首钢股份
SHOUGANG STEEL

Embrace the mission Lead the future

Beijing Shougang Company Limited Sustainability Report 2022

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Sustainability Report 2022

About This Report

Esteemed readers,

The 2022 Shougang Steel Sustainability Report adheres to the principles of objectivity, standardization, transparency, and comprehensiveness. It systematically discloses Beijing Shougang Co., Ltd.'s commitments, management, measures, and achievements in social responsibility, environmental protection, and corporate governance in 2022.

Beijing Shougang Co., Ltd.

August 2023

Reporting Period

The reporting period covered by this report spans from January 1, 2022 to December 31, 2022 (referred to as the "reporting period"). Part of the content may refer to previous years as needed.

Report Scope

This report covers Beijing Shougang Co., Ltd. and its subsidiaries, branches, and affiliated units. For the sake of description and readability, Beijing Shougang Co., Ltd. is also referred to as "Shougang Steel" "the company", or "we" in the report.

Shougang Steel's main product production companies: Shougang Qian'an Iron&Steel Co., Ltd.(Qiangang Co.), Shougang Jingtang United Iron & Steel United Co., Ltd. (Jingtang Co.), Beijing Shougang Cold Rolling Co., Ltd. (Cold-R Co.), Shougang Zhixin Qian'an Electromagnetic Materials Co., Ltd. (Zhixin Co.).

Note: The Qianshun Base refers to the integrated production organization and product research and development system formed by Qiangang Co, located in Qian-an, Hebei province, and Cold-R Co., located in Shunyi District, Beijing.

Data Sources and Reliability Assurance

The information and data disclosed in this report originate from the company's documents and statistical data, and have been verified by relevant departments. The company guarantees that the contents of this report are free from any false records or misleading statements and takes responsibility for the authenticity, accuracy, and completeness of the contents.

Preparation Basis

- Guidelines for Preparation of China Corporate Social Responsibility Report (CASS-ESG5.0) issued by the Chinese Academy of Social Sciences
- Guidelines No. 1 for Self-Discipline Supervision to Listed Companies- Normative Operation of Main Board Listed Companies issued by Shenzhen Stock Exchange
- The Sustainability Reporting Standards (GRI Standards) issued by the Global Sustainability Standards Board
- The United Nations 2030 Sustainable Development Goals (SDGs)
- State-owned Assets Supervision and Administration Commission of the State Council "Guidelines for Better Fulfillment of Social Responsibilities by State-owned Enterprises" (State Asset Research [2016] No. 105)
- The Guidance on Social Responsibility Reporting (GB/T 36001-2015)

Text Language

This report is available in both Chinese and English. In the event of any discrepancy between the two languages, the Chinese version shall prevail.

Report Acquisition

The electronic version of document can be downloaded from the Social Responsibility section on the official website of Shougang Steel (http://www.sggf.com.cn/).

CONTENTS

Message From Chairman

The year 2022 is the year of the successful convening of the 20th CPC National Congress of the Communist Party of China, the key year for implementing the "14th Five-Year Plan", and also the key year to lay a solid foundation for Shougang Steel's high-quality development. Due to the turbulence of the international situation, the demand for steel market declined more than expected, the steel price continued to weaken, the raw mateiral and fuel price remained relatively high, and the industry benefit declined significantly year-on-year. Facing the new situation, new tasks, and new challenges, in accordance with the vision of building a steel listed company with international competitiveness and influence, the company has implemented the strategy of strengthening the company with talents, consolidated the governance foundation, innovatively driven by technology leadership, guided by green safety demonstrations, enhanced development momentum, and continuously improved sustainable development capabilities.

People-oriented, strengthening the company with talents, striving to build a world-class enterprise. We adhere to a people-oriented development strategy, deeply promote talent-driven development, and build a multi-level training system for all staff. The company has established the "voyage" career development system for high-potential talents, encompassing the entire professional lifecycle, and constructed a "four horizontal and three vertical" training system for all staff. We open up the channels for horizontal movement of talent across three sequences: "business management, professional technology, and skill operation", thereby improving the flow of talents. The proportion of high-tech and highly-skilled personnel in the company has steadily increased. We comprehensively create a talent innovation highland, with 4 employees honored with the title of "Shougang Scientist". We enrich incentives for high-level talents, implement treatment for sophisticated talents, and optimize and enhance the incentive mechanisms for innovation and market operations, reinforcing the vitality of enterprise development.

Optimizing governance, operating in compliance, building a solid governance foundation. We adhere to compliant operations and comprehensively promote the modernization of the company's governance system and governance capabilities. We have established a standardized and orderly corporate governance framework, forming a governance mechanism characterized by clearly defined rights and responsibilities, transparency, coordinated operation, and effective checks and balances. We have established a comprehensive compliance management system, replete with well-structured organization, complete regulations, standardized processes, and features distinctive to Shougang Steel. Continuously optimizing and enhancing our internal control system, we also advance special risk governance and build a risk-warning indicator system. Through integrating risk control with compliance, we aim to achieve "strong internal control, effective risk prevention, and enforced compliance".

Intelligent manufacturing, leading by technology, strengthening the long-term advantages of the enterprise. We adhere to technological innovation, pushing technological innovation to become the First Competitiveness of the company. We aim to make technological innovation a key variable, driving high-quality growth and taking steps towards becoming a world-class enterprise, with continuous breakthroughs in "first release of products, original processes, and first deployment of equipment". We actively advance digital transformation and intelligent manufacturing, continually progressing in the construction of smart factories, achieving new breakthroughs in intelligent manufacturing. We have built the world's first specialized production line for high-grade non-oriented electrical steel used in new energy vehicles. The product performance, dimensional accuracy, and production efficiency have all reached the world's leading standards, with two types of electrical steel products being globally launched.

Green manufacturing, inherent safety, setting industry benchmarks. We insist on green manufacturing and practicing inherent safety, aiming to become a model enterprise. We encourage the whole chain of green production and manufacturing. Shougang Steel is the world's first company to achieve ultra-low emissions throughout the entire process. It has exported ultra-low emission transformation technology and management experience to 35 domestic steel companies, contributing Shougang's wisdom to the steel industry's ultra-low emission transformation. We actively respond to climate change, voluntarily integrate into the national dual-carbon strategy, vigorously carry out energy-conversation and carbon-reducing work, continue to research and innovate low-carbon metallurgical technology, and deepen the construction of the LCA system, building a "carbon management" information application platform. We prevent and resolve risks at the source, creating an intrinsically safe enterprise system that encompasses personnel, machines, environment, and management.

Customer-oriented, providing precise services, pursuing joint and win-win development. We adhere to a market-oriented approach, centering on customers, using technology as the means, walking side by side with customers, and striving for win-win development. We deepen the marketing strategy of "technology + service", continuously optimize the customer service system, build an intelligent marketing service platform, and continuously improve customer service efficiency. We effectively construct a user ecosystem service system characterized by "open sharing, interconnectedness, and value co-creation" to work with customers to create and build together, continuously creating value.

Fulfilling our mission with long-term commitment, enhancing our achievements and composing a new chapter. We will continue to set our sights on world-class enterprises, firmly adhere to the strategy of "green manufacturing, intelligent manufacturing, high-quality manufacturing, lean manufacturing, and precise services", and persist in talent-driven development, governance modernization, technology-driven development, green and low-carbon development, and customer orientation to promote the high-end, intelligent, and green development of Shougang Steel!

Zhao Minge

Chairman of Beijing Shougang Co., Ltd.

About Us

Key Performance Indicators

Year 2022.

- Pig iron:
  22.22 million tonnes
- Crude steel:
  23.23 million tonnes
- Finished products:
  22.18 million tonnes
- Operating profit:
  118.142 billion yuan
- Total profit:
  1.793 billion yuan
- Net profit attributable to shareholders of the company:
  1.125 billion yuan

Beijing Shougang Co., Ltd. was listed on Shenzhen Stock Exchange in December 1999 (Stock Code: 000959), controlled by Shougang Group, a Fortune Global 500 enterprise.

Shougang Steel owns Shougang Qian'an Iron&Steel Co., Ltd.(Qiangang Co.), Shougang Jingtang United Iron&Steel United Co., Ltd. (Jingtang Co.), and controls Beijing Shougang Cold Rolling Co., Ltd. (Cold-R Co.), Shougang Zhixin Qian'an Electromagnetic Materials Co., Ltd. (Zhixin Co.), and other steel entities. The company has a complete production process including coking, ironmaking, steelmaking, rolling, and heat treatment, and has internationally advanced equipment and process levels. We have a complete series of hot-rolled and cold-rolled flat products with complete varieties and specifications, providing customers with high-quality products such as electrical steel, automotive sheet, tinplate, pipeline steel, and household appliance sheet, as well as value-added services such as early vender involvement(EVI).

Development Strategy

Focusing on the promotion and implementation of the "Two Strong and Three Excellent" project (strong profitability, strong innovation capability, excellent asset quality, excellent operational efficiency, excellent energy-conservation and environmental protection), we adhere to the strategic determination of "green manufacturing, intelligent manufacturing, high-quality manufacturing, lean manufacturing, and precise services", advocate the dual-drive of "capital + operation" to promote deepening reform and high-quality development. We adhere to the development direction of "high-quality products + services", continuously promote the development of high-end products, focusing on electrical steel, automotive sheet, and tinplate(chromium), and continuously improve the level of steel material manufacturing services and operational efficiency, forming a cluster of strategic product customers with international competitiveness, and striving to build the company into a listed steel company with international competitiveness and influence.

To strive for excellence better quality

To be sincere better service

To be virtuous better growth

To be beautiful better environment

Company History

1999.12
Successfully listed on Shenzhen Stock Exchange, becoming the first listed company in China to introduce strategic investors, the first listed company to issue shares through a combination of online and offline distribution, and the first listed company to conduct public roadshows.

2002.12
Shougang Qian'an Iron&Steel Co., Ltd. was established.

2004.10
Qiangang Co. Phase I project was put into operation.

2005.11
Completed the stock-reform.

2007.01
Qiangang Co. Phase II project was completed and put into operation.

2008.08
Beijing Shougang Cold Rolling Co., Ltd. was established.

2009.12
Jingtang Co. Phase I first stage project was fully completed and put into operation.

2010.10-2014.04
The mainstream process facilities positioned in Shijingshan District, Beijing, were shut down and transferred to Qiangang Co.

2015.04-2016.04
Acquired 51% equity of Jingtang Co.

2018.03
Shougang Zhixin Qian'an Electromagnetic Materials Co., Ltd. was established.

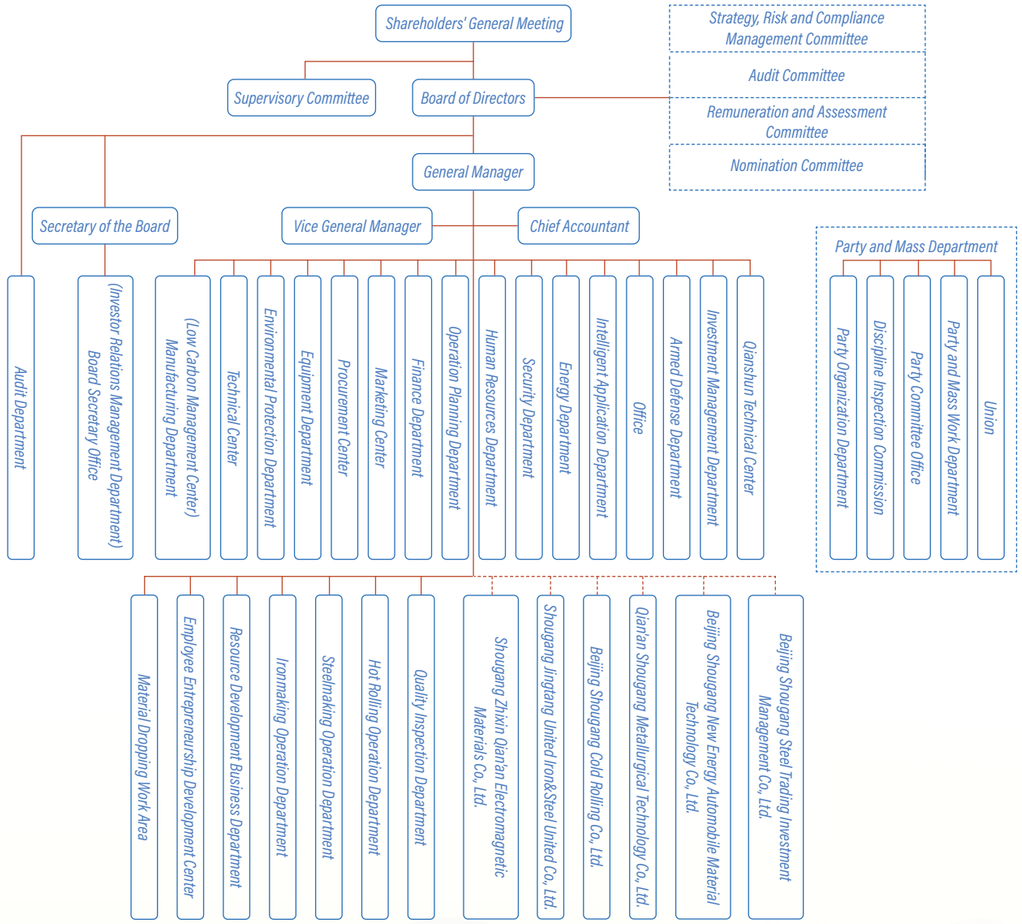
2020.06
Acquired 51% equity of Beijing Shougang Steel Trading Investment Management Co., Ltd. (Steel Trading) through asset exchange.

2021.07
Acquired 19.1823% equity of Jingtang Co.

2022.03
Acquired 49% equity of the Steel Trading.

1999 | 2002 | 2004 | 2005 | 2007 | 2008 | 2009 | 2010 | 2015 | 2018 | 2020 | 2021 | 2022

Organizational Structure



Shougang Relocation

Creating the Future with Spirit of Historical Responsibility

Entering the 21st century, Shougang implemented the future layout adjustment of the national steel industry and the fulfillment of the commitment to the "Green Olympics" in Beijing in 2008. In 2005, the State Council approved the *Shougang Relocation, Structural Adjustment, and Environmental Governance Plan*, and Shougang's steel-related industries began to relocate from Beijing. By the end of December 2010, the steel main process facilities in the old factory area in Shijingshan, Beijing, had completely shut down, marking the end of Shougang's 91-year history of steel melting in Beijing.

From Shijingshan to Cao Fei Dian in Hebei, the historic relocation of Shougang is not only a landmark project for the coordinated development of Beijing, Tianjin, and Hebei, but also a landmark event in the history of China's steel industry development.

The relocation of Shougang is a new layout for new capacity, new technology, and new levels. Before the relocation, Shougang Steel mainly produced long products, but after the relocation, it shifted its focus to the production of high-end flats. The business forms of Shougang in Beijing have transformed from extensive production to a multi-forms development model of headquarters economy, demonstrating the modernization and upgrading of product structure. The concept of green, circular, and low-carbon development has been systematically implemented, demonstrating the green upgrading of production processes.

In Cao Fei Dian, Hebei Bohai Bay
A steel "dream factory" has stood for more than ten years
From Shijingshan to Bohai Bay
From the old Shougang to the new Jingtang
Shougang has achieved a phoenix-like rebirth

February 2005

The State Council approved the *Shougang Relocation, Structural Adjustment and Environmental Governance Plan*, and agreed to build an internationally advanced integrated steel plant in Caofeidian, Tangshan, Hebei as the carrier for the relocation.

June 2005

The shutdown of BF No. 5 of Shougang ironmaking plant marked the official start of the production reduction and relocation work of the Shougang in Beijing.

October 2005

Shougang Jingtang United Iron&Steel United Co., Ltd. was established.

May 2009

The ignition of BF No. 1 of Jingtang Co. marked the launching of the trial production of the Jingtang Co. project.

End of 2010

With the complete shutdown of the main steel production lines in Shijingshan, Beijing, and the production of the second stage of the first phase of the Caofeidian Jingtang Co., the historic task of Shougang's relocation and adjustment was basically completed.

August 2019

The full production of the second phase of one-stage projects in Jingtang Co. was achieved.

Jingtang Co. has relocated more than **4,500** workers from the Beijing area,

Recruited about **5,400** college graduates to settle in Caofeidian,

Created nearly **20,000** jobs in related upstream and downstream service industries.

Honors in 2022

- ★ Awarded the "National May Day Labor Award"
- ★ Shougang Steel and Zhixin Co. were awarded the title of "National Intellectual Property Advantage Enterprise"
- ★ Awarded the "National Harmonious Labor Relations Demonstration Enterprise"
- ★ Rated as the "Grade A" enterprises in environmental protection performance evaluation
- ★ Awarded the label of "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant Cultivation Enterprise" by China Iron and Steel Association
- ★ Awarded the title of national "Industrial Product Green Design Demonstration Enterprise", which is the only steel enterprise on the list
- ★ Named as the "Bookish Enterprise of 2022"
- ★ Awarded the "Best ESG Disclosure Award" and the "Best Board of Directors Award" by Tianma Award
- ★ Received the "16th China's Top 100 Listed Companies Growth Award" by Securities Times
- ★ As the only steel enterprise, received the "Special Contribution Award" from BYD, and received 16 awards including the "Partner Progress Together Award" from FAW-Volkswagen, and the "Excellent Supplier" from CIMC and CRSBG
- ★ Xu Houjun was selected as one of the "Top 10 Beijing Role Models of 2022", and Nanning was elected as the "Capital Citizen Learning Star"

Figures for 2022

5 shareholders' general meetings held

11 meetings of board of directors held

10 meetings of supervisory committee held

55 information disclosures released

100% accuracy rate for information disclosure

Debt-to-asset ratio decreased by 2.18 percentage points

Financial expenses per tonne of steel decreased by 21.78% year-on-year

Total environmental investment amounted to 1.122 billion yuan

The reaching standard rate of pollutants achieved 100%

Emissions of three major air pollutants (particulate matter, sulfur dioxides, nitrogen oxides) per tonne of steel achieved **domestic leading level**

Water recycling and reuse rate exceeded 98.7%

Utilization rate of industrial solid waste approached 100%

The implementation rate of three-simultaneous environmental protection (designed simultaneously, constructed simultaneously, and put into operation simultaneously) achieved 100%

Achieved 100% synchronous operation rate of environmental protection facilities

18,608 employees in total

100% labor contract signing rate

100% employee training coverage

100% social insurance coverage

Total investment in safety production amounted to 137 million yuan

Total safety training time reached 801,222 hours

R&D investment accounted for 4.56%

654 authorized patents

Online procurement orders accounted for 99.14%

Focus 1 Inherent safety, environmental protection model

Incorporating 165 key process safety parameters

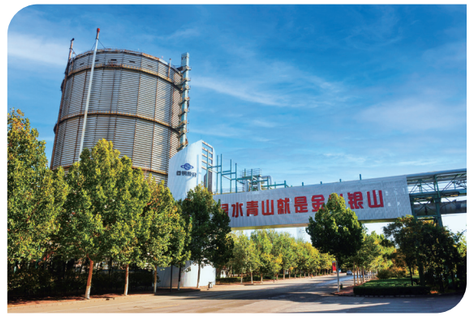
Assisting 35 iron and steel enterprises with advanced technology and management experience for ultra-low emission transformation

The first iron and steel enterprise: achieving ultra-low emissions in the whole process

Long-term commitment to inherent safety has yielded significant results. Shougang Steel emphasizes safety culture, earning recognition as a national level demonstration enterprise for end-to-end safety culture. The company has concentrated on safety standardization construction, completing level-one compliance across main process units. Utilizing the "dual control" mechanism as a core strategy, Shougang Steel has independently developed a 'dual' prevention and control system for occupational safety, becoming a leader in the unified and digital management of safety risk control, and hazard detection and remediation. In 2022, Shougang Steel quantified 2,642 job responsibility lists, integrated 165 critical safety parameters into the dual control system, ensuring that all employees "follow the rules" and that the system "automatically detects hidden dangers". Emphasizing inherent safety management, the company has created unique twelve-step methods such as lock-out/tag-out, mechanical protection, and energy isolation, setting a precedent for the metallurgical industry's inherent safety management. In 2022, Shougang Steel completed 403 key breakthroughs in areas like new technology application, maintenance workwear R&D, and elimination of confined space operations, reducing the total on-site risk value by 10% for three consecutive years.

In 2019, Qiangang Co. became the first iron and steel enterprise to achieve ultra-low emissions throughout the entire process, earning a "Grade A" rating for environmental protection performance in Hebei Province. Jingtang Co. received the same rating in 2020.

Shougang Steel promotes green production manufacturing throughout the entire value chain. It is the only steel enterprise to be awarded the title of national "Industrial Product Green Design Demonstration Enterprise". The company was awarded the title of "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant Cultivation Enterprise", awarded the "2022 Industrial Wastewater Recycling Pilot Enterprise" by the Ministry of Industry and Information Technology, and was named one of the first batch of "Zero Waste Enterprise" in Hebei Province. In fulfilling our social responsibility, we have promoted ultra-low emission advanced technology and management experience, and have helped 35 iron and steel enterprises improve their environmental performance. We have deepened the construction of the LCA system, and established a "carbon management" information application platform, and the EPD platform of hot-rolled products has been successfully released.



Focus 2 Independent innovation, technology leadership

Shougang Steel is the only high-end steel product supplier in the steel industry in China with independent brand (both electrical steel and automotive sheet being products of independent innovative technology). The company, leading in technology and committed to green and low-carbon practices, is a manufacturer and service provider of metal soft magnetic materials and high-end metal materials. We provide industrial materials for national pillars, cooperate with top-level customers worldwide, and have a direct supply ratio of over 90%.

ESW1230 and 20SW1200H, the first electrical steel for new energy vehicles in the world, were globally launched; 0.18mm thick and 1200mm wide grain-oriented electrical steel CRC was developed firstly in the industry; breakthroughs were achieved in mass production of ultra-high strength steel such as GA780MPa and 980MPa; automotive outer sheet DP490+Z has been successfully localized; ultra-high carbon steel S100VD for valve discs was first launched in China. Shougang Steel and Zhixin Co. were awarded the title of "National Intellectual Property Advantage Enterprise".

Global debut
electrical steel for new energy vehicles ESW1230, 20SW1200H

The output of key products and strategic products totaled approximately 13.9 million tonnes, accounting for 63%.

The output of three strategic products (electrical steel, automotive sheet, and tinplate(chromium)) totaled 5.71 million tonnes.

Global debut ceremony of electrical steel for new energy vehicles ESW1230, 20SW1200H

Steel production line for new energy vehicles

Focus 3

Assets optimization, value enhancement

Shougang Steel is the first listed company in China to introduce strategic investors, the first listed company to issue shares through a combination of online and offline distribution, and the first listed company to conduct public roadshows. For a long time afterwards, Shougang Steel provided a reference for companies planning to issue shares and played a demonstrative role, providing assistance to the development of China's securities market. In 2010, according to the overall planning of the State Council and the relocation and adjustment approval of the National Development and Reform Commission, Shougang's main process facilities in Beijing's Shijingshan District had ceased production.

Shougang Steel continues to benchmark against world-class enterprises. Through capital operations, optimizing the company's equity structure, and leveraging the equity financing function of listed companies, the company's debt-to-asset ratio has significantly decreased, and asset quality and efficiency have greatly improved. The total share capital of the company has increased from 2.31 billion shares at the time of listing to 7.82 billion shares. The company has facilitated the integration and injection of high-quality assets, achieved an increase in the revenue and profit levels of the listed company's, further enhanced the company's performance, and strengthened its comprehensive competitiveness and sustainable development capabilities.

Building a steel listed company with international competitiveness and influence

1999.12
Listed on the Shenzhen Stock Exchange, with a total share capital of 2.31 billion shares.

2003.12
Issued 2 billion convertible corporate bonds to build Cold-R Co.

2007.12
After the conversion of convertible corporate bonds issued by Shougang Steel, the total share capital increased to 2.97 billion shares.

2014.04
Injected in Qiangang Co., and the total share capital increased to 5.289 billion shares.

2015.04
Shougang Steel replaced Shougang Group's 51% stake in Jingtang Co. with its full stake in Guizhou Investment.

2020.01
Shougang Group and Baowu Group completed the transfer of equity with no cost of Shougang Steel and Baosteel.

2020.06
Exchange of 12.83% equity in BAIC held by Shougang Steel with 51% equity in Steel Trading held by Shougang Group.

2021.04
Issued 1.235 billion shares to purchase 19.18% equity in Jingtang Co. held by Beijing Investment and Beijing Guorui.

2021.10
Introduced 6 external investors to increase the capital of Zhixin Co. by 1.7 billion yuan, and the equity ratio of Zhixin Co. held by Shougang Steel changed to 82.77%.

