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Original Paper

Analysis of Zijin Mining's Green Transformation and Effectiveness under ESG Concepts

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Abstract

Based on the ESG concept, this paper discusses the practice and effect of non-ferrous metal industrial enterprises in green transformation. Taking Zijin Mining as a case study, it analyses the motivation of Zijin Mining's green transformation and combs through its green governance path, assesses the effectiveness of the transformation from the three levels of governance, environment and society, and evaluates the effect of governing Zijin Mining's green transformation. The study finds that Zijin Mining's green transformation has significantly improved economic performance, energy saving and emission reduction, and actively promoted social performance, reflecting the corporate environmental and social responsibility. The conclusions of this paper not only provide feedback for Zijin Mining's green governance, but also provide practical references for the green transformation of enterprises in the same industry, helping enterprises to achieve the goal of sustainable development.

Keywords

zijin mining, green transformation, green performance

1. Introduction

Against the backdrop of growing global awareness of environmental protection, environmental protection has become a core issue in promoting sustainable economic and social development. The signing of the Paris Agreement marks a new legally-driven stage in the global green transformation, and China, as the world's second-largest economy, is faced with the dual challenges of rapid economic growth and environmental protection, with the concept of ESG, as a key framework for evaluating the sustainability of corporations, providing an important guideline for corporations in exploring the path of green transformation.

The concept of green transformation can be traced back to the introduction of the "green economy", which was first articulated by British economist David Pearce in 1989. Since then, scholars such as Blättel-Mink (1998) have defined green transformation as the process of corporations legitimising the use of resources through green innovation within the framework of legitimacy theory, emphasising the necessity for corporations to live in harmony with the environment (Blättel-Mink, 1998), and Nan and Levine (2010) have analysed the motivations for green transformation from the perspective of game theory, pointing out that rising costs triggered by environmental changes have forced corporations to move towards green and low carbon technologies. It was pointed out that the rising costs caused by environmental changes forced enterprises to transition to green and low-carbon modes (Zhou, Mark, & Lynn, 2010). In the Chinese context, Li (2023) further pointed out that green transformation is a necessary way to respond to the new development concept and achieve high-quality development (Li, 2023).

Existing studies generally agree that corporate green transformation is influenced by multiple factors, including industry competition, environmental regulations, sustainable development needs and changes in industrial structure, etc. Hart's (2011) study reveals the role of internal and external pressures in driving the implementation of corporate green strategy, emphasising its role in enhancing the core competitiveness of enterprises (Hart, & Dowell, 2011). In terms of the transformation path, foreign scholars such as Blättel-Mink (1998) emphasised the importance of innovation, including product innovation, technological upgrading, market expansion and the use of green management models (Blättel-Mink, 1998). Cagno (2015) pointed out that technological innovation is the key driving force for green transformation of enterprises (Cagno, Andres, & Andrea, 2015). Domestic scholars Zhao and Wu (2018) believe that in order to get out of the resource limitation dilemma faced by enterprises, research and development and innovation of green technologies are needed (Zhao & Wu, 2018).

Zijin Mining, as a leading enterprise in the non-ferrous metal industry, its green transformation practice has become the focus of attention in the industry. This paper focuses on the case of Zijin Mining's green transformation under the ESG concept, and analyses in depth the driving force behind its transformation, the specific implementation path, and the results achieved. Through this analysis, we aim to extract replicable and scalable green transformation experiences that can provide reference and inspiration for enterprises in the same industry and even in a wider field. Zijin Mining's green transformation practice is not only a positive response to the ESG concept, but also an in-depth exploration of the path of sustainable development, which is of great significance in promoting economic and social development in a greener, low-carbon and sustainable direction.

2. Zijin Mining Green Transformation Case Introduction

Zijin Mining Group Company Limited (Zijin Mining), as a globally renowned multinational mining giant in the exploration, development and technological R&D of metal mineral resources, with business covering a wide range of metals such as copper, gold, zinc, lithium and other metals, has an extensive

domestic and international mining layout and strong technological strength. Zijin Mining not only occupies an important position in the international metal mining industry, but also has made remarkable achievements in the green and efficient development of resources, driven by its scientific and technological innovation.

