and pursuing sustainable development

Main resources: Natural resources, human resources and social resources

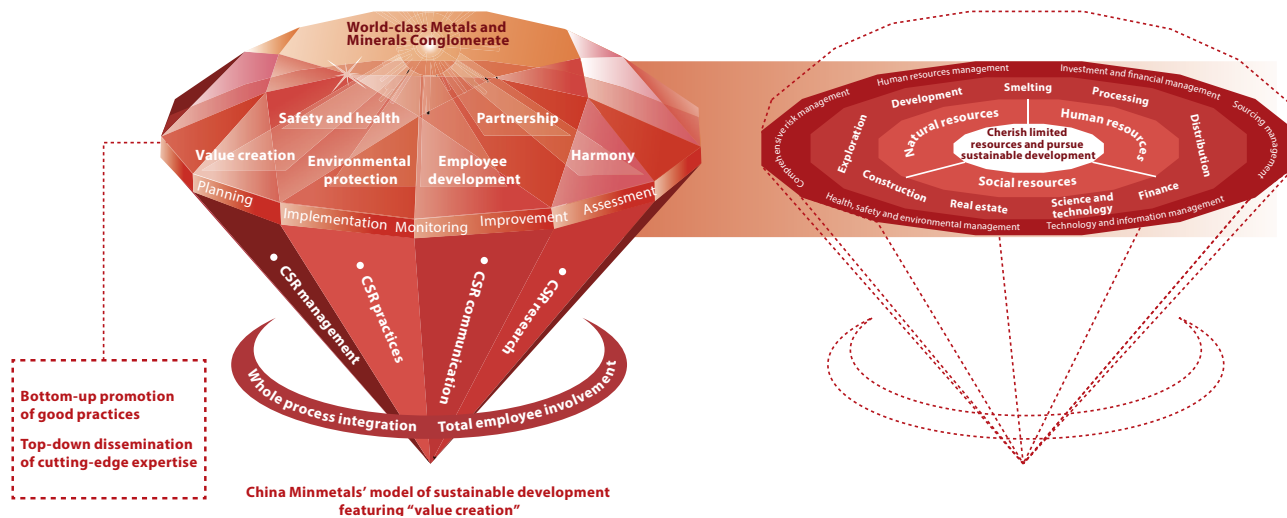
Means: Whole process integration and total employee involvement

Approaches: CSR management, CSR practices, CSR communication, CSR research

Process: Application to all areas of business and management

The Value Creation Formula of China Minmetals

$$\text{Max Comprehensive Value} = \sum_{\text{Max}} \text{Positive Effect} - \sum_{\text{Min}} \text{Negative Effect}$$



Corporate Culture

STRATEGIC VISION

A world-class powerhouse with global competitiveness in the metals and minerals industry

MISSION

Main force to ensure the security of resources
National team to upgrade the metallurgical industry

CORE VALUES

Cherishing limited resources
Pursuing sustainable development

Action guide, value orientation, corporate spirit

Adhere to the mission of becoming a world-class powerhouse

Adhere to the leading role of independent innovation

Adhere to the problem-oriented work approach

Adhere to the quality of excellence

Adhere to the spirit of never giving up



CSR Communication

China Minmetals is committed to building an effective CSR communication mechanism to gain an in-depth understanding and respond to the expectations and demands of stakeholders. In this way, we strive to urge all relevant parties to participate in the Corporation's decision-making and operation, ensure their rights to know, supervise, and participate, to achieve common development.

China Minmetals has established a sustainability reporting mechanism with 15 sustainability reports. On this basis, qualified subsidiaries are encouraged to issue their independent reports, the overseas performance reports and the sustainability reports of major projects, forming a three-dimensional reporting model of the company, subsidiaries and project-oriented reports.

China Minmetals Sustainability Report 2020
won
the GoldenBee Excellent CSR Report 2020 • Evergreen Award with Two Stars

China Minmetals Sustainability Report 2020
2020 Social Responsibility Report of Metallurgical Corporation of China Ltd.
MMG Sustainability Report 2020

In June, 2021, the official Tiktok account and video account of China Minmetals went online, opening up more channels for communication with stakeholders.

Let Mr. Tian Fang stop being arrogant created by China 19th Metallurgical Corporation under China Minmetals Corporation
won
the first prize of "the fourth excellent story of central enterprises"

Stakeholder Engagement

Based on the Corporation's actual operation and business, we seek to develop new modes of stakeholder communication and interaction, proactively identify key CSR topics, respond to stakeholders' concerns, and keep improving our CSR performance to grow together with all stakeholders.

<p>SASAC & Shareholders</p> <table border="1"> <thead> <tr> <th>Expectations and requirements</th> <th>Communication response</th> </tr> </thead> <tbody> <tr> <td>Compliance operation</td> <td>Special report</td> </tr> <tr> <td>Satisfactory market capitalization</td> <td>Increasing profitability</td> </tr> <tr> <td>Safety production</td> <td>Safety management</td> </tr> <tr> <td>Green development</td> <td>Energy conservation and emissions reduction</td> </tr> <tr> <td>Brand promotion</td> <td>Brand building</td> </tr> </tbody> </table>	Expectations and requirements	Communication response	Compliance operation	Special report	Satisfactory market capitalization	Increasing profitability	Safety production	Safety management	Green development	Energy conservation and emissions reduction	Brand promotion	Brand building	<p>Local Governments</p> <table border="1"> <thead> <tr> <th>Expectations and requirements</th> <th>Communication response</th> </tr> </thead> <tbody> <tr> <td>Tax payment according to law</td> <td>Taking the initiative to play taxes</td> </tr> <tr> <td>Employment promotion</td> <td>Providing support and guidance</td> </tr> <tr> <td>Economic development</td> <td>Driving economic growth</td> </tr> </tbody> </table>	Expectations and requirements	Communication response	Tax payment according to law	Taking the initiative to play taxes	Employment promotion	Providing support and guidance	Economic development	Driving economic growth	<p>Customers</p> <table border="1"> <thead> <tr> <th>Expectations and requirements</th> <th>Communication response</th> </tr> </thead> <tbody> <tr> <td>Contractual obligations</td> <td>Honoring contracts</td> </tr> <tr> <td>High-quality products</td> <td>Improving product quality</td> </tr> <tr> <td>Quality service</td> <td>Increasing service capacity</td> </tr> </tbody> </table>	Expectations and requirements	Communication response	Contractual obligations	Honoring contracts	High-quality products	Improving product quality	Quality service	Increasing service capacity
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High-quality Development for a Brilliant Start of the 14th Five-Year Plan

The year 2021 marked the centenary of the founding of CPC, and held the key to the "Two Centenary Goals". China Minmetals fully implemented the guiding principles of the 19th CPC National Congress and all plenary sessions of the 19th CPC Central Committee, worked hard and tirelessly to achieve a wonderful start of "over one trillion yuan of business revenue and a two-fold increase in five years" to celebrate the Party's 100th birthday with brilliant achievements.



Strategic Guidance and Layout

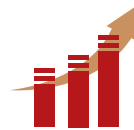


During the 14th Five-Year Plan period, the guiding ideology of China Minmetals includes: Follow the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era; fully implement the guiding principles of the 19th CPC National Congress and all plenary sessions of the 19th CPC Central Committee; thoroughly implement the important speeches and instructions made by Chinese President Xi Jinping on the reform and development of SOEs and on Party building; accurately grasp features of the new development stage, fully implement the new development philosophy, and deeply integrate into the new development pattern; focus on the goal of becoming a "world-class powerhouse" while continuing to promote high-quality development and enhance competitiveness; comprehensively boost forces driving development and strengthen new drivers of growth, and unremittingly strengthen, expand, and increase returns on state capital.



Launching strategies and actions to promote innovation-driven development

We leverage our technological advantages and the institutional strength of concentrating resources to get things done, improve systematic coordination, and highlight independent innovation in an effort to accelerate the development towards the high end of the industrial chain and value chain, and build a high-level competitive edge.



Taking actions to enhance competitiveness and exploit business potential

With a scientific indicator system for contractual management, we regard improving the efficiency of personnel and things as a key measure to enhance competitiveness. We regard "cost reduction" as the long-lasting theme of competitiveness enhancement, and continue to tap potential and increase efficiency to foster competitiveness with a focus on key indicators.



Launching the three-year action plan for SOE reform to stimulate reform

We continue to deepen trial reforms in state capital investment companies, fully implement the key tasks of the three-year action, and create an upgraded version of the "China Minmetals Model." We scientifically grasp the timing, methods, and pace in steadily promoting reforms, so as to fully stimulate enthusiasm and creativity to create an independent market entity.



Implementing capital operations strategy to stimulate the vitality of capital

We enhance our awareness of being an industrial investor and a capital manager, and make full use of the "two engines" of industrial management and capital operations. We take advantage of the capital market to achieve a virtuous circle and orderly expansion of industry and capital, and realize the overall circulation and interaction of assets and capital through capital operations.



Implementing restructuring and integration strategies to enhance synergy

We steadily advance internal integration to build a professional, efficient and standardized industrial platform, and actively promote external mergers and acquisitions and restructuring to achieve the continuous growth of the industrial system.



Implementing the strategy for developing high-caliber personnel and stimulating the vitality of talents

We attach great importance to the strategy for developing high-caliber personnel, and regard it as a major and urgent task. We are committed to building a contingent of competent personnel and a more reasonable personnel structure to support the implementation of the Company's development strategies during the 14th Five-Year Plan period.

Brilliant Opening to a New Chapter



In 2021, China Minmetals deeply implemented the important speeches and instructions made by Chinese President Xi Jinping, thoroughly fulfilled the deployments of the CPC Central Committee and the State Council, and implemented the spirits of the speech delivered by Chinese President Xi Jinping during his visit to the National Sliding Center. We enhanced “four consciousnesses” and “four-sphere confidence”, and adhered to the “two upholds”. During the centenary of the CPC, we made new achievements in reform and development and Part building, increased business revenue while containing the virus as a responsible SOE to make a brilliant start in the 14th Five-Year Plan.

Annual operating revenue over
RMB **800** billion

Net operating cash flow
RMB **49** billion

Net profit increase from the previous year
10%

As a central SOE, we actively fulfilled the mission to scale up the real economy, and strove to strengthen, expand, and increase returns on state capital. Throughout the year, the metal mining industry achieved “stable production and sales, steady cost, and high efficiency”. We gave full play to the unique competitive edge of metallurgical construction and operation, designed the hydrogen energy development and utilization demonstration project of HBIS Group Xuansteel Company with high standards, led the green and low-carbon development of China’s steel industry, and built high-quality projects including the National Sliding Center.

Resolutely adhering to high-quality development, we saw spikes in the annual business revenue, total profit and net profit compared to the previous year. Since the strategic restructuring, we achieved increases for six consecutive years with better operation quality, stronger risk avoiding ability, and more stable and sustainable development.

We solidly promoted the three-year action plan of SOE reform, the “two major political principles” of adhering to the Party’s leadership over SOEs and building a modern enterprise system as the guidance to SOE reform. We made sure the Party Group play an essential role in a systematic way based on regulations. We continuously improved the market-oriented operation mechanism of matching responsibilities with rights, and comprehensively rolled out the tenure system and contractual management of the management staff at the subsidiaries.

1
Further highlighting the main responsibilities and businesses

2
Further stimulating the momentum of corporate development

3
Further consolidating the quality of corporate development

4
Further strengthening Party building

5
Further improving corporate governance

6
Further preventing and controlling COVID-19

Relying on independent technologies, we further forged our strengths in green and efficient development of mineral resources, clean and low-carbon metallurgy, deep-sea mineral resources exploitation, and preparation of new energy materials to grow into a major sci-tech force in the industry.

We earnestly studied and implemented the spirits of the speeches made by Chinese President Xi Jinping on July 1st, of the Sixth Plenary Session of the 19th CPC Central Committee, and of the National Party Building Conference of SOEs. We guaranteed implementation through “five-step closed loop” method, improved the quality of Party building through “five parallel working mechanisms”, and deepened integration through “five integration” mechanisms. We vigorously consolidated poverty alleviation results and further aligned them with rural vitalization to fully fulfill the social responsibility as a central SOE.

In accordance with the general requirements of preventing both imported cases and local cases, we tightened control of key areas, enterprise and personnel, coordinated the deployment of COVID-19 containment forces, and effectively ensured normal business operation. We gave emphasis to the well-being of people, of life, and of the safety and health of employees at home and abroad, and worked hard to help overseas personnel return home.

Consolidating Poverty Alleviation Results for Rural Vitalization

In 2021, China has eradicated absolute poverty and regional poverty, and entered a new stage of consolidating the achievements of poverty alleviation and aligning them with rural vitalization. The CPC Central Committee and the State Council have made it clear that rural vitalization is a major strategy in embarking on a new journey of building a modern socialist country in an all-round way. China Minmetals actively responded to the advocate of the Party, carried out the new task of rural vitalization, and adhered to the three principles of "accuracy, distinction and efficiency" to continue to solidly and orderly promote the assistance work to six targeted assistance counties, one county in partner assistance relationship with China Minmetals*. The Poverty Alleviation Office of China Minmetals was awarded the title of "National Outstanding Collective in Poverty Alleviation".



* China Minmetals provided targeted assistance to Zhenxiong County, Yiliang County and Weixin County in Yunnan Province, Huayuan County in Hunan Province, Yanhe Tujia Autonomous County and Dejiang County in Guizhou Province. Among them, Zhenxiong County, Yanhe County and Yiliang County are key national counties for rural vitalization. Qilian County in Qinghai Province is in partner assistance relationship with China Minmetals.

Throughout 2021, China Minmetals and our subsidiaries pledged to all assistance areas

Invested non-reimbursable aid fund
RMB **66.977** million

Agricultural products were purchased and helped sell
RMB **49.282** million

Throughout 2021, for **SIX** targeted assistance counties

Invested non-reimbursable aid fund
RMB **54.497** million

Invested reimbursable aid fund
RMB **520** million



Attracted investment for free aid
RMB **22.759** million

Agricultural products were purchased
RMB **45.316** million

Agricultural products were helped sell
RMB **3.966** million

Carried out training on primary-level officials
2,753 person-time

Improving the Top-level Design for Targeted Assistance

We earnestly studied a series of important speeches made by Chinese President Xi Jinping on poverty alleviation and rural vitalization, followed the deployments of the CPC Central Committee and the State Council, and continued with assistance responsibility, support, policies and supervision to upgrade the leadership and working systems for rural vitalization. We timely formulated work plans, highlighted key measures, and organized education and training sessions on Party history and on contributing to public well-being to shoulder responsibilities.

● Laying down responsibilities and work plans

China Minmetals timely adjusted the leading group of poverty alleviation into the leading groups of targeted assistance and counterpart assistance, formulated the annual work plan which specifies 23 measures from 5 aspects, putting forward unified thoughts, lucid ideas and clear requirements. We assigned members of top management and subsidiaries to counties in partner assistance to launch research, provide guidance, and visit households to investigate the implementation of rural vitalization policies. Throughout 2021, we carried out twenty-five supervision and guidance, of which seven times were done by the top leading groups, covering seven counties, formulating 23 reports and identifying 44 problems.

Supervision and guidance in 2021

25

Supervision reports

23

Problems found

44

● Sending selected officials to rural areas

China Minmetals continued to select young officials with good political awareness, strong work ability and honest work style, and dispatched ten of them to six targeted assistance counties for temporary positions with the tenure of no less than two years. We continued to standardize the management of officials at temporary positions, sign letters of responsibility, and tighten work discipline. Officials at temporary positions shall summarize, report and communicate key projects and junctures on a regular basis.

● Scaling up financial investment

China Minmetals further optimized the whole-process closed-loop assistance mechanism covering construction, assistance, supervision and consumption, and budgeted annual assistance fund in accordance to project implementation to ensure the flow and efficiency of the fund. Throughout 2021, we pledged a total of RMB 66.977 million non-reimbursable aid fund to all assistance programs undertaken by China Minmetals and our subsidiaries, including RMB 54.497 million for six targeted assistance counties, offering greater help to them than in 2020.