2021.12
Implemented the equity incentive plan, and the total share capital increased to 6.76 billion shares.

2022.04
Issued shares to purchase the remaining 49% equity in Steel Trading held by Shougang Group, achieving 100% (direct + indirect) shareholding in Jingtang Co.

2022.05
Zhixin Co. absorbed and merged Qian'an Electrical Steel, and the equity ratio of Zhixin Co. held by Shougang Steel changed to 75.4%.

2022.06
Issued shares to raise supporting funds, and the total share capital increased to 7.82 billion shares.

2022.11
Acquired pellet-sintering assets held by Shougang Mining Corp. for cash.

2022.12
Introduced 15 external investors to increase the capital of Zhixin Co. by 2 billion yuan, and the equity ratio of Zhixin Co. held by Shougang Steel changed to 68.0293%.

01

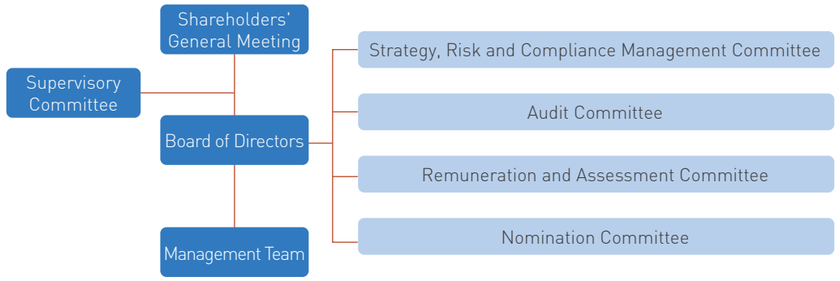
Governance: Strengthening the Foundation of Governance

Shougang Steel always adheres to legal and compliant operation, and continuously improves the scientific nature of risk management and the effectiveness of internal control. At the same time, we establish the mechanism of communication with investors, enhance the level of information disclosure, and strictly enforce anti-corruption measures and promote integrity, making high-quality governance the cornerstone of the company's sustainable development.

Corporate Governance

Governance Structure

Shougang Steel has established a standardized and orderly corporate governance structure in accordance with the requirements of relevant laws, regulations, rules, and normative documents such as the *Company Law of the People's Republic of China, the Securities Law of the People's Republic of China, the Code of Corporate Governance for Listed Companies,* and *Listing Rules of Shenzhen Stock Exchange*. We have also formed a governance mechanism characterized by clear and transparent rights and responsibilities, coordinated operation, and effective checks and balances, ensuring the efficiency and compliance of corporate governance.

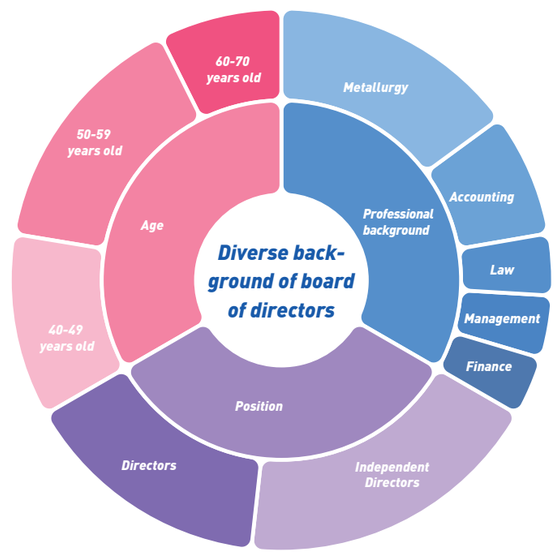


Corporate Governance Structure

The shareholders' general meeting, board of directors, supervisory committee, and management of Shougang Steel all perform their respective duties, highly coordinate, maintain effective checks and balances, and fulfill their duties diligently. They strictly operate according to decision-making authority and procedures, achieving positive synergy in setting directions, making decisions, supervising, and ensuring implementation. This fully safeguards the legitimate rights and interests of the company and all stakeholders.

Shareholders' general meeting. The shareholders' general meeting is the supreme governing body of of the company. It is convened and held in strict accordance with the *Articles of Association, the Rules of Procedure for General Meetings* and relevant regulations. All shareholders, especially small and medium shareholders, have equal rights and fully exercise their voting rights. In 2022, 5 shareholders' general meetings were held, and 22 proposals were passed after deliberation.

Board of directors. The company is committed to improving the diversity and independence of the board of directors. The board of directors consists of 9 directors, including 5 independent directors. These directors possess rich knowledge and experience in various fields such as technology, law, finance, and management. For details of the expertise and skills of directors, please refer to the Corporate Governance section of the *Annual Report 2022*. The board of directors has a sound decision-making mechanism and is responsible for exercising decision-making authority. It has established four specialized committees: the Strategy, Risk and Compliance Management Committee, the Audit Committee, the Remuneration and Assessment Committee, and the Nomination Committee. The Audit Committee and the Remuneration and Assessment Committee are composed entirely of independent directors. Independent directors, based on their professional expertise, provide opinions on major matters such as corporate strategy, standardized operations, management, and risk control, forming internal checks and balances within the board of directors. In 2022, Shougang Steel held 11 meetings of board of directors, 2 meetings of Audit Committee , and 1 meeting of Remuneration and Assessment Committee. 65 proposals were passed after deliberation. The company was awarded the "Best Board of Directors Award" at the 13th China Listed Companies Investor Relations Tianma Awards, and Chen Yi, the secretary of the board, was awarded the "Best Secretary of the Board" at the 18th New Fortune Best Secretary Awards.



Diverse background of board of directors

Best Board of Directors Award

18th New Fortune Best Secretary Awards

Supervisory committee. The supervisory committee consists of 5 supervisors, including 2 female supervisors and 2 employee representative supervisors. The supervisory committee is responsible for supervising the company's financial condition, major matters, and the legal compliance of directors and senior executives, and providing independent opinions and suggestions. In 2022, Shougang Steel held a total of 10 meetings of supervisory committee.

Management team. The management team consists of 8 senior executives who have rich technical and management experience. The management team is capable of flexibly responding to market changes, taking corresponding measures, and implementing effectively.

In 2022, Shougang Steel continued to deepen standardized operations and strengthen scientific corporate governance. The company has formulated 48 systems such as *Authorization Management System of the Board of Directors to Managers* and *Compliance Management System*, and revised 78 systems such as *Rules of Procedure of the Board of Directors and Funds Management System*.

Information Disclosure

55 information disclosures

100% accuracy rate in information disclosure

"Best ESG Disclosure Award"

According to relevant laws, regulations, rules, and normative documents, and in accordance with the requirements of the Shenzhen Stock Exchange, Shougang Steel actively fulfills its obligation to disclose information, ensuring timely and fair disclosure of information and ensuring that the disclosed content is true, accurate, and complete. We have established a regular internal review process for information disclosure to eliminate any false records, misleading statements, or significant omissions, and continuously improve the efficiency and quality of information disclosure. We comprehensively and efficiently convey the company's management and business development information to investors, and safeguard the legitimate rights and interests of investors. In 2022, based on the rules of high-quality mandatory information disclosure, the company increased the voluntary disclosure of key concerns of domestic and foreign investors and the capital market, such as corporate strategy, production and operation, green production, employee rights, and supply chain management, continuously enhancing the quality and transparency of information disclosure.

The company timely discloses information through China Securities Journal, Shanghai Securities News, Securities Times, Securities Daily, and CNINFO Website, which may have a significant impact on investor decisions and stock prices, fully disclosing potential risks. In 2022, the company completed 55 information disclosures and submitted 396 documents to the Shenzhen Stock Exchange. The company achieved a 100% accuracy rate in information disclosure and was awarded the "Best ESG Disclosure Award" at the 18th New Fortune Awards.

ESG Management

Stakeholder Communication

Shougang Steel respects the demands of stakeholders and establishes a regular communication mechanism with stakeholders based on the principles of integrity, interaction, equality, and transparency. We fully understand the demands and suggestions of all parties and actively respond through multiple channels, ensuring the stakeholders' right to know, to participate and to supervise, and maximizing the comprehensive value of stakeholders.

During the reporting period, we regularly record, measure, and review the communication between the company and stakeholders. We improve the communication mechanism in a timely manner based on stakeholders' feedback, continuously enhancing the effectiveness and timeliness of communication with stakeholders. The main issues of concern to stakeholders and the company's communication methods are as follows:

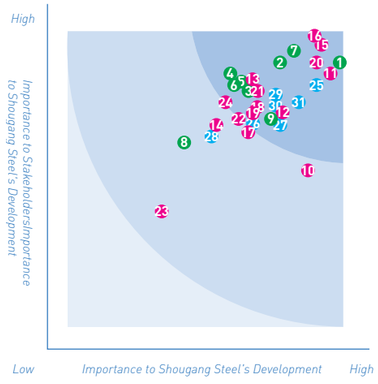
Issue Communication and Response

Stakeholders	Expectations	Communication and Response
Shareholders and Investors	• Corporate governance • ESG management • Anti-corruption • Compliance management • Risk management • Business ethics • Climate change response	• Annual general shareholders meeting / extraordinary general shareholders meeting • Performance briefing • On-site investigation • Investor communication (Interactive Easy Platform, etc.) • Information disclosure
Employees	• Diversity and equal opportunities • Employee compensation and benefits • Employee care and satisfaction • Employee career development and training • Occupational health management • Work Safety management	• Employee representative conference • Various employee activities • Meetings and training • Employee performance assessment • Shougang Sincere Friend app • Employee satisfaction survey
Customers	• Product quality management • Information security and privacy protection • Quality service and complaint handling • Responsible marketing • Technological innovation • Green products	• Customer satisfaction survey • Customer on-site representative • Green production
Suppliers	• Responsible supply chain	• Supplier qualification audit • Industry communication • Exchange and visit
Government and regulatory agencies	• Serving national major strategies • Environmental management system • Energy management • Water resource management • Wastewater discharge • Waste gas emission • Waste disposal • Biodiversity	• Daily communication and reporting • On-site surveys • Information disclosure • Compliance with laws, regulations, and policy learning • Acceptance of regulatory inspections
Community organizations, non-governmental organizations	• Public welfare activities	• Public welfare activities • Information disclosure
Industry partners, industry associations, and research institutions	• Industry development and win-win cooperation	• Industry communication • Establishment of joint laboratories
Media	• Information disclosure	• Timely disclosure of important information, news • Acceptance of media interviews

Materiality Analysis

Shougang Steel conducted materiality analysis, referring to the GRI's recommendations on dual materiality analysis of important issues, and combining the company's business characteristics to identify the most important sustainable development issues for the company as important references for ESG management and information disclosure.

Issue identification: Based on international initiatives and standards, relevant domestic policies, industry trends, stakeholder concerns, and company development goals, 31 highly relevant issues were identified.



Assessment Matrix

Issue impact analysis: For the identified highly relevant issues, a risk-based approach was used to evaluate the actual and potential impact of these issues on Shougang Steel, as well as the impact of Shougang Steel on these issues.

Stakeholder survey:Online questionnaires and on-site surveys were conducted for key stakeholders to understand the important issues of concern to stakeholders.

Issue assessment:Based on the results of the issue impact analysis and the level of stakeholder concern, the importance and priority of ESG issues were ranked, confirming 21 high material issues, which are also the focus of the company's risk management.

Determine the report boundaries:Based on the identified material issues, the focus of this report has been determined.

Material Issues List

Highly important issues		
Classification	No.	Issue
Environment	1	Environmental management system
	2	Energy management
	3	Water resource management
	4	Wastewater discharge
	5	Waste gas emission
	6	Waste disposal
	7	Green products
	9	Climate change response
Society	11	Employee compensation and benefits
	12	Employee care and satisfaction
	13	Employee career development and training
	15	Work Safety management
	16	Product quality management
	18	Quality service and complaint handling
	20	Technological innovation
	21	Responsible supply chain
Governance	25	Corporate governance
	27	Business ethics
	29	Compliance Management
	30	Risk management
	31	Information disclosure

Moderately important issues		
Classification	No.	Issue
Environment	8	Biodiversity
Society	10	Diversity and equal opportunities
	14	Occupational health management
	17	Information security and privacy protection
	19	Responsible marketing
	22	Industry development and win-win cooperation
	23	Public welfare activities
	24	Serving national major strategies
Governance	26	ESG management
		Anti-corruption

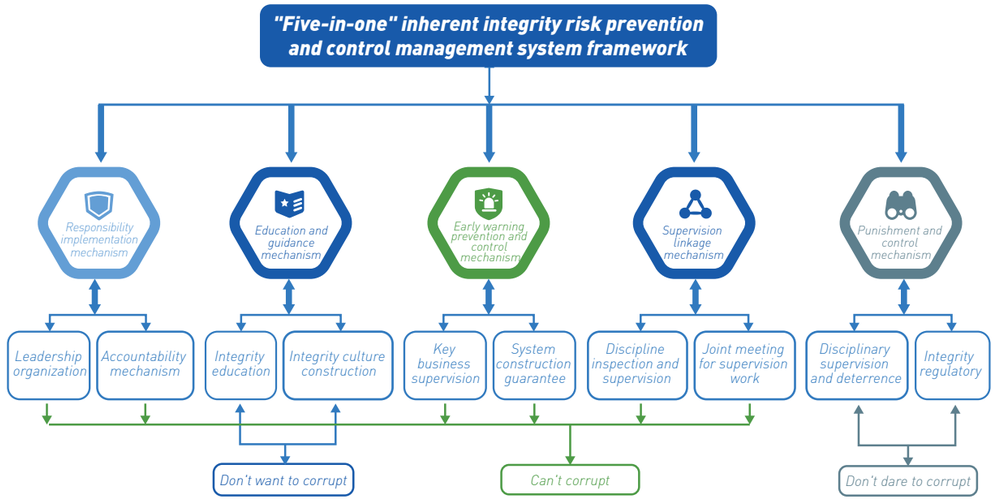
Business Ethics

Shougang Steel conducts business cooperation with a professional, honest, and integrity attitude, strictly adhering to the highest standards of business ethics to ensure integrity in operations. We respect the principles of market competition and actively promote and maintain a fair and free market competition environment. We firmly oppose any form of unfair competition, monopoly, and money laundering, and carry out comprehensive management in areas such as anti-monopoly and anti-money laundering. We value and continuously cultivate an integrity corporate culture, firmly resisting any form of corruption, and are committed to creating a healthy business ecosystem. In 2022, the company did not receive any penalties related to business ethics.

Integrity Construction

The company attaches great importance to integrity and anti-corruption, and adopts a zero-tolerance attitude for corruption, fraud, and other non-compliant behaviors. We focus on anti-corruption, conflicts of interest, and unfair competition, strengthen the integrity education of personnel with business disposal rights, and regulate their professional conduct. We strengthen the supervision and accountability mechanism, maintain integrity in production and business activities, and regulate the behavior of partners, suppliers, and employees in relevant positions.

Integrity risk prevention and control. The company has established five mechanisms: responsibility implementation, education and guidance, early warning prevention and control, supervision linkage, and punishment and control. The company has built a "five-in-one" inherent integrity risk prevention and control management system with Shougang characteristics, achieving accurate identification and effective control of integrity risks, and creating a clean and upright working environment.

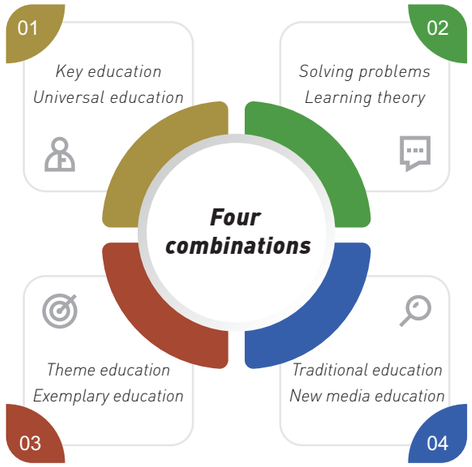


The company has built a closed-loop management system for integrity risk identification, hierarchical control, investigation and governance, education and supervision, and punishment and rectification throughout the entire chain. The company has formulated a comprehensive, specific, and quantitative indicator evaluation system. We continuously improve the supervision mechanism, implement the system of sending discipline inspection and supervision to different regions and the joint meeting system for supervision work, and carry out special supervision on integrity risks. We identify integrity in key areas, key links, and key businesses throughout the entire process, and carry out multi-departmental, cross- specialty, and full-chain joint prevention and control. We also construct a database of clean and honest behaviors for relevant personnel and parties, sort out key business processes and integrity risk points for relevant personnel, evaluate the level of integrity risks, and formulate prevention and control measures and preventive supervision measures.

We strengthen supervision for positions with high integrity risks and long tenure, promote job rotation for personnel with business disposal rights, and carry out education and training on "integrity conduct", hierarchical talks before taking office, and warnings on integrity self-discipline, etc.

Integrity culture construction. The company incorporates anti-corruption education and training into important work deployments and corporate culture construction, determining different education content and methods based on different levels, positions, and targets.

Exploration and Practice of Strengthening the Construction of Integrity Culture in State-owned Enterprises in the New Era **won the first prize in the national steel industry discipline inspection and supervision research paper selection**



Integrity education system

- Universal education:The company organized activities such as "three meetings and one lesson", independent education and learning, thematic study and seminars. We also carried out special education on party discipline and government integrity laws and regulations, and published 10 issues of *Cartoon on Discipline* and 10 issues of *Famous People's Family Style*.
- Key Education:Focused on important time nodes, key business processes, and major work matters, we conducted warning education through joint education, joint inspections, and other forms. We ensure that discussions are held before taking up a position, in case of petitions or complaints, when early signs of problems are discovered, and before holidays and major business activities.


A forum on integrity construction before the Mid-Autumn Festival was held

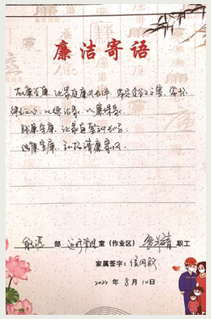
- Theme Education: The company organized activities such as "My Family Rules and Traditions" "Discipline Education Around Us" "Jingtang Ethics" and integrity conduct essay competition. The "Integrity Culture Month" was carried out, including organizing exhibitions on family traditions, signing integrity and ethical pledges, telling "family ethical stories", conducting "clean and friendly assistance" activities, and holding integrity culture knowledge competitions. We also carried out activities for the disciplinary education propaganda month, including visits and research by leading cadres, supervision and inspections, and reminder conversations.

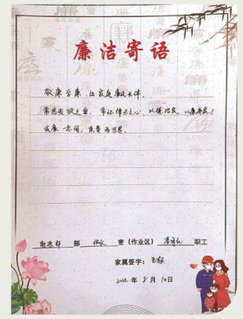


Integrity training







Integrity Culture Month


Activities for the disciplinary education propaganda month

- Exemplary education: The company summarized and established advanced examples of diligence, integrity, and excellence through activities such as exemplary report meetings, experience exchange meetings, storytelling of "integrity stories," and organizing training courses for young cadres titled "Promising Youth, Ethical Companions". Additionally, we conducted warning education activities such as typical cases of violations of discipline and law learning, visits to Nangang Prison in Jidong Sub-bureau, and warning education activities at the Beijing Warning Education Base.



Training course for young cadres titled "Promising Youth, Ethical Companions"

Warning education

- New media education: The company expanded the influence of propaganda and education through enriching the content of the "Integrity Construction" column and organizing exhibitions on integrity culture.

Due diligence. The company has carried out thorough and practical due diligence on new business partners, focusing on factors such as corruption and bribery. During the bidding and qualification review process, we review the new business partners' illegal and criminal information, credit information, etc. At the same time, we require new business partners to strictly comply with national laws and regulations and company requirements, ensure no bribery or integrity issues, and make an integrity commitment.

Reporting and investigation. The company supports and protects whistleblowers and has established an open, transparent, and accessible reporting channel. The procedures for investigating violations are clearly defined. During the verification process, the identity of the whistleblower and the information provided will be strictly confidential to prevent retaliation. We attach great importance to the authenticity and credibility of the reported information. Upon receiving a complaint, we promptly collect and organize the information and conduct further investigations if necessary. Once violations of discipline, regulations, or laws are confirmed, the company will propose corresponding disciplinary measures and transfer suspected criminal cases to the relevant authorities.

Risk Management

Compliance Operation

According to the international compliance management system standards, Shougang Steel has defined compliance policies and objectives, improved the compliance management organizational structure and responsibilities, comprehensively reviewed the compliance risk database, formulated compliance operation and guarantee mechanisms, and evaluation and improvement management systems, and established a complete compliance management system with Shougang Steel characteristics. In 2022, the company modified the strategy and risk committee to strategy, risk, and compliance management committee to strengthen compliance management.

Institutional system. The company strengthens the top-level design of the compliance management system and builds a compliance management system that takes the basic management system as the core, supported by special management methods and guidelines for key areas. It contains "laws and regulations identification list" "compliance obligation list" and "compliance risk measures list", and combines positive guidance with negative lists. This provides basic guidelines for the company's units, employees, and stakeholders, and guides and promotes the company to operate in compliance with laws, with integrity and in a standardized and rigorous manner. In 2022, the legal review rate for both the system and contracts reached 100%.

Compliance Management System

3 basic management systems

Compliance management system manual,
Compliance management system,
Compliance management manual

4 key areas of special compliance regulations

Management Measures for Work Safety Compliance Audit,
Guidelines for Environmental Protection Compliance Management,
Management Measures for Commercial Partner Compliance in Procurement,
Guidelines for Asset Compliance Management

5 supporting systems

Management Measures for Compliance Objectives and Policies,
Methods for Compliance Risk Identification,
Evaluation, and Control, Management Measures for Compliance Monitoring and Reporting,
Management Measures for Compliance Internal Audit,
Management Measures for Compliance Management Review

The rate of legal review of system and contract: 100%

No major non-compliant incidents such as legal sanctions, regulatory penalties, significant property losses, and reputation damage

Compliance measures. The company implements the main responsibility for compliance management. The company focuses on key core businesses and high-risk businesses, and strengthens the responsibilities of business departments, operating units, and project frontline entities. We strictly observe compliance requirements in business decision-making process, and ensure that legal compliance review is a prerequisite for major decisions. In 2022, based on compliance interviews, risk matrix, and external regulatory requirements, Shougang Steel identified key compliance risk points in areas such as safety production, environmental protection, business partner management, and assets management. Meanwhile, we completed key work such as basic research on compliance management, formulation of special management systems, laws and regulations lists, and compliance obligation list databases.

Risk Management

Shougang Steel has established a strict, standardized, comprehensive, and effective risk control systems, promoted the construction of risk special governance and risk warning indicator systems, and continuously optimized and improved the internal control system construction. Thereby, the effective integration of risk control and compliance systems is ensured, and "strengthening internal control, preventing risk, and promoting compliance" is achieved.

Institutional system. The company has formed a risk control system consisting of risk control management system, risk control manual, and risk control evaluation manual. In 2022, the company formulated the *Risk Control Management System*, optimized and adjusted the *Risk Control Manual*, guided the subsidiaries to carry out internal control system construction, strengthened the control of key business of subsidiaries, and achieved full coverage of risk control systems for Shougang Steel's wholly-owned and controlling subsidiaries.

Management structure. The company implements risk classification and hierarchical management, builds a sound risk management structure, and establishes three risk defense lines to ensure the closed-loop of risk control and compliance management mechanism. The three risk defense lines are composed of business units and business entities, risk management function departments, and the internal audit department. In addition, we have integrated ESG risks, including safety production management, environmental protection management, energy management, and employee rights protection management, into our existing risk control system, demonstrating our commitment to social responsibility.

- First line of risk defense: Business units and business entities.
- Second line of risk defense: Risk management department and the strategy, risk, and compliance management committee under the board of directors.
- Third line of risk defense: Internal audit department and the audit committee under the board of directors.

Risk management process. The company continuously optimizes the risk management process, establishing a comprehensive mechanism that involves all staff, covers the whole process, and integrates the entire system for risk prevention and control. The risk management processes include risk information collection and identification, risk assessment, risk response strategies formulation, proposal and implementation of risk management solutions, supervision and improvement of risk management, and risk management reporting. In addition, Shougang Steel has established a multi-disciplinary collaborative inspection mechanism, focusing on key areas to carry out integrated joint supervision, inspection, and evaluation, improving the effectiveness of supervision and the implementation of internal control system.

Major risks and early warning. The company organizes annual identification of major risks, and determines and implements major risk control projects. The company continuously improves the risk warning indicators system, and optimizes the functions of the risk warning platform, achieving comprehensive dynamic early warning coverage in five major areas including strategy, market, operations, finance, and law.

Compliance and risk control culture construction. The company continuously fosters a corporate culture of compliance management, enriches the channels for promoting risk control culture, and enhances employees' risk prevention awareness and level of risk management.