This paper chooses Zijin Mining as the case study object mainly based on the following reasons: firstly, Zijin Mining has a complete industrial chain and is in a mature stage of development, and its green transformation practice can purely reflect the direct impact of ESG concepts on corporate performance. Secondly, Zijin Mining has outstanding performance in ESG, actively constructing a perfect ESG system and winning many awards, and its green transformation is highly effective, with high research value and typicality. Moreover, Zijin Mining has experienced environmental crisis, and through profound reflection and active rectification, it has successfully transformed from a pollution accident frequent to an ESG model, which provides rich practical materials and space for comparative analysis for the study of green transformation under the concept of ESG. Finally, Zijin Mining, as a listed enterprise for many years, has high transparency and standardisation of information disclosure, especially in recent years, it has strengthened the preparation and release of ESG reports, which provides detailed and authoritative data support for the research of this paper.

3. Zijin Mining Green Transformation Motivation and Path Analysis

Under the trend of ESG concepts gradually becoming a global consensus, Zijin Mining's motivation and path of green transformation can be analysed in depth from a multi-dimensional perspective. The primary motivation lies in the company's commitment to environmental protection and sustainable development, which is reflected in the effective management of energy consumption and strict control of pollution emissions, which is the core consideration of the environmental dimension. Further, from the perspective of social responsibility, Zijin Mining's green transformation is not only a fulfilment of legal obligations, but also a demonstration of its active commitment to social responsibility and response to social expectations. Finally, as an essential attribute of an economic entity, profitability is also a driving force for Zijin Mining to move towards green transformation, to explore new growth points through the green development model, and to realise a win-win situation in terms of both economic and environmental benefits.

3.1 Analysis of Zijin Mining's Green Transformation Motivation

Environment: With the clarification of the global carbon neutrality target and the promotion of China's "dual-carbon" strategy, Zijin Mining and other high-energy-consuming and high-emission industries are facing enormous environmental protection pressure. In order to achieve sustainable development, Zijin Mining actively responds to national environmental protection policies, reduces carbon emissions through green transformation, and improves resource utilisation efficiency, so as to cope with green barriers in international trade and enhance international competitiveness.

Social level: Zijin Mining, as a member of society, bears an important social responsibility. Past

environmental problems have not only affected the company's economic performance, but also damaged its social image. Therefore, Zijin Mining actively responds to social concerns through green transformation, meets the public's expectations for a better environment, rebuilds the company's social image and enhances social trust.

Governance level: Under the ESG concept, the governance level of an enterprise is directly related to its sustainable development capability. Through green transformation, Zijin Mining optimises its governance structure, improves its management level, reduces the risk of pollution accidents and ensures sound operations. At the same time, green transformation also helps Zijin Mining enhance its international competitiveness and better cope with the complex environment of global economic fluctuations, epidemic challenges and industry overcapacity.

3.2 Analysis of Zijin Mining's Green Transformation Path

3.2.1 Green management

(1) Improvement of environmental management structure

Zijin Mining has established an all-round green transformation management system from the board of directors to the front-line work sections to ensure that the green transformation strategy is systematically and strategically implemented. Through the certification of ISO14001 and other international environmental protection standards, the company not only follows national environmental protection regulations, but also takes the initiative to buttress the international environmental protection standards and improve the level of environmental management. This system ensures the effective implementation of the green transformation policy and the implementation of environmental protection responsibilities at all levels.

(2) Deepening reform of the environmental protection system

In order to promote green transformation, Zijin Mining continuously deepens the reform of environmental protection system and builds a scientific, standardised and feasible system. The Group has formulated core green transformation policies, while the affiliated enterprises have refined their implementation programmes in the light of the actual situation, forming an up-and-down linked institutional framework for green transformation.

(3) Strengthening emergency management and disposal

The Company attaches importance to emergency management in the process of green transformation, establishes and improves emergency response plans for environmental emergencies, and establishes an emergency response liaison mechanism with local governments and communities. Through regular drills, we enhance our ability to respond quickly and handle accurately all kinds of environmental risks to ensure environmental safety in the process of green transformation.

3.2.2 Green Production and Pollution Control

(1) Promoting green production model innovation

Zijin Mining comprehensively implements a green production model, reducing pollution at source and enhancing resource utilisation through technological innovation and digital transformation. The

company strengthens environmental impact assessment, selects environmentally friendly materials and processes, and implements waste recycling and reasonable packaging, effectively reducing the environmental load in the production process. In terms of energy management, the company builds an efficient energy management system, improves the resource recovery rate, and actively explores the application of renewable energy to promote the transition of production to low-carbon and environmental protection.