In addition, China Minmetals continued the assistance through driving consumption. We signed marketing contracts with production enterprises and cooperatives, and mobilized members of over 700 labor unions to purchase special products from our assistance regions. In 2021, we purchased a total of RMB 45.316 million of agricultural products from these regions out of poverty, and helped sell RMB 3.966 million of agricultural products.

Innovating in the Modes of Rural Vitalization

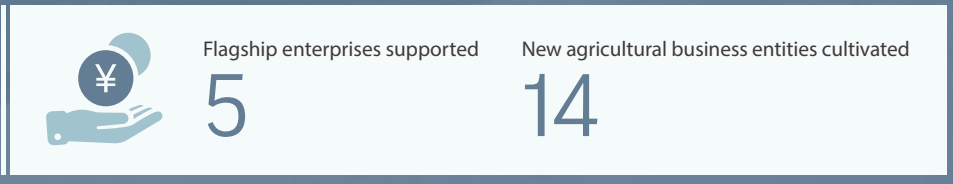


In 2021, China Minmetals further strengthened and perfected our tried and true special assistance mode based in the previous poverty alleviation work, and established a series of characteristic, powerful and effective assistance projects focus on "five dimension vitalization".

Driving the development of local industries

Rural vitalization must go hand in hand with thriving local industries. In 2021, China Minmetals focused on cultivating one special industry and one special brand in every county and continued to build a model of "funded by central SOEs + operated by rural cooperatives + increased incomes of registered households + promoting sales of products in the company + fostering internal drivers through the clear distribution of incomes". We supported five flagship enterprises, cultivated fourteen new agricultural business entities, created demonstration projects for rural vitalization, and helped six counties accelerate the industrialization of agriculture and animal husbandry.

We have built mushroom planting bases, breeding bases for ducks fed on corns and oil-tea camellia processing bases in Huayuan County; mushroom planting bases, standardized breeding bases for laying hens and agricultural product exhibition and marketing center in Zhenxiong County; chrysanthemum breeding and processing bases in Dejiang County; navel orange and pear bases in Yanhe County; and dried noodles and kiwi processing bases in Weixin County, so as to unleash the potentials of local industries and increase people's incomes.



▲ The mushroom industry in Huayuan County in Hunan Province

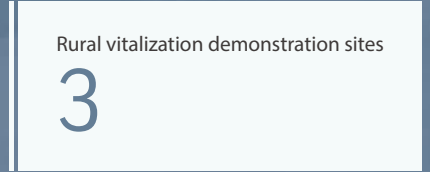
Supporting local talent training

Focusing on the industrial characteristics of each targeted assistance county and counterpart assistance village, China Minmetals carried out targeted training on the guiding principles of the Sixth Plenary Session of the 19th CPC Central Committee, on Party history, on rural vitalization policies, on agriculture, rural areas and farmers, and on laws and regulations for primary-level officials 1,233 person-time. We organized training on agricultural project operation and management, mushroom cultivation, and export business operation for rural vitalization leaders and technicians 1,520 person-time.

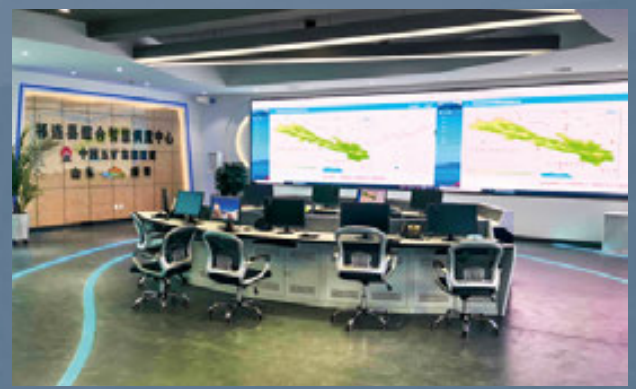


Promoting local culture and ecology through tourism

China Minmetals invested RMB 520 million as reimbursable assistance in the shanty town renovation project of Cuijia Village in Yanhe County and the Red-star International Residence project in Zhenxiong County. We built three rural vitalization demonstration sites in Gaopo Village in Guozhu Town in Zhenxiong County, Lianghe Community in Lianghe Town in Yiliang County, and Aiqun Village in Heishui Town in Yanhe County to promote local culture and ecology.



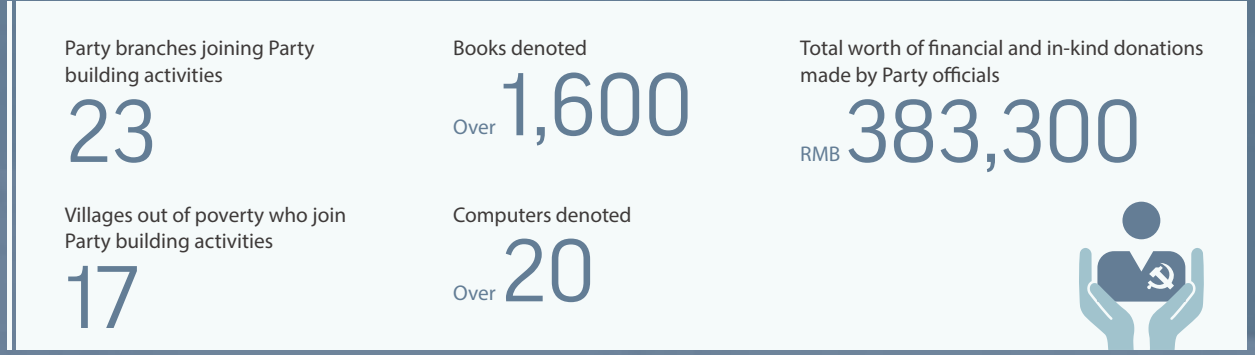
Relying on the advantages of our subsidiaries in agricultural consultation, planning, design and construction, we tapped the potentials of the assistance counties in red tourism and ethnic tourism resources to foster a stable driving force for poverty alleviation through promoting local culture and ecology. We designed the overall scheme of new rural construction for Heishui Town in Yanhe County, helped Huayuan County develop the Shibadong Village tourism project, and developed Gaopo Village, a Yi village in Zhenxiong County into a home-stay tourism destination. We signed a strategic cooperation agreement with CYTS to improve Zhenxiong County's karst doline and cave cluster ecological and cultural tourism project to further integrate cultural tourism operation with new business forms, and pool the strength of rural vitalization and development.



▲ Qilian ecological environment monitoring system of Qilian County in Qinghai Province

Supporting rural vitalization through Party branches

China Minmetals stayed committed to promoting rural vitalization through Party building, and organized primary-level Party branches at subsidiaries to launch Party building activities with their counterparts in targeted assistance areas.



Making Concerted Efforts for Stronger Development

Devoting greater efforts to special assistance

For four consecutive years, China Minmetals attracted investment for free aid to six targeted assistance counties. In 2021, we attracted investment RMB 22.759 million, an increase of 9.7% over 2020, mainly for procuring special education equipment for children with hearing and speech impairments, children with cerebral palsy and other disabilities, as well as for love assistance projects such as “loving packages” and “dear mom”. Our assistance efforts remained consistent for the special projects.

In 2021, we attracted investment RMB **22.759** million for free aid

CASE Launching “futures + insurance” financial assistance for five consecutive years

In 2021, relying on the foundation of finance, Minmetals Futures expanded the coverage of the “futures + insurance” pilot assistance project, and initiated 14 pilot projects and concluded 12 projects. The projects benefited 62,501 households (12,203 households on the verge of poverty that can fall back in), 84 cooperatives, 140 family farms and 16 agricultural enterprises in 11 counties of 8 provinces

(autonomous regions and municipalities) including Xinjiang, Gansu, Shaanxi, Henan, Chongqing, Guizhou, Yunnan and Hainan. The projects involved six varieties of products, such as natural rubber, apple, pig, corn, soybean meal and cotton, weighing 96,425 tons. There was 255,639 mu planting area under protection, and 168,000 pigs (with the total yield of soybean meal feeding 130,300 pigs).

CASE The “Mining Center” vocational education campaign

We launched the “Mining Center” vocational education program, providing free vocational education lasting three years and securing the employment for outstanding students from 6 targeted assistance areas.

In 2021, China Minmetals invested RMB 2.08 million in the project and enrolled 50 disadvantaged students, bringing them new life and new hope in the new era. At present, the “Mining Center” owns a total of three classes with 128 students majoring in ten fields, such as welding processing, cold metal plate processing, and automobile maintenance. Two students joined the welding training team of the World Skills Competition for intensive training.



Students of the “Mining Center” learning welding technology under the guidance of the teacher from Panzihua Technician College

CASE Loving package donation for eleven consecutive years

Every year, China Minmetals works with China Foundation for Poverty Alleviation to send loving packages to children in underdeveloped areas. After eleven years of unremitting persistence, we have delivered more than 100,000 loving

packages. In 2021, China Minmetals continued the effort in six target assistance counties and one counterpart assistance county. The packages build a bridge between China Minmetals and the children.



Children receiving loving packages

Sharing our experience

China Minmetals made full use of the mainstream media and its own convergence media platform for internal and external publicity to showcase our achievements, experience and practices for rural vitalization. More than 30 original reports were published by the state-owned media and local mainstream media, with more than 10,000 retweets. In the 2020 *China Minmetals Sustainability Report*, we set up a new section featuring “Fulfilling the Commitment of Poverty Alleviation”. We also advocated the spirit of poverty alleviation through a series of videos.

Together, the state-owned media and local mainstream media dedicated more than **30** original reports

The Metals and Minerals Industry

Aiming at becoming a world-class powerhouse with global competitiveness in the metals and minerals industry, China Minmetals has continuously improved its competitiveness, innovation, control, influence and risk resistance to become one of the world-class flagships of the mining industry with large scale, strength, comprehensive industrial chain and international level, ranking the first among its peers in the Fortune Global 500.



Orderly Operation of Mines

38 mines
at home and abroad

Of which

15 mines
overseas

Resources are the source of the industrial system, and metals are the foundation of a manufacturing powerhouse and the necessity of a better life for people. China Minmetals owns rich metal and mineral resources with 38 mines at home and abroad in Asia, Oceania, South America and Africa, among them 15 are located overseas. Our world-class active mines, such as the Las Bambas Copper Mine in Peru, Dugald River Zinc Mine in Australia, Ramu Nickel Cobalt Mine in Papua New Guinea and the Hunan Shizhuyuan Nonferrous Metals Co., Ltd. operate stably. The metal varieties we handle cover about 70% of China's strategic mineral catalog. The stock of tungsten, crystalline graphite and bismuth rank among the top in the world, and the stock of copper, zinc, lead and antimony also rank world top.

We actively seek increment and stabilize stock. In 2021, the metal mining sectors achieved "stable production and sales, steady cost, and high efficiency". We expanded the scale of bulk minerals, increased stock, and improved the self-sufficiency rate of resources. For strategic small varieties, we made them special to improve the industry concentration.

Stable and high yield of active mines

We continued to improve the overall operation level of domestic and foreign mining projects. In 2021, Las Bambas Copper Mine, Dugald River Zinc Mine, Ramu Nickel Cobalt Mine, Saindak Copper Mine, Duddar Lead Zinc Mine, and Tungsten Mine were run at full capacity, with the total profits increasing significantly year-on-year; and Shuikoushan Lead Zinc Mine and the stocks of other resources saw strong growth.

Powerful construction of new mines

The construction of Chentaigou Iron Mine, the Second Stope of Las Bambas Copper Mine, and the deep ore body of Luzhong Mining has been accelerated; and Qingfa Mining was completed and put into operation. Hunan Nonferrous Metals Huangshaping and Shuikoushan increased lead-zinc ore by 1.4 million tons and 710,000 tons respectively throughout the year through edge and deep prospecting, ensuring the continuous development of resources.

Rapid strides in new materials

Attaching great importance to developing new energy materials, China Minmetals continued to upgrade the business layout of new generation power battery materials and technologies to unleash the advantages of an integrated and comprehensive industrial chain for new energy materials. Minmetals Salt Lake has made breakthroughs in the "high-efficiency lithium extraction technology from Salt Lake raw brine", shortening the original two-year production cycle to 20 days, eyeing great increase in the comprehensive recovery rate of lithium resources, and ranking the second place in China for lithium carbonate output. The battery foil project of North China Aluminum Co., Ltd. successfully attracted leading strategic industrial investors such as CATL. Its "1070 alloy battery foil project for high-performance lithium iron phosphate hybrid power cells" won the Alufoil Trophy China 2021 and has been successfully applied to a variety of high current collection battery cell packs, including new hybrid power cells and blade batteries.

The "1070 alloy battery foil project for high-performance lithium iron phosphate hybrid power cells" won the Alufoil Trophy China 2021.

► Initiation of the new energy battery foil project of North China Aluminum Co., Ltd.



The mining area of Las Bambas Copper Mine

CASE The successful listing of Changyuan Lico

Changyuan Lico is among the first Chinese enterprises to engage in R&D and production of ternary cathode materials, and it has successfully penetrated the supplier system of mainstream lithium battery manufacturers such as CATL, BYD, EVE, and Sunwoda. In 2021, Changyuan Lico was listed, raising more funds than expected, laying a solid foundation for China Minmetals' new energy battery material industry.

In 2021, the phase I and phase II of Changyuan Lico's ternary material 80,000 tons project was put into operation, and the market share ranked among the top three in the industry; the 60,000 tons lithium iron phosphate project was launched, seeing continuous improvement in the product structure.



Efficiently promoting the construction of the phase I project of expanding the production of automotive lithium battery cathode materials

CASE Propelling the phase I construction of Hegang graphite

In 2021, China Minmetals Graphite started the construction of a green and intelligent mine, boasting an annual output of six million tons of ore graphite, 200,000 tons of fine powder and 50,000 tons of spherical graphite in Hegang, accelerating the building of an integrated chain of "resources + production capacity + new materials" and of a world-class crystalline graphite base. As the only entity

integrating graphite resources in Hegang, China Minmetals Graphite responded actively to the national carbon peak and neutrality strategy, and established an intelligent management and control platform to continuously improve the comprehensive utilization rate of resources and explore a new path for the green development and use of graphite resources.

Strategic Layout of Resource Exploration

China Minmetals closely follows the national strategic guidance, and tirelessly enriches the variety of metals. We study major mining projects worldwide to improve our ability in global resource acquisition, and ensure the safety of scarce minerals. We develop and incubate emerging strategic minerals, and tighten the control of dominant minerals to further promote exploration and prospecting.

In China

We took stock of the mining companies and assets in key provinces, formulated control standards for strategic mineral resources, identified potential investment targets, actively aligned with local plans, and further promoted the domestic regional layout through cooperation with large-scale platforms.

Overseas

With risks well under control, we summarized the experience of Chinese enterprises in "going global" to obtain overseas mineral resources in the past decade, and timely followed policy changes and project developments to actively and steadily promote the layout of overseas investment.

CASE Successful implementation of 2021 voyage in polymetallic nodule contract area

In 2021, the fourth voyage mission carried out by China Minmetals at the exclusive exploration mining area of the international seabed set a record of 111 days' longest voyage without supply and personnel rotation in the history of China's scientific research in oceans. The mission which mapped the terrain and landform, nodule abundance, coverage, continuity, mining environmental conditions, main metal element content and other characteristics of the mining area lays a solid foundation for national deep-sea mining researches and future commercial mining programs.