Case: Compliance System Construction Promotion Conference and compliance training were held

On June 14, 2022, Shougang Steel organized a conference on the promotion of compliance system construction to promote the establishment of the compliance management system, ensuring that all work has legal and regulatory basis. At the meeting, the Chief Compliance Officer explained and promulgated the *Compliance Management Manual*. The managers took the lead in signing the compliance commitment letter. The investment management department spoke on behalf of the department responsible for compliance, and conducted training on "Experience Sharing in Compliance System Construction".

Tax Risk Management

Compliance with tax laws is the most basic social responsibility of enterprises. The company has established a comprehensive tax management system and an effective tax risk assessment and evaluation mechanism, providing pre-warning, in-process control, and post-assessment of tax risks. The company regulates the entire process management of tax-related accounting, declaration, monitoring, evaluation, forecasting, and reporting. By formulating tax management measures, enhancing training and learning, and improving invoice management, we strengthen tax management foundation, thereby strengthening enterprise tax risk management and actively preventing tax risks. In addition, the company regularly evaluates the performance of compliance with national tax regulations and internal tax management system requirements involved in daily business operations.

The company firmly opposes tax corruption, fulfills tax obligations with integrity, transparency, and cooperation, and keeps a good and professional cooperative relationship with local tax authorities. In 2022, there were no major tax violations. We promise:

- We adhere to tax laws, fulfill tax declaration obligations, and follow the principle of transparent interaction with government departments to carry out work.
- We disclose tax information to the public in accordance with the principle of transparency. Financial statements and audit reports include relevant information such as deferred income tax assets, liabilities, corporate taxes, and tax rates.
- We actively respond to tax policies, promote the development of businesses encouraged by the government, and enjoy tax benefits.

Business Continuity Management

Shougang Steel attaches great importance to business continuity management, and optimizes and improves the business continuity system and process. The company establishes a sound mechanism for dynamic identification and assessment of business continuity risks, and forms a hierarchical business continuity management organization system with the board of directors, supervisory committee, management team, risk management department, and other risk management business units as the main body. The company has specific risk control management personnel and establish a business continuity management operating system with clear responsibilities, standardized processes, hierarchical management, and coordinated collaboration.

For critical areas such as procurement, marketing, and accounting that may affect the company's business continuity, relevant professional management departments collect relevant information in a timely manner, assess business continuity risks, determine risk management strategies based on actual business, and propose and implement risk management measures.

Information Security

Shougang Steel attaches great importance to data and privacy security. In order to protect the confidentiality, integrity, and availability of information systems, equipment, and data, and strictly protect the security bottom line in all aspects, we have established a sound information security system and corresponding management measures, and continuously improve our technical capabilities in the field of information security. In 2022, the company was awarded the title of Advanced Unit in Network Security Work in Shijingshan District for the Beijing Winter Olympics and Paralympics.

Awarded the title of Advanced Unit in Network Security Work in Shijingshan District for the Beijing Winter Olympics and Paralympics in 2022

The company attaches great importance to information security incident management and business continuity management, and is committed to protecting the company's core assets and customer information security. We effectively reduce the risk of customer interests being damaged due to the lack of business continuity through the construction of institutional documents, the establishment of a security warning and notification system, the implementation of security protection, security situation management, emergency drills, and other means. In 2022, there were no customer privacy breaches.

Institutional system. In 2022, the company has formulated institutional documents such as the *Information Security Strategy Management System and Information Security Incident Management Measures*, which clarify the classification, grading, and response processes of information security incidents, stipulate procedures such as security assessment management and emergency plans, and provide guidance to carry out information security management systematically. Combined with audits and evaluations of information security management system, we achieve comprehensive supervision of the company's information security. In 2022, Shougang Steel formulated and implemented the *Industrial Control System Information Security Management Measures*, which stipulates emergency exercises, data security, whitelist protection mechanisms, and other content. Additionally, we conducted emergency drills at six integration levels and two business levels.

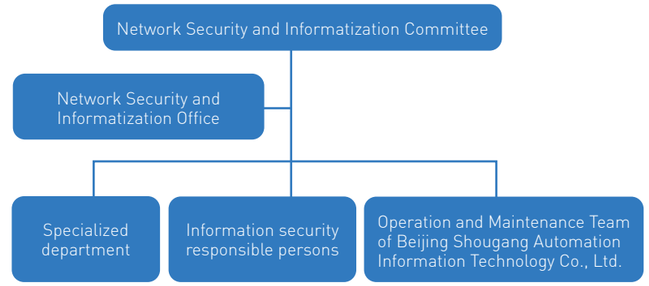
Qiangang Co. completed the re-certification of the information security management system, and the assessment result showed that the system is running effectively. Zhixin Co. completed the certification of the information security management system for the frist time.

100% software legalization commitment signing rate

100% coverage of information security management system auditor training

36 people obtained the certification of information security management system internal auditors

Organizational structure. Shougang Steel has established a three-level information security management organizational structure, consisting of the Network Security and Informatization Committee, the Network Security and Informatization Office, and information security responsible persons at various levels. The company holds monthly informationization meetings organized by the company's responsible managers to coordinate the overall network security work and supervise the implementation of various tasks. Information security management covers the following areas: network security, host security, terminal security, data security, application security, and security management.



Information security management system organizational structure

Training. The company continues to carry out training and promotion work in the field of information security. We provide general information security training for all employees and specialized awareness and skills training for personnel engaged in information security-related work on a regular basis. In 2022, the company organized a series of activities such as the Capital Network Security Day on April 29th, Software Legalization Knowledge, and National Network Security Awareness Week, and organized employees to participate in network security technology training and competition activities.

Investor Relations

In 2022, Shougang Steel's practice was successfully selected as the "Excellent Practices in Investor Relations Management of Beijing Listed Companies" by the Listed Companies Association of Beijing.

Shougang Steel attaches great importance to investor relations management, continuously optimizes investor communication mechanisms, and strengthens communication with investors and potential investors. Through holding company's performance conference, actively participating in investment strategy meetings organized by securities firms, and other forms, the company showcases its operating conditions to investors. Through forms such as the Shenzhen Stock Exchange Interactive Easy platform, investor hotline, and on-site surveys, the company listens to and responds to investor questions, safeguarding investors' right to know, to participate, to express, and to supervise.

In 2022, in order to have real-time interactive communication with investors, Shougang Steel held the Annual 2021 and Q1 2022 Performance Briefing through video live streaming and online interaction. The company also held semi-annual and Q3 2022 Performance Briefings through the "Online Performance Briefing" and "Specific Investor Performance Briefing" formats. The company's senior management interacted with small and medium investors on the Panorama Network studio to discuss the company's operating results. The company continued to carry out roadshow activities and had one-on-one or one-on-many exchanges with over a hundred investment institutions to promote Shougang Steel's investment highlights to investors. We actively respond to investor concerns, and answered a total of over 600 questions covering electrical steel, finance, capital operations, industry development, and other aspects, ensuring smooth communication channels between the company and investors.

02

Environmental protection: Practicing and Leading By Example (E)

Shougang Steel has earnestly implemented Xi Jinping's ecological civilization ideology, and actively practiced this new development concept. The company has taken green development as its core strategy and dutifully pursued the path of green and low-carbon development. By vigorously advancing the technological innovation of energy conservation and carbon reduction, continuously improving the level of ultimate energy efficiency, actively promoting the use of clean energy, deepening the construction of carbon emission control system, vigorously developing green and low-carbon products, to construct a pattern of green and low-carbon development framework, we have demonstrated the responsibility and commitment of state-owned enterprises with practical actions, and contributed to the response to climate change and the improvement of ecological environment quality.

The company is the first enterprise to realize ultra-low emissions throughout the entire process. We have been rated as the "Grade A" enterprises in environmental protection performance evaluation for consecutive years and the benchmark enterprise for green development in the steel industry, and have built a national-level "Green Factory", green supply chain management enterprise, and environmentally creditworthy enterprise, playing an important role in demonstrating green development in the steel industry. During the reporting period, the company was awarded honorary titles such as "Industrial Wastewater Recycling Pilot Enterprise" "Industrial Product Green Design Demonstration Enterprise" by the Ministry of Industry and Information Technology, and "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant Cultivation Enterprise".

Environmental Management

Environmental Management Structure and System

Shougang Steel's environmental management system consists of three tiers:

The first level is the Environmental Protection Leadership Group. It is responsible for the company's comprehensive environmental management work, studying major environmental issues within the company, making decisions, coordinating and solving important environmental problems.

The second level is the Environmental Protection Department. It is responsible for developing and enhancing the company's environmental management system, structure and goals. Additionally, this department oversees the monitoring, inspection, and evaluation of the company's environmental management effectiveness. This department coordinates efforts at enhancing the performance of each subsidiary, thus ensuring their compliance with legal requirements when conducting environmental impact assessments on construction projects.

The third level is the Environmental Protection Departments of each subsidiary, responsible for the construction, management, and monitoring of the localized environmental protection system.

Shougang Steel strictly complies to the requirements of various legal, regulatory, and normative documents including the *Environmental Protection Law of the People's Republic of China, Environmental Impact Assessment Law of the People's Republic of China, Air Pollution Prevention and Control Law of the People's Republic of China, Water Pollution Prevention and Control Law of the People's Republic of China, Opinions on Promoting the Implementation of Ultra-low Emission in the Iron and Steel Industry, Ultra-low Emission Standards for Air Pollutants in the Iron and Steel Industry,* and *Regulations of Hebei Province on Ecological and Environment Protection.* The company has established a robust environmental management system, crafting and continually improving systems for environmental protection, energy management, water resources management and emissions management.

The company continues to maintain ongoing supervision and management, methodically crafting environmental supervision work plans. During the reporting period, a total of 2,298 environmental supervision inspections were undertaken. Through follow-up assessments and similar approaches, all identified issues from these inspections were successfully addressed within the required time frame.

Environmental Management Certification

Shougang Steel has obtained ISO14001 environmental management system certification in accordance with the requirements of GB/T24001-2004 Environmental Management System, with a certification rate of 100%. The company has also invited third-party organizations to conduct annual supervision audit of the environmental management system, focusing on improving the level of environmental management.


能源管理体系认证证书
CERTIFICATE OF MANAGEMENT SYSTEM FOR ENERGY
SHOUGANG QIAN'AN IRON & STEEL COMPANY
EnMS

Environmental Investment and Performance

During the reporting period, Shougang Steel invested a total of 1.122 billion yuan in environmental protection, carried out a number of key environmental improvement projects, further reduced pollutant emissions, and effectively improved the ecological environment in and around the plant. At the same time, the company strengthened environmental publicity and education, actively carried out environmental training on specific topics, enhanced environmental awareness, and achieved a training coverage rate of 100%.

1.122 billion yuan invested in environmental protection, **100%** training coverage rate

Key environmental protection projects of the company in 2022

NO.	Project	Investment (RMB10,000)	Effect
1	Zhixin Co. Annealing Furnace Environmental Denitrification Modernization Project.	2,500.0	Control NOx Emissions.
2	Qiangang Co. Hot Rolling Heating Furnace Denitrification Facility Addition Project	3,499.0	Control NOx Emissions
3	Qiangang Procurement Center Dry Mist Dust Suppression in Green Recycling Industrial Park Project	1,445.0	Control Dust Emissions
4	Qiangang Procurement Center New Electric Dust Removal And Fan for the Primary Line of Desulfurization in Green Recycling Industrial Park Project	1,490.0	Control Dust Emissions
5	Qiangang Co. Ironmaking Operation Department BF No. 1 Hot Stove Flue Gas Treatment Project	8,990.1	Control Pollutant Emissions
6	Qiangang Co. Steelmaking Operation Department No. 1 Steelmaking Sleeve Kiln Raw Material Unloading and Loading Mode Optimization Project	2,185.0	Control Disorganization
7	Qiangang Co. Ironmaking Operation Department BF No. 2 Hot Stove Flue Gas Denitrification Treatment Project	3,698.9	Control Pollutant Emissions
8	Qiangang Co. Ironmaking Operation Department BF No. 3 Hot Stove Flue Gas Treatment Project	8,207.7	Control Pollutant Emissions
9	Sintering Plant Lime Kiln Denitrification	2,684.0	Control NOx Emissions
10	Installing Cover on the Torpedo	1,126.0	Control Pollutant Emissions
11	Installing Denitrification Systemfor Lime Sleeve Kiln	2,954.0	Control NOx Emissions
12	Secondary Closure of Conveyor Belt	2,918.0	Control Disorganization

100%
compliance rate for environmental standards regarding pollutants

100%
synchronous operation rate of environmental protection facilities

During the reporting period, the company achieved the emission standards for all pollutants, with a 100% compliance rate for environmental standards regarding pollutants, a 100% synchronous operation rate for environmental protection equipment and facilities, and no occurrences of major environmental or other significant social safety issues. The emissions of particulate matter, sulfur dioxides, and nitrogen oxides were significantly lower than the permitted emissions. The water recycling and reuse rate reached 98.73%. The chemical oxygen demand in wastewater discharge was much lower than the permitted discharge. All solid waste was either utilized or disposed of through commissioned processing.

Shougang Steel Environmental Targets/Permitted Emissions and Actual Emissions in 2022

Indicators	Units	Actual Emissions in 2022	2022 Targets/Permitted Emissions
Nitrogen oxides emissions	Tonne	5,226	10,105
Nitrogen oxides emissionsemissions	Tonne	2,212	4,727
Chemical oxygen demand emissions	Tonne	17.87	648.99
Comprehensive utilization rate of solid waste	%	99	100

Environmental Warning and Emergency Mechanism

Based on the Shougang Steel's environmental management system, Qiangang Co., Jingtang Co., Cold-R Co., and Zhixin Co. have formulated emergency plans for sudden environmental accidents and special emergencies such as air and water pollution, further improving their emergency response capabilities for air pollution, water pollution, and hazardous waste.

During the reporting period, in accordance with the requirements of the plan, Jingtang Co. implemented 25 emergency drills, including oil leakage emergency drills, oil sludge leakage emergency drills, and radiation accident emergency drills, to improve the skills of preventing and dealing with sudden environmental pollution accidents and enhance practical capabilities. Qiangang Co. established an emergency command center and established emergency organizations and emergency expert groups to carry out environmental emergency drills 22 times, mainly targeting risks such as acid leakage and gas leakage. Zhixin Co. has enhanced its emergency response capabilities for sudden environmental incidents through drills, timely problem identification, and rectification.

Case: Qiangang Co. improves emergency response capabilities through drills

Qiangang Co. has established an emergency command center and established emergency organizations and emergency expert groups, to unify command and coordination of prevention, disposal, and rescue of sudden environmental incidents. According to the warning level issued by the emergency command center, corresponding emergency response measures are initiated, and the warning level is divided into workshop level, enterprise level, and social level. Each emergency team adopts appropriate emergency response measures according to different levels of emergency response. In 2022, a total of 22 environmental emergency drills were conducted, which strengthened the response capability of the company's emergency command center, better tested the emergency response level of personnel in the event of an accident, and further strengthened the optimization of on-site emergency response plans and emergency response capabilities.

Emergency drill

Ultra-low Emissions

Shougang Steel takes the lead in exploring and practicing ultra-low emissions and is the first steel enterprise to achieve ultra-low emissions in the whole process, making ultra-low emissions in the steel industry possible and playing a demonstrative and leading role.

Green Leadership, Achieving Ultra-low Emissions Comprehensively

In 2019, against the background of winning the battle against air pollution, the Ministry of Ecology and Environment issued the *Opinions on Promoting the Implementation of Ultra-low Emission in the Iron and Steel Industry,* marking the beginning of ultra-low emissions in the steel industry. In the absence of any experience in implementing ultra-low emissions for steel enterprises, Shougang Steel closely followed the policy guidance, made advanced plans, and organized meticulously. Following the concept of source control, process control, and end treatment, a series of modernizations were carried out, including organized emission locations achieving stable ultra-low emissions, integrated management of unorganized emissions control, and clean transportation methods. Multiple flue gas treatment technologies were developed and introduced. On January 7, 2020, Qiangang Co. became the first company in the country to pass the ultra-low emission assessment and monitoring organized by the Ministry of Ecology and Environment, successfully creating a model of a green steel company.

Measures such as source control, process control, and end treatment were taken to strengthen source control of harmful substances such as sulfur in materials and fuels and enhance organized emission locations control.

For unorganized emissions, a series of upgrades were carried out, including enclosing stockyard and material transportation belt corridors.

A complete list of unorganized emission sources in the entire plant area was established to achieve real-time online monitoring and key control of more than 400 key pollution sources.

Data collection and analysis were integrated using advanced technologies such as big data and AI to achieve automated operation and intelligent control of environmental protection systems.

In 2022, the company's "Exploration and Practice of Refined Environmental Management Based on Ultra-low Emissions Technology" project was awarded the first prize of the 36th Beijing Enterprise Management Modernization Innovation Achievement by the Beijing Enterprise Management Modernization Innovation Achievement Appraisal Committee.

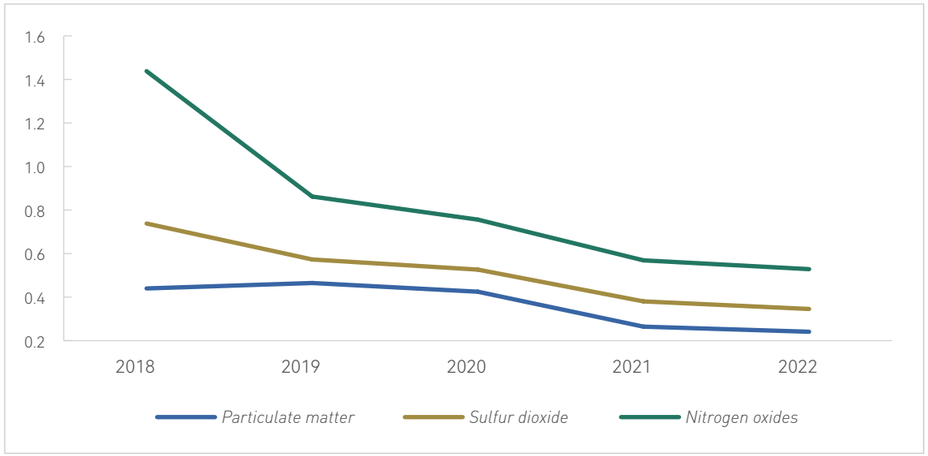
Technological Output, Contributing Shougang's Wisdom

Qiangang Co. has won 6 provincial and ministerial-level (industry) scientific and technological progress awards (including 3 first prizes) for its achievements in ultra-low emissions. The company has also participated in establishing and revising 13 industry and group standards, as well as a series of replicable and promotable ultra-low emission control technologies and management experiences. We have conducted benchmark training, experience exchanges, and hosted large-scale conferences such as Hebei Province's steel company for "Grade A" performance benchmark training and national steel industry ultra-low emission and assessment monitoring seminars, assisting 35 iron and steel enterprises in improving their environmental performance and contributing Shougang's intelligence.

Assisted **35** iron and steel enterprises in improving their environmental performance and contributing Shougang's intelligence

Pursuing Excellence, Improving Continuously

Shougang Steel continues to promote strict and precise environmental control, tap into the potential for environmental improvement, and ensure a continuous and stable reduction in pollutant emissions. In 2022, the company's particulate matter, sulfur dioxides, and nitrogen oxides emissions per tonne of steel were significantly lower than the industry average and the national level of clean production. Among them, Qiangang Co.'s particulate matter, sulfur dioxides, and nitrogen oxides emissions per tonne of steel decreased by 45.5%, 66.7%, and 74.3% respectively compared to 2018.



Qiangang Co.'s pollutant emissions per tonne of steel have been decreasing year by year (Kg/t-crude steel)

Circular Economy

Energy Management

Shougang Steel employs a three-tier energy management system, encompassing the parent company, functional departments, and various subsidiaries. The Energy Leadership Group is responsible for the overall energy management of the company. The Energy Department establishes and improves energy management systems and is responsible for organizing, supervising, inspecting, and coordinating daily energy management. The energy departments of each subsidiary are engaged in the localized construction, management, and monitoring of their respective energy systems.

Qiangang Co., Jingtang Co., and Cold-R Co. have successively established and implemented energy management systems that comply with national standards (GB/T23331). They have also obtained energy management system certification from China Classification Society Certification, with a certification rate of 100%.

In recent years, the company has adhered to the philosophy of circular development and continuously improved the efficiency of the system through plan, do, check, act (PDCA) as the basic method, greatly improving the energy efficiency.

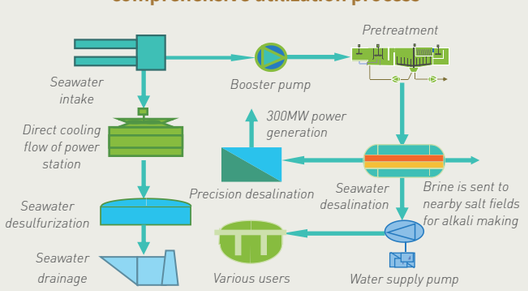
Energy management system certification

Water recycled rate exceeded **98.73%**, Utilization rate of industrial solid waste approached **100%**

Case: Jingtang Co. develops "water and electricity symbiosis" technology, and achieves cascade energy utilization

Jingtang Co. has independently developed the "water and electricity symbiosis" technology based on seawater desalination. This technology replaces the condenser of the power generation turbine with a thermal seawater desalination device, directly coupling the steam turbine generator with the seawater desalination equipment. It is the first successful attempt in the world. Compared with the steam extraction mode of conventional power plants, the pre-seawater desalination steam turbine generator system of energy cascade utilization principle has a high thermal energy utilization rate of 82.23% and an annual power generation of 340 million kWh. At the same time, the generated power is used for the membrane seawater desalination device, and seawater desalination has reduced the energy cost by 50%.

Schematic diagram of seawater comprehensive utilization process



Case:Qiangang Co.'s combined cycle power plant

Qiangang Co. practices the concept of scientific energy use, fully recovers and utilizes the waste heat, excess pressure, and excess gas in the steel production process, and applies advanced and efficient low-calorific gas power generation technology to build 3 combined cycle power plant (CCPP).

Waste Disposal

Shougang Steel has compiled the *Solid Waste Secondary Resource Management System* and carried out source reduction control and professional management of waste based on this system. After multiple inspections, the company has developed the *Green Development Plan*, aiming to achieve the full recovery and efficient utilization of solid waste secondary resources, achieve reduction, resource utilization, and productization, maximize benefits, achieve "no solid wast leaving the factory", promote internal circulation, and gradually realize social circulation. Jingtang Co. follows the concept of "absorption, value-added, and leading" in the management of solid waste resource utilization, continuously expands the comprehensive utilization of metallurgical slag resources, achieves "zero external discharging" of solid waste, and creates a model for the green utilization of solid waste secondary resources in the steel industry. The company was awarded the "Industrial Resource Comprehensive Utilization Base" by the Ministry of Industry and Information Technology in 2019, and applied for the provincial-level "Zero Waste Factory" in 2022.

The company has established a complete desulfurization slag and steel slag processing line, realizing the maximum recovery and utilization of desulfurization slag and steel slag.

Low-alkali steel dust and iron-scale, which have low alkali metal content, can be directly used in sintering. For zinc-containing dust with high alkali metal content, in order to achieve the recycling of iron and zinc elements, Shougang Steel accumulated and processed 146,600 tonnes of zinc-containing dust using external rotary kilns in 2022. The processed slag has been used for pelletizing, and the iron-containing resources have been returned to the plant for reuse.

In 2022, the total amount of general industrial solid waste generated was 119.2 million tonnes, all of which were recycled. The amount of hazardous waste generated was 462,800 tonnes, of which 453,200 tonnes was recycled, achieving a recycling rate of 97.92%.

Waste discharge and related indicators of Shougang Steel in 2022

Indicators	Units	2022
Scrap steel recycling rate	%	100
Total amount of waste generated	10,000 tonnes	1,238.43
General waste generation	10,000 tonnes	1,192.14
General waste recycled	10,000 tonnes	1,192.14
Hazardous waste generation	10,000 tonnes	46.28
Hazardous waste recycled	10,000 tonnes	45.32

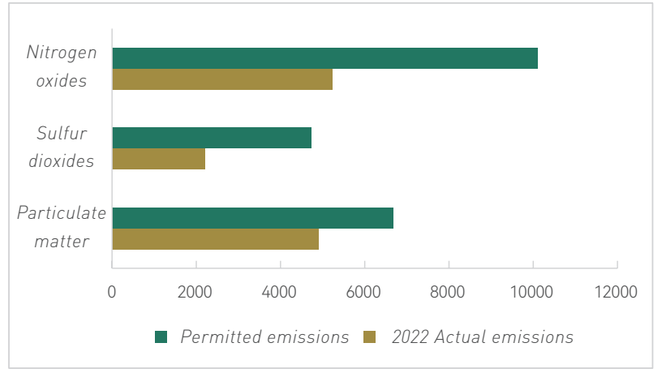
Waste Gas Management

In accordance with the regulations and policies such as the *Air Pollution Prevention and Control Law of the People's Republic of China and Implementation Plan for Ultra-Low Emission in the Iron and Steel Industry,* the company has taken the lead in completing the ultra-low emission projects, continuously strengthened comprehensive air pollution control, and established an environmental monitoring and control system based on online monitoring of pollution sources combined with self-monitoring and environmental inspection. The company is equipped with monitoring equipment for waste gas, wastewater, and ambient air quality throughout the plant, and monitors various indicators in real time.