(2) Implementation of green pollution control technology upgrading

In terms of pollution control, Zijin Mining has adopted a series of green transformation measures. In terms of wastewater treatment, the company follows the principle of "source prevention, process control and end treatment", and implements the technology of waste water diversion, deep treatment and recycling to improve the efficiency of wastewater treatment. In terms of waste gas management, the company achieves efficient purification and comprehensive utilisation of waste gas through process optimisation, equipment upgrading and online monitoring technologies. In solid waste management, the company adheres to the principle of resource utilisation, and carries out classification treatment and recycling of tailings, waste rock and smelting waste, so as to reduce environmental pollution and enhance economic benefits at the same time.

3.2.3 Green Reputation and Image

(1) Biodiversity Conservation and Ecological Restoration

Zijin Mining attaches great importance to biodiversity protection and ecological restoration in the process of green transformation. The company strictly abides by natural resources protection regulations and ensures minimal interference with the natural environment from mining activities through the exhaustive Mine Geological Environment Protection and Land Reclamation Programme and biodiversity assessment. Meanwhile, the company actively implements ecological restoration measures during the mining process, giving priority to the use of native plants to restore the original appearance of the mining area, demonstrating the company's respect for and protection of biodiversity.

(2) Green Information Disclosure and Transparency Enhancement

In order to enhance the transparency and social influence of green transformation, Zijin Mining has continuously published the Social, Environmental and Governance (ESG) Report since 2018. The content of the reports has been enriched and improved year by year, and third-party authentication has been carried out to ensure the authenticity and reliability of the information. These reports comprehensively demonstrate the Company's strategic planning, implementation progress and effectiveness in green transformation, which not only enhance the Company's green reputation and image, but also provide learnable experience and inspiration for enterprises in the same industry. In particular, in recent years, the Company's ESG reports have become more focused on key areas such as climate governance, ecological and environmental management, and social responsibility, demonstrating in an all-round way Zijin Mining's firm determination and remarkable achievements on the road to green transformation.

4. Zijin Mining Green Transformation Effect Analysis

The analysis of the green transformation effect of the case enterprise includes both financial and non-financial dimensions, which is more in line with the concept of green transformation, and can more accurately reflect the effect of the enterprise's implementation of green transformation, and further scientifically verify the value of the enterprise's green transformation to the enterprise itself; moreover, the conclusions obtained based on the objective indexes or data can further promote the enterprise to choose to carry out green transformation. The previous section analyses the motivation of green transformation from the environmental, social and corporate governance levels, and selects the corresponding paths based on the three levels, thus generating the corresponding effects at each level. Therefore, the evaluation and analysis of the effects of green transformation should also be based on these three levels, i.e. environmental performance at the environmental level, social performance at the social level, and financial performance at the governance level.

4.1 Analysis of Effectiveness at the Governance Level

4.1.1 Profitability Analysis

As shown in Figure 4-1, Zijin Mining's return on net assets has shown a steady increase in recent years, a trend that echoes the rebound of the non-ferrous metal industry under the "new normal" economy, but more importantly, it highlights the positive results of the enterprise's proactive implementation of the green transformation strategy. In particular, after the full-scale green transformation, the average annual growth rate of return on net assets significantly exceeded the previous stage of only taking active environmental protection measures, proving that in the context of high-quality development, green transformation is not only the embodiment of corporate social responsibility, but also an effective path to enhance the profitability of enterprises. In addition, although the role of the recovery of international metal prices after 2020 in boosting gross profit margins and net profit margins should not be overlooked, the significant improvement in Zijin Mining's profitability indicators is more attributable to the successful implementation of its green transformation strategy, which further strengthens the positive driving effect of green transformation on corporate profitability.