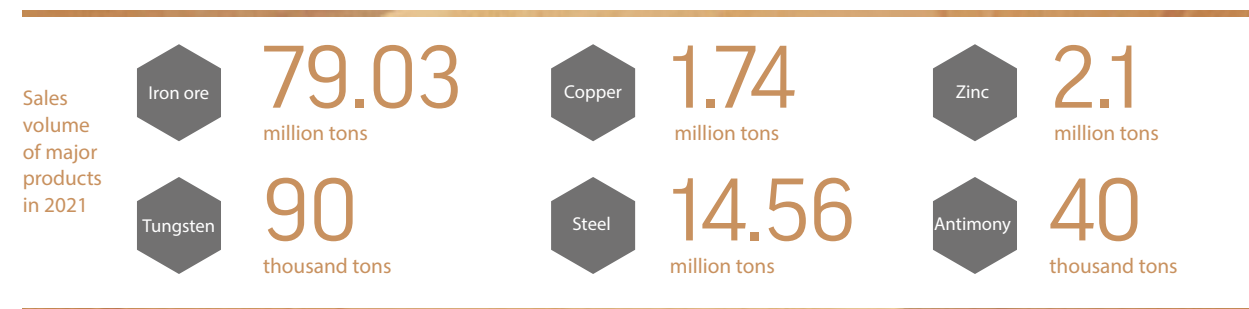


China Minmetals successfully carried out the fourth mission at the international seabed's exclusive exploration area

Stable Supply and Price of Trade and Logistics

China Minmetals owns a global trade network with outstanding warehousing, logistics, distribution and delivery capabilities. As a large-scale domestic service provider for the circulation of bulk metal and mineral products with wide network coverage and comprehensive service capabilities, we dominate a leading position in the trade of bulk metallurgical raw materials and the distribution and supply of steel engineering.

Adhering to the strategic requirements of serving the country and seizing the opportunity of rising market prices, the total sales volume of metal and mineral products reached historical high, amassing 120 million tons in 2021.



Note: the above business volume data include production business and trade business



China Minmetals gave full play to the function of electronic trading platform for bulk commodities and actively implemented the national requirement of “ensuring supply and stabilizing prices”. China Minmetals’ Electronic Auction Platform (I.oTeng) under Minmetals Development has become a platform for stocking and destocking national metal materials. During the four phases, the platform released 110,000 tons of copper and 180,000 tons of zinc, effectively curbing the expectation of rising commodity prices. The National Strategic Reserve Center sent us a letter of thanks.

Giving full play to the trade in blending ore at ports, we continued to vigorously expand the Caofeidian International Ore Trading Center, and the trade in blending iron ore increased by 15% year-on-year. Fangchenggang and Lianyungang bonded blending ore bases were completed and put into operation, with the cumulative volume of blending copper concentrates exceeding 240,000 tons.



Via the integrated network of domestic and foreign trade, we made use of our own mineral resources and overseas cooperation channels to promote recycling and import. The import volume of bauxite, zinc concentrates and copper concentrates increased significantly, effectively alleviating the shortage of raw materials for domestic metallurgy enterprises. We expanded new sources of goods such as from Russia, and successfully imported 10,000 tons of coal to ensure coastal power generation.

CASE The first copper concentrate transaction via blockchain technology

With the raging COVID-19 pandemic disrupting traditional trade, Minmetals International accelerated the digital transformation. Business personnel kept close communication with customers through the blockchain platform, tracked in real-time the logistics of goods, and cooperated with ship owners, mines and banks through the blockchain platform to complete the delivery of electronic bills of lading and online transfer of cargo rights, leading the new trend of trade development.

In August, 2021, Minmetals International and BHP Billiton used the MINEHUB blockchain technology to complete the first batch of electronic presentation for copper concentrates, which was also the first transaction of mineral product using blockchain technology in China’s non-ferrous metal industry.

Innovative Manufacturing of High-End Products

China Minmetals actively develops basic industrial tools, upgrades the national industrial foundation, and contributes to improving the independence and control of the national industrial chain and supply chain to ensure their safety and stability.

CASE Commercialization of the sci-tech achievements of micro diameter cutter

In 2021, China Tungsten Hightech built the first automatic production workshop for micro drill bits in the industry, and micro diameter cutter with a diameter of 0.01 mm (about 1/8 of human hair) was put into use. This innovative breakthrough will greatly improve the quality of China’s electronic information, medical care and other fields, and

accelerate the upgrading of micro machining tools. China Tungsten Hightech has also successfully developed and produced ultra-fine micro drill products with a diameter of 0.01 mm, which is of great significance to enhance the independence and control of the domestic electronics, communications, automotive and other industrial chains.

CASE Green industrial application powered by high temperature nano sensor technology

The high temperature nano sensor technology project developed by Hui Jin Technology, a subsidiary of China Minmetals, won the Second Prize of the Third Shining Star Innovation Competition for Central SOEs hosted by the SASAC. The sensor, widely applied to detecting the transient temperature, heat flow, strain and other physical quantities

in extreme environments such as metallurgy, nuclear power, aerospace, and supercomputer packaging, is of great significance to bolster weak spots in intelligent sensing under complex working conditions, support the follow-up industrialized application, and enhance the competitiveness of China’s intelligent equipment.

Metallurgical Construction

Committed to building a national team for the metallurgical industry, China Minmetals focuses on consolidating the foundation of the steel industry, and continuously improving the capability of technological and service innovation. We lead green development and intelligent manufacturing in China and the world's steel and metallurgical industry to drive their high-quality development.



Steady Progress in Key Projects

China Minmetals is the pioneer and main force of China's steel industry in the field of metallurgical construction. We successively undertook the planning, survey, design and construction projects of major large and medium-sized steel enterprises in China, accumulated core technical advantages and design and construction capabilities covering all links. We also actively undertook large and medium-sized greenfield steel design and construction projects in the world.

In 2021, we won the benchmark projects in China and in countries along the "the Belt and Road", such as the old urban area renovation of Han Steel, the first localized heavy rail production line of Hebei Yong Yang Special Steel Group, the two million tons / year aluminum oxide plant in Raman in Indonesia, and the No. 4 coke oven of Erdemir in Turkey, maintaining a dominant position in the global metallurgical market.

CASE Major projects of Dexin Steel Group were put into operation

In February, 2021, despite the looming shadows of COVID-19 outbreaks, WISDRI and China 19th Metallurgical Corporation completed the construction of the No. 2 blast furnace of Dexin Steel Group and put it into operation. In June, China 22nd Metallurgical Corporation successfully finished the thermal load test run of No. 3 continuous caster of Dexin Steel Group's converter continuous casting project. Dexin Steel Group's 3.5 million tons annual output project -- a full process

metallurgical EPC comprehensive steel plant by MCC Group -- parallels its global counterparts in main technical, economic and environmental indicators. After the project is put into operation, it will produce a large number of high-quality steel bars for infrastructure construction in Indonesia and even in Southeast Asia. It is another effort by MCC Group to actively integrate into the construction of the "the Belt and Road".

CASE Linyi Steel Group's project with an annual output of 2.7 million tons of special steel

Linyi Steel Group's 2.7 million tons high-quality special steel project is a key project in Shandong Province conducted by CERI. With the goal of building a "green, harmonious, intelligent, high-quality and high-efficiency" Lingang joint steel base, CERI helped Lingang District of Linyi City to build a green, circular, intelligent and garden type comprehensive park, which is of great significance to expand the local economic scale and accelerate the transformation of old and new drivers.



Linyi Steel Group's project with an annual output of 2.7 million tons of special steel

CASE Baosteel Desheng's fine stainless steel green industrial base project

Baosteel Desheng's project is a key engineering project in Fujian Province. The construction of metallurgical units such as sintering, steelmaking and continuous casting, raw materials and iron making is undertaken by China 5th Metallurgical Corporation, China 17th Metallurgical Corporation, China 20th Metallurgical Corporation and Shanghai Baoye Group respectively. Aiming at green products, ultra-low carbon emissions, smart manufacturing and low cost, the project produces high-end stainless steel products. It is one of the largest production bases of high-end stainless steel products in China. After completion, it will propel the high-quality development of the steel industry in Fujian Province and build a world-class high-end steel manufacturing base in China.



Baosteel Desheng's stainless steel green industrial base project

CASE The first domestic universal heavy rail production line put into operation

In December 2021, China's first independent large-scale universal heavy rail and section steel production line with key process, equipment and control technology provided by CISDI was successfully hot tested at Hebei Yong Yang Special Steel Group. This marks that CISDI has reached the world leading level in the key process equipment and

control technology of universal profile steel, and that the key production equipment and technology of high-quality rail steel in China's high-speed rail and other fields no longer rely on imports, greatly improving China's high-end equipment manufacturing level in this field.



The first domestic universal heavy rail production line independently developed by CISDI

Green and Low Carbon Development of Metallurgy

As a pollution and energy intensive industry, the steel industry faces great challenges in decarbonization. China Minmetals leads the trend of green, low-carbon and high-efficiency metallurgy in China, improves the innovation ability of core technologies, introduces a number of major energy-saving and environmentally friendly technologies in the whole industrial chain, and enhances the endogenous driving force for green and low-carbon transformation and development of the steel industry.

Researches on low carbon standards

We set up four low-carbon technology research institutes for research and consultation on low-carbon development and policies, preparation of low-carbon standards in metallurgy and related fields, research and development on common key topics of low-carbon technology, and construction of university research demonstration bases. By establishing a technical and standard system of low-carbon development, we own a number of core technologies with independent intellectual property rights and the comprehensive capacity of the whole industrial chain of low-carbon metallurgy.

CASE Carbon emission assessment and identification

In 2021, China Research Institute for Building Construction (CRIBC) unveiled the "China MCC Carbon Emission Assessment Center" which provides carbon emission assessment and accreditation services for enterprises in the steel and construction engineering industries, facilitates building the carbon asset industrial chain, and formulates the scheme of the carbon asset management system for enterprises involved in steel and construction engineering industries. The center has undertaken several "carbon peak and emission reduction" planning projects.



MCC Xiong'an carbon transaction exchange meeting

Researches on low carbon technologies

In order to promote the green, low-carbon and high-efficiency development of the steel industry, China Minmetals started the initiation and implementation of the first dozens of key R&D projects, including more than 30 technologies in the field of process flow and intelligent manufacturing. Through the research and development of new energy metallurgy and carbon dioxide recycling and capture technologies, we researched and developed key technologies such as hydrogen production from coke oven gas, direct hydrogen reduction metallurgy and hydrogen blast furnace to build China's hydrogen metallurgy technology system. Relying on our unique advantages in waste-heat power generation, photovoltaic power generation, gas power generation, as well as a large number of innovative energy-saving equipment and technologies, we have created a number of environmentally friendly and efficient benchmark projects to drive the high-quality development of the steel industry.

CASE Green low hydrocarbon metallurgical technology reduces carbon emission

Hydrogen metallurgy technology is one of the effective ways to realize green, low-carbon and sustainable development of the steel industry. In 2021, CERI and HBIS Group jointly built the first 1.2 million tons hydrogen metallurgy demonstration project in the world, and developed the technology of "coke oven gas auto-thermal reforming for hydrogen production + direct hydrogen reduction" to prepare high-quality deoxidized pellets, which significantly reduces carbon dioxide emissions. After the project is put into operation, the localization rate of China's first set of hydrogen metallurgy equipment will exceed 60%, and carbon emission during iron production will be reduced by over 70%, which is a first step in the world for the commercial application of the "hydrogen metallurgy" technology.



CERI - ZhangXuan Hightech hydrogen energy development and utilization engineering demonstration project

CASE High efficiency energy dispatching technology optimizes electricity dispatching for steel enterprises

CERI's "efficient power grid energy dispatching project for ten million-ton steel enterprises" won the First Prize in the China Innovation Methods Competition. The project significantly reduces energy consumption per ton of steel, extends the service life of generator units, and increases the utilization rate of self-generated power by enterprises by more than 7%. The project makes breakthroughs in the core technologies such as power flow prediction and real-time simulation of power grid, optimizes the comprehensive utilization of power dispatching in steel enterprises, saves 330 million kilowatt hours of power for enterprises every year, and reduces the operation and maintenance personnel by 90%.



CERI built the intelligent control center and production management system for Yingkou Steel

CASE Innovation in super electric arc furnace steelmaking equipment solves bottleneck problems

The project of "innovative R&D of super electric arc furnace steelmaking equipment - solving bottleneck problems" developed by CISDI won the First Prize of China Innovation Methods Competition. The project develops CISDIFlex DC electric arc furnace flexible power supply device with completely independent intellectual property rights in China, localizes core equipment and improves smelting efficiency, which is of great significance to adjust energy

consumption structure of China's steel industry and the low-carbon and green transformation of steel enterprises. In 2021, the super electric arc furnace body technology was applied in the industry, which improved the overall reliability of the equipment and the operation rate of the electric arc furnace, greatly reduced the power and electrode consumption during smelting, shortened the smelting cycle by 20 minutes, and improved the yield of iron and alloy.

CASE MCC Baosteel promotes low carbon smelting

The photovoltaic power generation project for the whole gantry stockyard of Baosteel coal yard undertaken by MCC Baosteel will generate green and clean electric energy for Baoshan base of Baowu Group. The total installed capacity of the project is 17.391 MW, covering an area of 220,000 square meters, with an average annual power generation of about 14.23 million kWh. The project was successfully connected to the grid in November 2021, increasing the proportion of clean electricity in steel plants.



MCC Baosteel promotes low carbon smelting

CASE High air temperature technology of hot blast stove reduces carbon dioxide emission

The project of "high air temperature technology of hot blast stove based on TRIZ innovation and development" by CERl won the Second Prize in China Innovation Methods Competition. The second generation rotary and top burning hot blast stove developed by the project improves the mixing effect of the burner on blast furnace gas and combustion

supporting air, reduces the consumption of blast furnace gas per unit air volume, and provides stable long-period high-temperature hot air for the blast furnace, improving the hot blast temperature, and reducing the consumption per ton of iron as well as carbon dioxide emission.

CASE Supercritical gas power generation technology improves environmental protection outcomes

WISDRI's super-critical gas power generation technology adopts higher steam parameters, and the power generation efficiency reaches 43-44%, which is 8-10% higher than the most advanced technology of its kind at present. Taking the 150 MW super-critical gas generator set as an example, at

least 3.2 billion cubic meters of blast furnace gas emission is reduced every year, saving about 360,000 tons of standard coal, equivalent to about 1 million tons of CO₂ emission reduction.

Building green steel bases

Applying the concept of green plant throughout the design - construction - production - operation stages of steel enterprises, we promoted cleaner production at the source, and created a "reduction, reuse and recycling" green plant based on the synergy of green technology and engineering design to empower the green transformation and upgrading of the steel industry.

CASE Successful application of the digital and green steel plant construction

In order to build green plants, CERl compiled the *Design Guide of Green Plants for Steel Enterprises* and the *Design Index of Green Plants for Steel Enterprises* as industrial standards. CERl also jointly completed the construction method and engineering practice of digital and green steel plant with HBIS Group. The project established a green technology database throughout the life cycle of steel enterprises to simplify processes, reduce pollutants and better treat pollutants in steel enterprises. It has been successfully applied to the construction of new steel plants, such as HBIS Group Tangsteel New Area, Hansteel, Shisteel, and Xuansteel, forming dozens of patents, software copyright, numerous standards and books.

CASE Industrial standards for metallurgical ventilation and dust removal passing review

The metallurgical industrial standards of *Technical Specifications for Ventilation and Dust Removal of Electric Steelmaking Furnace Flue Gas*, *Technical Specifications for Ventilation and Dust Removal of Converter Flue Gas*, *Technical Specifications for Ventilation and Dust Removal of Steel Rolling Process* and *Technical Specifications for Ventilation and Dust Removal of Blast Furnace Flue Gas* edited by CRIBC have been rated as advanced international level. The four standards guide the construction and transformation of ventilation and dust removal of steel enterprises, promote advanced technologies for comprehensive flue gas treatment, protect the effective capture and treatment of organized and unorganized emission of flue gas by steel enterprises, and promote ultra-low emission in the industry.

CASE Zhongtian Construction Group's green and high-quality steel project

Zhongtian Construction Group's green and high-quality steel project is a key project in Jiangsu Province, which is jointly constructed by 15 units, including MCC Huatian Engineering and Technology Corporation, ACRE Coking and Refractory Engineering Consulting Corporation and China Third Metallurgical Group. MCC has undertaken the construction of a "large-scale, efficient, intensive, green and intelligent" steel production line, achieving efficient and flexible production and green manufacturing. After completion, it will become the first zero emission project with "no waste water outlet" worldwide, bearing heavy economic value and social significance.