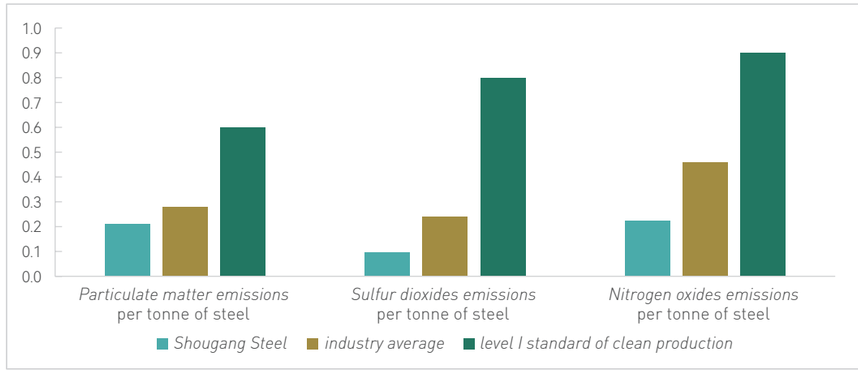
In 2022, the company implemented key environmental deep treatment projects such as hot stove flue gas treatment, denitration and desulfurization ash modernization of sintering plant No. 3 and reduction of particulate matter emissions, desulfurization of heating furnace, and denitrification of annular shaft kiln flue gas. The emissions of major pollutants and characteristic pollutants are lower than the government's permitted emissions. The emission intensities per tonne of steel are 0.211 kg for particulate matter, 0.095 kg for sulfur dioxide, and 0.225 kg for nitrogen oxides respectively, significantly lower than the industry average and the national level I standard of clean production.

Waste gas emissions of Shougang Steel in 2022

Indicators	Units	Actual Emissions in 2022	Permitted Emissions
Particulate matter emissions	Tonne	4,908	6,669
Sulfur dioxides emissions	Tonne	2,212	4,727
Nitrogen oxides emissions	Tonne	5,226	10,105



Comparison of air pollutant emissions with the permitted emissions (Tonnes)



The company's air pollutant emissions intensity is significantly lower than the industry average and the level I standard of clean production (Kg/t-crude steel)

Water Resources Management

The water recycled amounted to 4.331 billion tonnes

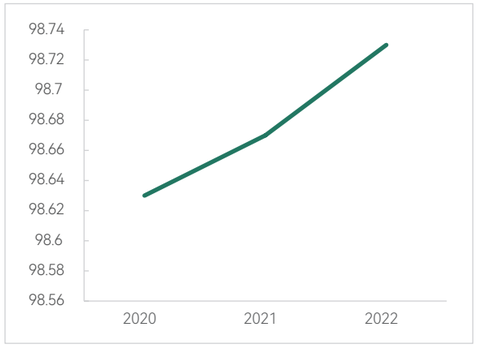
The water recycling and reuse rate reached 98.73%

Shougang Steel adheres to the concept of "minimizing intake, treating comprehensively, and reducing discharge" for water use, insists on legal water intake, scientific water-saving, and water recycling, and develops a series of water-saving and water treatment technologies to continuously improve the reuse rate of water resources. Jingtang Co. utilizes its advantage of being by the sea to develop water and electricity symbiosis technology and produce low energy-consumption, high-quality desalinated water. The company has achieved the title of "Excellent Marine Engineering" for seawater desalination and achieved "zero discharging" of wastewater. Qiangang Co. achieves nearly "zero discharging" of wastewater through comprehensive water resources management and the use of the "three dry" process and cascade utilization. The company has been successively awarded the titles of "Hebei Province Water-saving Enterprise" and "National Water Efficiency Leader", and has been selected as "Industrial Wastewater Recycling Pilot Enterprise" by the Ministry of Industry and Information Technology in 2022. Cold-R Co. extensively uses municipal reclaimed water in various production systems, and in 2022, the proportion of municipal reclaimed water and reused wastewater reached 55.9%. The company has been recognized as a water-saving enterprise and an advanced collective for water-saving in Beijing.

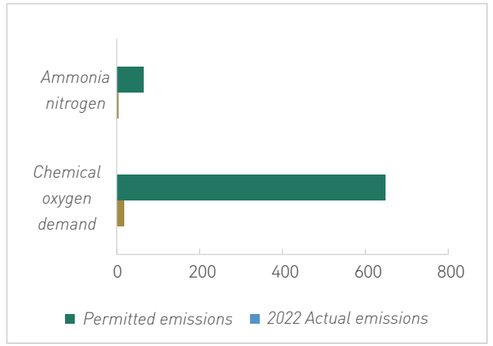
During the reporting period, the water recycled amounted to 4.331 billion tonnes, and the water recycling and reuse rate reached 98.73%. The total discharge of wastewater was 434,700 tonnes, with chemical oxygen demand and ammonia nitrogen discharge of 17.866 tonnes and 0.216 tonnes respectively, which were much lower than the permitted discharge.

Water utilization and wastewater discharge data of Shougang Steel in 2022

Indicators	Units	2022
Annual fresh water consumption	10,000 tonnes	6,696.83
Water recycled	10,000 tonnes	433,087
Water recycled rate	%	98.73
Wastewater Discharged	10,000 tonnes	43.47
Chemical oxygen demand in wastewater discharge	Tonne	17.866
Ammonia nitrogen in wastewater discharge	Tonne	0.216



Water recycled rate (%)



Chemical oxygen demand and ammonia nitrogen in wastewater discharged, and permitted discharge (Tonnes)

Case: Qiangang Co. was selected as "Industrial Wastewater Recycling Pilot Enterprise" in 2022

Qiangang Co. actively responds to the call of Hebei Province to create water-saving enterprises, strictly implements the *Hebei Province Water-saving Regulations*, vigorously promotes new technologies, new equipment, and new processes for industrial water-saving, and has invested approximately 1.53 billion yuan in water systems. By adopting advanced water-saving technologies and building first-class water treatment facilities, the water consumption per tonne of steel has been greatly reduced and the water recycled rate has exceeded 98.6%. The company has been awarded the titles of "Tangshan Water-saving Enterprise" and "Hebei Water-saving Enterprise", and become a provincial water-saving demonstration enterprise and an industrial wastewater recycling pilot enterprise.

Comprehensive wastewater treatment for the entire plant. The company adopts the "separate drainage of rain and sewage" system to ensure the effective collection of wastewater. According to the principle of separate treatment, production and domestic sewage treatment facilities have been constructed. Among them, the designed treatment capacity of production wastewater is 60,000 tonnes/day, and the designed treatment capacity of domestic sewage is 3,600 tonnes/day.

Advanced "Zero Waste" technology. The company adopts the double membrane deep treatment technology, all the reclaimed water from the sewage treatment plant is reused. The generated desalinated water is used for the closed-loop water systems, vaporization cooling systems, rinsing and spraying in the production process. The concentrated brine is used for slag flushing for blast furnace, stewing slag, and sintering mixture after further concentration and reduction through concentrated water reverse osmosis, achieving nearly "zero" discharging of industrial wastewater.

Reuse of various types of wastewater. In accordance with national standards, industry standards, and production practices, various measures are taken into reuse various types of wastewater. Circulation use includes the iron slag flushing water system, the hot rolling turbid water system, and the steelmaking turbid water system; cascade utilization includes the drainage of the oxygen production circulating water system into the hot rolling laminar flow spraying system; comprehensive utilization includes the treatment and utilization of various types of production wastewater. Various types of sewage and wastewater are treated separately. Starting from the design, sewage and wastewater are classified according to their water quality and treatment difficulty, so that the collection, treatment, and reuse of sewage and wastewater can truly be implemented, facilitating the improvement of water resource efficiency.

Qiangang Co. was selected as "Industrial Wastewater Recycling Pilot Enterprise"

Case: Jingtang Co. achieves " drawing water from the ocean"

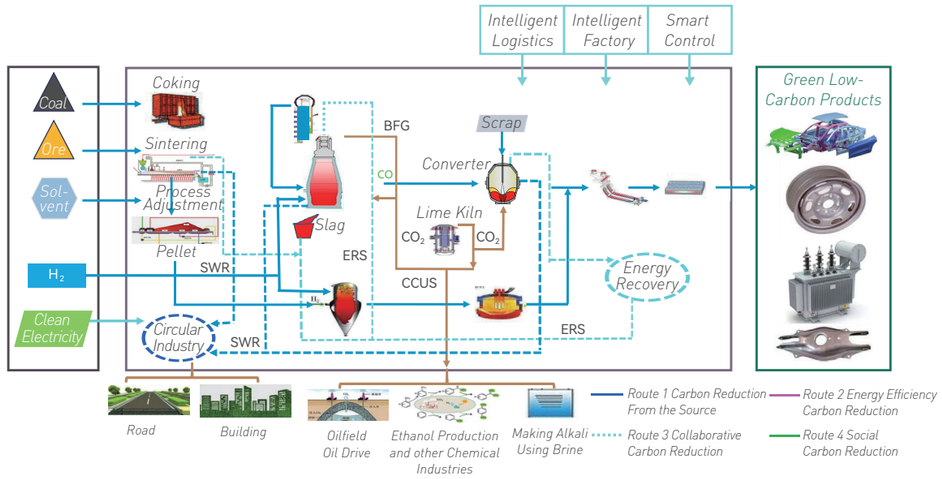
Jingtang Co. utilizes its advantage of being by the sea and fully deploys the technical route of comprehensive and efficient utilization of seawater. The company has successively built 50,000 tonnes/day, 35,000 tonnes/day, and 10,000 tonnes/day seawater desalination projects, forming a total seawater desalination capacity of 95,000 tonnes/day. We have created a low-carbon, low-cost seawater desalination new model, promoting the cascade utilization of seawater and saving 19.93 million tonnes of fresh water resources annually. By using the water and electricity symbiosis technology, we produce low-energy consumption and high-quality desalinated water, realizing the concept of "drawing water from the ocean", and earning the title of "Excellent Marine Engineering" in seawater desalination.

Low-carbon Development

Carbon Management Structure and Strategy

Shougang Steel firmly establishes the concept of green and low-carbon development, consciously integrates into the local economic development, and regards achieving carbon neutrality as an important part of achieving high-quality development and high-standard environmental protection. The company strengthens top-level design, focuses on key areas, reinforces target guidance, takes comprehensive measures, and steadily advances efforts to reach carbon peak and carbon neutrality. In March 2022, low-carbon management center was established, mainly responsible for collecting, organizing, and studying national low-carbon management policies, building a carbon management system, establishing management systems and processes, setting decarbonization goals and plans, establishing management assessment systems, establishing an information management platform, and promoting the implementation of low-carbon work. The center is also responsible for life cycle assessment (LCA) evaluation and research, actively carrying out environmental product declaration (EPD) work.

The "dual carbon" targets of the company: striving to peak carbon emissions and possessing the capability for a 60% reduction in CO_2 emissions of some products by 2025, possessing the capability for a 30% reduction (compared with 2020) in CO_2 emissions intensity of steel production lines by 2030, reducing CO_2 emissions by 30% from the peak by 2035, and striving to achieve carbon neutrality between 2050 and 2060.



Shougang Steel's carbon reduction technology route

GHG Emissions

The company always prioritized ultimate energy efficiency, and committed to the concept of high-end green manufacturing. The company vigorously researched and innovated low-carbon technology, actively developed and utilized renewable energy, comprehensively promoted energy-conservation and carbon reduction work, and significantly reduced GHG emissions compared to 2021.

In 2022, the company's GHG emissions were calculated by the Department of Ecology and Environment of Hebei Province. The details of GHG emissions are as follows:

GHG emissions	Units	2020	2021	2022
Direct emissions (Scope 1)	tCO_2e	35,855,259	38,615,904	38,542,164
Indirect emissions (Scope 2)	tCO_2e	3,207,411	4,179,058	3,936,676
Direct/indirect GHG emissions (Scope 1 & 2)	tCO_2e	3,9062,670	42,794,962	42,478,839

Climate Risk and Opportunity Identification

Climate change is a global issue that concerns the community of human destiny and is a major challenge for sustainable development. The steel industry is crucial for achieving peak carbon emissions and carbon neutrality in society. Shougang Steel actively responds to climate change, identifies climate change risks and opportunities, combines its own advantages and the development stage and characteristics of the industry, actively integrates into China's "dual carbon" strategic layout, vigorously promotes energy conservation and carbon reduction work, and continuously promotes the green and low-carbon development of the company.

Risk Category		Risk Parameters	Potential Impact
Physical Risk	Acute risk	The severity and frequency of extreme weather events (such as typhoons, floods, etc.) increase	Jingtang Co. is located on the coast of Bohai Sea and experiences 1-2 severe typhoons and extreme weather events each year. Especially in recent years, there has been a sudden increase in global extreme weather events, which may lead to impairment or loss of physical assets, as well as other potential economic losses.
Transform-ation Risk	Policy, Laws and regulations	Policy constraints, carbon pricing mechanism and costs	With the implementation of energy-conservation and emission reduction policies in the steel industry, as well as the implementation of environmental and carbon-related laws and regulations, the company will face rising carbon prices and carbon compliance costs, restrictions on coal use, and other energy transition policies, which will lead to corresponding increases in investment and operating costs, affecting revenue.
		Carbon tariffs	The European Union Commission announced the launch of the world's first "Carbon Border Adjustment Mechanism" plan, imposing tariffs on imported carbon goods including steel and cement, which will restrain the company's exports of certain products and affect revenue.
	Technology and cost	Low-carbon technology transformation	In response to China's 30-60 Decarbonization Goal and to achieve the company's "dual carbon" goals, significant investments will be required in the future for the research and development or application of low-carbon steelmaking technologies. The research and development process involves uncertainties.
		Transformation cost	During the low-carbon transformation process, the company will increase the use of renewable energy, new energy, and other energy-conservation and environmental protection technologies. The application and investment in low-carbon steelmaking technologies will lead to an increase in the company's research and development costs and the risk of value loss of existing fixed assets.
	Market	Increasing demand for green and low-carbon products	With the deep adjustment period of domestic steel markets and the promotion of the green and low-carbon development trend throughout the industry chain, the market demand for green and low-carbon steel products will significantly increase. The industry competition will become more intense, and if the greenization process is too slow, it may lead to a decrease in the company's market share.
		Rising raw material costs	Prices of energy and other resources will increase due to the impact of climate change, which will in turn affect the procurement costs of fuel and raw materials, resulting in increased costs and other risks.
	Reputation	Concerns of stakeholders regarding climate change measures	Investors and other stakeholders, as well as the public, will pay more attention to the company's response to climate change measures, and may even consider it a key factor in evaluating the company's performance. This could potentially pose reputation risks to the company, and resources need to be invested to strengthen carbon management in order to meet their expectations.

Climate change promotes and changes the social and economic development model, and also brings corresponding opportunities for the sustainable development of enterprises. Through analysis of the industry and market environment, combined with the company's own characteristics and strategic planning, the following opportunities have been identified:

Product development: Research and develop green products such as electrical steel for new energy vehicles and high-performance oriented electrical steel to meet the market and customer demand for low-carbon products and services.

Energy efficiency: Continuously optimize process technology, fully utilize waste heat and waste energy, research and introduce advanced energy-conservation technologies, use big data and intelligent technologies to build a smart energy management system, improve resource and energy efficiency, promote energy-conservation and emission reduction, and reduce operating costs.

Energy sources: Increase the use of clean and low-carbon energy, replace traditional high-carbon energy, further increase photovoltaic power generation capacity, and increase the proportion of green electricity purchased from external sources.

Promoting Technological Innovation, Strengthening Carbon Reduction from the Source

The company actively develops low-carbon sintering technology, large-scale blast furnaces (BF) with a large proportion of pellet ore for low-carbon ironmaking, efficient application of recycled steel materials, and efficient recycling of secondary resources, continuously strengthening carbon reduction from the source and achieving good results.

Jingtang Co. has successfully applied its independently developed blast furnace (BF) large proportion pellet ironmaking technology, implemented its independently developed sintering composite injection and flue gas recycling technology, as well as high air temperature oxygen-enriched pulverized coal injection technology. During the reporting period, the pellet ore ratio reached a maximum of 65%, and the carbon emissions per tonne of hot metal were reduced by more than 10% compared to traditional processes, promoting clean production in the pre-ironmaking stage and pioneering the domestic similar BF technology.

High scrap steel ratio steelmaking: By comprehensively applying low-carbon technology, the BOF scrap ratio has been increased to over 40%, achieving a 30% carbon reduction for the production of low-carbon automotive coating products.

Low-carbon sintering process technology: Developed sintering flue gas circulation + ultra-thick burden layers sintering + steam spraying coupling energy-conservation and consumption-reducing technology, achieving a reduction of over 25% in pollutant emissions and over 9% in CO_2 emissions from the sintering process.

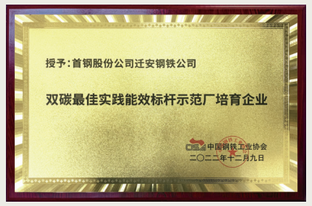
Dust ash substitution for desulfurizing agent: The dust ash generated during the steelmaking process is used instead of the desulfurizing agent in the hot metal desulfurization process. One tonne of dust ash can replace 600 kilograms of desulfurizing agent, reducing the consumption of desulfurizing agent by 7,200 tonnes per year and reducing CO_2 emissions by over 10,000 tonnes.

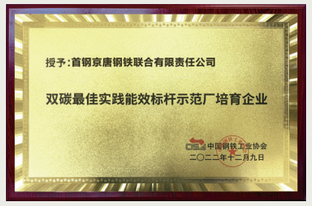
Persisting in Pursuing Excellence, Strengthening Energy Efficiency and Carbon Reduction

Shougang Steel always places ultimate energy efficiency work in a prominent position. We work on the pursuit of excellence, advanced planning, systematic innovation, and precise control, and continuously strengthen the "dual control" of energy consumption intensity and total amount. The company has independently developed technologies such as "water and electricity symbiosis" "fuel gas-wasteheat-electricity-wastewater-salt" five-in-one efficient cascade recycling system, efficient conversion of steel manufacturing processes, and maximum recovery and utilization of waste heat, promoting energy efficiency and carbon reduction. In December 2022, Qiangang Co. and Jingtang Co. were both selected as the first batch of "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant Cultivation Enterprise" in the industry.

Case: Qiangang Co. and Jingtang Co. have both been awarded the title of "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant Cultivation Enterprise"

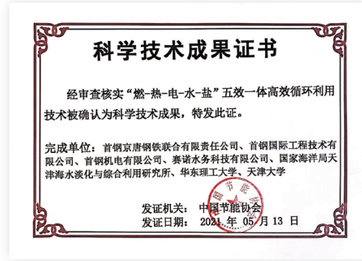
In order to better promote the three-year action plan for energy efficiency benchmarking, the China Iron and Steel Association has organized the cultivation work of "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant". The aim is to use the leading role of industry-leading enterprises in energy efficiency benchmarking to promote the steel industry to reach benchmark levels of energy efficiency in an orderly manner, further improve the mechanism for energy-conservation, carbon reduction, and efficiency enhancement in steel enterprises, and significantly increase the intensity and level of energy-conservation, carbon reduction, and efficiency enhancement. By the end of 2023, 80-100 million tonnes of capacity may achieve benchmark levels of energy efficiency. By the end of 2024, 150-200 million tonnes of capacity may achieve benchmark levels of energy efficiency. By the end of 2025, over 300 million tonnes of capacity within the China Iron and Steel Association members may achieve benchmark levels of energy efficiency and the capacity below the energy efficiency benchmark level will be basically eliminated. In December 2022, at the launching ceremony of the three-year action plan for energy efficiency benchmarking in the steel industry, 21 steel companies were awarded the title of "double carbon Best Practice Energy Efficiency Benchmark Demonstration Plant", and Qiangang Co. and Jingtang Co. were both listed.

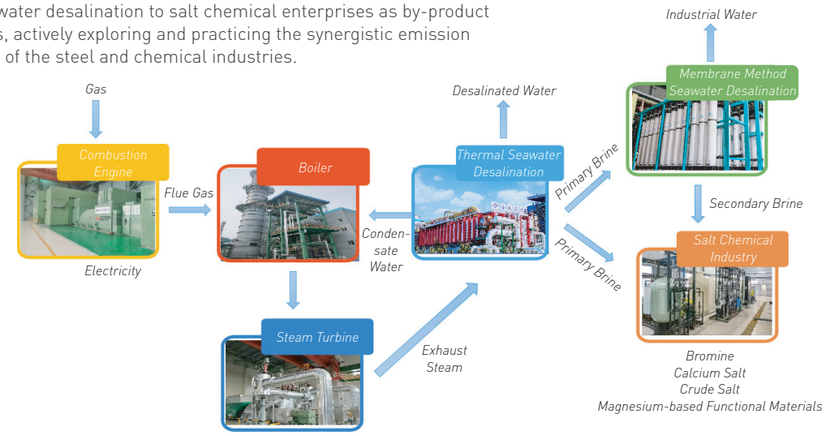




Five-in-one efficient cascade recycling system. With Combined Cycle Power Plant (CCPP) and low-temperature multi-effect distillation seawater desalination as the core, combined with the downstream salt-alkali chemical industry chain, the world's first "fuel gas-wasteheat-electricity-wastewater-salt" five-in-one efficient cascade recycling system has been constructed. This system realizes the efficient cascade utilization of energy media, reducing CO_2 emissions by 400,000 tonnes per year. This system also won the first prize for energy-conservation and carbon reduction technological progress, and being promoted by Hebei Province.

This technology realizes low-cost and efficient stable operation, and establishes a new model for the efficient conversion and cascade utilization of metallurgical energy. The efficiency of the CCPP has been increased to 47%, an increase of 2 percentage points compared to similar models, ranking first in the industry; the thermal efficiency of the water and electricity symbiosis system reaches 81.5%, reaching the international leading level; the cost of seawater desalination has been reduced by more than 50% compared to the conventional method of using steam from power plants. This system also extends the steel circular economy industrial chain, transporting the concentrated brine from seawater desalination to salt chemical enterprises as by-product resources, actively exploring and practicing the synergistic emission reduction of the steel and chemical industries.





Efficient utilization of gas and waste heat energy. Qiangang Co. adheres to the principle of zero gas emission and achieves dynamic balance of gas utilization, develops efficient utilization paths for gas resources, and realizes the maximization of gas cascade utilization. The company has realized the efficient utilization of BF slag flushing water waste heat for civilian heating in winter and industrial utilization in summer.

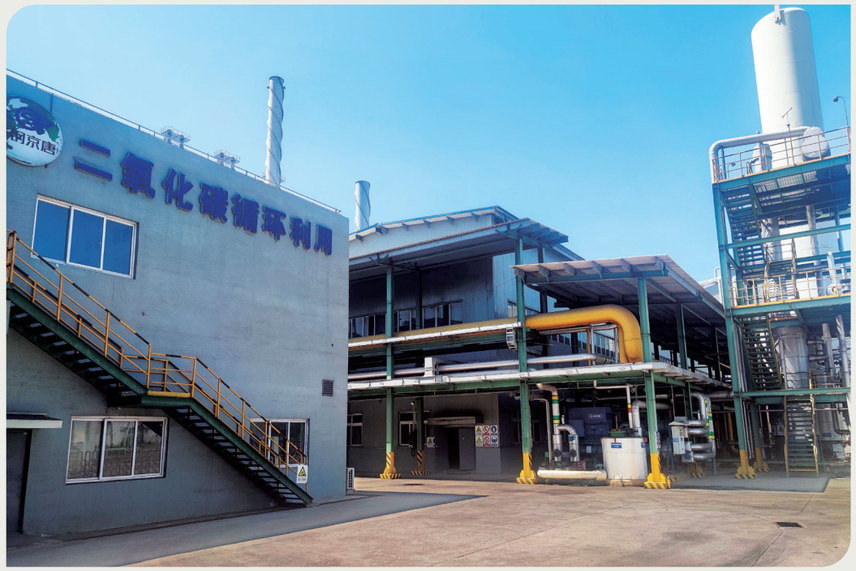
The company has taken multiple measures to optimize and improve interface energy efficiency. By strictly controlling the temperature of hot metal, improving the hot charging and hot delivery rate, and implementing measures such as the "one ladle to the end" of BF hot metal and the MCCR-DUE compact strip production, the company has continuously optimized and improved interface energy efficiency. In 2022, temperature drops of hot metal have narrowed to 97℃ in Qiangang Co. and Jingtang Co., a decrease of 37.42% and 11.01% respectively compared to 155℃ and 109℃ in 2019, and the hot charging and hot delivery rates have increased from 46% and 41% in 2019 to 66% and 62.4% in 2022, respectively.