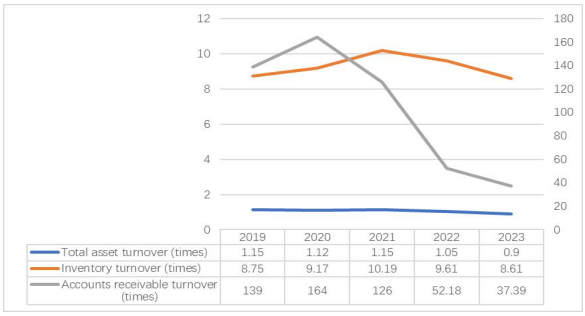
	2019	2020	2021	2022	2023
Return on net assets (%)	11.38	12.19	23.97	25.29	21.43
Gross margin (%)	11.4	11.91	15.44	15.74	15.81
Net interest rate (%)	3.72	4.93	8.71	9.16	9.05

Figure 4-1. Zijin Mining Profitability Indicator Data, 2019-2023

Source: Company annual reports.

4.1.2 Operational Capacity Analysis

As can be seen in Figure 4-2, Zijin Mining has demonstrated efficient control over the use of capital. Despite slight fluctuations in some indicators in 2020, the overall situation remains robust. The fluctuations in the accounts receivable turnover ratio reflect the dynamic changes in the market economic environment, while the slight decline in 2022 and 2023 can be attributed to the short-term impact of production capacity expansion, which does not mask the relative stability of its overall collection efficiency. Particularly noteworthy is the continued rise in inventory turnover, which maintained steady growth even during the epidemic, which is not only a positive signal of the industry's rebound, but also a direct reflection of Zijin Mining's optimised inventory management and enhanced supply chain resilience. This series of data shows that the green transformation has not only not had a negative impact on Zijin Mining's operational efficiency, but has instead played a positive role in promoting its internal management refinement and process optimisation, laying a solid foundation for the company's sustainable and healthy development.



	2019	2020	2021	2022	2023
Total asset turnover (times)	1.15	1.12	1.15	1.05	0.9
Inventory turnover (times)	8.75	9.17	10.19	9.61	8.61
Accounts receivable turnover (times)	139	164	126	52.18	37.39

Figure 4-2. Zijin Mining's Operating Capacity Indicators, 2019-2023

Source: Annual reports of companies.

4.1.3 Solvency Analysis

In examining Zijin Mining's solvency, the data presented in Figure 4-3 reveals the company's financial resilience in the face of the challenges of the global epidemic. Although the gearing ratio increased slightly in 2020, the increase was limited, demonstrating Zijin Mining's prudent strategy and effective regulation of liability management. The current ratio fluctuates, but maintains a relatively stable level, close to 1% fluctuation within the range, reflecting the moderate protection of the enterprise's short-term capital liquidity. Especially crucial is the upward trend of cash flow ratio, although it has not yet reached the ideal level of 1%, but it indicates that the enterprise's ability to repay debts with cash and equivalents is gradually increasing, which provides strong support for Zijin Mining to maintain financial soundness in the complex economic environment. On the whole, Zijin Mining's long-term debt-servicing ability is solid, and its short-term debt-servicing ability is under control, although there is room for improvement.

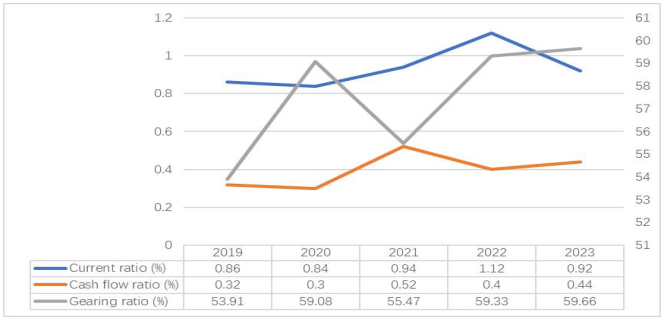


Figure 4-3. Solvency Indicators of Zijin Mining, 2019-2023

Source: Zijin Mining Annual Report.

4.1.4 Growth Capacity Analysis

Turning to the analysis of growth capacity, Figure 4-4 reveals the volatility of Zijin Mining's total asset growth rate, which to a certain extent reflects the dynamic adjustments in the market environment and the company's internal expansion strategy. The significant jump in net profit margin in 2021 is mainly attributable to the efficiency improvement brought about by the expansion of production capacity, reflecting the growth in economic efficiency achieved by Zijin Mining through optimising the allocation of resources in the context of green transformation. The continued rise in operating income growth rate further confirms the solid market position and unleashed growth potential of the enterprise. Although the fluctuation of total assets growth rate and net profit growth rate makes it difficult to directly determine the single impact of green transformation on growth capacity, the positive growth of net profit margin indicates that even with a large investment in the initial stage of green transformation, the enterprise is still able to achieve a sustained improvement in profitability through reasonable strategic deployment and capacity expansion. Therefore, it is reasonable to speculate that green transformation has injected sustainable development momentum into Zijin Mining, and its long-term growth ability is worth looking forward to, while short-term fluctuations need to be comprehensively considered in the context of the market environment and the adjustment of corporate strategy.