Zhongtian Construction Group's green and high-quality steel project

CASE Major breakthroughs in domestic environmentally friendly technology and equipment

Zhongye Changtian International Engineering Co., Ltd. (the second unit) successfully won the First Prize of the National Science and Technology Progress Award in 2020 for the "coordinated deep treatment technology and application of multi-pollutants in industrial flue gas" project, with 198 patents applied (including 107 invention patents) and 103 patents authorized. In this project, the key technology of collaborative and efficient purification of multi-pollutants

in flue gas by activated carbon has realized ultra-low emission in the steel industry, synchronous removal of multi-pollutants and resource utilization of by-products. The technology, with higher removal efficiency, 40% lower investment and construction cost, lower operation cost, and lower carbon emission, has been applied in Zhanjiang Steel, Baosteel's headquarters and other over 20 sintering equipment around the world.

Digital and Intelligent Upgrade in the Metallurgical Industry

Grasping the new opportunities for developing the digital economy, China Minmetals combined knowledge in the field of steel metallurgy with cutting-edge information technology, and deeply integrated the Internet, big data, and AI with the steel industry to enable the digital and intelligent transformation and upgrading of the industry.

In 2021

Shanghai Baoye Group's *One-stop Information Management Platform for Steel Structure Intelligent Manufacturing*
 WISDRI's *Demonstration Application of Big Data Visual Management Platform for Smart Blast Furnace*
 CISDI's *R&D and Application of the Intelligent Management and Decision-making System for Steel Enterprises Based on Big Data*
 Won the 2021 pilot demonstration project of the big data industry of the Ministry of Industry and Information Technology

NBCCID undertook the 2021 industrial Internet innovation and development project of the Ministry of Industry and Information Technology
 —Industrial real-time database project, etc
 Chongqing's key information-based laboratory for network-based collaborative manufacturing of steel metallurgy was approved

CASE Launching China's first 5G+ iron-steel interface intelligent control platform

In November 2021, the 5G+ iron and steel interface intelligent control platform of Wuhan Iron and Steel Co., Ltd. constructed by CISDI was successfully launched, marking the completion of the largest 5G wireless intranet in China. The project, integrating AI technology into the platform, upgraded and transformed five blast furnaces, four steel plants, 20 molten iron transportation locomotives, 67 torpedo tankers, 100 open top molten iron tankers and 12 crossings in the plant; and controlled more than 400 molten iron transportation lines. It is expected to optimize the operators of the interface by 20%, improve the transportation

efficiency of molten iron by 10% and reduce the molten iron temperature by 10°C. According to preliminary estimates, the direct economic benefits generated by transportation alone is more than

RMB 40 million per year, promoting the transformation, upgrading and high-quality development of Wuhan Iron and Steel Co., Ltd.



The 5G+ iron and steel interface intelligent control platform by CISDI won the first place in the "Bloom Cup" 5G Application Competition.

CASE Building the world's first digital twin-driven intelligence stockyard

WISDRI is committed to the research and development of dynamic and high-precision digital twin technology to improve the transparency of steel manufacturing process, and ensure high stability and precision of the process and the product quality.

As the world's first stockyard digital twin system, it provides strong analysis and decision-making for optimizing and managing stockyard operation through automatic roaming, online quality control of raw materials, raw material inventory upgrade, and transportation costs and fund occupation reduction.



WISDRI launched the world's first digital twin-driven intelligence stockyard - Xinyu Raw Material Stockyard

CASE Digital design empowers steel engineering construction

The "phase II Quwo base capacity reduction and replacement project and converter continuous casting project of Jinnan Steel Group" by WISDRI has become the only domestic steel project winning the "2021 Advancing Infrastructure" award. Jinnan phase II iron and steel project bears great significance for building a large "ten million tons high-quality special steel" production base in the central and western regions. Through the three-dimensional cloud design platform, the

project achieved remote real-time collaborative design involving 16 professions during the COVID-19 outbreaks, becoming a shining model for work resumption in Wuhan. Through 3D digital and visual simulation, the accident rate is reduced to zero, effectively improving the project efficiency. The steel production rate is lifted by 5%, reducing carbon emissions by 0.1 ton / ton of steel.

Diverse Industries

China Minmetals diversifies investment by promoting the high-quality development of the finance and real estate industries. We leverage the business structure in which short-term and long-term changes in business cycles are adjusted and financial and non-financial industries reinforce each other. We have transformed our business based on years of metallurgical construction with remarkable results in transportation, high-end housing, municipal environmental protection, theme parks, etc.



Finance and Real Estate

Guided by the principles of "industrial finance, a solid bottom line, technology empowerment, and integrated services", China Minmetals promotes high-quality development and builds capabilities of distinctive industrial finance, a leading headquarters control and empowerment system, and an integrated and efficient risk management system.

Finance and investment

China Minmetals is one of the three central state-owned financial service providers approved by the SASAC. We are licensed for financial services such as trust, financial leasing, securities, futures, finance, banking, funds, insurance, etc. We offer financial services for the main business of the Group and to upstream and downstream players. We work hard in industrial finance to build a first-class platform in China. We improve supervision over state-owned assets, follow market-based principles, and act prudently to improve the management of state-owned financial assets.

Minmetals International Trust Co., Ltd.

It engages in RMB cross-border trade settlement and has completed 15 such services worth RMB 340 million in the past two years, becoming the first Chinese-funded enterprise in Sydney to cross the threshold of RMB 100 million.

Financial Company

China Minmetals gives full play to its functions of "fund collection platform, fund settlement platform, fund monitoring platform, and financial service platform," to improve fund use efficiency. We continue to pursue innovation and become the first enterprise connected to the bill pool of two commercial banks.

China Minmetals H.K. (Holdings) Ltd.

China Minmetals H.K. (Holdings) Ltd. analyzes the sources and use of all managed funds, focuses on high-quality and undervalued assets, and controls both the position and credit of the investment portfolio to make it more risk resilient, thus achieving the phased goal of interest preservation and appreciation.

Minmetals Capital Company Limited

Guided by the "three-year action plan for the reform of SOEs", Minmetals Capital Company Limited advances high-quality development and contributes to the Group's "industry + finance" development.

Minmetals International Trust Co., Ltd.

Minmetals International Trust Co., Ltd. has implemented the strategy of expanding overseas markets and issued the first QDII scheme to make overseas markets available for asset allocation products.

Minmetals Securities

On the occasion of the 20th anniversary of its establishment, Minmetals Securities will continue to build an investment banking system based on the capital market and enhance its overall financial services.

Minmetals Innovation Investment Co., Ltd.

Minmetals Innovation Investment Co., Ltd. runs the Group's Innovation Fund for specific investments and has made the decisions and channeled funds for the first ten projects. Fangyuan, a company invested by Yuanding Fund, has been listed on the science and technology innovation board.

CASE Improving investment decision management and enhancing risk control

To strike a balance between risk control and decision-making efficiency, Minmetals Innovation Investment Co., Ltd., based on third-party evaluation results and comprehensive research, improves the investment decision-making process

and reshapes the decision-making management system. In 2021, it decided to invest in Tafel, a leading lithium battery company, and Betterial Film, a leading photovoltaic film company, and held 38 special equity investment meetings.

Real estate

China Minmetals is one of the SASAC's first batch of 16 central SOEs with real estate as their main business, with its subsidiaries of Minmetals Land and MCC Real Estate under China Minmetals enjoying high popularity in the real estate sector. Under the principle that "housing is for living in, not for speculation", we transform ourselves from a "real estate developer" to an "urban operator" by creating new models, improving quality, and accelerating transformation. We also develop high-quality projects such as Montego Bay, Wukuangjunlan Hotel, Minmetals LIVE, Wanjing Xiaoxiang, MCC Shijia, Dexian Mansion, Dexian Huafu and have won many awards.

2021 Key Honors

Minmetals Land

- Top100 Excellent China Real Estate
- China Real Estate Enterprise of Comprehensive Strength
- China Blue Chip Real Estate Enterprise
- Real Estate Enterprises of Investment Value (Top 30)
- China Real Estate Annual High Growth Enterprise

MCC Real Estate

- No. 40 among China's top 100 real estate enterprises
- One of the top10 in the 2021 China top100 profitable real estate enterprises and 2021 China top100 robust real estate enterprises
- 2021 excellent real estate enterprises with Chinese characteristics - urban developer and operator
- 2020-2021 China real estate social responsibility enterprise
- 2021 China real estate enterprises with outstanding products
- 2021 top10 Chinese real estate enterprises in brand value (RMB 26.8 billion)
- Top10 Chinese real estate enterprises with sound building products

Minmetals Land Central China

- The model house of Wanjing Xiaoxiang commercial villas won the platinum award, the highest honor in the interior design category of residential and commercial properties in the 2021 US MUSE Design Awards
- Our self-developed 5M intelligent health system (mechanical and electrical equipment) won the third prize of the China Real Estate Association Science and Technology Award and was the only enterprise to receive the award
- Four projects were listed as "standardized construction sites with work safety of national engineering projects"
- The property management sector was listed on the "Top500 Chinese property service enterprises with comprehensive strength" and was awarded the title of "China property management company with leading social responsibility contributions"

MCC Real Estate

- MCC Property was awarded "2021 China's leading brand of professional property service"
- Yanjiao MCC-Shengshi International Plaza project ranks among the "2021 top10 China real estate projects in brand value"
- Shijiazhuang MCC Dexian Huafu Project was awarded the "Top10 exemplary projects of healthy buildings in 2021"

CASE Minmetals Land wins the honor of Green and Sustainable Finance Awards

In 2021, Minmetals Land issued 5-year USD 300 million sustainable development bonds featuring green concepts overseas, the first-ever such bonds by a state-owned real estate company. The bonds attracted more than ten high-quality investors in Europe, America, and Asia Pacific, including green investors.

Minmetals Land formulated a sustainable financing framework for this issuance. It was the first time for USD-denominated bonds issued by a Chinese enterprise to be certified by three international institutions, namely S&P Global, Sustainalytics, and Hong Kong Quality Assurance Agency before the insurance.

Minmetals Land won the 2021 Outstanding Award for Green and Sustainable Loan Issuer (Central SOEs in Real Estate Industry).



Hong Kong Green and Sustainable Finance Awards 2021 Ceremony

Creating a new model of a better life

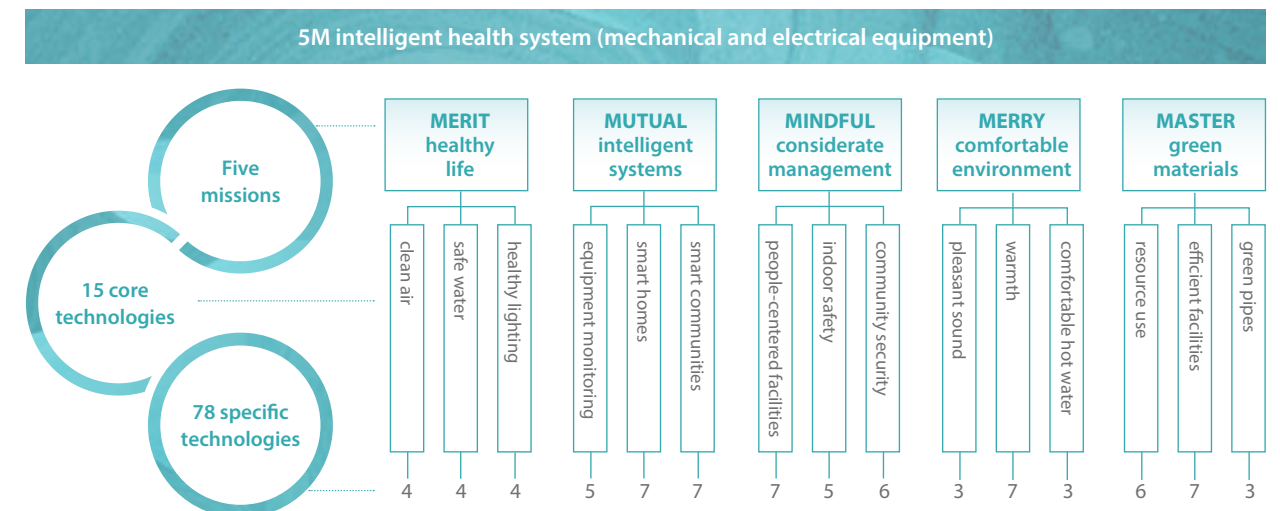
We lead the efforts in improving the urban living environment, carry out real estate development, construction, and management, and create a "healthy community +."



Wanjing Xiaoxiang

CASE Developing the 5M intelligent health system for healthy housing

Minmetals Land vigorously develops the 5M intelligent health system featuring intelligence, health, and green life. The system includes five missions of a healthy life, intelligent systems, considerate management, a comfortable environment, and green materials. The system set standards for garden landscapes, buildings, decorations, and equipment. The system has been applied to projects in four cities: Chengdu, Nanjing, Guangzhou, and Hong Kong.



CASE Creating housing projects with garden landscape

MCC Real Estate carries out its business in the Yangtze River Delta region and has built the MCC Guorui Project in Xiangcheng District of Suzhou. The project has applied the 6S smart system of "smart home, smart services, smart security, smart energy conservation, smart healthcare, and smart property management", creating comfortable lifestyles integrating quality, care, technology, and art. The project has developed a water landscape, putting in place a system of "two belts, two rings, and seven gardens" in a residential area that suits people of all ages.

Creating a whole industry-city business structure

In 2021, we stepped up integrated industrial and urban development, business management, and property business. We created new business expansion models, driving the coordinated development of investment, construction safety, and property. We steadily advanced urban renewal and the expansion of TOD projects* and the implementation of the 3.0 industry-city model. We also filled up regional commercial gaps by designing and operating urban complexes and shopping malls.

CASE Opening a new chapter of "Happiness"

The Tianjin MCC Heyuehui Commercial Street, constructed by MCC Real Estate, covers five business formats: food, retail, supporting experience, parent-child activities, and cultural and creative space, targeting over a million potential customers in Hexi District and within a radius of 3-5 kilometers. Following the concept of "business + culture", MCC Real Estate analyzes the characteristics of merchants. In 2021, it held special activities such as "The Year of Chinese Culture", "Wild Fun Festival", "Heyuehui Cultural Carnival", and "Nezha Sports Carnival", and opened the first Sanlian Taofen Bookstore in Tianjin. At the same time, a membership system is established with a cultural brand "rapeseed academy" that serves nearly 130,000 members.



Heyuehui Cultural Carnival

CASE Creating an urban complex for Changsha

Minmetals Land, based on the Hunan culture, developed the first large-scale commercial complex project in the province, the Changsha Live project. It is a super entertainment landmark that is closely connected with the local fully developed culture and entertainment industry. The project contains parks, cultural and creative activities, and entertainment, as well as four core business areas. The diverse and open commercial space can be regarded as an urban park, which can be used for movie release events or small concerts. It can appeal to citizens to engage in a wide range of activities. The Changsha Live project won the 2020 "Best Architectural Design Award for Complex" in the GBE Complex Design Award.



Changsha Live homes the first youth sports training center in Hunan Province

*TOD model is an integrated community development model that centers on public transportation while bringing residential properties, commercial centers, and parks together.

Basic Construction

As the pioneer in China's construction industry, China Minmetals seizes the strategic opportunity of "a new development paradigm that allows domestic and global markets to reinforce each other, with the domestic market as the mainstay". Relying on our excellent research, survey, design, and construction capabilities, we build our strengths and quality brands in the field of basic construction.

In 2021, our newly signed contracts were worth over RMB **1,200** billion

Basic infrastructure

In prosperous regions such as the Beijing-Tianjin-Hebei region, Yangtze River Delta, Pearl River Delta, Guangdong-Hong Kong-Macao Greater Bay Area, and the Chengdu-Chongqing economic circle, we focus on improving our project contracting capabilities and strengthening our brand and build infrastructure to power regional economic growth. Projects in these five major urban clusters have increased to 56%.