Innovating Low-carbon Technology, Promoting Synergizing Carbon Reduction

Shougang Steel vigorously develops and innovates low-carbon technological methods to promote synergizing carbon reduction in the industrial chain. By using by-product gases such as converter gas as fuels and employing microbial fermentation technology, the company produces ethanol products for automobile and aviation fuels. The company has built the first domestic lime kiln exhaust CO_2 capture and recovery used for mixed blowing in steelmaking, leading the industry in low-carbon technology innovation. We have won the third prize for typical cases of carbon peak and carbon neutrality actions in 2022 awarded by the State-owned Assets Supervision and Administration Commission of the State Council, and have been included in the pilot projects for CO_2 capture, utilization, and storage as well as the catalog for promotion of low-carbon technology of Hebei Province.

Case:Jingtang Co.'s lime kiln exhaust CO_2 capture and recovery used for mixed blowing in steelmaking

Jingtang Co.'s lime kiln exhaust CO_2 capture and recovery use CO_2-O_2 mixed blowing in steelmaking process is the first industrial demonstration project in China that captures CO_2 from lime kiln exhaust and uses it for mixed blowing in steelmaking. It can capture 50,000 tonnes of CO_2 annually and use it for converter steelmaking. This technology utilizes pressure swing adsorption to extract CO_2 from lime kiln exhaust, achieving a CO_2 concentration of≥ 99.8% and reducing CO_2 emissions by 26 kg per tonne of steel. By using CO_2 instead of some nitrogen for bottom blowing in the converter, it can reduce nitrogen consumption, production costs, nitrogen content and slag in the steel, and improve the quality of the steel. The mixed blowing of CO_2-O_2 in converter steelmaking can reduce the temperature of the oxygen jet flame point area and improve the recovery efficiency of gas. This technology has achieved a leading level in the industry and offers substantial benefits in energy-conservation, emission reduction, and carbon reduction effects, such as reducing CO_2 emissions and industrial dust emissions, reducing industrial gas consumption and iron loss, and improving the calorific value of converter gas. It has innovated the mode of CO_2 resource utilization and circular utilization, and has been included in the first batch of CO_2 capture, utilization, and storage pilot projects and the low-carbon technology promotion catalog of Hebei Province. It has won the third prize for typical cases of carbon peak and carbon neutrality actions in 2022 awarded by the State-owned Assets Supervision and Administration Commission of the State Council.



Utilizing Clean Energy, Building Green Steel Plants

Shougang Steel actively develops and utilizes renewable energy, striving to create a new generation of green steel plants that are "circular economy-oriented, energy-conservation and environmentally friendly, and clean and efficient". The company actively utilizes photovoltaic power generation on the roofs of factories and parking lots in the plant area, with an installed capacity of 13.69MW, generating 15.5 million kWh of electricity annually and reducing CO_2 emissions by 14,000 tonnes per year. In 2022, a total of 719 million kWh of green electricity was purchased, accounting for 15.4% of the purchased electricity, which equals to reducing CO_2 emissions by 640,000 tonnes per year. At the same time, the proportion of clean energy transportation methods for bulk raw materials entering the plant and finished products leaving the plant has reached 85% through rail, belt, and electric truck transportation. There are about 100 electric trucks for internal transportation in-plant, accounting for 60% of the transportation trucks. All fuel trucks for in-plant transportation and external delivery meet the National VI emission standards.

Case: Cold-R Co.has built the largest photovoltaic project in Beijing

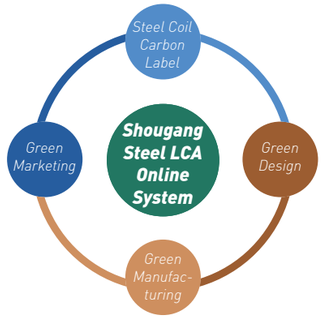
Cold-R Co. constructed what was then the largest distributed photovoltaic demonstration project in Beijing, boasting an installed capacity of 8.3MW and an annual average power generation of 10 million kWh. In 2022, the new photovoltaic support bracket was commissioned, generating 10.02 million kWh of electricity throughout the year, saving 2.678 million yuan in electricity costs, generating an economic benefit of 60.4261 million yuan, and reducing CO_2 emissions by more than 6,000 tonnes. At the same time, through measures such as purchasing green electricity and photovoltaic power generation in the market, carbon emissions decreased by 4.3% year-on-year.

Establishing an LCA System, Carrying Out Carbon Management

In response to the trend of green and low-carbon development and the demand for carbon reduction from customers, Shougang Steel has carried out carbon footprint management for steel products throughout their life cycle assessment. The company has established a life cycle assessment(LCA) system for steel products, comprehensively controlling the carbon footprint of steel materials from raw materials to manufacturing processes and service stage. Carbon reduction effect assessment has been conducted, and third-party low-carbon certification has been initiated. Jingtang Co. has released an Environmental Product Declaration (EPD) for hot-rolled products, and completed the application for green products for key grades such as high strength steel. Zhixin Co. has completed the green design product application of two series of non-oriented electrical steel and oriented electrical steel for new energy vehicles and obtained national recognition.

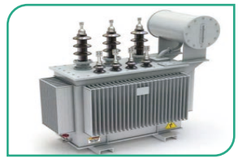
LCA research: Following the ISO standard methodology, a comprehensive life cycle assessment system has been established, including methodology development, model construction, calculation software, a factor database, and an online data collection platform. This facilitates the depiction of the carbon footprint and the visualization of carbon emissions data for the company's steel products, offering product carbon labeling. Through the LCA method, carbon emission accounting and reduction potential analysis have been performed for the company's green manufacturing, green procurement, and green marketing. Collaborative efforts with upstream and downstream partners in the industrial chains have been initiated to collectively engage in ecological design, continually minimize the carbon emissions of steel products throughout their life cycle, and construct a green product ecological design and manufacturing system anchored in LCA methodology, thus bolstering Shougang's green and low-carbon development.

Initiating the construction of a carbon data management platform: In June 2022, the company has launched the establishment of the "Shougang Carbon Data Management Platform". The collection of carbon and product carbon data, modeling, installation of carbon emission data servers, and integration of carbon model systems were completed, achieving the visualization of carbon emissions information in the production process.



Green Products

Shougang Steel adheres to the concept of high-end green manufacturing and is committed to developing high strength lightweight, long-life, and highly corrosion-resistant green products. The company promotes collaborative carbon reduction in multiple industries such as machinery, automobiles, household appliances, and construction, helping downstream industries reduce CO_2 emissions by more than 5 million tonnes annually. In the past three years, Shougang Steel has developed 19 new green products, such as high-grade non-oriented electrical steel for new energy vehicles. The cold-rolled high-strength steel sheet and strip for automobile was recognized as "green design products" by the Ministry of Industry and Information Technology in 2021, marking the steel industry's first green product in this category. During the reporting period, the company was selected as "Industrial Product Green Design Demonstration Enterprise" by the Ministry of Industry and Information Technology. Shougang Steel has built the world's first specialized line for new energy vehicle electrical steel, and two products are the first electrical steel for new energy vehicles in the world. Seven new products, including high strength automotive outer panel UF steel, were first launched in China. Five categories of products, including oriented electrical steel, were recognized as green design products by the Ministry of Industry and Information Technology.



Oriented electrical steel: Oriented electrical steel is widely used in "double-million" ultra-high voltage transformers and high-efficiency energy-conservation distribution transformers. It has been successfully applied in national key engineering projects and power plants and grid projects of the Belt and Road, accounting for 50% of the supply of main transformers in the Baihetan Hydropower Station and 70% of the supply of generator transformers in the Wudongde Hydropower Station.

Cicada wing steel: The company successfully rolled 0.07mm "cicada wing steel", exceeding the equipment's design limit by 42%, reaching a world-leading level. It was successfully used in the Beijing Winter Olympics sports project postcards.

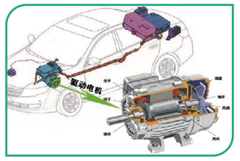
Shougang's

Green Low-Carbon Products

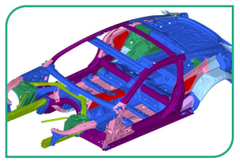
Promote Downstream Industry to Reduce Carbon by ***5.35*** *Million tpy*

Resisting hydrogen steel: Resisting hydrogen steel not only meets the conventional mechanical properties but also meets the requirements of strength, resistance to temper embrittlement, and hydrogen corrosion at high temperatures. It also has good formability and weldability, making it suitable for long-term use in high-temperature, high-pressure, and hydrogen-containing environments.

High-toughness bridge steel: The ultra-thick high-toughness and easily weldable bridge steel accounts for 90% of the special thick bridge plate market in China. It has been successfully applied to the Padma Bridge project in Bangladesh, with a supply proportion of up to 70%.



Non-oriented electrical steel: The company has formed a product system of 107 grades in four series, with a leading market share in China. The dedicated product system of non-oriented electrical steel for new energy vehicles consists of five series and 23 grades. Every three new energy vehicles in China use Shougang electrical steel for manufacturing.



Automotive sheet: The product structure of automotive sheet has been further optimized. The company became the second company in the world to pass the certification of GA products with a strength level of 980MPa or higher from a Japanese automaker. Zinc-aluminum-magnesium coated products have been used in large quantities for automotive side panels. UF steel made its debut in China and achieved mass production.

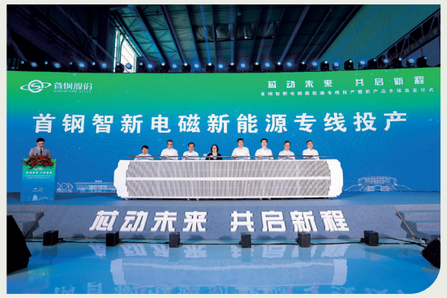
9Ni steel, etc.: The company has successfully developed the renowned "steel diamond" 9Ni steel and achieved mass production, making a breakthrough in the production of 9Ni steel for ultra-low-temperature containers.

Case:The world's first specialized production line for new energy vehicle electrical steel has been built and put into operation

On August 31, 2022, Shougang Steel completed the world's first specialized production line for new energy automotive electrical steel. The self-developed six-stand cold continuous rolling mill "SUPPER MILL" is a world first, and the product performance, profile control, and production efficiency have also reached the world's leading level. The commissioning of the new production line will greatly enhance Shougang's research and development and innovation capabilities for electrical steel products for new energy vehicles, as well as its supply chain service guarantee capabilities, further expanding its leading advantages. The new line will be able to provide the industry chain with more high-end, efficient, and environmentally friendly electrical steel products, support the healthy development of the new energy vehicle industry, and contribute to the technological progress and transformation and upgrading of the steel industry and the national economy with "Shougang power".

At the same time, two products, 20SW1200H and ESW1230, are the first electrical steel for new energy vehicles in the world, which surpass the performance of conventional electrical steel and can greatly improve the power density and efficiency of motors. Among them, the ESW1230 product provides a new definition for electrical steel used in drive motors. Compared with the current high-end 0.25mm thick electrical steel, the iron loss performance is improved by 5%, and the motor efficiency can be increased by more than 0.8%; the 20SW1200H product is mainly aimed at the development needs of high-speed motors. With its low iron loss and high strength characteristics, it will empower new energy vehicles with greater power, higher efficiency, and longer endurance.

As a rising star in the field of electrical steel, Shougang Steel has efficient, green, clean, and advanced full-process electrical steel production equipment, and has always adhered to the positioning of high-end, efficient, and environmentally friendly products. We have formed a cluster of advantageous products with high efficiency and low iron loss. In particular, the high grades and high-magnetic induction, thin-specification electrical steel products maintain a leading position, leading the continuous improvement of energy consumption levels in the national electromechanical equipment application field.



Case:High-efficiency electrical steel contributes to green social development

Shougang Steel has efficient, green, clean, and advanced full-process electrical steel production equipment, forming a cluster of advantageous products with high efficiency and low iron loss. In particular, the company's high-grade, high-magnetic induction, thin-specification electrical steel products maintain a leading position, leading the continuous improvement of energy consumption levels in the national electromechanical equipment application field. As a green and efficient energy material, the utilization of Shougang's electrical steel in household inverter air conditioners can save 36 kilowatt-hours of electricity annually. Likewise, the application of Shougang's electrical steel in new energy vehicles can save 375 kilowatt-hours of electricity each year, and in a transformer within the construction of a national green power grid, it can reduce power loss by 7600 kilowatt-hours annually, thereby supporting the development of a green society.

Application of electrical steel

A houshold inverter air conditioner **saves 36 kilowatt-hours of electricity per year**

A new energy vehicle **saves 375 kilowatt-hours of electricity per Year**

A transformer **reduces loss by 7600 Kilowatt-hours per Year**

Biodiversity

Emphasizing Biodiversity

Shougang Steel fully understands the importance of biodiversity to the company, strictly complies with national and local laws and regulations, and continues to pay attention to the harmonious development of the factory environment and the surrounding ecological environment. During the project design phase, biodiversity conservation and land use assessment are carried out in accordance with relevant requirements. During the project operation phase, the surrounding ecological environment is continuously monitored. Active measures are also taken to protect biodiversity, reduce the impact of production and operation on the ecological environment, avoid disturbance to wildlife habitats, and prevent soil erosion and deforestation.

By the end of 2022, Qiangang Co. has a greening area of 1.8539 million square meters in the factory area, with 8 key landscapes and more than 70 species of trees and over 30,000 trees, and more than 110 species of flowers and shrubs with over 1.5 million plants. The greening coverage rate and green space rate have reached 45.67% and 35.83% respectively, and 100% greening is achieved with available green space. The company has successively been awarded the honorary titles of "Garden-like Enterprise" in Tangshan City, "Garden-like Enterprise" in Hebei Province, and "High-quality Greening Project" in Hebei Province. The greening area of Jingtang Co. 's factory area has reached 5.265052 million square meters, with a greening coverage rate of 41% and a green space rate of 38%. The entire factory area has achieved a green natural landscape, with "flowers in three seasons, evergreen in four seasons" , and a concept of "forest in the factory, factory in the forest". The integration of greening, culture, and production serves to showcasing the green ethos of modern steel enterprises. The greening area of Cold-R Co.'s factory area is 270,000 square meters, with a greening rate of nearly 40%. It has established avenues of magnolia, red maple, water fir, and Chinese scholar tree, along with areas showcasing various flowers such as peony, rose, chrysanthemum, and hibiscus, thus forming a distinctive landscape feature characterized by "one road, one scene".

Strengthening Green Environmental Protection Publicity

The company organized theme publicity activities such as "harmonious coexistence between man and nature" "building a global community of life" and "environmental protection and green production" in conjunction with National Low Carbon Day, Biodiversity Day, World Environment Day, etc. By organizing a series of learning and training activities, the environmental protection awareness of all employees is enhanced, and employees are guided to consciously fulfill their responsibilities for ecological environment protection. These activities promote a lifestyle and concept of simplicity, green and low-carbon living, civilized health practices, and actively encourage and guide employees to engage in ecological environment protection. Furthermore, they motivate employees to become participants, advocates, and practitioners of ecological civilization construction.

Case: Qiangang Co. carries out a series of activities to promote the prevention and control of noise pollution with the theme of "Building a Clean and Beautiful World"

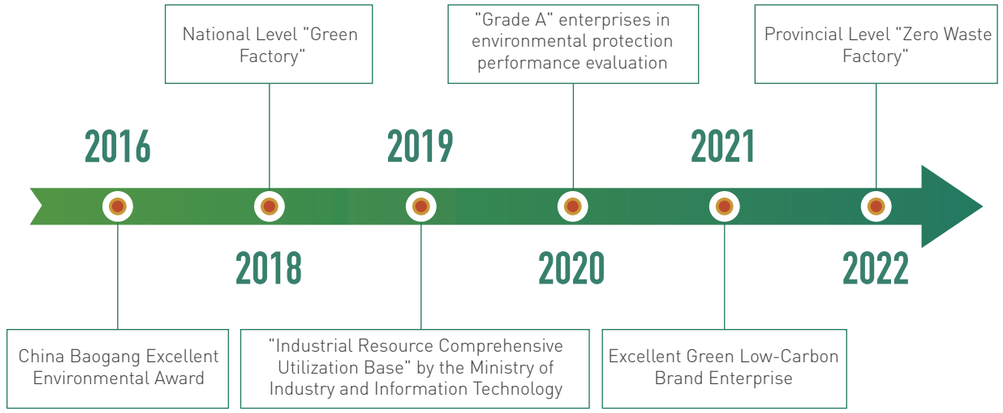
June 5, 2022, marked the 51st World Environment Day. To promote the company's deep and extensive commitment to ecological environment protection, the Environmental Protection Department invited the Qian'an City Branch of the Tangshan City Ecological Environment Bureau to visit Qiangang Co., launching a series of activities themed "Building a Clean and Beautiful World" to advocate for the prevention and control of noise pollution.

Under the guidance of the Tangshan City Ecological Environment Bureau's Qian'an City Branch, the Law Propagation Section held an awareness campaign about the Noise Pollution Prevention and Control Law at the east gate of the Production Environmental Protection Command Center. They called on employees to actively participate in environmental protection efforts, maintain quiet, and collaborate in preserving Qian'an's clean air, environment, water, peaceful living conditions, and harmonious working environment. This activity also encouraged individuals to practice green and low-carbon living, translate the company's green concepts into practical actions, and work collectively to foster and safeguard the harmonious coexistence of humans and nature.

At the event site, environmental tote bags and informational brochures on environmental protection were distributed, and consultations regarding noise pollution prevention and control laws were provided. These efforts aimed to encourage employees to focus on ecological civilization construction and inspire them to become ambassadors for environmental protection.

Special topic: Circular development, Jingtang Co. builds an "industrial resource comprehensive utilization base" and a provincial-level "zero waste factory"

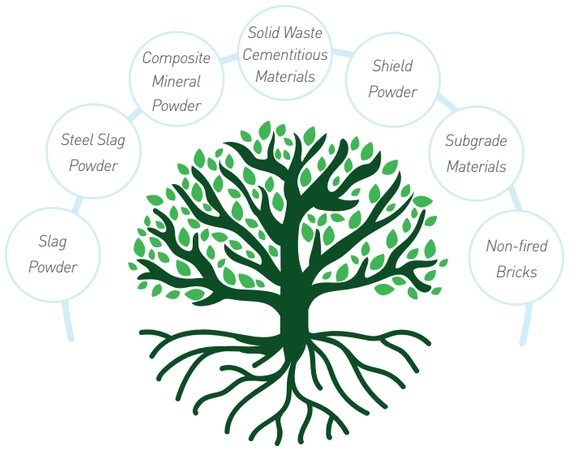
Jingtang Co. always adheres to the concept of circular economy development, pursues the path of green, low-carbon, and circular development, and continuously expands the comprehensive utilization of metallurgical slag resources in accordance with the management concept of "absorption, value-added, and leading" for solid waste resource utilization. In 2019, the company was awarded the "Industrial Resource Comprehensive Utilization Base" by the Ministry of Industry and Information Technology, and applied for the provincial-level "Zero Waste Factory" in 2022.



The green development path of Jingtang Co.

Comprehensive Utilization of Metallurgical Slag

Jingtang Co. cooperates with Shougang Research Institute, University of Science and Technology Beijing, and other research institutes, leveraging the advantages of industry-university-research collaboration to actively innovate and practice in the field of circular economy and comprehensive utilization of solid waste. Through technologies such as sintering process solid waste disposal, steel slag "roller press + pressure-hot stew" treatment, ground granulated BF slag, and zinc-containing resource recycling, a variety of products such as solid waste cementitious materials, shield powder, composite mineral powder, slag powder, subgrade materials, and non-fired bricks have been developed, realizing the comprehensive utilization of metallurgical slag resources.



Metallurgical slag resource products

Disposal of Solid Waste in the Sintering Process

As the main entity responsible for solid waste disposal, Jingtang Co. has a high proportion of solid waste in the sintering process, with an annual disposal of more than one million tonnes of solid waste, achieving 100% disposal of iron-containing solid waste, including iron-containing dust, steel slag, iron oxide scale, and hot-rolled sludge. Calcium-containing solid waste such as annular shaft kiln dust, digestion ash, and KR desulfurization dust is 100% recycled.

Sintering reuse system

Steel Slag Pressure-hot Stew Technology

Jingtang Co. adopts the "roller press + pressure-hot stew" technology for steel slag treatment, which has the advantages of excellent environmental performance, high degree of automation, compact process, short handling time, thorough separation of slag and iron, and high efficiency. The processed steel slag tailings have a particle size of less than 10mm, with more than 90% reaching this size, and the contents of metallic iron and free calcium oxide are both less than 2%. This technology has excellent stability and can be directly used in the production lines of non-fired bricks, prefabricated concrete components, and roadbed materials.

Steel slag roller press + pressure-hot stew processing line

Resource Utilization Production of Steel Slag

Steel slag processed by the "roller press + pressure-hot stew" technology can be directly used in the production of non-fired bricks, roadbed materials, etc.

Non-fired bricks: Utilizing steel slag of 0-5mm particle size as aggregate, mixed with cement and other auxiliary materials, various types of non-fired bricks such as square bricks, permeable bricks, S bricks, Dutch bricks, as well as standard bricks, lawn bricks, curb stones, etc., are produced through brick machines. The products cover strength grades from C10 to C60, and 172,000 bricks were supplied for the construction of the China International Fair for Trade in Services in Beijing 2021.

Subgrade materials: After the aging and digestion of steel slag tailings in the raw material shed, different grades of subgrade materials are produced through processes such as primary crushing, two-stage magnetic separation, and three-stage screening. The products are mainly used in subgrade, cement stabilized layer, concrete aggregate, asphalt pavement, etc.

Roadbed material production line

Ground Granulated BF Slag Technology

According to the production scale of BF, Jingtang Co. has built six 600,000 tpy of ground granulated BF slag production lines, with a capacity of 3.6 million tonnes per year of slag powder. BF slag is fed into the vertical mill system through the charging system, then undergoes grinding and drying, and finally produces slag powder that meets the particle size requirements through air classification. Slag powder is widely used in cement, building materials, and other fields, and has been widely used in major national mega projects such as the Hong Kong-Zhuhai-Macao Bridge. In addition, a new vertical mill production line is used to produce composite mineral powder, whose product performance indicators meet the application standards of JGT486-2015 compound mineral admixtures for concrete, mainly used in road engineering, construction engineering, etc.

Ground granulated BF slag production line

Production and Reuse of Metallurgical Slag Resources

By using metallurgical slag resources such as steel slag, BF slag, desulfurization gypsum, and coal ash powder as raw materials to develop solid waste cementitious materials, comprehensive utilization of metallurgical slag resources has been achieved. Compared to the production of ordinary silicate cement, the carbon emissions reduce by 40%—60% per tonne. The solid waste cementitious materials are used in in-plant roads and external projects. Jingtang Co. has used solid waste cementitious materials to pave multiple in-plant roads, as well as in various projects such as external roads and floors. In June 2021, solid waste cementitious materials were successfully applied to the floor of the W4 venue of the China International Fair for Trade in Services, with a paving area of 3000 square meters, thickness of 120mm, and strength reaching the C30 standard requirement for concrete, while effectively reducing the cost of concrete.

Prefabricated concrete components. Steel slag, cement or cementitious materials, refractories, etc. are mixed in a certain proportion, mixed evenly, and then steamed and cured to produce converter grate materials, which have been stably applied in the steelmaking process for a long time. Various prefabricated components can also be produced using different molds according to demand. The project produces 50,000 square meters of prefabricated components each year, such as wave breakers, isolation piers, integrated pouring houses, prefabricated building materials, etc., with an annual consumption of about 15,000 tonnes of steel slag.

Recycling of Zinc-containing Solid Waste

The disposal of zinc-containing solid waste includes homogenization production lines and zinc resource recycling lines. The homogenization production line takes dust ash, industrial sludge, etc. into the raw material system, and mixes them in a certain proportion to generate homogenized material with a moisture content of less than 15%, which is used as raw material for the ironmaking process. The zinc resource recycling line takes different types of zinc-containing dust and binders, etc., and mixes them in a certain proportion, then presses and dries them to enter the rotary hearth furnace for heating and reduction, generating metallized pellets. After cooling, screening, and other processes, they enter the finished product warehouse.