Figure 4-4. Growth Capacity Indicators, 2019-2023

Source: Company annual reports.

4.2 Analysis of Effects at the Environmental Level

4.2.1 Energy Consumption

As a leading company in the non-ferrous metals industry, Zijin Mining is well aware of the fundamental role that energy and resources play in the development of its business. However, in the face of finite resources and growing global concern for sustainable development, Zijin Mining is actively taking measures to promote green transformation with a focus on reducing energy and water intensity. As shown in Table 4-1, Zijin Mining's energy consumption intensity and water intensity have shown a significant downward trend from 2019 to 2023. This trend indicates that the enterprise has effectively reduced energy and water consumption while generating unit operating revenue, reflecting its foresight and execution in environmental management.

Table 4-1. Zijin Mining Energy and Water Consumption Intensity, 2019-2023

norm	2019	2020	2021	2022	2023
Energy intensity (GJ/million yuan revenue)	300.92	299.54	243.66	217	233.4
Water intensity (tonnes/million yuan revenue)	332.33	296.04	269.04	269	225.39

Source: Company ESG reports, Cathay Pacific.

Further analysing Zijin Mining's energy use in depth, as shown in Table 4-2, it is not difficult to find that the enterprise has achieved significant results in the consumption of traditional energy sources, such as heavy fuel oil and liquefied petroleum gas (LPG), and the annual consumption of these energy sources has been declining year by year. However, it is worth noting that the total energy consumption has increased to a certain extent due to the expansion of the enterprise's scale and the commissioning of new projects. In the face of this challenge, Zijin Mining has not stood still, but has actively entered the field of new energy, and has diversified and decarbonised its energy structure by increasing the proportion of renewable energy used. In the past three years, the proportion of renewable energy in Zijin Mining's energy mix has increased significantly, which not only demonstrates the company's active exploration and application of new energy technologies, but also sets a good example of how it can respond to climate change and realise the goal of sustainable development.

Table 4-2. Zijin Mining Direct Energy Consumption by Indicators 2019-2023

norm	2019	2020	2021	2022	2023
Paraffin (hundred tonnes)	39.29	18.33	14.81	5.92	3.79

Diesel (million tonnes)	202.34	25.69	34.59	39.29	52.92
Gasoline (million tonnes)	11.62	14.57	15.02	10.61	6.14
Coal (million tonnes)	61.07	85.95	63.67	56.02	52.89
Natural gas (million cubic metres)	3.59	1.41	2.25	1.79	2.5
Comprehensive Energy Consumption (10^2GWH)	67.35	91.53	87.78	84.19	101.38

Source: Based on Zijin Mining's ESG report.

4.2.2 Pollutant Emissions

Pollutant emissions are one of the key indicators of the effectiveness of an enterprise's green governance. Zijin Mining has taken a series of effective measures to manage the discharge of wastewater, waste gas and solid waste, and seeks to minimise the environmental impact. As shown in Figure 4-5 and Table 4-3, COD emissions from wastewater show an overall decreasing trend, and although the total amount of wastewater pollutants and the intensity of emissions increase in 2021 due to the commissioning of new mine projects and the impact of high rainfall, the concentration of pollutants emitted has always been kept at a lower level, which is in line with, or even far lower than, wastewater emission standards for the project site. This result is attributable to the company's strict environmental protection monitoring system and efficient wastewater treatment facilities.

In the area of waste gas emissions, although the emission intensity of sulphur dioxide increased in some years due to the expansion of production capacity, the overall trend showed a year-on-year decrease, indicating that the enterprise has made positive progress in waste gas management. However, in the area of solid waste emissions, general waste emissions per unit of revenue have fluctuated in the past two years, suggesting the need for continued optimisation and improvement in waste management.