CASE Lanzhou Olympic Sports Center project

The Lanzhou Olympic Sports Center undertaken by China MCC17 is a major project in Gansu Province. The project includes a 60,000-seat stadium, an 8,000-seat grade-A gymnasium, a grade-A swimming pool with a capacity of 2,000 people, a grade-A tennis hall with a capacity of 3,000 people, outdoor sports venues, sports rooms, athlete apartments, and outdoor supporting buildings. It will become a new landmark in Lanzhou for sports activities, large gatherings, competitions, and training.



Lanzhou Olympic Sports Center project

CASE Xiamen New Convention and Exhibition Center project

Xiamen New Convention and Exhibition Center and Exhibition Center Section II was undertaken by Shanghai Baoye Group. It is a key project in Xiamen. After completed, it will become China's largest international investment and exhibition base, a center for attracting international investments, and one of the cross-strait economic and trade cooperation bases. The project covers 538,200 square meters and includes four standard exhibition halls of 24,000 square meters, the central corridor, the east and west registration halls, the energy center, the coastal exhibition facilities, and basements.

CASE A branch of the Cancer Hospital of the Chinese Academy of Medical Sciences project

The Cancer Hospital of the Chinese Academy of Medical Sciences (Langfang branch) is constructed by Zhongye Changtian and MCC Tiangong. It is one of the largest cancer hospitals in the world. Focusing on cancer diagnosis and treatment, the hospital is a grade A tertiary cancer hospital integrating comprehensive medical care, education, scientific research, and cancer prevention. It has become a regional medical center for cancer clinical treatment and technical guidance at home and abroad.



A branch of the Cancer Hospital of the Chinese Academy of Medical Sciences project

CASE Xiamen 6th generation flexible AMOLED production line project

In May 2021, the main factory of Tianma Xiamen, the largest flexible single panel factory in China and the most advanced in the world, undertaken by Shanghai Baoye Group, was completed. The project covers an area of over 810,000 square meters, of which the total construction area of the process clean area is about 600,000 square meters. After it is put into operation, it will expand Xiamen's technology industry and promote industrial upgrading.

CASE Tianjin Juilliard School project

In October 2021, the Tianjin Juilliard School, developed by MCC Real Estate and contracted by MCC Tiangong, held an inauguration ceremony. To construct extraordinary buildings and offer first-class acoustics, MCC employees have overcome difficulties in main structure complexities, a tight schedule, and COVID-19. After four years of hard work, a 700-seat concert hall, a 300-seat recital hall, a 250-seat black box theater, and 118 acoustic classrooms have been put in place. The project has been recognized by the American school, musicians, and design institutes, adding a new platform for Sino-US cultural exchanges.



Tianjin Juilliard School project

CASE The first ecological office district (EOD) in Guangdong Province

MCC Urban Investment, together with MCC2, CISDI, and MCC Shen Kan, signed a contract for the EOD project of Donghai Island Industrial Park in Zhanjiang (Phase 1-4), also the Donghai Island Industrial Park supporting service project, with a total investment of RMB 20.18 billion. The project is

the first district development project worth over RMB 10 billion invested by MCC Group and a strategic project in Guangdong. The project adopts the EOD model advocated by the Ministry of Ecology and Environment, the first such project in Guangdong.

Green construction

We aim to make green, smart, and commercialized buildings. By widely adopting prefabricated buildings, energy-saving equipment, and temporary and permanent facilities, we reduce redundancy and environmental pollution and promote a green construction industry.



Prefabricated buildings

The Gengyang Jinyuan project in Hebei Province undertaken by China MCC22 adopts prefabricated structures for environmental purposes. It reduces carbon dioxide by more than 35% compared with traditional structures. The education construction project in Hechuan District constructed by China Huaye Group Co., Ltd., also applies prefabricated components, reducing 80% of construction waste and 60% of material losses and avoiding nearly 600 tons of carbon dioxide emissions.



Energy saving equipment

The China Optics Valley Convention and Exhibition Center undertaken by MCC20 has fully applied power-saving equipment, reducing carbon dioxide by 616.993 tons. The prefabricated steel structure production base of China MCC5 (Chengdu) Construction Technology Industrial Park is equipped with plasma CNC cutting machinery, which is five times as fast as flame cutting. The machine is used in coating equipment that has a huge market in the southwest region and consumes only 30% of the energy required by conventional equipment. The entire base can reduce carbon dioxide by 200 tons each year.



Temporary and permanent facilities

The Lanzhou Olympic Sports Center constructed by MCC17 allows some permanent facilities to be directly used during construction, which reduces construction waste to less than 400 tons per 10,000 square meters. More than 80% of waste is recycled and all hazardous waste is classified, reducing carbon dioxide by about 90 tons. The MCC Apollo Future Industry Town adopts the combination of "permanent and temporary facilities" so that buildings constructed can serve two purposes, reducing one ton of carbon dioxide.

Beijing 2022 projects

We shoulder great responsibilities. In recent years, we have built sports venues and supporting facilities for 18 ice and snow events in Beijing 2022 and fully guaranteed the holding of competitions, demonstrating the strength and responsibility of a central SOE.

Sports venues

The Yanqing National Sliding Center >>

Responsible for the construction and operation, we developed eight core technologies, including the preparation and quality control technology of track gunning materials, the forming of the 10,000-meter hyperboloid refrigeration pipeline, and the lining and forming of millimeter-level hyperboloid tracks. The project was delivered as scheduled.



<< The steel structure of the National Alpine Skiing Center

We built the starting area on the top of the mountain, the middle platform, the competition end zone, the mountain plaza, and the race end zone.

Wukesong Ice Sports Center Steel Truss Structure project >>

The main body of the Wukesong Ice Sports Center is a large steel truss structure. During the construction, the virtual pre-assembly technology developed by MCC Construction Research Institute was applied and the main steel structure took 100 days.



Competition services



<< Yanqing Zone Comprehensive Management Monitoring Center of Service Facilities

We built and ran the center, which is the "brain" of the service facilities in the Yanqing Zone of 2022 Winter Olympic and Paralympic Games. During the competition, it carried out real-time monitoring to effectively ensure the smooth operation of events and systems.

Integrated services for temporary facilities in Yanqing Zone >>

We built temporary facilities and guaranteed services during Beijing 2022 in the National Sliding Center and Yanqing Winter Olympic Village.

The mountain ecological restoration project to prevent geological disasters in the Core Area of Yanqing Zone >>

Wuhan Surveying Geotechnical Research Institute of MCC applied nearly ten kinds of geological disaster control techniques for high-quality ecological restoration projects. In March 2022, it received a thank-you letter from the Beijing Yanqing District Party Committee and the Government as well as the operation command unit of the Beijing 2022 Yanqing Zone.

All-around logistical support

Headquarters of the Beijing Organizing Committee for the 2022 Olympic and Paralympic Winter Games in Shougang Park >>

We provided structural inspection, reinforcement design, technical consultation, and other services for existing structures in multiple areas of Shougang Park, making it the headquarters for the Beijing Organizing Committee and a training and competition venue for athletes. In doing so, we promoted the protection and utilization of industrial legacies and sped up the upgrading of old industrial bases.



<< Inspection of important transportation infrastructure for Beijing 2022

We provided concrete, bridge metals, and tunnel waterproof materials for key transportation projects such as Beijing-Zhangjiakou High-speed Train, Zhangjiakou-Chongli Expressway, and Beijing Metro Line 11 (Winter Olympic Branch) to improve the access to the Winter Olympics venues.



Urban New Images

Driven by market demand, China Minmetals focuses on key areas such as utility tunnels, sponge cities, and smart cities and builds major projects to create a beautiful new image for sustainable development.

CASE Universal Beijing Resort project

Universal Beijing Resort is one of the largest, smartest, and most high-end Universal theme parks in the world. It is another masterpiece after China Minmetals completed more than ten large top theme parks such as Zhuhai Chimelong Ocean Kingdom and Shanghai Disneyland Resort. China Minmetals is the sole enterprise that covers the whole construction process including blueprint design, general contracting, project supervision, special equipment installation, audio and video design, supply, and installation, professional technical guidance, and designated packaging material supply. In August 2021, Universal Beijing Resort was opened. The Hollywood and Transformers Metrobase built by Shanghai Baoye Group impressed tourists. The Hollywood Walk of Fame built by MCC Construction Research Institute



Transformers Metrobase in Universal Beijing Resort by Shanghai Baoye Group

has become a must-see place for tourists. The disaster special effects theater is one of the ten core units in the theme park.

CASE Shenzhen Line 13 comprehensive utility tunnel project

The underground comprehensive development of Keyuan Avenue and the Line 13 utility tunnel is a key project in Shenzhen constructed by a consortium of MCC South China, MCC20, and STEC. After completion, it will become one of the largest and longest underground space development projects in the world's railway transportation and space integration.

CASE Dong'an Lake Sports Park of Chengdu 2021

The Dong'an Lake Sports Park of Chengdu 2021, a key project in Sichuan Province and an important supporting infrastructure project for Chengdu 2021, is undertaken by MCC5. The project includes four ecological restoration areas, the relocation of Lihe Weir, Dong'an Reservoir, tunnels, and bridges. It shows the garden scenery with Chengdu characteristics to the world.



Dong'an Lake Sports Park of Chengdu 2021

CASE Ezhou comprehensive environmental improvement project

The comprehensive environmental improvement project of coastal roads and river beaches in the Fankou area of Ezhou was undertaken by CFMCC. The project includes comprehensive renovation of rivers and beaches, water systems, main coastal roads, environmental landscape engineering, and municipal supporting construction projects. It serves flood control, ecological protection, and people's life and restores Ezhou's environment.



Ezhou comprehensive environmental improvement project

CASE Contributing to Shanghai's green and renewable energy

The Baoshan renewable energy utilization center phase II project undertaken by Shanghai Baoye Group is one of the first domestic harmless waste treatment projects after the formal implementation of waste sorting in Shanghai. It can handle waste and generate power. The project can burn 3,000 tons of waste and handle 800 tons of wet waste every day, with annual power generated through renewable energy

reaching 800 million kWh. Shanghai Baoye Group aims to make the project an example in China and a global first-class waste incineration project. The project will become an ecological, fashionable, and leading eco-park in the Yangtze River Delta region, improving harmless waste treatment and resource utilization in Shanghai.

CASE Waste-to-energy project in Gu'an County

The Gu'an waste-to-energy project invested and constructed by China ENFI in a BOT model is a major project in Gu'an County, Hebei Province. The project adopts cutting-edge waste incineration technology and new, efficient, and reliable pollutant prevention and control technology. Its emissions meet EU standards. It will be able to process 438,000 tons of garbage every year in Gu'an County and surrounding areas and add 185 million kWh of electricity to the grid.



Waste-to-energy project in Gu'an County

CASE Tianfu Art Park project

MCC5 Tianfu Art Park project builds a park-wide ecological protection network. Through micro-terrain design and sponge city technology, an ecological sponge garden consisting of lakes, green spaces, green roofs, rainwater plants, and permeable pavements is put in place, which can save 35,000 tons of water and achieve zero wastewater discharge. The whole system adopts optical simulation analysis and energy-saving lighting, which saves 547,000 kilowatt-hours of electricity and reduces pollution by more than 140 tons and carbon dioxide by more than 400 tons.



Tianfu Art Park project

Innovation

Driven by innovation, China Minmetals implements the innovation-driven development strategy, focuses on reform, accelerates the development of original technology and the efforts to become a core industry chain leader, and consolidates the foundation for sustainable development and high-quality growth.



Better Management

China Minmetals implements General Secretary Xi Jinping's important instructions on strengthening the management system and management capacity building, implements the three-year action plan for state-owned enterprise reform, and follows counterparts to improve standards to move towards a world-class enterprise.

The "1+N" comprehensive risk management system of Shenzhen Jinzhou Precision Technology Co., Ltd., MCG Las Bambas Mining Company, and China Minmetals has been selected as "exemplary projects" of the management of key "exemplary SOEs."

Deepened SOE reform

We advance the three-year action for state-owned enterprise reform in an all-around manner with targets, promote the reform of mixed ownership, and carry out special reform projects and pilot programs. We also follow first-class standards and conduct research on state-owned capital investment companies, a key research topic of the SASAC.



Two enterprises have been rated as "Science and Technology Reform Demonstration Action" exemplary enterprises and excellent enterprises by the SASAC



Significant progress has been made in corporate reform, and key loss-making subsidiaries have registered profits. We have stripped our non-business social functions, making it easier for us to carry out operations.

Enhanced risk management

We continue to improve the "1+N overall risk management system". By establishing a "1+N" system at each level, we align the goals and methods of major risk management and control between the headquarters and major subsidiaries and form a system for identifying, evaluating, tracking, and responding to major risks to see that major risks at all levels are measurable and controllable. The 2021 risk management guidelines were issued, and specific requirements and tasks were put forward for ten major risks. We have carried out annual risk management work, improved our risk monitoring and response to major operational risks, and conducted regular major risk inspections. We promote the risk management culture and heighten the risk awareness and response of all employees by holding risk management exchanges and special training.

Advantages in the industrial chain

We have established a connection mechanism for engineering projects, real estate, and financial business of the whole group and hold regular meetings. We hold industry-finance promotion meetings and innovation investment seminars with venture capital companies to explore cooperation. At the same time, we reward excellent collaboration to motivate the whole industry for cooperation.

In 2021, our newly signed cooperation contracts were worth

RMB **190** billion

an achievement in both quantity and quality

Technology R&D

Since the beginning of the "14th Five-Year Plan", China Minmetals has vigorously implemented the innovation-driven development strategy, focused on key technological breakthroughs in the core business sectors and the application of technologies, and gathered talent for innovation, which powers high-quality development.



Hangzhou International Expo Center (G20 Venue) evaluated by MCC Construction Research Institute

Research in multiple areas

Our research is focused on carbon peaking and neutrality, strategic metals, intelligent mining, as well as key engineering service capabilities. We have organized multiple huge industry-university-research seminars on low-carbon metallurgy, industrial digitization, tailings recycling, and regional mines. Breakthroughs have been made in key core technologies such as in-depth ultra-large-scale continuous mining, solid waste recycling, and green and low-carbon metallurgy.

We explore new models of building technology platforms. With reform in our system, we aim to put in place a virtual, open, and cross-sector new R&D platform, consolidate the foundation of technology management, and enable the innovation of the main business.

Multi-faceted mechanisms

We continue to improve the innovation management mechanism and ensure that innovation serves our strategic development. We formulate the *Evaluation System of Patents* and analyze the distribution of intellectual property rights in key areas. We focus on major technological projects and apply technological outcomes to see that technology can contribute to better productivity.