Zinc resource recycling line

Hazardous Waste Recycling

In order to prevent environmental risks in the disposal of hazardous waste, and based on the principle of "recycle, reuse, reduce", Jingtang Co. conducts resource utilization of waste acid, oil washing residue, tar residue, and oily sludge. Among them, the waste hydrochloric acid arising from the cold rolling pickling process is converted into regenerated acid through high-temperature calcination and reused in the production line; the oily sludge generated resulting from the cold rolling wastewater treatment process enters the coal blending system of coke plant and undergoes dry distillation in the coke oven, generating by-products such as gas and tar; oil washing residue and tar residue are utilized within the process by returning to the coal blending system and entering the coke oven for resource utilization.

Establishing an Achievement Transformation Platform

Jingtang Co. cooperates with Anhui University of Technology to establish a collaborative base for industry-university-research, as well as an internship and practice base. Utilizing the metallurgical resource advantages of Jingtang Co., they jointly develop ultrafine powders, effectively promote the research and development, achievement transformation, and industrial application of solid waste resource utilization. At the same time, we actively exchange and learn from advanced enterprises in the industry and research institutes, and actively participate in various solid waste industry exchange conferences to improve our capabilities in waste disposal and research and development achievement transformation.

In the future, Jingtang Co. will exert a high sense of social responsibility and mission, and vigorously develop a circular economy, striving to build an "Industrial Resource Comprehensive Utilization Base" and a provincial-level "Zero Waste Factory" with first-class environmental performance, and making due contributions to carbon peak and carbon neutrality.

03

Society: Achieving a Better Life (S)

In alignment with the values of "loyalty, gratitude, passion" and the philosophy that "talent drives development, and development shapes talent", Shougang Steel adheres to a talent-empowering strategy, building a comprehensive "selection, cultivation, utilization, retention" closed-loop management system. This approach energizes the talent pool, establishes a competitive edge in talent recruitment, and reinforces the talent foundation for building a globally influential steel enterprise.

Employee Protection

In 2022, the signing rate of labor contract: 100%

The coverage rate of collective labor contracts: 100%

Providing equal opportunities for every employee
Implementing human rights protection policies

Employment

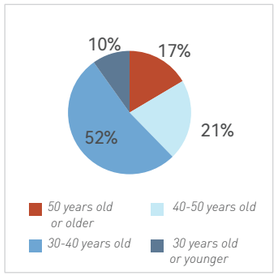
Rights Protection

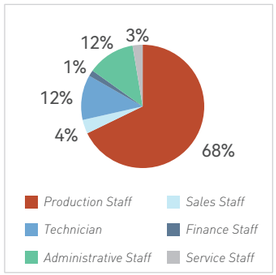
Shougang Steel strictly follows the requirements of the *Labor Law of the People's Republic of China*, *the Labor Contract Law of the People's Republic of China*, and other related laws and regulations. The company has formulated the *Labor Contract Management System* and continuously improves the human resources management systems, to create an equal, inclusive, and diverse employment environment and safeguard the legitimate rights and interests of every employee. As of December 31, 2022, Shougang Steel had 18,608 employees in total. The signing rate of labor contract was 100% and the coverage rate of collective labor contracts reached 100%.

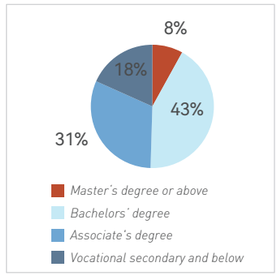
The company is committed to providing equal opportunities for every employee and believes that differences in nationality, ethnicity, religious beliefs, and cultural backgrounds can bring greater innovation. We respect the customs and habits of ethnic minority employees and strictly protect the personal privacy of employees. In recruitment, salary and benefits, vocational education, technical training, promotion, and participation in enterprise democratic management, we make our decisions on objective facts and do not discriminate against or treat employees differently based on their gender, physical characteristics, marital status, or other reasons.

The company is committed to implementing human rights protection policies, and respecting employees' rights to freedom of association, participation in trade unions, and collective bargaining. We prohibit forced labor, child labor, and workplace harassment. We have formulated management measures such as the *Prohibition of Child Labor Regulations and Child Labor Remediation Control Procedures*, *Standards for the Protection of Female Workers and Minor Workers*, *Standards for the Prohibition of Discrimination, Harassment, and Abuse,* and *Standards for the Prohibition of Forced Labor.* Thereby, we strengthen monitoring in the recruitment, employment, and promotion processes, establish channels for employees to appeal to senior management, and eliminate the use of child labor, forced labor, harassment, bullying, intimidation, and other illegal behaviors, resolutely safeguarding employees' human rights. In 2022, Shougang Steel did not have any illegal or irregular employment incidents.

Employee Structure







Salary and Benefits

Shougang Steel has established a comprehensive and differentiated salary and incentive mechanism, and a fair and favorable incentive salary structure. The salary structure bases on basic salary and follows the principle of equal pay for equal work, supported by performance bonuses, allowances, and benefits. The salary and incentive mechanism and structure ensure that employees receive remuneration consistent with the posts they held and the value they created. At the same time, we continuously optimize salary management measures, establish long-term incentive mechanisms, and formulate equity incentive policies. The scope of incentives includes core technical personnel and management backbones, fully exerting the incentive effect of the salary system on talents and fully mobilizing employees' enthusiasm, initiative, and creativity. During the reporting period, we formulated and implemented the *Job Salary Management System, Salary Management System,* and *Performance Assessment and Distribution Management System.*

Salary and Benefits System:

Salary and bonuses: Job salary; Performance salary; Overtime pay; Individual rewards, etc.

Various subsidies: Seniority wages; Housing allowance; Transportation subsidy; Communication subsidy; Position allowance; Subsidy for working in a different location; Subsidy for high-skilled talents; Allowance for team leaders and group leaders; Craftsman allowance; Female worker fee; Subsidy for infants and young children; Only child fee; Other subsidies, etc.

Medium and long-term incentives: Equity incentives; Tenure incentives, etc.

The company continuously improves employee benefits and has formulated the *Three-Year Plan to Improve Employee Quality of Life* to continuously improve employee welfare levels based on national statutory standards. Various types of paid leave, such as paid annual leave, family visit leave, childcare leave, parental care leave for only children, and paternity leave, have been provided to employees, making them have more time to spend with their families and helping them achieve a balance between work and life.

In 2022, the social insurance coverage rate: 100%

In 2022, employee satisfaction: 100%

Non-monetary Benefits:

Various types of protection: Social insurance such as pension, unemployment, medical, work-related injury, maternity; Supplementary medical insurance; Employee mutual aid insurance, etc.

Various types of paid leave: Statutory holidays, weekends; Paid annual leave; Family visit leave; Marriage and funeral leave; Supplementary leave for female workers; Maternity leave; Childcare leave; Paternity leave; Parental care leave for only children, etc.

Various projects: Health check; Occupational health monitoring; Recuperation, etc.

In order to enhance employees' sense of happiness and belonging, Shougang Steel has taken various measures. In terms of infrastructure, the company builds "Workers' Home", which includes staff gymnasiums, libraries, and other professional equipment such as intelligent physiological screening robots, providing employees with comprehensive rest areas. The company has also further improved on-site living facilities and commuting conditions, continuously improving on-site living standards. We also provide guaranteed housing for employees, and assist in the enrollment of employees' children, ensuring the well-being and career development of employees. In terms of soft benefits, Shougang Steel has carried out activities such as sending warmth during festivals, providing coolness during the summer, showing care during major situations, and implementing a health care plan for employees. The company has organized employee recuperation, employee car purchase discounts, and parent-child sports events, and conducted special lectures on parent-child relationships and psychological adjustment during exams, as well as summer care classes for employees' children, enhancing employees' quality of life and sense of pride in their work. In 2022, our employee satisfaction reached 100%.

Providing coolness during the summer

In 2022, Shougang Steel was awarded the "National May Day Labor Award" "National Harmonious Labor Relations Demonstration Enterprise" and was named one of the top ten "Bookish Enterprises" of Beijing. The employee health cabin was recognized as an outstanding demonstration site.

Employee Care

Democratic Management

Shougang Steel always listens sincerely to the voices of employees, ensuring that their most concerned, urgent, and difficult issues are promptly addressed and resolved through online and offline communication channels, guaranteeing employees' right to know, to participate, to express, and to supervise, and jointly building harmonious labor relations with employees. Through online channels, we have set up a "Employee Service Hotline" to respond, process, and provide timely feedback to employees' reasonable demands. We also use the Shougang Sincere Friend app, special meetings, WeChat subscription, and other means to convey the latest information on corporate strategy and industry trends to employees, enhancing their understanding of the company's development. Through offline channels, we have formulated the *Factory Affairs Open Management System*, conducted annual employee satisfaction surveys, held quarterly employee demand meetings, and regularly organized employee forums and "Listening to Voices and Solving Problems" reception events, to directly respond to and resolve employee needs.

Employee Demand Meeting

In 2022, 538 employee demands in total were responded to and resolved

The response rate, resolution rate, and satisfaction rate all reached 100%

The company actively promotes democratic management, continuously improves the democratic management system with the Workers' Congress as the basic form, and revises the *Regulations on the Workers' Congress*, fully playing the role of the union as a bridge and link. We listen to the opinions of employees in advance and accept their supervision afterwards on hot and difficult issues including company development, cadre appointment, salary and benefits, and other matters that are closely related to the vital interests of employees, to ensure their right to know and to participate to the maximum extent.

Assistance for Employees in Difficulties

Shougang Steel is committed to creating a corporate culture atmosphere that cares for employees, and continuously improving the long-term and normalized assistance mechanism. We gradually improve the system of assistance and relief for employees in difficulties, and provide assistance and relief through multiple channels and methods such as visiting and comforting, fundraising, employee mutual aid insurance, and Shougang assistance fund. In 2022, the company formulated the *Subsidy fir Employees in Difficulties Management System*.

Comforting

Caring for Female Employees

Shougang Steel is committed to safeguarding the rights of female employees from the root, and paying attention to the needs of female employees. We conduct special physical examinations for female employees every year, organize lectures and activities on women's health, and comfort female employees in difficulties and single-parent female employees, to implement concrete measures to care for female employees. In 2022, the company reviewed and approved the *Special Collective Contract for Safeguarding Female Employees's Rights*.

In 2022, Shougang Steel organized a series of activities for International Women's Day and the "Women's Merit Competition". We also organized daily activities for female employees, such as yoga, physical training, parent-child early education training, and live streaming of beauty and makeup. We conducted a series of knowledge lectures on gynecological health and psychological care for female employees, and organized special physical examinations for female employees, with a 100% participation rate. In addition, we established a volunteer team to guarantee the supply of daily necessities for female employees living in the factory, and set up a "Resident Female Employee Daily Necessities Guarantee Group" to provide one-on-one assistance in solving special needs, coordinating and distributing labor protection supplies for female employees living in the factory, and solving practical difficulties.

A Series of activities for International Women's Day

Mental Health

In addition to ensuring the physical health of employees, Shougang Steel actively explores new methods and approaches for employee mental health, and constructs a comprehensive and full-cycle service for employee health. We build "Home for Employees" and "Soul Station", conduct annual assessment of overall employee happiness index and psychological risk screening, hire senior professional psychological counselors for one-on-one counseling four times a week, provide a 24/7 counseling service hotline for employee psychological counseling, and organize positive psychology growth salons, mental health lectures, and other activities to help employees and their families obtain timely and effective psychological support.

Soul Station

Mental Health Training

*Won the **"Outstanding Employee Psychological Service Promotion Project in 2022"** of Beijing Federation of Trade Unions*

*Employee happiness index increased by **1** percentage point year-on-year*

Case: 5+N psychological care model

Shougang Steel implemented the 5+N psychological care action plan, which includes: establishing a base, conducting a set of training, cultivating a team, conducting an assessment, and providing one-on-one counseling. At the same time, comprehensive activities such as psychological care in work teams and other N items are carried out, using various methods to provide knowledge, assistance, and services to employees. By improving psychological quality through mental health services, employees can work happily and live healthily.

5+N "establishing a base": Shougang Steel has built the "Harmony Team" training base and employee soul station with high-standard in employee living area, with an area of 300m^2, including reception area, group activity room, counseling room, VR experience room, 4D stress relief space, venting room, and other 10 functional areas.

5+N "conducting a set of training": Shougang Steel cooperated with a professional psychological technical service team to develop the "Employee Harmony Team Training System" and carry out comprehensive mental health knowledge popularization and training for all employees.

5+N "cultivating a team": We have formed internal trainers for psychological care and formulated the *Employee Harmony Team Training System Internal Trainer Development Project Plan.* In July 2022, a three-day SPC employee psychological care instructor training was conducted, and a professional skills training certificate for employee psychological care instructors was issued by the Office of National Workers Health Promotion Project.

5+N "conducting an assessment": We have developed a set of psychological health assessment system suitable for Shougang's characteristics, and conducted annual assessment of the happiness index and psychological risk screening for all employees. In 2022, a survey on "employee happiness" was conducted, and 17 team counseling sessions and one-on-one interviews with 120 employees were organized. Employee happiness index increased by 1 percentage point year-on-year.

5+N "providing one-on-one counseling": We have established an employee psychological counseling room and hired senior professional psychological counselors to provide one-on-one counseling on Tuesdays, Thursdays, Saturdays, and Sundays to help resolve psychological problems.

5+N "N" series of practices: We conduct positive psychology growth salons, mental health lectures; bring psychological care to work teams and employees; organize "Harmony Leadership Enhancement Training", etc.

Rich and Colorful Activities

The company holds employee cultural festivals and labor and skills competitions annually, and periodically organizes various activities and competitions such as food exhibitions, photography, speeches, and singing to meet the spiritual and cultural needs of employees, enhance their vitality and sense of happiness, and create a warm and welcoming atmosphere enterprise. In 2022, the company organized a series of 20th CPC National Congress activities such as walking, themed concerts, and story competitions. We also organized Spring Festival garden parties, Mid-Autumn Festival and National Day celebrations, and a series of cultural and sports activities such as host challenges, basketball games, and youth friendship events. In addition, we organized four categories of 21 online activities, including readings and cloud singing, to enrich employees' leisure lives.

Employee Cultural Festival - Swimming Competition

Employee Cultural Festival - Badminton Competition

Employee Cultural Festival - Basketball Competition

Employee Cultural Festival - Other activities

Youth friendship activities

Walking

Parent-child activities

Spring Festival garden party activities

Mid-Autumn Festival garden party activities

119 Fire Safety Month series of activities

I am Jingtang's excellent lecturer competition

"Shining Stock" Youth Host Challenge

"Celebrating Mid-Autumn Festival, Welcoming National Day" large-scale food exhibitions

Other colorful activities

Talent Development

Talent Attraction

In order to attract high-quality talents, Shougang Steel conducts campus recruitment and social recruitment through double selection meetings, special job fairs and other forms. We collaborate with universities such as University of Science and Technology Beijing, Beijing Institute of Technology, and Yanshan University to build university-enterprise talent cultivation programs. To accelerate the growth and development of talents and enhance the introduction of high-quality talents, we have made a *Work Plan for Differentiated Cultivation and Incentive Mechanism of Graduates*. In addition, to motivate and retain core talents, the company has introduced equity incentive plan for core technical skill employees.

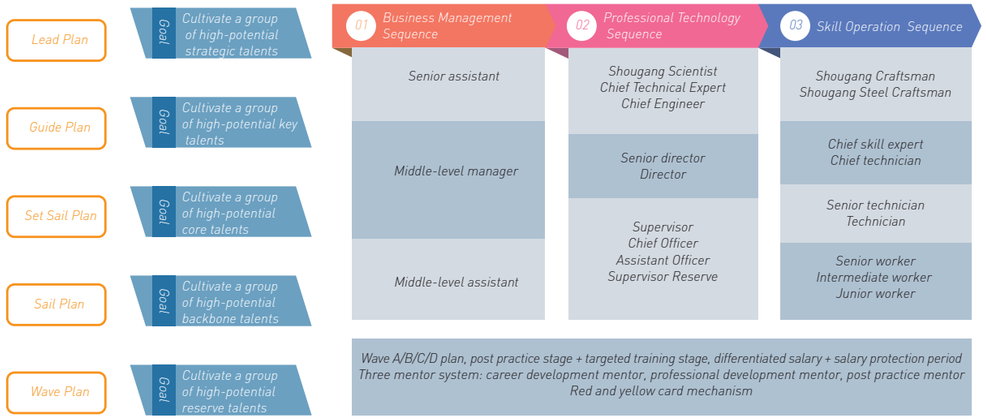
Career Development

Shougang Steel adheres to the concept that talent is the primary driving force for enterprise development. Based on respecting, caring for, and developing talents, the company continuously optimizes the building and development system of the company's talent team. Supported by capabilities in technology, evaluation methods, and development strategies, based on the development path of three talent team channels, an empowerment and development system named "voyage" for high-potential talents, and the training and management system for all members of the three talent teams, we have formed a "Three Teams, Three Series, and Three Channels" development and management relationship that encourages both vertical promotion and horizontal collaboration. We are committed to creating a comprehensive ecological system conducive to talent growth and development, laying a solid foundation for sustainable development.

The company has built the "voyage" full life cycle career development system, gradually established five levels of talent development and training platforms: "Wave, Sail, Set Sail, Guide, Lead", based on the talent positioning needs of different levels. Thanks to the continuous diversification, targeted empowerment training, scientific evaluation and selection, etc., the construction of the "Dual System" of three sequences talent management is solidified, the vitality and creativity of employees is stimulated, and the internal driving force for development is strengthened.

The company has improved the evaluation mechanism, implemented the promotion of positions and ranks, and optimized the promotion of primary management personnel to promote three sequences talent incentive mechanisms. The company has innovatively implemented performance accumulation system, using cumulative points as promotion entry clause for high-level talents. During the reporting period, the percentage of employees receiving regular performance and career development reviews is 100%.

The company attaches great importance to employee career planning and development, and helps employees achieve their career goals through measures such as training and development, job rotation, skills competitions, performance evaluations, and job promotions. During the reporting period, the company implemented the "Big Positions, Big Job Categories" labor organization model, the "Master Craftsmen" selection and evaluation system, and strategic talent reviews to create a talent hub for scientific and technological talents. The company recommended, voted and hired the first batch of "Shougang Scientists" to create good environment that values technology and cherishes talents.



"Voyage" full life cycle career development system

18,608
participants trained

1,316,073
training hours

Employee Training

To comprehensively and thoroughly implement the strategy of making the enterprise stronger through talents, Shougang Steel has built a multi-dimensional talent training system, promoted the construction of a learning organization, and provided training for all employees. The company has formulated the *2022 Talent Work Promotion Plan,* combined with the *2022 Employees Education and Training Work Plan,* focusing on six key areas such as leadership development, scientific and technological innovation, functional and professional improvement, and empowerment of front-line workers, implemented 82 targeted training programs at different levels, and established a sustainable talent training mechanism through training course systems design, training systems implementation, and training evaluation effects tracking. During the reporting period, the training coverage is 100%.

The company has established a four step closed-loop management mechanism of "selection—cultivation—utilization—motivation" for internal trainers, realizing talent empowerment and focusing on building a high-quality professional talent team. As of the reporting period, we have a total of 1,020 internal trainers.

Skill competitions provide strong talent support for high-quality development and create a "Fast Lane" for the growth and development of skilled personnel. In 2022, Shougang Steel held the 8th Vocational Skills Competition, with 91 preliminary competition job categories and 9,042 participants in the preliminary competition. 762 participants participated in the finals of 17 job categories, achieving a double increase in both the number of job categories and participants.

Shougang Steel continues to cultivate a fertile ground for talent development, incubating an innovation cradle. With expert workstations and employee innovation workshops as the strategic platforms, high-tech and high-skilled talents as the leaders, we incubate and cultivate innovation backbone talents, accumulating empowerment for the sustainable development of the company.

Talent development measures of Shougang Steel in 2022	
"Cyan" Training Program	In order to help new employees integrate into their work quickly, the company implements the "Cyan" training program, formulates career planning and training plans, and assigns corresponding mentors to help them grow rapidly.
"Deep Blue Training Camp" training program	In order to identify, cultivate, and retain talents with leadership qualities and key positions potentials, Shougang Steel implements the "five forces model" Deep Blue Training Camp training program to cultivate a core middle-level leadership team with market thinking, excellent leadership, and high performance execution.
Technology Innovation Youth Training Camp	In order to strengthen the talent echelon and reserve construction, in 2022, Shougang Steel held the "Technology Innovation Youth Training Camp". 46 young talents of the company participated in a two-month full-time training, continuously empowering the company's technological innovation.
Promoting the "Big positions, Big job categories" labor organization model	The company continues to promote the "Big Positions, BigJob Categories" labor organization model, providing a platform for operators to engage in entrepreneurship and effectively forming a positive development channel with development opportunities. In 2022, 38 pilot positions for "Big Positions, Big Job Categories" were established, 152 talents of "All-round Duty Workers" were trained by the energy department, and 63 talents of "Full-line Operators" were trained by Cold-R Co.
Establishing "Master Craftsmen" evaluation mechanism	The company has established a hierarchical evaluation mechanism "Master Craftsmen", which includes gold, silver, bronze, and skilled operators, and carefully cultivates a high-skilled talent team with knowledge, skills, and innovation.

Case: Special skills training for "promoting learning through competition and promoting application through learning"

In 2022, according to the principles of "internal strengthening planning, external expansion of channels" and the full coverage of main categories of work in company-level competitions in five years, Shougang Steel has built a competition platform and organizes multi-level skills competitions annually. At the same time, in accordance with the requirement of "training and preparing throughout the competition", we establish training bases, simulation laboratories, and training classrooms for multiple categories of work, and combine the competition with job operation training through theoretical knowledge training and on-site practical exercises. We have cumulatively cultivated more than 300 technical experts at all levels of the country, Beijing, and Shougang.

Health and Safety

Work Safety Management

Health and Safety Management System

Shougang Steel consistently prioritizes the health and safety of employees. The company strictly complies with relevant laws and regulations such as the *Work Safety Law of the People's Republic of China, Law of the People's Republic of China on Prevention and Control of Occupational Disease* and *Fire Prevention Law of the People's Republic of China*. We adhere to the principle of "safety first, people and life foremost", establish the safety production committee, strengthen the responsibility system for safety production, promote standardized safety production procedure, and create safe and healthy workplace for employees and stakeholders.

The company has set short-term and long-term occupational health and safety management goals. During the reporting period, Shougang Steel did not experience major or over safety accidents, and the injury severity rate of work-related accidents in million man-hours was 0. In 2022, the company invested a total of 137 million yuan in work safety sector.

Qiangang Co., Jingtang Co., New-E Co., and Cold-R Co. have all obtained ISO 45001 Occupational Health and Safety Management System certification. The company implemented work safety standardization construction in multiple production units according to the first-level standard. Among them, Jingtang Co.'s sintering plant and pelleting plant, rolling, iron-making, energy, and steelmaking units have all passed the first-level certification of safety standardization. Qiangang Co.'s iron-making and energy units, New-E Co., and Cold-R Co. have also passed the first-level certification of safety standardization. Other production units have met the application conditions for first-level certification of safety standardization.

Intrinsic Safety Management

Based on the consideration of "Personnel-Machine-Environment-Management", Shougang Steel adheres to the principle of source control, fully utilizing technological and informational means such as "Mechanized personnel replacement, Automation to reduce personnel, and Intelligence to eliminate humans" for unmanned operations, to strengthen safety behavior control and strive to build an inherently safe company.

Dual-Prevention Mechanism Construction

Shougang Steel continues to promote the construction of dual-prevention mechanism for risk classification control and hidden danger investigation and governance. We formulate a list of hazard identification and control measures and carry out standardized and normalized risk classification and control. The company also independently develops a "Dual Control" system to automatically investigate hidden dangers. It concludes the process and equipment parameters of major risk points such as BF top pressure and difference in oxygen gun inflow and outflow into the system platform for real-time monitoring, forming an intelligent closed-loop control process of "alarm push-notification disposal-rectification confirmation"

Risk classification control and hidden danger investigation and governance measures adopted in 2022	
Continuously promting special rectification	The company continues to promote special rectification work. We have carried out the "Hundred Days Zero Clearance Action", organized the "Look Back" of key areas such as relevant parties, maintenance and construction, safe electricity use, and material silos, and achieved a 100% completion rate for hidden danger rectification.
Solidly doing a good job in safety and stability work	The company conducted in-depth inspections of safety production around special events such as the "Winter Olympics", the "Two Sessions", and the "20th National Congress", identified various risks and hidden dangers, which strengthened responsibilities to ensure safety and stability during key periods.
Creating incentive mechanisms for closed-loop safety management	The company continues to carry out series of selections such as "Skilled Inspectors" "Governance Models" "Sharp Eyes", and "Safety Experts", fully stimulating the intrinsic motivation of employees to participate in intrinsic safety management. At the same time, we comprehensively implement high-risk analysis pre-shift meetings, continuously strengthen the closed-loop process of "identification-confirmation-operation" for high-risk operations, and strictly prevent unsafe behaviors.