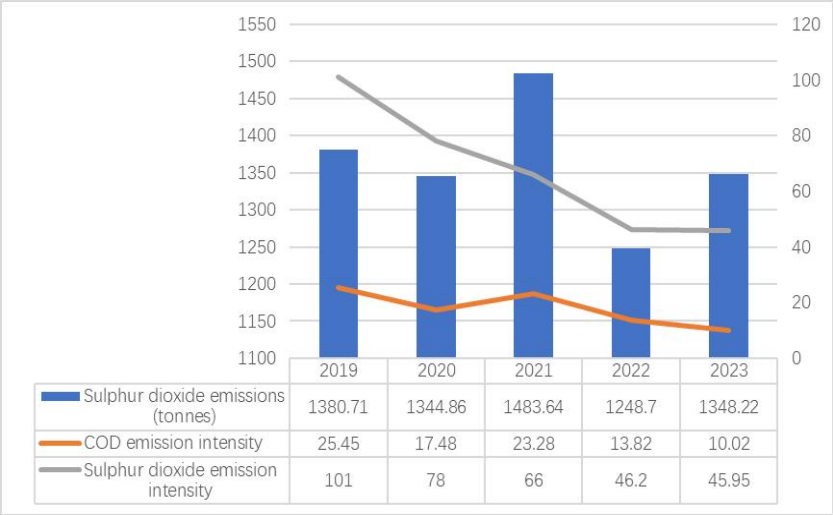


Figure 4-5. Emission of Important Pollution Factors of Zijin Mining Wastewater and Waste Gas, 2019-2023

Source: Based on Zijin Mining's ESG report.

Table 4-3. Solid Waste Emissions, 2019-2023

norm	2019	2020	2021	2022	2023
General waste generation per unit of revenue	33.22	32.34	28.45	26.21	32.71
Hazardous waste generation per unit of revenue	3.04	1.63	1.59	1.19	0.55

Source: Based on Zijin Mining's ESG report.

4.2.3 Sewage Management

As shown in Table 4-4, the enterprise's water recycling utilisation rate will climb year by year from 2019 to 2023, thanks to the enterprise's great attention to water resource management and the extensive application of advanced water treatment technologies. At the same time, the comprehensive utilisation rate of general waste and hazardous waste has also increased significantly in the past two years, which is not only a reflection of technological progress, but also a result of the deepening of the enterprise's green management concept. By improving the resource utilisation of waste, Zijin Mining has not only reduced environmental pressure, but also created additional economic value for the company.

Table 4-4. Water Resources and Solid Waste Recycling in Zijin Mining, 2019-2023

norm	2019	2020	2021	2022	2023

Water recycling rate (%)	91.29	91.86	92.02	94.29	94.8
Comprehensive utilisation rate of general waste (%)	7.69	12.91	13.62	14.71	14.88
Comprehensive utilisation rate of hazardous waste (%)	15.78	23.19	34.07	48.41	48.98

Source: Based on Zijin Mining's ESG report.

4.2.4 Technological Innovation

As shown in Table 4-5, although the share of environmental protection investment has fluctuated slightly in recent years, the share of R&D investment has shown a steady upward trend. This trend shows that enterprises pay more attention to solving environmental protection problems through technological innovation and improving production efficiency and resource utilisation. Meanwhile, the increasing number of new patents and the proportion of R&D personnel have also provided strong support for the green transformation of enterprises. These efforts not only promote the enhancement of enterprises' technological strength, but also lay a solid foundation for them to realise their green, low-carbon and recycling development goals.

Table 4-5. Technological Innovation Indicators for Zijin Mining, 2019-2023

norm	2019	2020	2021	2022	2023
Share of environmental protection investment (%)	0.53	0.64	0.63	0.54	0.47
R&D investment (%)	0.35	0.34	0.34	0.46	0.33
Number of new patent applications	27	24	32	29	58
Number of R&D personnel (%)	1.21	16.7	10.25	10.14	9.48

Source: Based on Zijin Mining's annual report and ESG report.