Ji Guangjie (Luzhong Mining), the 15th national skilled worker - operates the welding robot

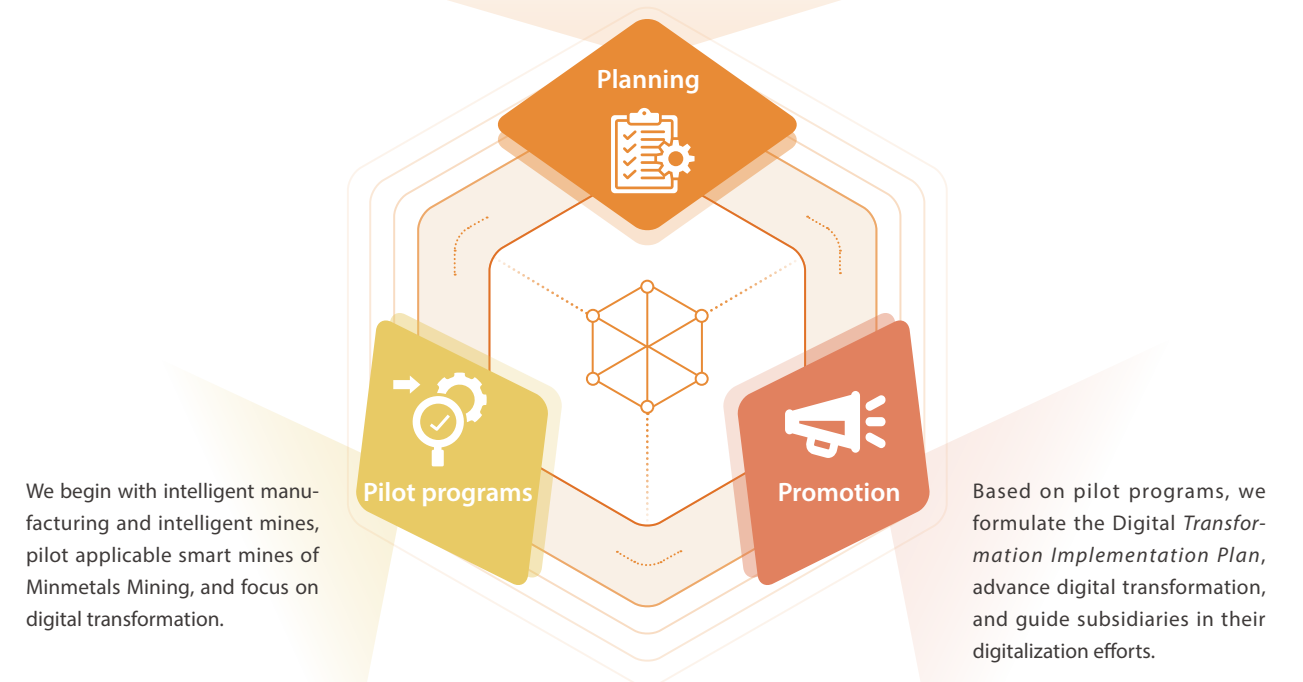
Digitalization

Digitalization is a must for SOEs. China Minmetals builds a new digital pattern and focuses on improving decision-making capabilities and corporate competitiveness to build a "Digital Minmetals" that supports high-quality and sustainable development.

Pathways

We have compiled the "14th Five-Year" digital plan and created "three systems" (unified construction and application system, data governance system, and network and information security system), "two platforms" (big data platform, industrial Internet platform), and "one center" (unified data center) through the "empowerment action" (to deepen reform, enable integration, and make innovation). We have formulated a three-step implementation plan of overall planning, pilot programs, and promotion to realize "information empowerment for digital Minmetals". Centering on risk management and control, we manage business elements, expand application scenarios, and build a solid digital foundation to create a "digital corporate brain".

We formulate the digitalization booklet of the "14th Five-Year Plan" and set planning, pilot programs, and promotion plans.

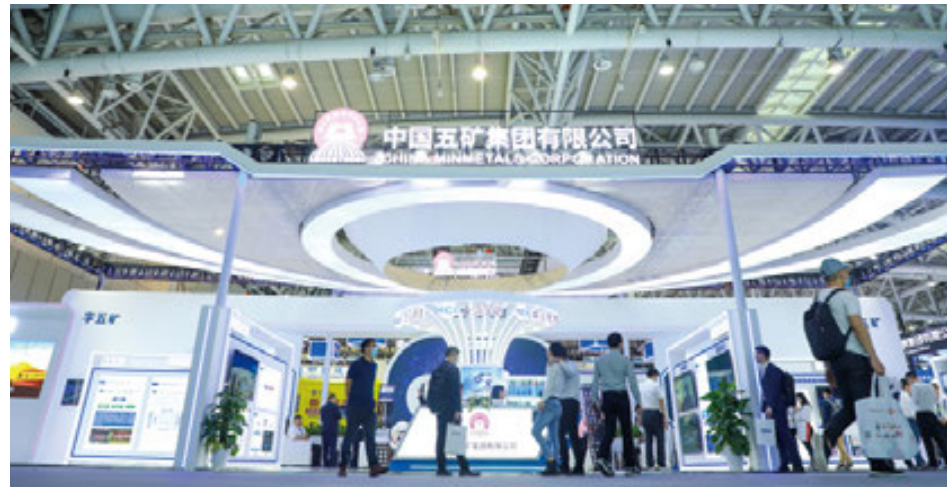


We begin with intelligent manufacturing and intelligent mines, pilot applicable smart mines of Minmetals Mining, and focus on digital transformation.

Based on pilot programs, we formulate the Digital Transformation Implementation Plan, advance digital transformation, and guide subsidiaries in their digitalization efforts.

Achievements

We focus on smart manufacturing, smart construction, digital delivery, and new infrastructure. We have contributed our wisdom to and achieved a lot in smart cities, smart agriculture, smart water affairs, digital villages, smart parks, smart government and enterprises, smart construction, and smart production of steel structures.



▲ China Minmetals' digitalization achievements displayed at the 4th Digital China Summit

- Our *China Minmetals' State-owned Assets Supervision System Enabled by Big Data and State-owned Assets and State-owned Enterprises Online Supervision System* won the SASAC's "13th Five-Year Plan" excellent cases of network security and IT application.
- *China Minmetals IT Construction for State-owned Assets Supervision and China Minmetals Smart Party Building Online Supervision System* were selected into the "Three-Year Action Plan" Innovation Demonstration Cases of the SASAC.
- *China MCC17's Industrial Internet Promoting Digitalization* was recognized as a typical case of digitalization of SOEs by SASAC.
- Zhuzhou Smelter Group won the annual excellent digitalization award by the China Association for Promoting International Economic and Technological Cooperation.

CASE Releasing a white paper on the digitalization of metallurgical mines

Based on smart mines experience, China Minmetals has joined forces with the government, industry, and research institutions to formulate the *White Paper on Digitalization of Metallurgical Mines*, which was released at the opening ceremony of the 2021 China Central State-owned Companies Digital Transformation Summit to guide the digitalization of the industry.

Digitalized industries

We embed emerging information technology into industrial development and apply digitalization outcomes in smart mines, smart construction, and smart factories to work for industrial digitalization.



Smart mines

Based on the mining digitalization examples of Minmetals Minmetals and Ankai Mining, we promote smart mining of the Longjiang graphite mine, build the Minmetals graphite project AR panoramic platform, and ensure real-time supervision of the production and environmental protection of the Shuikoushan mine.



Smart construction

In the National Sliding Center for Beijing 2022 built by Shanghai Baoye Group, we used digital modeling technology for accurate track models to build a high-quality project. We also ensured the formation of the special-shaped hyperboloid track at the millimeter level. Digital technology for upmarket cultural and tourism projects was used in the Universal Beijing Resort to achieve full-process and professional design. MCC5 won the "Best Industrial Project of BIM Application" award at the 6th International BIM Awards.



Smart factories

Zhuzhou Smelter Nonferrous Metals has built a first-class MES system in the industry and has been listed as an intelligent manufacturing example for nonferrous smelting and processing by the Ministry of Industry and Information Technology. ZCCTC and Zhuzhou Cemented Carbide Group Co., Ltd. have started the factory digitalization project and designed factories based on the Siemens smart factories. They have offered targeted suggestions on improving digitalization with implementation plans.



Hunan nonferrous metal factory

Safety and Environmental Protection

China Minmetals builds a new pattern of safety and environmental protection, guards against safety and environmental protection risks, and launches work safety campaigns. We continue to investigate and handle safety and environmental protection hazards, apply technology on a large scale, and set a good example to contribute to sustainable development.



Improved Management

China Minmetals continues to implement various safety and environmental protection measures and strengthen the risk prevention system. Remarkable improvements have been made in the issues found in the central ecological and environmental inspection. We rectified 41 out of 48 problems in 2021 while the remaining seven issues are being tackled. Overall, we have better safety and environmental management.



Regulation and Systems



9 key subsidiaries have put in place "four lists" of "responsibility, source of danger, hidden dangers, and measures"

We make a list dynamically monitoring **26** major hazardous chemicals

We release a list of responsibilities for environmental protection covering **11** functional lines and **3** management levels to ensure long-term and systematic management

CASE Revising multiple policies for environmental protection

China Minmetals has issued more than 20 documents on ecological and environmental protection and formulated or revised 11 policies. We have updated the *Comprehensive Evaluation of Safety and Environmental Protection* to make evaluations contribute to better results. We also include ecological and environmental protection indicators in the annual assessment plan and ecological civilization in the comprehensive evaluation of the leadership team. We also incorporate the learning of Xi Jinping's ecological civilization thought into Party building. We have issued the *Action Plan for Strengthening the Compliance Management System* and highlighted seven measures for environmental compliance. We have revised investment decision-making and management rules and mandated full-process environmental protection of investment projects.



We have set up a task force for integrating MCC inspection and certification business and completed such work in Southwest China, Xiong'an, Shanghai, and Ma'anshan, covering more than 70% of MCC's inspection and testing business. The analysis and testing business of Changsha Research Institute of Mining and Metallurgy has been incorporated. More than 600 parameters have been added to the over 1,200 project parameters, further expanding the testing capabilities. Minmetals Real Estate ensures that "safety and environmental protection is a must for the industry and production". In 2021, we registered zero production-induced pollution cases.

Inspection and rectification

China Minmetals has made the rectification of issues found in central environmental protection inspection transparent.

- 216 rectification measures carried out by 19 subsidiaries
- Regular rectification meetings; inspection teams to ten provinces and cities to check rectification with reviews for each case
- Case closure with clear standards and process
- An accountability task force to conduct in-depth investigations and respond to issues found
- Five rectification reports sent to the Central Inspector Office and disclosed to the public as required to show the progress in environmental supervision and rectification

Risk prevention

<p>Sticking to the dual risk prevention mechanism</p> <p>We have put in place measures of dynamic risk identification and graded assessments and a hidden danger investigation and handling mechanism and maintained closed-loop rectification. In 2021, enterprises at all levels carried out a total of 43,212 safety inspections and checked 235,980 hidden dangers, 99.8% of which were rectified to prevent accidents in advance.</p>	<p>Assessing and improving the safety prevention of tailings ponds</p> <p>We have assessed the safety risks of 47 domestic tailings ponds and rectified problems and hidden dangers. Before the flood season in 2021, we checked the flood discharge function of 33 domestic tailings ponds in use and two video inspections for tailings ponds of key overseas mines. All problems and hidden dangers were removed.</p>	<p>Strengthening the risk prevention mechanism of early warnings and forecasts</p> <p>We issued over 50 forecasts and early warnings and enterprises at all levels sent out 1,526 forecasts and early warnings, ensuring safe and stable operations. At the same time, we had dynamic monitoring of energy conservation and emission reduction data with eight early warnings released throughout 2021.</p>	<p>Strengthening emergency drills and response</p> <p>In 2021, a total of 824 emergency drills were organized to improve our emergency response.</p>
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CASE Effective control of overseas safety risks

We investigate the safety risks of all overseas projects, especially in high-risk countries, and have a general picture of the situation. Emergency evacuation plans are formulated for projects in high-risk areas. Through the inspection of overseas risks, we heighten our responsibility awareness and

protect the lives and health of overseas personnel. We have also built a safety system and improved the coordinated defense mechanism. We organize emergency drills to bring overseas risks under control.

CASE MMG reviews and manages cybersecurity risks

MMG runs business in different jurisdictions, so managing cybersecurity risks is imperative. In 2021, MMG and external partners launched a review campaign where they identified business risks of USB storage on MMG users' computers. To avoid potential cybersecurity risks, it published a new policy that prohibits USB mass storage, granting limited exemptions. The work will be completed in 2022, better protecting important and confidential business information.



MMG manages cybersecurity risks

CASE Assessing climate change risks

To minimize the impacts of climate change, MMG reviews opportunities for mitigation and adaptation in the case of extreme climate events, conducts stress tests on climate change, and discloses its risk exposure. In 2021, MMG hosted several site-specific workshops to identify climate risks, opportunities, and adaptation needs across the value chain.

MMG will take a more in-depth look at climate risks in key business links from M&A, procurement, to mine planning and design (including closure and recovery). MMG will continue the work in 2022 with host communities to address climate risks and embrace opportunities.



MMG assesses climate change risks on water management

Training on Safety

We maintain safety and environmental protection training to make employees bear in mind relevant concepts. Training videos on "environmental legal risks and prevention" have attracted more than 9,000 employees. Special activities such as the annual energy conservation week and low-carbon day have been carried out.

In 2021, we organized special training on the newly revised *Work Safety Law* and our employees participated in the national emergency management law knowledge competition.

Safety education sessions
76,594
Safety training participants
Over **1** million

CASE Party building with work safety

MCC20 launched the special activity of "No Accidents Around Party Members", which integrated Party building with work safety. In 2021, a total of 2,673 Party members signed the "No Accidents Around Party Members" Commitment. We established 80 work safety Party branches, 168 Party member work safety task forces, 612 Party member work safety posts, and 423 Party member work safety responsibility areas to give full play to the leading role of Party members in safety management.



MCC20 "No Accidents Around Party Members" campaign

CASE Carrying out the work safety month activity

MCC Group has carried out the work safety month activity of "fulfilling safety responsibilities and promoting safe development" and started a work safety month column in *China Metallurgy* to introduce advanced practices. During

the activity, MCC organized 10,296 safety training sessions and 1,392 safety competitions, published 2,230 safety articles, and carried out 3,933 emergency drills to ensure the safety and health of employees.



"Work safety month" launching ceremony



An emergency drill

Work Safety

Decrease of work safety accidents

22.7%

Decrease of deaths

19.2%

In 2021, the three-year work safety action of China Minmetals achieved practical results, with the number of accidents and deaths falling by 22.7% and 19.2% respectively year-on-year. At the same time, enterprises at all levels have implemented the safety and environmental measures required by the local authorities. Among them, Hunan Nonferrous Metals and China Tungsten Hightech have been recognized as the Hunan excellent enterprises for work safety and fire protection. MCC5, MCC20, Shanghai Baoye, and Baosteel Technology Service Co., Ltd. have been rated as provincial excellent work safety companies.

Actions

To make the three-year work safety action more effective and consolidate the foundation of work safety, we are guided by problems with targeted efforts. Under the theme of “eliminating hidden dangers and ensuring science-based risk prevention”, we carried out the “consolidation action” in 2021. We analyzed problems at all levels and improved the safety management system.

CASE Creating standardized work safety learning projects

MCC5 ensures that 100% of construction sites meet standards. In 2021, five projects were awarded the “national standardized work safety learning projects” while 45 projects and 44 projects were granted the provincial and municipal titles respectively. This shows remarkable achievements in establishing construction sites of standardized work safety.

In 2021, a total of 19 projects of China Minmetals were awarded the “national standardized work safety learning projects” while 241 projects were given the provincial title.

CASE Strengthening the safety management and control of subcontracting teams

China Minmetals reviews the qualification of subcontracting teams of mining enterprises. China Tungsten Hightech has established a “black and yellow list” for subcontracting teams, assessed the certifications of subcontracting team members, and facilitated the entry and exit mechanisms. Hunan Nonfer-

rous Metals implements “two identities, one management” by including subcontracting personnel into unified corporate management. In 2021, eight subcontracting teams were disqualified and the safety management of subcontracting teams was made more effective.

CASE Carrying out designated inspection of special equipment

China Minmetals continues to inspect tower cranes, construction elevators, mobile crawler cranes, and other construction equipment. MCC Group has stepped up equipment maintenance and daily monitoring. In 2021, a sample of 3,948 tower cranes was inspected by a third party, accounting for 60.9% of the total in use. A total of 3,443

construction elevators were inspected, accounting for 69.1% of the total in use, helping remove hidden dangers. Mining enterprises have increased the inspections of transportation systems such as elevators in mines, thus lowering accidents caused by special equipment, a phased achievement in our actions.

CASE Minmetals Development establishes the North-South Safety and Environmental Protection Technology Service Center

In June 2021, Minmetals Development established the North-South Safety and Environmental Protection Technology Service Center for cross-regional guidance, supervision, inspection, and training to improve safety and environmental protection management. The first group

of safety and environmental protection commissioners of the Center were selected by the Minmetals Development Safety and Environmental Protection Department based on the evaluation results. They were excellent employees in production, equipment, and quality control.