Safety Emergency Drills

The company has revised the company's production safety emergency plan and improved the emergency drill system in accordance with the requirements of normative documents such as *Regulation on Emergency Responses to Work Safety Accidents,* and effectively enhanced the level of emergency management from aspects such as emergency monitoring and early warning, equipment upgrading and modernization, and the construction of a cross-regional and adjacent post emergency coordination mechanism. In 2022, the company strengthened monitoring and early warning, and promoted the application of 129 sets of mobile sentinels, temperature-sensitive thermal imaging electrical fire monitoring, and continuous toxic and harmful wireless monitoring systems for high-risk operational sitess such as limited space operations, hot end work operations, and gas operations. We also launched an intelligent firefighting "cloud maintenance and cloud patrol" management system to ensure the continuous operation and safety of employees. The company conducted a total of 3,571 safety emergency drills.

Case: Strengthening emergency plan drills, and enhancing the overall emergency rescue and disposal capabilities of all staff

Shougang Steel combined on-site safety risks and the demand for employees' emergency response capabilities, formulated annual emergency drill plan for work safety accidents in 2022, cooperated with local government emergency rescue forces, and carried out emergency plan drills for safety, fire protection, occupational health, and other activities.

Safety Management of Stakeholders

Shougang Steel regards stakeholders as part of the safety management community, incorporates relevant units into internal overall management, builds a work safety responsibility system, implements hierarchical and classified management, and highlights the long-term mechanisms of overall management, accurate control, and autonomous improvement. Based on the risk characteristics of maintenance and construction projects, the company has focused on the development of "mechanization to replace humans" workwear. In 2022, the company focused on tackling the difficulties and bottlenecks during the course of equipment maintenance, which are characterized by high hazard coefficients, time-consuming, and labor-intensive. The company also independently developed and customized 124 sets of maintenance workwear, comprehensively improving the level of standardized management of maintenance safety and ensuring the health and safety of relevant personnel.

Construction of Smart Safety Enterprise

Shougang Steel actively promotes the digital and intelligent transformation of safety management, builds a smart safety-oriented enterprise around the elements of health and safety, fire protection, and emergency production management, strengthens the safety monitoring of production processes and sites, and continuously improves the standardization level of safety management.

Information-based Standardized Safety Management

The company establishes a safety management platform based on the "dual prevention mechanism" and "safety production standardization", improving the efficiency and accuracy of the company's health and safety management. This platform mainly includes functions such as safety training activities, risk control, hidden danger investigation, and monitoring and early warning.

Visual Comprehensive Monitoring of Safety Risks

The company utilizes the safety management platform to promote the process control of safety risks. In 2022, the comprehensive coverage of workplace monitoring videos was completed, and process monitoring of hazardous operations and key control projects was achieved through video surveillance and online monitoring technologies. This timely regulates employees' work behavior and ensures safe and efficient production.

Intelligent Safety Real-time Monitoring and Early Warning

The company promotes the construction of an intelligent "Dual Control" system to monitor and warn personnel's work behavior, abnormal states, and the status of objects. The company builds an information-based and intelligent management system based on industrial Internet to perceive, assess, monitor, warn, and handle safety, thereby reducing safety risks and improving the level of intelligent safety prevention and control of the enterprise.

The company has developed an automatic hidden danger investigation function in the "Dual Control" system, which monitors the process and equipment parameters in real-time and sets 774 warning and alarm thresholds. At the same time, it sets warning lines for major hazard sources and major risk operation data, enabling proactive control and enhancing the control capabilities of major hazard sources and major risks.

Control of personnel's work behavior and abnormal states	Control of the status of objects
Shougang Steel uses intelligent analysis cameras and "superbrain" AI self-learning and training functions to real-time identify violations such as unauthorized entry of zinc pots and surrounding, personnel falling, and failure to wear safety helmets, as well as abnormal equipment temperatures, achieving automatic capture, analysis, alarm, SMS notification, and hidden danger management task assignment of 24-hour safety warnings.	By upgrading the existing online monitoring system for hazardous gases, Shougang Steel collects, analyzes, classifies alarms, sends SMS notifications, and at the same time, automatically generates alarm data and sends hidden danger notifications to relative personnel precisely, supervises the entire process of rectification and acceptance, and achieves PDCA closed-loop control.

2.7719 million yuan
invested in work safety training

801,222
training hours

193,985
participants in the training

The coverage rate of employee and related party safety training:
100%

Safety Culture Construction

Shougang Steel adheres to the principle of "shaping culture with safety and preserving safety with culture", strengthens the sense of responsibility for work safety of all employees, and continuously optimizes the safety culture system, including the assessment mechanism for safety objectives, the implementation mechanism for safety regulations, and the education and training mechanism for safety. This promotes the stable development of work safety.

Safety Performance Linkage

The company continues to improve the *Safety Performance Evaluation Criteria*, conducts job safety responsibility assessment, sets 9 dimensions and 34 evaluation criteria, and promotes the implementation of safety responsibilities at all levels. In order to ensure the standardized operation of the hidden danger investigation system, the company analyzes and evaluates the hidden danger investigation data at all levels on a monthly basis, and the evaluation results are included in the monthly safety performance, eliminating the "idle" of the hidden danger investigation system.

Safety Education

The company strengthens the overall safety competence of all employees, formulates an annual safety training plan, and conducts special training on emergency rescue, fire management, limited space operations, hazardous chemicals management, etc. The company adopts a combination of online and offline training methods to ensure full coverage of safety training for all employees.

Case: Safety education activities organized by the company in 2022

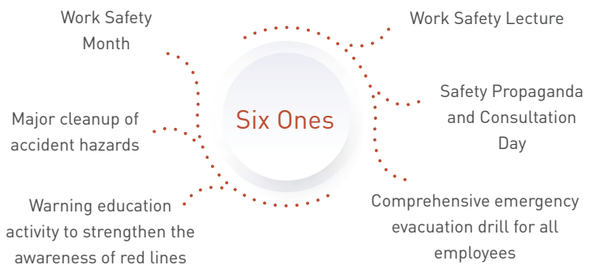
Safety Three-Minute Learning: Shougang Steel organizes daily morning meetings of "Safety Three-minute" learning, focusing on the interpretation of new laws and regulations, intrinsic safety management, interpretation of major accident hazards, and other series of content to instill the concept of "safety first" to all employees. During the reporting period, a total of 877 issues of 40 series of "Safety Three-minute" learning materials were organized.

Safety Little Instructor Training: Shougang Steel vigorously strengthens the construction of the safety education team, and trains team little safety instructors. The company organizes internal excellent lecturers and a little safety instructors to carry out safety lectures, helping cadres and employees to become experts in safety. During the reporting period, 30 new excellent little instructors were added, a total of 2,021 courseware were produced, and 3,365 trainings were conducted with 37,203 participants.

Enhancing the safety management capabilities of grassroots backbone: Shougang Steel organizes team leaders to conduct special training on safety knowledge such as safety standardization, emergency rescue, gas, confined spaces, and safety culture.

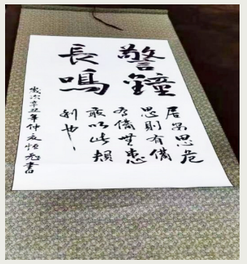
Work Safety Culture Promotion

The company is committed to ensuring the health of employees and their families. The company organizes a series of educational activities during the "Work Safety Month" every year, focusing on the theme of "complying with the work safety law and being the first person responsible", and carries out the "Six Ones" activities. At the same time, we organize employees' family members and related parties to participate in the "Work Safety Family Culture" including company's safety, fire, and health education activities, further enhancing employees' safety awareness and their ability to respond to emergencies.



Case: Carrying out characteristic safety culture activities, deepening the construction of Shougang Steel's safety culture

Through activities such as safety VR experience, work safety lectures, safety skills competitions, and party member demonstration posts, Shougang Steel continuously enhances the safety awareness and quality of all employees, and deepens the construction of Shougang Steel's safety culture. Among them, the activity of leaders "Going on Stage and Talking about Safety" was carried out, with leaders at all levels conducting 341 trainings with a total of 12,420 participants throughout the year.



We innovated the content of safety activities, organized 8 online family-enterprise linkage and family-assistance safety activities; collected 33 suggestions, completed 446 standardized and qualified internal evaluations of team groups, and shaped safety cultural symbols with Shougang Steel characteristics through continuously summarizing and refining.

At the same time, the company creates a "One Family" cultural activity for relevant parties, with a focus on clear responsibilities, fulfilling responsibilities, and taking responsibilities. We implemented hierarchical, layered, and classified management for 95 long-term relevant parties. Through forms such as "self-improvement + guidance and assistance" and "typical experience exchange tour", we promote mutual learning and exchange of safety management experience and safety culture integration, and build a new pattern of win-win situation in enterprise governance capability building and the implementation of relevant party's main responsibilities.

Occupational Health Protection

Shougang Steel is committed to building a healthy enterprise. In accordance with the *Law of the People's Republic of China on Prevention and Control of Occupational Diseases*, *Regulations on Occupational Health Management in Workplaces* and other relevant laws and regulations, we have formulated the *Occupational Disease Hazard Prevention and Control Responsibilities*. The company continuously improves the working environment and conditions, protects the physical and mental health of employees and related parties through occupational health standardization system, and occupational health monitoring. In 2022, no cases of occupational diseases were found.

The company strengthens occupational health monitoring, conducts comprehensive health check-ups for all employees, and establishes employees' occupational health monitoring files. In addition, we provide personal labor protection equipment that meets the requirements of job operations for employees, and set up occupational disease prevention facilities such as dust collectors and soundproof walls to ensure the occupational health and safety of employees and related parties during the operation process.

The detection rate of occupational disease hazards: 100%

Occupational hazard exposure certificate rate: 100%

The rate of employee occupational health monitoring: 100%

In 2022, Qiangang Co. and Jingtang Co.were respectively awarded the advanced units for emergency management and work safety in Hebei Province.

Qiangang Co. was awarded the title of "Healthy Enterprise" in Hebei Province.

Cold-R Co. was awarded the advanced unit for fire safety work in Shunyi District, Beijing in 2022.

Quality Assurance

Quality Management System

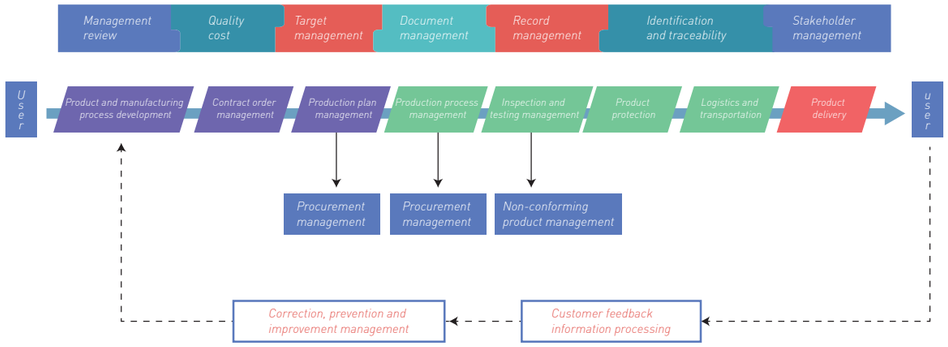
Shougang Steel adheres to the quality management concept of "dedicated to excellent products, pursuing customer satisfaction", strengthens the quality responsibility system structure, solidly promotes the construction of quality, environment, and occupational health and safety management system on the basis of *Management Manual*, continuously improves product quality, meets customer needs, and creates value for customers.

The company implements comprehensive quality assurance and quality prevention. The company has obtained ISO9001 quality management system certification, IATF16949 automotive industry quality management system certification, ISO27001 information security management system certification, and ISO10012 measurement management system certification. We have obtained third-party product certifications such as CE certification, BIS certification, UKCA certification, and certifications from multiple international classification societies, and maintained the continuous and effective operation of the quality system. The company's laboratories have accredited by the China National Accreditation Service for Conformity Assessment (CNAS), which provide strong technical support for the products quality and innovative research and development.

Quality Risk Control

Strengthening Process Control

The company establishes quality management systems such as control plan management, product standard management, product identification management, and non-conforming product management. At the business level, we clarify the content of quality control at various levels by combing through business processes from product management and process management. The company insists on benchmarking advanced manufacturing services, focusing on "quality improvement, cost reduction and efficiency enhancement, competitive advantage", and continuously improving the service skills of user technical personnel and providing technical support for production lines.



Full-process quality assurance system

Product development quality management:Combining the APQP (Advanced Product Quality Planning) process with the actual situation of the company, we optimize the product development process, and implement a hierarchical management model for the development of new products/components to ensure the reliability of product quality.

Supplier quality management: Starting from the source of raw material procurement, the company creates a supply chain evaluation model to comprehensively evaluate the supplier's ability to stably supply goods from the perspective of the quality system. It realizes the switching from quality inspection of supplied goods to supplier production process control, leads supplier quality improvement, and ensures the safety of product quality.

Manufacturing quality management: Quality control points are implemented in aspects of personnel, machines, materials, methods, environment, and measurement, and established control standards are adhered to during production preparation. In addition, online automatic detection equipment is equipped in the entire process and multiple processes to build an online quality monitoring platform to ensure the stability of product quality. Furthermore, the company has participated in the revision of 4 national standards and led formulating of 1 industry standard in terms of quality inspection. The company has established requirements for quality accident management, non-conforming product management, and product quality inspection, clarifying the responsibilities and management processes of each unit in the production process, and strictly controlling the product quality.

Customer quality management:The company delivers products utilizing a three-level service system, implements the "technology + sales" dual representative system, switches services from after-sales to pre-sales, actively responds to customer feedback, and provides "personalized" full-lifecycle services to users. At the same time, we establish logistics quality management, setting acceptance release standards for port storage and loading operations, to ensure that product labels and physical quality are consistent, and to safeguard the timely delivery of products to customers.

Strengthening Supervision and Assessment

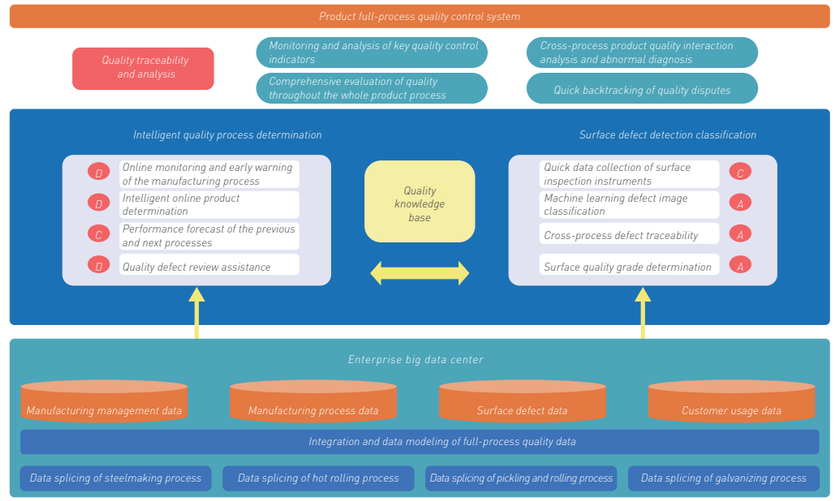
The company has established a comprehensive system for product quality rewards and punishments, which includes mechanisms for inspection management, customer complaint handling, problem listing and oversight, and professional assessment management. Implementation of inspections and supervision occurs at all levels, with weekly self-inspections by each unit and joint inspections by specialized departments. Through careful analysis and resolution of customer complaints, the company has enhanced customer satisfaction.

In addition, Shougang Steel has formulated the *Product Management Accident Measures* for production line quality issues, and divided them into corresponding assessment methods based on accident levels. At the same time, in order to motivate employees to innovate and promote continuous improvement of quality, we carry out activities such as "Listed Supervision Projects" and "Double Ten Projects" to tackle bottleneck quality issues. Every year, we evaluate outstanding individuals and collectives in terms of quality, creating a good atmosphere of everyone participating in quality improvement.

In 2022, the company implemented the "Quality Improvement Year" and conducted 50 rounds of process quality inspections throughout the year, checking 552 items and identifying 84 issues. At the department level, we conducted 50 rounds of process quality inspections, checking 4,295 items and identifying 431 issues. With the focus on closing the loop on quality technical issues and management issues, we continuously improve the level of quality management through organizing quality inspections and quality problem-solving.

Intelligent Control of the Entire Quality Process

The company has built a full-process quality control system around intelligent quality process determination and cross-process quality traceability analysis. In the quality control stage, key links in each process are equipped with intelligent control models to establish online determination and process monitoring throughout the entire process. This enables macro-control of quality control and facilitates the separation and positioning of defects in processes, making it easier to dynamically adjust processes. Through the application of intelligent control of the entire quality process, the company comprehensively enhances its quality control capabilities and responds promptly to customer demands.



Product full-process quality control system's functional architecture diagram

Product Safety Management

In order to ensure product safety and protect the health and safety of employees and customers, Shougang Steel strengthens self-inspection and self-control of products. The company implements monitoring and control of hazardous substances in product design, raw material procurement, production, and packaging. The company organizes third-party testing of relevant products and publishes third-party testing reports to ensure that all products comply with the specifications for the prohibition and restriction of hazardous substances. The HRC, pickled sheets, automotive sheet, and electrical steel products of the company consistently meet the requirements of the EU RoHS Directive, SVHC substances of high concern, China National Standard GB/T30512-2014 for Automotive Prohibited Substances, Registration, Evaluation and Authorization of Chemicals(REACH) and the End-of-Life Vehicles Directive (ELV Directive).

Case: Cold-R Co. tackled quality control challenges and solved the "bottleneck" problems

In 2022, Cold-R Co. successfully produced a test coil that exceeded the upper limit of the product's design width on the galvanizing line No. 2, which is of great significance for further enhancing the cold rolling galvanized automotive sheet order-taking capability and improving the supply level for automotive sheet customers.

In order to meet market demand, Cold-R Co.'s product quality improvement team focused on optimizing product structure and increasing production capacity, gathering technical backbone, conducting technical demonstrations and implementing plans, independently upgrading and transforming existing equipment, breaking through equipment bottlenecks. Focusing on the product goals of widening the galvanizing line No. 2, 28 equipment upgrade and modernization contents were sorted out, and independent upgrade and modernization were carried out to solve the "bottleneck" problems that restrict the stable operation of the widening production system, solve the equipment problems that have troubled its production and product quality, restore equipment accuracy, and provide strong support for the road to widening automotive sheet supply.

Quality Culture Construction

Shougang Steel carries out comprehensive quality culture construction activities through various forms such as quality education and monthly quality events, strengthening the awareness of quality management among all employees and promoting the enhancement of the company's quality management culture.

The company attaches great importance to employee quality education and has established a four-level quality training system for senior management, middle management, technical personnel, and operators. This includes training in quality system thinking, IATF16949 internal auditor certification, quality standards and tools, and product knowledge. In 2022, the company conducted quality skills training for 1,194 person-times.

In addition, The company carries out the "Voice of Customer" activity, making video files of product defects that have affected customer usage over the years and playing, conveying the real voice of the customers, and bringing product issues to the forefront, in order to provide satisfactory products to the users.

Case: Shougang Steel launched Quality Consistency Master Class training

In October 2022, in order to comprehensively strengthen the construction of the quality consistency talent team and the cultivation of talent reserves, Shougang Steel launched the "Quality Consistency Master Class" training, with 7 selected students and a planned training period of 12 months. Taking this training as an opportunity, The company further improved the talent cultivation system for quality consistency management needed for the high-quality development, and reserved talents for the realization of the "technology-oriented company" strategic transformation.

Case: Taking "quality as the lifeline" as the development pivot, and refining high-quality products

Taking customer satisfaction as the standard, the company relentlessly pursues the stability and consistency of quality through measures such as weekly board meetings, quality inspections, quality meetings, "Double Ten" tackling, and listed supervision, aiming to create quality advantages and continuously improve product quality. In 2022, the company has completed the development of 10 new products for non-oriented electrical steel: the first release of ESW1230 and 20SW1200H products in the world, which have been appraised by the expert committee of the Chinese Society for Metals and reached the international leading level, and are applied to the next generation of new energy drive motors; the development of ultra-thin specifications USW35085 and USW40110 products, with P1.0/1k reaching below 35W/kg, leading in domestic product performance.

Breakthroughs have been made in the efficient process of oriented electrical steel industry, realizing mass production of 0.30mm and 0.27mm thick products. The rate of high-end product 20SQGD070 has increased by 12.4%, and the rate of 18SQGD065 has increased by 10.2%, achieving the production of low-excitation 23SQGD085LS, and small-scale production of high-end products 27SQGD080 and 23SQGD070. Significant improvement in the control level of nitrogen infiltration uniformity, and 100% wide specification production in the double-loop furnace have been achieved.

Non-oriented electrical steel

Oriented electrical steel finished goods warehouse

In 2022, Shougang Steel won the second prize of the Quality Technology Award for "Construction and Application of Digital Empowerment Intelligent Customer Service System for Iron and Steel Enterprises" awarded by the China Association for Quality.

The company has been awarded the "National Quality Inspection Stable Qualified Product" by the China Association for Quality Inspection, and was recognized as a National Quality Leading Enterprise in the metallurgical industry, a National Quality Integrity Benchmark Enterprise, a provider of National Trustworthy Products, one of the National Top 100 Quality Inspection Integrity Benchmark Enterprises, and a Hebei Province Quality Benchmark Enterprise.

Customer Service

Shougang Steel adheres to the orientation of satisfying user needs, fully implementing the service concept of "customer first, utmost integrity; meticulous to the extreme, innovation-driven". Upholding the responsibility and mission that "service creates value", the company works on building a smart marketing service platform, promoting a new model of integrated online and offline marketing services, strengthening the closed-loop management of customer appeals, enhancing customer experience and satisfaction. Effectively constructing a user ecosystem service system characterized by "open sharing, interconnectedness, and co-creation of value", Shougang Steel co-creates and builds together with customers, continuously and unceasingly creating value.

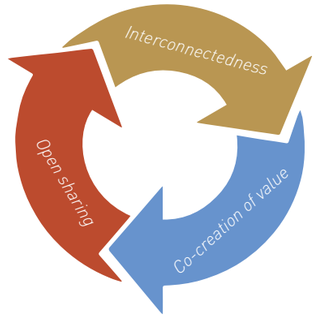
A three-level service system in one ecosystem

Emphasis on customer relationship management

Optimize the three-tier service system, build a "manufacturing + service" flexible task force

Emphasis on customer experience

Build intelligent marketing services, focus on co-creation and co-construction with users, and improve customer satisfaction



Emphasis on continuous improvement

Establish a customer feedback mechanism, focus on customer needs, form a closed-loop management of customer response and claim mechanism, and continuously optimize customer service

Emphasis on win-win cooperation

Practice responsible marketing, ensure the consistency of products and services, and create higher value for customers

Building a user ecosystem service system

Optimizing the Three-level Service System

Shougang Steel has set up a three-level service support system, focusing on customer demands, delivery quality assurance, and continuous improvement of services. The company has established customer service, supervision, and evaluation mechanisms, implementing graded service strategies across dimensions such as quality assurance, supply assurance, technical services, logistics services, and commercial guarantees, continuously enhancing comprehensive interactions and collaboration with customers.

With a customer-first approach and sincere service, the company strives to create an excellent professional service team, achieve forward-moving service, and take multiple measures to improve the quality of customer service. The company has established a customer-centric Key Account Manager team. They represent the customers internally and the company externally, providing comprehensive, convenient, and efficient exclusive services to customers. The company also has a flexible problem-solving team that combines manufacturing and service, conducting on-site R&D and service at customer sites.

★: Main responsibility
△: Secondary responsibility
○: Related

		Before sales								During sales			After sales			
		User information collection	Technical service activities visit and exchange	Technical demand discovery, identification, and transfer	Establish parts archives	Participate in user authentication	Guide user material selection	New product technical recomme-ndation	EVI	Technical demand transfor-mation and implem-entation	Delivery quality assur-ance	Usage process guidance	Customer complaint analysis and improve-ment	Objection comp-laint handling	Quality conti-nuous improve-ment	Personalized tech-nical solut-ions
Zero level	Resident representative	★	△	★	△	△	△	△	△	△	○	△	△	★	△	○
	Customer representative	★	★	★	★	△	★	★	△	★	○	★	△	★	△	○
	Processing center	★	△	★	△	△	★	△	△	△	△	△	△	★	△	△
	Regional steel trader	★	★	★	△	△	★	△	△	★	△	★	△	★	○	○
First level	Service department	★	★	★	★	★	★	★	★	★	△	★	★	★	★	★
	Sales department	★	★	△	△	△	★	★	★	★	★	○	○	○	○	△
Second level	Research institute	○	★	△	△	★	△	★	★	★	△	△	★	△	★	★
	Manufacturing department	○	○	△	△	★	△	△	△	★	★	△	★	△	★	★
	Operation department	○	○	○	○	△	△	△	△	★	★	△	★	△	★	★

Shougang Steel's three-level service system

Creating Smart Marketing Services

Shougang Steel has created a smart marketing service platform with the goal of improving customer experience and increasing service efficiency. The company has integrated customer marketing services internally to achieve information sharing and logistics coordination throughout the entire supply chain of Shougang. Externally, the company has achieved visual tracking of orders for major customers in industries such as automobiles and home appliances, as well as intelligent demand forecasting and automated inventory alerts. By offering features like mobile access, delivery tracking, shortage alerts, and material performance analysis, we consistently enhance user experience and trust.