4.3 Analysis of Effects at the Social Level

4.3.1 Employee Dimension

As shown in Figure 4-6, the level of per capita welfare has continued to rise in recent years, especially in 2021, when it achieved significant growth, which not only reflects the company's emphasis on the quality of life of its employees, but also its proactive efforts to enhance employee welfare. Meanwhile, the proportion of safety investment has steadily increased and expanded by 0.17% in 2023, highlighting Zijin Mining's strong commitment to safeguarding the safety of its employees. In addition, the company has effectively safeguarded the legitimate rights and interests of its employees by providing benefits such as comprehensive coverage of labour contracts, social insurance and annual medical check-ups, and the employee turnover rate has stabilised at a low level, further enhancing the stability and cohesion of its workforce.

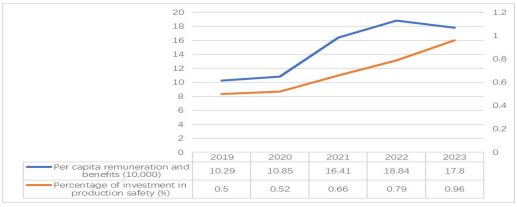


Figure 4-6. Zijin Mining Employee Dimension Metrics, 2019-2023

Source: Company annual reports.

4.3.2 Social and National Dimensions

Zijin Mining not only focuses on its own sustainable development, but also actively fulfils its responsibilities to society and the state on the road to green transformation. As shown in Figure 4-7, between 2019 and 2023, the enterprise's total tax payments, community inputs and social contribution value per share show a year-on-year increase, especially in 2023, when it achieves significant growth. This demonstrates that Zijin Mining is paying more attention to giving back to society through practical actions after its green transformation, showing its responsibility as an industry leader. The increase in social contribution not only strengthens the company's social reputation, but also sets a good example for it in the industry, which helps the company maintain its leading position in the fierce market competition.

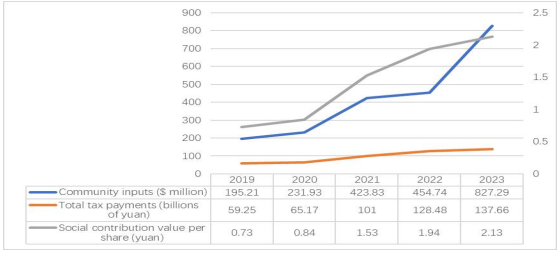


Figure 4-7. Social and National Dimension Performance Indicators, 2019-2023

Source: Company annual reports.

4.3.3 Customer Dimension

Customers are the cornerstone of enterprise survival and development. Through the establishment of a sound customer demand information collection and feedback mechanism, Zijin Mining is able to understand and respond to customer demand in a timely manner, and continuously optimise its product development and production processes. As shown in Table 4-6, between 2019 and 2023, Zijin Mining's product qualification rate and customer satisfaction are both close to 100%, and no product recalls or complaints have occurred. This performance not only reflects Zijin Mining's strict control of product quality, but also highlights its good reputation in the hearts of customers.

Table 4-6. Zijin Mining Product Management and Customer Service Data, 2019-2023

norm	2019	2020	2021	2022	2023
Number of products recalled (tonnes)	0	0	0	0	0
Number of products complained about (pieces)	0	0	0	0	0
Conformity rate of mineral products (%)	99.9	99.8	99.9	100	99.98
Customer satisfaction (per cent)	99.28	99.29	99.22	99.60	99.65
Product packaging wood (tonnes)	206	253	699	703	479
Product concentrate packaging (tonnes)	2725	2370	1841	3818	2887

Source: Based on Zijin Mining's ESG report.

Zijin Mining attaches great importance to the co-operative relationship with suppliers in the process of green transformation, as shown in Table 4-7, the number of suppliers of Zijin Mining has maintained a

steady growth in recent years, while the proportion of domestic suppliers still occupies a dominant position despite a slight decline. It is worth noting that the enterprise has incorporated ESG indicators into the supplier evaluation system, and in 2022, Zijin Mining has adopted environmental and social standards to select the number of new suppliers 1,547, and the finalised number of suppliers is 780, with an access ratio of 50.42%, through which it has not only improved the overall environmental protection level of the supply chain, but also promoted mutually beneficial and win-win relationships with suppliers. In addition, Zijin Mining strictly enforces green policies in the procurement process, effectively reducing environmental risks in the supply chain.