Hazard investigation and prevention

Investigating hidden dangers in mining operations

We urge mining enterprises to ask for approval for fire-related operations and hold special meetings on mine safety management to pass on the lessons from mining accidents. We also carry out special accident analyses to share lessons. We supervised the handling of 33 major safety hazards in mines, all of which were rectified to ensure work safety of mining enterprises in 2021.

Investigating hidden dangers of major projects

We strengthen the safety management of dangerous major projects involving deep foundation pits, tall formworks, and installation and disassembly of hoisting machinery, organize the mutual inspection of dangerous major projects among central state-owned constructors as well as large-scale safety inspections to reduce risks.

Investigating hidden dangers of hazardous chemicals and explosives

We hold special meetings on safety management and partner with the discipline inspection and supervision teams for special safety inspections. We sort out the producers of hazardous chemicals and explosives, and following the principle of “five investigations and five strict actions”, we investigate the problems in the safety management of hazardous chemicals and explosives to prevent accidents.



Technology-powered safety

We promote smart construction sites and improve delicacy management of project safety. Technologies such as face (image) recognition, BIM, cloud platforms, and online monitoring have been gradually applied in project safety management. The “smart construction cloud platform” of the 23rd Metallurgical Construction Group Co., Ltd. of Minmetals has been used in 37 projects under construction. We have formulated the *Hunan Smart Construction Site Application and Evaluation Standards*.

We vigorously promote smart mines, organize special exchanges, and build an exchange platform for “technology-powered safety”. The 16 smart mine sub-projects of Anhui Development Mining have been put into operation, realizing unmanned operations and transportation. Hunan Shizhuyuan Nonferrous Metal Co., Ltd., and Xianglushan Tungsten Co., Ltd. have made full use of advanced mining equipment such as rock drilling jumbos and rock prying rigs. The Kangjiawan mine and Huangshaping mine of Hunan Shuikoushan Nonferrous Metal Group Corporation have been automated to improve both production efficiency and safety.

CASE Unmanned smart mine operations improve employee safety

Minmetals Mining has launched the first group of smart mines with a pilot project in Anhui Development Mining. The test of “remote shoveling and loading - autonomous driving - automatic unloading - automatic return” was carried out. The remote driving test line for underground electric locomotives, the intelligent output system of electric carry-

scrapers, and the underground remote driving system of electric locomotives were built. On-site unmanned mine output and transportation in the test area were realized, allowing mining workers to stay away from safety risks and occupational hazards caused by dust and noise.



Anhui Development Mining Digitalized Production Center

CASE Digitalized monitoring improves safety and environmental protection

Hunan Shuikoushan Nonferrous Metal Group Corporation realized the transmission of mobile signals into the underground mine ramps of Kangjiawan mine and the lead and zinc mine, tailings pond online monitoring, the transmission of static and dynamic data, key production site video real-time transmission, mine personnel positioning,

and underground detection information integrated into the dispatch center. In doing so, it strengthened the real-time supervision of mine production and safety and environmental protection, visualized the production of mines and smelting companies, digitalized monitoring, and improved safety and environmental protection.

Green and Low-carbon Operations

MCC Group projects evaluated as green construction projects

26

Bearing in mind the 30-60 goal and dual circulation development paradigm, China Minmetals explores new standards, technologies, new energy, green and digital technologies, and other fields and makes multiple sectors go intelligent, efficient, green, and low carbon to create a better life and contribute to China's high-quality and sustainable development.

A total of 26 MCC Group projects have been evaluated as green construction projects. Zhuzhou Smelter Nonferrous Metals and Hunan Nonferrous Metals Huangshaping Mining Co., Ltd. have been rated as environmental credit and integrity enterprises for the first time. Zhuzhou Cemented Carbide Group Co., Ltd. has been once again recognized as an environmental credit and integrity enterprise in Hunan Province.

Contribution to Carbon Peak and Carbon Neutrality

The 30-60 goal is what China Minmetals has focused on in recent years. We organize special training on greenhouse gas accounting methods, investigate historical carbon emissions, and guide subsidiaries to have an accurate measurement of carbon emissions based on accounting methods in eight industries. We also get key information such as carbon emission sources and emission structure and forecast carbon emissions between 2021 and 2030 to help prepare our carbon peaking action plan.

In 2021

Pieces of outdated production equipment decommissioned

50

Energy consumption reduced 26,000 tons of coal equivalent

Year-on-year decrease in 2021 after coal consumption dropped for nine consecutive years

22.4%

Year-on-year decrease of coal in the energy mix 29.6%

Year-on-year decrease of MCC's coal consumption

33%

China Tungsten Hightech fully decommissioned coal-fired boilers and realized “zero use of coal”



We achieved the “dual control” of energy

Year-on-year decrease of overall energy consumption

5.9%

Year-on-year decrease of overall energy consumption per RMB 10,000 of output

12.2%

Energy saving and emission reduction targets were realized ahead of the schedule

CASE MMG Dugald River Zinc Mine adopts solar energy for low-carbon development

MMG, together with members of the International Council on Mining and Metals (ICMM), has taken aggressive measures to mitigate climate change and pledged to achieve net-zero carbon emissions by 2050. At the UN climate change forum, MMG announced its net-zero emissions plan.

MMG Dugald River Zinc Mine has signed a long-term solar purchase agreement with APA Group to provide renewable energy so that carbon emissions can be reduced. The solar facility will also reduce energy costs for Dugald River Zinc Mine when commissioned in early 2023, helping MMG deliver its commitment to supporting the global transition to a low-carbon economy. Dugald River Zinc Mine mainly produces copper and zinc, which are important raw materials in the development of sustainable technologies such as solar panels, wind turbines, electric vehicles, and batteries.



Low-carbon transition of Dugald River Zinc Mine

Pollution prevention and control

We develop and apply new technologies and equipment, lowering overall pollution. We also revise and formulate a series of standards and specifications and serve major national strategies such as the implementation of the Law on the Prevention and Control of Solid Waste. Since the launch of China Minmetals special projects such as “arsenic salt purification and cobalt and nickel recycling technology” and “treatment and recycling of mining and urban solid waste”, a million-ton copper-lead-zinc comprehensive smelting base and the multiple hazardous waste recycling demonstration project have been established. Hunan Nonferrous Metals Holding Group, Hunan Shuikoushan Nonferrous Metal Group Corporation, Minmetals Copper (Hunan) Company Limited, and China ENFI focus on heavy metal hazardous waste in copper, aluminum, zinc, gold, vanadium and other industries to achieve whole-process pollution control.

Green mines



CASE Breakthrough in antimony mine waste-free technology

The Antimony Resource Waste-free Technology Development and Demonstration project jointly completed by Changsha Research Institute of Mining and Metallurgy and Hsikwangshan Twinkling STAR Co., Ltd. realizes the separation of tailings and flotation wastewater and the recycling of tailings and wastewater. The research enabled a 1,000-ton/

year antimony resource tailings-free development demonstration project in Hsikwangshan Twinkling STAR Co., Ltd. Since the project was put into operation, the recovery rate of antimony has increased by more than 1.5%, realizing no tailings and no wastewater for a green mine.

CASE Restoration of subsided areas maintains biodiversity

Restoration of subsided areas is a key project for Luzhong Mining to build green mines and an important part of the central government’s environmental inspection. As of the end of 2021, Luzhong Mining had replenished more than

37,000 cubic meters of base filling and over 170,000 cubic meters of planting soil and cultivated over 50,000 plants and 36,400 square meters of hollyhock, medick, and potatoes.



The restoration of subsided areas of Luzhong Mining has achieved practical results

Green buildings

Green buildings refer to buildings that save resources, protect the environment, and reduce pollution in the whole life cycle, while providing comfortable, efficient, and healthy space and realizing the harmonious coexistence of man and nature. China Minmetals has stepped up input, improved product quality, and developed green buildings to achieve energy conservation, emission reduction, and sustainable development.

CASE Setting an example for national green construction projects

In October 2021, the innovation and technology incubation building of the Leshan High-tech Zone infrastructure and supporting facility project contracted by CISDI was rated “three stars”, the highest level of green construction in China.

During the construction, CISDI formulated measures on construction management, environmental protection, resource, water, and energy, land saving, and construction site protection, which added a new image to the urban construction market of CISDI.

CASE Creating “Xiongan Standards for Green Construction”

MCC22 Xiong’an Rongxi Concrete Mixing Plant promotes green construction in a five-in-one model of “prefabricated building + green building + EPC + BIM + garden-style construction site”, and has received the “three-star” green construction. It has been granted the first “China Green Building Materials Product Certificate” in the ready-mixed concrete industry issued by GJC.

The project adopts advanced testing equipment with data automatically stored and connected with the digital Xiongan platform. Video monitoring covers the whole production process. The workshop adopts centralized dust removal, clean energy, and heat pumps in its enclosed production space to ensure zero solid waste, waste gas, and sewage.

CASE New architectural coatings contribute to a green and healthy living environment

MCC Jade’s new architectural coatings can remove formaldehyde and mildew and release negative air ions, making it possible to move in after decoration. The material can create a sterile, mold-free,

bright, and fresh living environment. The architectural coatings have been applied to several samples and passed the on-site and laboratory tests of the National Building Materials Testing Center.

Green Ecology

Supported by technological innovation, China Minmetals leads the green development of the mining and metallurgy industries. Minmetals Exploration and Development Co., Ltd., China ENFI, and Zhuzhou Smelter Group have achieved remarkable results in soil treatment, mining area restoration, decommissioning of outdated production capacity, relocation and reconstruction of smelting bases, and environmental improvement to realize the concept of “lucid waters and lush mountains are invaluable assets.”

CASE Ecological restoration turns barren mountains into fertile soil

Minmetals Exploration, together with the Laixi government, carried out a comprehensive land improvement and ecological restoration project in Laixi City. The project has completed the restoration of many ponds, the construction of reservoirs and irrigation wells, and the ecological restoration of abandoned mines. These efforts have solved the problems of fragmented land, disordered layout, inefficient land use, and degraded mine ecology, greatly improving agricultural conditions. It has made the planting of high-quality crops possible and improved the quality and efficiency of agriculture.



Laixi comprehensive land improvement and ecological restoration project

CASE Applying key technologies to promote ecological restoration

The No. 5 tailings pond of Dexing Copper Mine undertaken by China ENFI is one of the largest tailings ponds in Asia. Given the geological hidden dangers and soil erosion of slopes, China ENFI adopted “in-situ soil improvement + direct vegetation” with external-soil spray seeding to restore vegetation. These actions helped Dexing Copper Mine restore the ecology and build a green mine.



Before and after the restoration of No. 5 tailing ponds in Dexing Copper Mine

CASE Recycling used batteries

Changsha Research Institute of Mining and Metallurgy has established an innovative business system of “recycling-graded energy storage-recycling” for used batteries. It has made breakthroughs in used battery dismantling lines, key technologies for graded utilization, and graded energy storage. It has also established four recycling centers and 47 recycling outlets. They can reduce safety and environmental

protection risks, help the government in tracing and monitoring used batteries and provide recycling big data for the new energy and new material industries. It has been listed in the graded battery utilization of the *Requirements for Comprehensive Utilization of Used Batteries for New Energy Vehicles* (the third group) of the Ministry of Industry and Information Technology.

Excellent Teams

Employees support China Minmetals' global business. We are committed to creating a leveling playing field of "positive incentives and happiness for all" with strict rules and sufficient care so that employees can concentrate on their careers. We prioritize employees' occupational health and benefits, improve their learning ability, and see our business and our employees empower each other.



喜迎建党100周年
学党史 跟党走 新长征 启征程



Talent Training and Use

We implement the strategy of empowering the Group with talent, build teams of talent, promote craftsmanship, establish a diversified career development mechanism, and level the playing field for employees.

Reform of talent development mechanism

We deepen the reform of the talent development mechanism, establish the Group talent task force, and formulate relevant policies. We review the current talent situation and release the *2020 China Minmetals Talent White Paper*.

Building the technology team

We have published the *Interim Measures for the Management of Chief Scientists and Technical Experts of China Minmetals*, continued to build an evaluation system of professionals with China Minmetals characteristics, standardized talent evaluation, and evaluated professionals in an orderly manner. In doing so, we aim to establish a team led by chief scientists and technical experts, mastering key core technologies, and leading global innovation.

Building a team of skilled workers

We are approved by the Ministry of Human Resources and Social Security to certify vocational skills. We have established the vocational skill certification center, formulated the vocational skill level and certification system, and registered 35 local branches. Based on the certification of vocational skills, we have established and improved the evaluation system for skilled workers.



Vocational skill certification test

In 2021,

1 employee won the Chinese Skills Award and **21** employees received the title of National Technical Expert

We build a multi-level skill competition platform for skilled workers and give full play to the leading role of high-skilled leading talent to see that workers can improve themselves rapidly. In 2021, one employee won the Chinese Skills Award and 21 employees received the title of National Technical Expert.



The 15th high-skilled talent awards ceremony and exchange

CASE Preparing for the WorldSkills Competition

As the center for the welding and the construction metal work of the 46th WorldSkills Competition, we have provided training to help young Chinese technicians to show their skills to the world.



The construction metal work training for the 46th WorldSkills Competition



The welding training for the 46th WorldSkills Competition

Innovative education and training models

In 2021, we offered trainings 1,234,518 person-time, prepared a training implementation plan and the overall framework, and arranged key projects to improve the ability of employees.

In 2021, we offered trainings
1,234,518
person-time

Holding training courses for recruits

We set up course modules in Party education, management and business, professional skills, and the experience of leading talent and offered 5-day training for 151 recruits of subsidiaries in Beijing. The main leaders of the Group gave lectures to facilitate the transition of new employees to their work and contribute to the Group's development.

Holding Party branch secretary training at China Executive Leadership Academy Pudong (CELAP)

In combination with Party history education, Party spirit, and the characteristics of Pudong's development and opening up, we organized 64 Party branch secretaries of different subsidiaries for 5-day training. In-class teaching was integrated with Pudong development cases so that students could better understand new thinking and the spirit of innovation and high-quality development.

CASE Minmetals Mining holds an employee skills competition

Minmetals Mining promotes rigorous and dedicated craftsmanship and improves the skills of employees. A total of more than 1,600 employees in 32 positions participated in the 2021 employee skills competition where a large number

of technical experts stood out. In 2021, we had one provincial innovation studio, one municipal top ten innovation studio, and three municipal employee innovation studios.



6-cubi- meter electric carry-scraper item in Minmetals Mining's skills competition

Rights Protection

We value and protect the legitimate rights and interests of our employees, abide by the *Labor Law*, *Labor Contract Law*, and the employment laws of our overseas locations, and respect human rights. We uphold an equal and non-discriminatory labor policy and implement democratic management to see that each employee is fully respected.

Equal employment opportunities

We pursue equal employment and treat employees equally regardless of their nationality, ethnicity, race, gender, religious beliefs, and cultural backgrounds, recruit employees with the help of intelligent tools, and standardize the recruitment mechanism.

In 2021,
New employees recruited

12,507

Fresh college graduates

5,121

Total number of migrant workers

686,994

By the end of 2021,
Total employees

193,965

On-the-job employees

155,865

Female employees

over **30,000**

Reform of compensation and benefits

We share what we have achieved with employees, improve their income, deepen the salary reform, and consolidate the foundation for salary management. Through science-based and comprehensive performance evaluation and a reasonable income growth mechanism, the average income of our employees grows steadily.

Democratic management

We have solicited extensive and reasonable suggestions about the Group's operation and management. By organizing workers' congresses, we listen to employees and facilitate communication channels.

Occupational Health

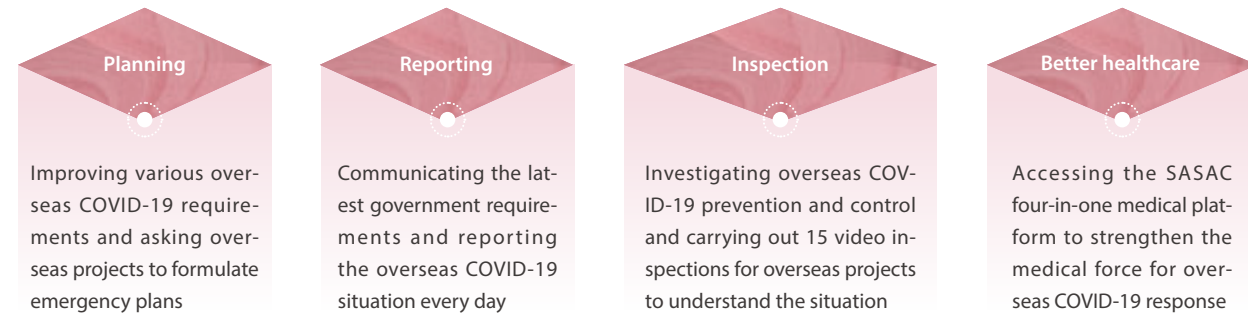
With an emphasis on the physical and mental health of employees, we advocate healthy lifestyles and implement the Healthy China initiative to improve the health of employees and build a better corporate culture.

Occupational disease prevention

We inspect and rectify occupational disease prevention and reduce the number of employees exposed to hazardous positions to prevent occupational hazards. Hunan Shuikoushan Nonferrous Metal Group Corporation has improved its equipment to reduce risks. The application of equipment has reduced the number of employees in dangerous operations by 122. A total of 35 underground sites have been improved, accounting for 70% of the total. Beiminghe Iron Mine and Laixin Iron Mine have been rated as provincial occupational health enterprises.

Overseas COVID-19 response

In 2021, worsening COVID-19 situations outside China threatened the lives and health of overseas employees. According to the guidance of "people first" by General Secretary Xi Jinping, we took multiple measures in the overseas COVID-19 response.



CASE Caring about overseas employees

In 2021, MCCT Saindak Copper-Gold Mine set up strict COVID-19 measures, secured sufficient supplies, and established 187 isolation rooms and nucleic acid testing laboratories to ensure timely and effective isolation and testing when there was an outbreak. We stepped up employee benefits by providing generous on-the-job subsidies to employees in Pakistan and sending masks, milk, hand sanitizers, disinfectant, and other items to employees off duty to protect them from the virus.



Nucleic acid tests

Employee Care

We identify the immediate concern of interest to our employees and make practical efforts to benefit our employees so that they can have a better sense of gain, happiness, and security.

We encourage employees to have a better work and life balance, organize cultural and sports activities, and build libraries and fitness rooms to see our employees can show their skills and create a culture of care.



A debater in the "Young People with Dreams for a New Era" debate competition

CASE Successful withdrawal of overseas staff

In July 2021, to ensure the safety of personnel and assets in Afghanistan, China Minmetals responded to changes swiftly by organizing a task force headed by Weng Zuliang, Chairman and Party Group Secretary of China Minmetals, and Guo Wenqing, General Manager and Deputy Party Group Secretary. The task force tackled the emergency. Thanks to concerted efforts, all 79 Chinese employees were withdrawn.

CASE Minmetals Land gets the first prize in the National Online Contest of Radio Gymnastics

In the "Healthy China Action" National Online Contest of Radio Gymnastics hosted by the General Administration of Sport of China and All-China Federation of Trade Unions, the "Real Estate Yuexiang Team" of Minmetals Land Central China and the "Stable GrowthTeam" of 23rd Metallurgical Construction Group Co., Ltd. of Minmetals stood out in the competition that attracted tens of thousands of participants. They both won the first prize in the group video competition, the first prize in the group registration competition, and the group video popularity award. In addition, 14 participants from the "Real Estate Yuexiang Team" and 16 participants from the "Stable Growth Team" won the first prize in the Yuedong competition.

Shared Development

China Minmetals serves China's economic and social development, meets different needs of customers with innovative products and services, and creates a win-win industrial chain to contribute to the development of the industry. With the commitment to "building a shared beautiful home", we donate money for disaster relief and improve people's life.



Win-win Partnerships

We work with our partners to create a harmonious and healthy industry, create a transparent, efficient, and responsible supply chain, and build a shared and win-win industrial ecosystem.

Customer services

Putting customers first, we improve service standards and customer experience throughout the product lifecycle, provide customers with high-quality services, and establish sustainable and win-win relationships with customers.



Focusing on customer needs and improving product quality



In response to market changes, China Tungsten Hightech formulates production and operation plans and conducts QC group activities that center on innovation and customer needs. We improve production site management and product quality and provide customers with high-quality services and products.



Making a breakthrough in zinc smelting under complex situations



The "key technologies and applications of intelligent control and collaborative optimization of zinc smelting process" with Zhuzhou Smelter Group as the second contributor has won the second prize of the 2020 National Invention Award. The project makes a breakthrough in the stable control and whole-process optimization of zinc smelting under dynamic zinc smelting conditions. Thus, 99.996% of zinc products met standards.

Responsible supply chains

We strengthen supply chain management, supplier reviews, cooperation monitoring, and evaluations, create a transparent and sustainable supply chain management model, and build an extensive, shared, and high-quality supplier database.

53,000

Suppliers evaluated in 2021

Evaluation coverage
100%

187

Suppliers blacklisted and removed

Industry Progress

We always work with partners for common development, create sound, fair, and transparent relationships, and complement each other to share prosperity and development and promote industry progress.



▶ Weng Zuliang, Chairman of China Minmetals, holds a talk with Mao Weiming, Governor of Hunan Province



▶ Weng Zuliang attends the 38th China-Japan Economic Knowledge Exchange Conference



▶ Guo Wenqing attends the online roundtable meeting of the China-Chile Entrepreneurs Committee



Government-enterprise cooperation

We expand and deepen our cooperation with governments. We have agreed on strategic cooperation with authorities in Shanghai, Shanxi, Tangshan, Sanmenxia, as well as government agencies such as the National Food and Strategic Reserves Administration, China Geological Survey, and Shanghai Stock Exchange to discover more business opportunities.



Enterprise-enterprise cooperation

We have established closer partnerships with China Baowu, Huawei, Xiamen Tungsten Co., Ltd., Jiangxi Copper Corporation Limited, China Resources, China Merchants Group, China Life Insurance Company, and enterprises in different fields for win-win results.



University-enterprise cooperation

We have long-term partnerships with Tsinghua University, Chinese Academy of Sciences, Central South University, Northeastern University, and other well-known domestic institutes and universities.



Global cooperation

We have strategic cooperation with international counterparts on the core business of metal and minerals and metallurgical construction.

People's Wellbeing

We engage in non-profit activities, give full play to our expertise in disaster relief, encourage employees to participate in voluntary activities and community services, and contribute to harmonious communities.

CASE Assisting Henan in rescue and disaster relief

In July 2021, a rarely seen heavy rainstorm struck many parts of Henan. China Minmetals immediately donated RMB 20 million to support the local flood control and disaster relief and soon prepared an emergency plan. We asked subsidiaries in Henan to immediately send large equipment for rescue efforts. We helped affected people get out of trouble and assisted in the evacuation of stations. We delivered emergency supplies such as pumps, hoses, raincoats, and shovels, demonstrating the responsibility of a central SOE.



Minmetals Innovation Investment Co., Ltd. launches the clothing donation activity

CASE Carrying out open day activities

On May 14, 2021, the "China Minmetals Open Day - School of Materials Science and Engineering of Tsinghua University" was held in Minmetals Plaza. More than 30 doctoral students attended the event. Through case sharing, seminars, and visits, we helped them understand more about China Minmetals and our corporate culture and communicate with industry experts.



Open Day

We serve communities and carry out non-profit activities such as helping those in need, cleaning the environment, preventing COVID-19, and donating blood.



Volunteers from Beijing Metallurgical Equipment Research Design Institute Co., Ltd. helped the Shenggunanli Community in the election of People's Congress delegates in 2021.

WISDRI has established a multi-professional "rural vitalization team", which serves Changjiang Village, the "demonstration village" in Jiangxia District of Wuhan City, and formulated the *Changjiang Village Rural Vitalization Strategic Development Plan*.

Volunteers from MCC Shen Kan helped the Yijingyuan community in Shenhe District to clean the environment.

Young volunteers of China Third Metallurgical Corporation Ltd. donate blood every year to serve others and contribute to society.



Volunteers from Beijing Metallurgical Equipment Research Design Institute Co., Ltd. help the Shenggunanli Community in the election of People's Congress delegates in 2021.



Voluntary services of MCC Shen Kan



"Rural vitalization team" of WISDRI

Contributions to Communities

China Minmetals localizes operations and contributes to the long-term development of communities by carrying out local community development programs and donations, building infrastructure, and improving people's life.

CASE Launching a community development program

In July 2021, MMG (DRC) Kinsevere Mine held a community development plan signing and launching ceremony, pledging to invest USD 6 million over the next five years to support long-term community development projects in

20 villages in the Bukanda region. Such efforts will greatly promote the development of SMEs, agriculture, education, and public infrastructure in the communities where the mines are located.



Kinsevere Mine community development plan signing ceremony

CASE Carrying out rescue and disaster relief

In July 2021, Papua New Guinea was hit by heavy rainstorms. In response to the call for urgent help from the local government, China MCC19 immediately reconstructed

the river embankment. After many hours of hard work, the breach was repaired, ensuring the safety of life and property of local residents.

CASE Helping those affected by disasters

In the early summer of 2021, wildfires ran rampant in Algeria. China Metallurgical Construction Engineering Group Co., Ltd.'s AZAZGA housing project department in Algeria quickly sent construction water to where the fire broke out. On the second day of the fire, the managers of the project department purchased three trucks of drinking water, 2,500 disposable masks, five boxes of disinfectant, 25 pairs of goggles, 200 pairs of gloves, 25 bottles of hand gel, and 10 boxes of medical supplies for burn treatment and sent them to the relief supply center.



China Metallurgical Construction Engineering Group Co., Ltd. helps those affected

CASE Supporting rural education

MMG Kinsevere Mine has invested more than USD 4.8 million since 2006 to improve local education and has built six elementary schools. Kinsevere Mine pays monthly bonuses to 65 teachers and provides scholarships to 75 students to help them complete secondary education. It also maintains school facilities. MMG Kinsevere Mine emphasizes the importance of rural teachers, especially during the COVID-19

pandemic. Supporting education is one of the best ways to reduce chronic poverty and teachers play an important role in the 26 villages where we operate. MMG Kinsevere Mine is exploring new ways for collaboration and is committed to providing more than 3,000 students with access to education.



Kinsevere Mine celebrates Teachers' Day

CASE All-around support for community development

In 2021, Ramu NiCo Management (MCC) Limited invested about RMB 16.92 million for local communities to improve bridges, roads, local education, and health services. About RMB 440,000 was invested in school buildings and teachers' apartments, helping 132 students finish their education. In addition, Ramu NiCo Management (MCC) Limited improved the support for local agriculture with RMB 770,000 and technical guidance and training for the planting of cocoa, vanilla, and agarwood in the project-affected areas.

Ramu NiCo Management (MCC) Limited invested about

RMB **16.92** million

for local communities to improve bridges, roads, local education, and health services



New primary school classrooms built by Ramu NiCo Management (MCC) Limited



Agricultural support and development

CASE Tractors donated by Las Bambas Copper Mine in Peru

Tractors are important agricultural equipment. After engaging with the local community, Las Bambas Copper Mine in Peru made community donations after understanding its demand for tractors and other agricultural equipment. Currently, 27 communities (about 4,500 people) in Espinar Province, where the mining area is located, have tractors, rakes, and plows for farming in the Coporaque District.

In 2021, Las Bambas Copper Mine donated

9 tractors

to the local community



Donating a tractor to the community



Appendix

Outlook 2022

The world is undergoing profound changes unseen in a century with great development opportunities and reform.

Confronted with new opportunities and challenges brought by profound changes at home and abroad, China Minmetals will be guided by Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era. We will keep in mind the general picture, take responsibility, and have overall planning. We will make every effort to create value and deepen reform and innovation. We will also consolidate the foundation of safety and quality, build a green development model, and share results and responsibilities. In 2022, the 20th CPC National Congress will be convened. We will be more determined and braver to work with all stakeholders for economic, social, and environmental values and move towards “a world-class powerhouse with global competitiveness in the metals and minerals industry.”



MCC Real Estate Zhuhai Yijing Mansion Phase III Project

Sustainability Performance

Economic performance	2017	2018	2019	2020	2021
Operating income (RMB 100 million)	4,934	5,297	6,104	7,039	8,502
Total taxes (RMB 100 million) *	182	200	224	219	248
R&D investment (RMB 100 million)	59	79	120	146	187
Number of new patents	3,709	4,641	4,278	6,778	8,477

*Including overseas

Environmental performance	2017	2018	2019	2020	2021
Year-on-year decline in energy consumption (%)	2.50	10.8	9.5	13.5	5.9
Year-on-year decline in COD emissions (%)				24.5	10
Year-on-year decline in SO ₂ emissions (%)	4.40	40.7	62.0	37.5	35
Number of environmental training sessions	817	1,637	9,003	7,674	6,001
Number of environmental training participants	38,160	94,696	250,000	210,000	232,594

Social performance	2017	2018	2019	2020	2021
Number of employees	196,609	186,258	199,141	200,000	193,965
Number of female employees	45,200	40,977	39,828	32,699	>30,000
Work safety investment (RMB 10,000)	299,058	404,000	559,395	638,600	902,585
Number of employee training participants	317,713	355,441	421,655	608,382	1,234,518
Proportion of contracts executed (%)	100	100	100	100	100

Assurance Statement



Assurance Statement of Corporate Social Responsibility Report

TUV Asia Pacific Ltd. ('TUV NORD') has been commissioned by the management of China Minmetals Corporation ('China Minmetals' for short) to carry out an independent assurance of the 2021 sustainability Report ('report' for short) .

China Minmetals is responsible for the collection, analysis, aggregation and presentation of information within the Report. TUV NORD's responsibility in performing this work (assurance of the report) is in accordance with terms of reference agreed in the scope of engagement with China Minmetals. China Minmetals is the intended users of this statement.

This statement is based on the assumption that the data and information provided in the report is complete and true.

Assurance Scope

- The report revealed the accuracy and reliability for key performance, information and management system which happened in 2021.
- Due to the impact of covid-19, in order to avoid accumulation of personnel, the verification was changed to remote online verification after being confirmed by China Minmetals.
- We evaluate the collection, analysis, aggregation of the information and data.
Assurance of the Report was done by remote audit from 19th May.2022 to 20th May. 2022.

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 2021. The data in report is reliable and objective, TUV NORD didn't find the system errors or substantial errors.

- The structure of report is complete, the revealed information is clear, easy-understand and available;
- The report disclosed the company's social responsibility performance in 2021 from six chapters, such as "The metals and Minerals Industry" "Metallurgical Construction" and "Diverse Industry". In



addition, it describes the development plan of China Minmetals during the "14th Five-year Plan" and the participation of "rural revitalization" were elaborated in two special forms, so that stakeholders have a deeper understanding of China Minmetals' development;

- The five-year performance data of some key performances are disclosed at the end of the report, which is quite comparable.

Suggestion for improvement

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

- In view of the industry environment and social data concerned by stakeholders, it is suggested to clarify the data, so as to facilitate the benchmarking of relevant enterprises in the same industry;
- For the field of science and technology research and development, it is suggested to disclose the cases of the transformation of scientific and technological achievements into practice, so that stakeholders can understand the performance of the organization in this field.

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.

TUV Asia Pacific Ltd. affirms its' independence from China Minmetals and confirms that there is no conflicts of interest with the organization or any of its subsidiaries and stakeholders when performing the assurance of the Report. TUV Asia Pacific Ltd. was not involved in any manner with China Minmetals, when the latter was preparing the Report.

The team leader: Ms. Huang Li
Date :23rd May.2022

The Authorized person: Mr. Song Haining
Date: 23rd May.2022

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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"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Layout and design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Readability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<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.