Table 4-7. Number of Suppliers to Zijin Mining, 2019-2023

sports event	2019	2020	2021	2022	2023
Total number of suppliers (homes)	4923	4669	5380	5444	6712
--Number of suppliers in China	4495	4172	4480	4229	4304
--Number of suppliers from other countries and regions	428	497	900	1215	2408
Number of first-tier channel suppliers	493	513	745	780	550
Screening of new suppliers using ESG criteria (home)	592	917	762	1547	1532

Source: Based on Zijin Mining's annual report and ESG report.

4.3.4 Shareholder Dimension

As shown in Figure 4-8, the enterprise's earnings per share and total dividends show an upward trend between 2019 and 2023, and achieve substantial growth between 2020 and 2023. By actively communicating with investors and sharing the fruits of corporate development, Zijin Mining has successfully built a good relationship with its shareholders, laying a solid foundation for the long-term

stable development of the enterprise.

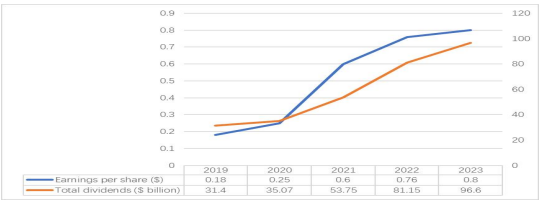


Figure 4-8. Shareholder Dimension Performance, 2019-2023

Source: Company annual reports.

5. Discussion

5.1 Conclusions of the Study

As a leading company in the non-ferrous metals industry, Zijin Mining, driven by the ESG concept and the goals of carbon peak attainment and carbon neutrality, is actively implementing green transformation. Its transformation is driven by a variety of factors, including national environmental protection policies and international carbon neutrality pressure, social responsibility, public supervision and industry green development trend, as well as the enterprise's own needs for adaptation to the international market, the pursuit of long-term economic benefits and risk prevention and control. On the path of transformation, Zijin Mining strengthens organisational construction, builds a green governance system, implements green production and pollution control strategies, and reduces pollutant emissions, while focusing on information disclosure, biodiversity protection and stakeholder cooperation to build a good corporate image.

Zijin Mining's green transformation has yielded results in financial, environmental and social terms. Financially, although short-term debt servicing and growth capacity have yet to be improved, overall stability has been achieved and profitability and operating capacity have been enhanced. On the environmental front, although the total consumption of resources has increased, energy efficiency has improved, the use of new energy has increased, the intensity of pollutant emissions has decreased, and investment in technological innovation has increased. On the social front, the company has actively fulfilled its social responsibilities, enhanced employee rights and interests, and strengthened investor relationship management.

5.2 Research Implications

Under the ESG framework, Zijin Mining's green transformation practice provides valuable insights for the corporate sector. Firstly, enterprises should proactively embrace green governance as an inevitable way to fulfil their social responsibilities, so as to build a good market image, enhance risk resilience and achieve sustainable development. This requires companies to change their mindset from the bottom of their hearts and view green governance as a long-term strategy rather than a short-term response.

Secondly, the establishment of a sound green management system and a clear governance programme is the key to success. Enterprises should scientifically plan their green development goals, implement

them in phases, and optimise their management structure to ensure clear responsibilities and efficient mechanisms. Drawing on Zijin Mining's experience, the motivation of management and technical staff should be enhanced by strengthening management functions, clarifying the division of responsibilities, and supplementing it with incentive mechanisms. At the same time, cultivate a green corporate culture to make it an endogenous driving force for green transformation.

Furthermore, technological innovation and energy transformation are the core drivers of green development for enterprises. Enterprises should continue to optimise production processes, introduce advanced technologies, improve resource efficiency and reduce pollution emissions. Increase R&D investment, strengthen technological innovation, and promote the transformation of energy structure, such as the development of clean energy, the implementation of "oil" to "electricity", and explore the application of "hydrogen energy" and other new clean energy. At the same time, we will vigorously develop a circular economy and enhance the efficiency of the energy sector. At the same time, we will vigorously develop a circular economy, enhance the comprehensive utilisation rate of resources, and strengthen our capacity for sustainable development.

Finally, enterprises should focus on performance improvement and information disclosure to enhance their core competitiveness. In the mining industry, resource control is a core advantage. Enterprises need to continuously improve product quality and ensure a high-quality and stable supply of resources to support the acquisition of cyclical and excess profits. At the same time, they should strengthen information disclosure and transparency to enhance investor and public trust and further consolidate their market position.

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