While focusing on technological innovation, we also emphasize co-creation and co-construction with our users, constantly improving customer experience. During the reporting period, the company continued to strengthen communication and interaction with customers through integrated online and offline marketing service models, such as exclusive apps, visits, forums, and offline user co-creation activities. We conducted 2,410 customer visits, including 1,423 technical exchanges and user services.

The company optimized and upgraded customer satisfaction management by combining the smart marketing platform and the production and sales system. We accurately grasped customer satisfaction from six aspects: overall impression, steel quality, supply capability, service quality, sales price, and suggestions, with a total of 40 questions. We also promoted rapid improvement in production, sales, and research coordination in response to customer requests, and implemented online closed-loop management for customer requests. This has promoted continuous upgrades in product quality and service quality, and improved user stickiness. In 2022, Shougang Steel's comprehensive customer satisfaction score was 98.62 points.

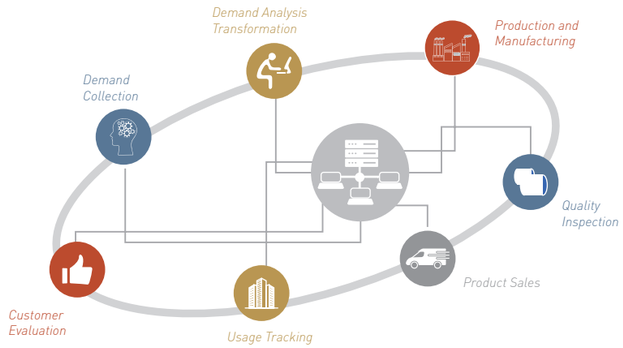
In 2022, over 500 customer demands were managed through closed-loop processes throughout the year

114 key user demands were advanced on the production, sales, and research platform

The customer complaint resolution rate: 100%

Establish Customer Feedback Mechanism

Shougang Steel has formulated the *Customer Complaint Management Regulations* and *Product Quality Objection Management Measures*, focusing on customer response needs, and strengthening the efficiency and effectiveness of demand collection, transmission, and handling. The company has established customer response mechanisms and fast claims settlement mechanisms. We carry out graded circulation of customer objection events, promote the circulation of demands through key issue tracking in weekly/monthly meetings, listing supervision, and internal collaborative problem-solving, thereby improving service efficiency. Based on previous customer feedback (mainly focused on objections), we have also promoted the collection of customer needs and provided value-added services to customers. At the same time, we have optimized the three-level service system, adjusting objection handling from the Marketing Center Service Department to branch offices. This not only improves the efficiency of objection handling by utilizing regional advantages but also enables the service department to provide accurate services and continuously improve customer service levels.



Customer demand closed-loop management mechanism

Practicing Responsible Marketing

Shougang Steel practices the concept of responsible marketing and adheres to the requirements of relevant confidentiality laws to strengthen customer privacy protection. At the same time, the company provides relevant training to convey the principles of responsible marketing to customers, ensuring consistency in products and services, avoiding inaccurate or misleading information, and protecting customer rights and fair transactions. During the reporting period, the company did not have any illegal or irregular incidents in market promotion or customer privacy. There were no violations in health and safety or labeling of products and services provided by the company.

The company focuses on meeting customers' comprehensive needs for quality, delivery, R&D, service, innovation, and efficiency. We create higher value for users with better technology, more refined products, and better services. The company received honors such as the "Best Service Provider Award" from BMW-Brilliance Automotive, the "Special Contribution Award" from BYD, the "Best Cooperation Partner Award" from Geely Automobile, and the "Partner Progress Together Award" form FAW-Volkswagen.

Case: Special Contribution Award - BYD praises Shougang Steel

At the BYD NEV Core Supplier Convention 2022, BYD presented the "Special Contribution Award" to Shougang Steel, fully affirming Shougang Steel's outstanding performance in "quality, cost, delivery, research and development, and service". Shougang Steel focuses on customer demand changes, fully leverages the advantages of marketing system synergy and full-industry chain synergy, explores and practices an integrated service system that is "agile, efficient, and orderly", and provides service guarantees for BYD's smooth production.

The production and service teams of the company take customer needs as their own responsibility, resonate with customers, and work together to promote the transformation of the new energy vehicle industry. We will advance the high-end process of Chinese brands, and contribute to the sustainable development of a better future for humanity.

Case: Shougang·BMW-Brilliance Automotive alliance works together for a win-win situation and creates the future together

Strong alliance creates high-quality products and works together for a win-win situation. In March 2022, the third phase of the Shougang·BMW-Brilliance Automotive alliance innovation studio project was launched in Shenyang. In response to the call of the All-China Federation of Trade Unions, an alliance innovation studio was established by the company and BMW-Brilliance Automotive, to explore the establishment of a new platform for "cross-border" worker innovation studios. The studio was jointly formed by the Shougang's Guo Dapeng BMW Service Innovation Studio and the BMW-Brilliance Automotive Stamping Workshop Guo Yingliang Innovation Workshop, achieving deep cooperation between Shougang and BMW-Brilliance Automotive across professions, fields, and enterprises.

At the meeting, Shougang Steel and BMW-Brilliance Automotive signed the Shougang · BMW-Brilliance Automotive Alliance Innovation Studio Phase III Project Cooperation Agreement. With the help of the alliance studio platform, we will further strengthen communication and cooperation, give full play to our respective advantages and strengths, and work together to create the future.

Supply Chain Management

Suppliers are important partners of Shougang Steel, and stable supply chain is the foundation and guarantee for sustainable development of the company. Shougang Steel attaches great importance to business cooperation with suppliers, continuously optimizes the supplier management system, strengthens supply chain ESG management, actively promotes the construction of green supply chain, and builds a responsible supply chain.

Supplier Management System

The company's suppliers include raw materials, fuel, production materials, spare parts, engineering equipment, and engineering materials suppliers. We strictly abide by national laws and regulations, carry out supplier admission, audit, evaluation, and grading work in accordance with the *Purchasing Supplier Management Measures*. We realize the full life cycle management of online supervision, dynamic management, and automatic evaluation of suppliers.

Admission: Suppliers are required to provide quality system certification certificates and other credit materials.

Review: We review the credit materials submitted by different types of suppliers according to requirements, and conduct on-site compliance research, letter research, and other research when necessary. On-site research or letter research are conducted in accordance with the admission scoring criteria.

Evaluation: Suppliers with order quantity in the previous year and new admission are included in the company's annual evaluation; suppliers with quality problems confirmed by various base departments in the previous year or suppliers that need to be evaluated for other reasons are included in the company's second-party audit.

Evaluation criteria for raw material suppliers: quality, delivery, collaborative response, service, price, excess freight, major impact, business reputation, etc.

Evaluation criteria for spare parts/engineering equipment/engineering materials suppliers: enterprise qualification, product quality, contract performance, supply capability, and after-sales service, etc.

Exit: If any safety or environmental accidents occur, delivery is delayed, or the company's integrity regulations are violated, resulting in economic losses or adverse social impact, the supplier may be included in the blacklist or permanently disqualified, depending on the situation.

Grading: According to the annual evaluation results, suppliers are classified into four levels: priority (A) suppliers, regular procurement level (B) suppliers, qualified level (C) suppliers, and alternative (D) suppliers. Suppliers with priority, regular, and qualified levels will continue to be included in the qualified supplier list and directly enter the next supply cycle.

As of December 31, 2022, the company has a total of 3,558 suppliers, all of which are mainland suppliers.

Supplier ESG Management

The company pays close attention to the performance of suppliers in terms of employment, environmental protection, safety production, and privacy protection, and informs relevant parties through various means that they must fulfill social responsibilities and comply with the *Supplier Code of Conduct Commitment*. At the same time, we carry out supplier admission, audit, and ESG assessment work, and visit the supplier site when necessary to identify environmental and social risks in various links of the supply chain. If the supplier's products are found to have a significant adverse impact on the environment, occupational health, and safety, the company will include them in the blacklist or permanently disqualified, depending on the situation.

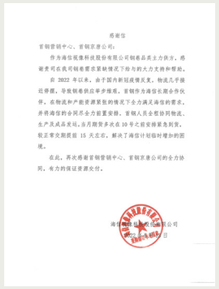
During the reporting period, a total of 1,495 suppliers were evaluated, of which 22.54% were A-level suppliers, 31.17% were B-level suppliers, 46.09% were C-level suppliers, and 0.2% were D-level suppliers. The number of suppliers whose cooperation was suspended due to non-compliance with social responsibilities was 0.

Stable Supply

With a strong sense of mission and responsibility, the company takes multiple measures and efficiently coordinates to ensure the stability and safety of the industrial chain and supply chain, effectively assisting upstream and downstream enterprises in resuming work and production. During the reporting period, the company urgently guaranteed supply for 35 key customers, processed hundreds of thousands of tonnes of urgent orders, and successively won 16 awards. These awards include the "Best Production and Supply Guarantee Award" from Great Wall Motor Company Limited Xushui Branch, the "Excellent Supplier" from Dongfeng Honda, the "Excellent Supplier" from CIMC Group and Foton, etc. We also received a commendation banner for supply cooperation from SAIC Maxus and a commendation banner for overcoming difficulties in supply from Great Wall Motor, as well as thank-you letters from 27 companies.

Case:Making every effort to stabilize the supply chain of key customers and gaining high recognition from customers

In 2022, the company's service team, guided by the customer-centric concept, thinks what the customers think and responds to their urgent needs. With multiple measures and efficient coordination, we have made every effort to solve the supply difficulties for multiple key customers and have withstood the severe test of supply chain guarantee.



As a long-term partner of Hisense, in the situation of tight logistics and production capacity resources, the company has made every effort to meet the needs of Hisense. We coordinated logistics, production, and shipment of finished products throughout the process, and solved the difficulties caused by the temporary increase in Hisense's plans. At the end of February, Penglai Dajin Ocean Heavy Industry signed a contract for 20 sets of Shandong Changyi Sanying Offshore Tower Project steel plates with Shougang. In order to ensure the timely delivery of the project, the company's service team raced against time and fought against difficulties, actively responded, coordinated operations, and shipped the products immediately after production completion, gaining time and creating favorable conditions for the smooth production of customers.

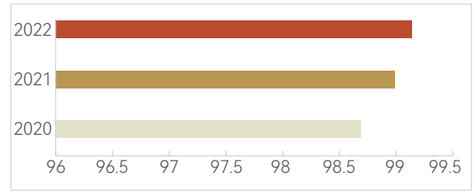
The company's service team has gained customer recognition through professionalism and practical actions, and has received thank-you letters from key customers such as Hisense, Dajin Ocean Heavy Industry, CXIC Group, China Merchants Group, and BYD. In these letters, they expressed their gratitude for the efforts made by the Shougang Steel service team to prioritize customers, guarantee supply, actively coordinate production and transportation, guarantee resource delivery, and escort the smooth production of customers.

Case:Prioritizing customers, Zhixin Co. rised to the challenge and ensured supply for 63 customers in emergency situations

In April 2022, Zhixin Co., with customer service as the center, has made every effort to solve the urgent material needs and supply difficulties of customers. To speed up the response, Zhixin Co. adopted the "one day, two meetings" coordination mechanism. Within one month, the company sorted out five batches of urgent customer orders and urgently shipped 12,000 tonnes of goods, solving the production and supply problems for 63 customers.

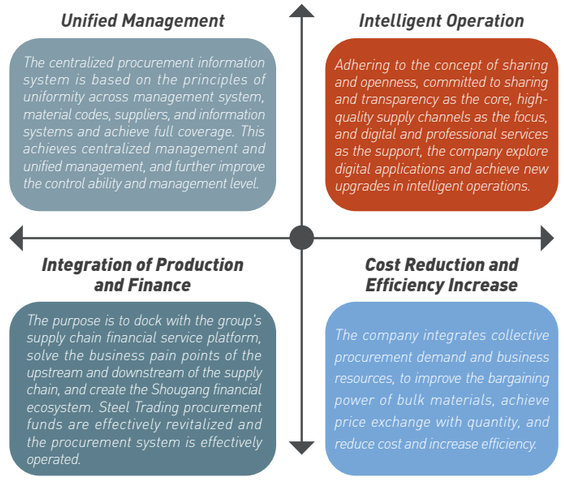
Transparent Procurement

By building a unified procurement system, developing functions such as electronic signature, supplier qualification warning and evaluation, and procurement efficiency evaluation, Shougang Steel has achieved online and transparent procurement throughout the entire process, with traceable data. At the same time, we have strengthened multidimensional control, actively promoted integrity with suppliers, and achieved transparent procurement. In 2022, the number of online procurement orders reached 117,191, accounting for 99.14%.



Percentage of the company's online procurement quantity

Building a centralized procurement system: Based on the principle of uniformity across management system, material codes, suppliers, and information systems, we have reorganized and standardized the procurement process, promoted the integrated business model of production and sales, and connected with the supply chain financial platform. Moreover, we have built a unified centralized procurement information system and a systematic and orderly procurement business management system, to solve the problems in actual business operations. This reduces procurement costs, creates procurement benefits, and improves procurement efficiency, process efficiency, and personnel efficiency.



Full-process traceability: The company has successively developed functions such as electronic signature, electronic contract, supplier qualification warning, supplier evaluation, and procurement efficiency evaluation. The transparency, openness, and traceability throughout the procurement process are achieved, creating conditions for transparent procurement and operational management, with an electronic contract signing rate of 94%.

Multidimensional control: We have streamlined the procurement business and inventory control processes, involving 2 primary processes, 11 secondary processes, 18 tertiary processes, and 29 risk points. We conduct regular risk self-assessment on a monthly basis, implement normalized management, and deeply integrate the execution of regulations, supervision and inspection, big data analysis, and process optimization in various procurement processes, to strengthen multidimensional control.

Integrity construction: The company actively promotes integrity construction activities with suppliers. We sign co-construction agreements with suppliers such as SINOSTEEL Xingtai Machinery&Mill Roll Co., Ltd., disseminating behavior guidelines such as the "Five Prohibitions " and the "Five Can't". We issue "integrity construction notices" to suppliers before key holidays, to actively promote integrity construction with suppliers, and jointly create a clean and transparent "sunshine" procurement environment.

ESG Training for Procurement Personnel

During the reporting period, the company conducted LCA, and environmental and social responsibility awareness training for procurement personnel, with a training coverage of 100%. The awareness of procurement personnel in terms of environmental and social responsibility has been significantly improved.

Supplier Empowerment

Through various means, the company promotes the green and low-carbon procurement requirements to suppliers, to foster win-win cooperation and synergistic development in the upstream and downstream supply chain of raw materials. We also disseminate the requirements for green emission reduction and low-carbon work to suppliers. At the same time, we provide suggestions for environmental risks that may arise during supplier admission and performance, disseminate the important value and main process of carbon accounting. These measures enhance suppliers' understanding of carbon accounting and the construction of a low-carbon supply chain.

04

Value: Demonstrating Mission and Responsibility (V)

Shougang Steel has always taken technology and innovation as the lead, intelligent manufacturing as a means to continuously break through technological bottlenecks and actively serve national key projects. The company always adheres to the concept of industry co-construction and cooperates closely with stakeholders to jointly promote the high-quality development of the steel industry. In the process of development, the company emphasizes social issues and participates in public welfare actions to provide strong support for promoting economic prosperity and sustainable social development.

National Strategic Projects Participation

Shougang Steel integrates company development into national strategies and focuses on new product R&D and localization substitution of bottleneck products. In 2022, 16 high-end materials, represented by automotive outer sheet 490+Z and automotive stabilizer bar steel 34MnB5, have been replaced by localization and supplied in batches. Shougang Steel exports electrical steel products to 29 countries and regions. These products have been successfully applied to several key national projects along the Belt and Road Initiative countries such as Laos.

Serving national projects: Shougang Steel actively participates in national and provincial-level projects, undertaking 7 national projects such as "Synergistic Optimization and Integrated Application of Key Elements in the Steel Process", and its products are widely used in national key projects and major engineering projects.

Products	Key projects	
Oriented electrical steel		Widely used in the field of UHV transformer substations such as Baihetan Hydropower Station, Wudongde Hydropower Station, Beijing World Expo venues, Winter Olympics venues, Laos-Chonkham-Nasertong Transmission and Transformation Belt and Road Project, UHV "double million" transformers, and high-efficiency energy-conversation distribution transformers.
Pipeline steel	 	Used in major national projects such as the "West-East Gas Pipeline Line 2" "West-East Gas Pipeline Line 3" "East Asia Line" "Shaanxi-Beijing Line" "Zhonggui Line" "New Guangdong-Zhejiang Line" "Central Asia Line" "China-Myanmar Line" "China-Russia East Line" as well as local oil and gas pipelines and key projects. In 2022, it is used in the Western Line 4 (Turpan-Zhongwei) natural gas pipeline project, the Kashagan project X60MOS low-temperature acid-resistant submarine pipeline, etc.
Hydropower steel	 	Used in projects such as Xianju Pumped Storage Power Station, Guandi Hydropower Station, Yazui River Hydropower Station, and Laos Nam Leuk Hydropower, and bulk supplied for the Ninghai Pumped Storage Hydropower Project.
Shipbuilding and Offshore engineering steel		Achieving full coverage from A-grade to E690, it is used in the world-wide deepest semi-submerged drilling platform "blue-whale 1#", Asia's largest ocean ranch "long-whale 1#", and won the bid for the CCSEH690 ultra-high-strength marine engineering steel projects for offshore wind power installation vessels.
Tank steel	 	Used in projects such as Sinopec Lanzhou Petroleum Reserve Base Project, Sinopec Sichuan Tank Farm Project, Shanxi YanChang Petroleum Group Jingbian Project, UAE Black Pearl Tank FARM Project, Ethiopia Ocean Engineering Project, etc.
Bridge steel	 	Used in the world's largest highway-railway bridge, the Shanghai-Nantong Yangtze River Bridge, the China-Russia Tongjiang River Bridge, the Baigou River Extra Large Bridge in Xiong'an New Area, BeiPanjiang River Bridge, Pingtan Strait Bridge, Bangladesh PADMA Bridge, etc.
High-performance building structural steel		Used in projects such as the Wuhan International Expo Center, the Winter Olympics Big Air Shougang, the Dubai World Expo Park Metro, the Xiong'an High-speed Railway Station, etc.
Wind power steel		Used in more than 30 large-scale offshore wind power projects at home and abroad. In 2022, it is used in projects such as the Heilongjiang Haotai Tonghe Wind Power.
Weathering steel		In 2022, high-grade weathering bridge steel is supplied in bulk for the first time for the largest single weathering bridge project in China. Weathering steel for new type power tower is used in the demonstration line of the State Grid.
Color-coated sheet		In 2022, participated in national key projects including the Changxing Shipbuilding Base of China Shipbuilding Corporation, Jiangxi Chaoyang Machinery Base of China Shipbuilding Corporation, Xi'an Xianyang Airport, and Xiamen North Station High-speed Railway Station, and involved in 13 provincial and ministerial key projects, including Xiamen International Convention and Exhibition Center, Shaanxi Jintai Chlor-alkali, Hebei Tangyin Steel City Relocation, Handan Steel Old Area Relocation and Integration, and Shanxi Postal Logistics, etc.

Case: Shougang electrical steel is first applied to ultra-high voltage direct current converter transformers

In July 2022, the Baihetan to Jiangsu ±800 kV ultra-high voltage direct current transmission project was completed and put into operation. The ultra-high voltage direct current transformer, manufactured using Shougang high-performance oriented electrical steel, was officially connected to the grid and put into operation. Shougang electrical steel once again engraved its glory on super projects and national heavy equipment.

The Baihetan to Jiangsu ±800 kV ultra-high voltage direct current transmission project is the world's first hybrid cascade ultra-high voltage direct current project. It is the first time in the world to develop the "conventional DC + flexible DC" hybrid cascade ultra-high voltage direct current transmission technology, integrating the advantages of ultra-high voltage direct current transmission with large capacity, long distance, low loss, flexible DC transmission control, and strong system support capability. This major project is the first application of Shougang high-performance oriented electrical steel in ultra-high voltage direct current transformers, marking another major breakthrough for Shougang Electrical Steel in more than ten years of climbing to new heights with constant craftsmanship, and achieving full coverage of high-voltage transmission in the field of ultra-high voltage electrical steel applications.

The Baihetan to Jiangsu ±800 kV ultra-high voltage direct current transmission project is the strategic artery of China's "West-East Power Transmission" project. It is a major project serving stable growth, a major green project serving the "dual carbon" goals, and a major innovative project serving technological self-reliance. After the completion and operation of the project, it can transmit over 30 billion kilowatt-hours of clean electricity annually, reduce coal consumption for power generation in the East China region by 14 million tonnes per year, and reduce CO_2 emissions by more than 25 million tonnes.




Research and Development Innovation

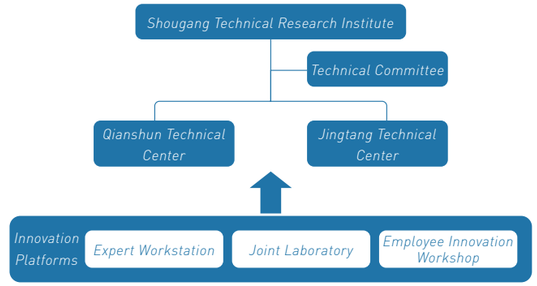
Research and Development System

Relying on the "one institute, multiple centers" system, Shougang Steel takes the improvement of independent innovation capability and driving force of industrial development as the core, and the breakthrough of major process and product quality bottleneck as the starting process, to strengthen the ability of "technology innovation + research and development". The company conducts in-depth technical research projects, establishes expert workstations, and creates practical platforms for external cooperation, pushing technological leadership to become the core competitiveness. We aim to make technological innovation a key variable, driving high-quality growth and taking steps towards becoming a world-class enterprise. Shougang Steel and Jingtang Co. have been identified as high-tech enterprises. Cold-R Co. has been identified both as a national and a Zhongguancun high-tech enterprise, and specialized new small and medium-sized enterprise of Beijing. Zhixin Co. has been identified as a leading technological enterprise in Hebei Province and a champion demonstration enterprise in the field of manufacturing electrical steel products in the sixth batch.

R&D System

Shougang Steel insists on building a "strong support, open sharing, and collaborative efficiency" R&D system, and implements solid and detailed scientific and technological innovation work based on the information system. Based on the "one institute, multiple centers" system, the company has established Qianshun Technical Center and Jingtang Technical Center, and set up a technical committee responsible for major technological innovation strategic decision-making. We have built innovative platforms such as expert workstations, joint laboratories, and employee innovation workshops, effectively integrating the scientific research strength of society and upstream and downstream enterprises, making breakthroughs in "first release of products, original processes, and first deployment of equipment".

Shougang Steel has Enterprise Technical Center of Beijing, Silicon Steel Technology Innovation Center of Hebei province, Silicon Steel Engineering Technology Research Center, Advanced Electromagnetic Materials and Motor Technology Joint Research Center, and other research centers. The company has built the only laboratory in the steel industry with the capability and qualification to test the performance of new energy-driven motors, certified by CNAS. In 2022, Hebei Seawater Desalination Technology Innovation Center was unveiled.



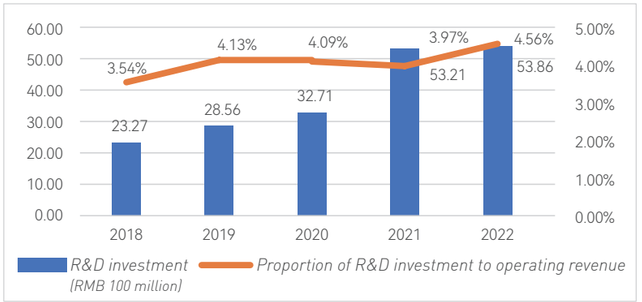
R&D system

R&D investment:
5.386 billion yuan

Proportion of R&D investment to operating revenue:
4.56%

R&D Investment

Shougang Steel has established a stable and growing R&D investment mechanism. The company continuously increases R&D investment through performance assessment, incentive policies, and R&D reserve funds. At the same time, the company strengthens the overall management of R&D investment, improves the supervision and management of R&D funds, and performance evaluation system. In 2022, Shougang Steel invested 5.386 billion yuan in R&D, accounting for 4.56% of operating revenue, ranking among the top in the industry.



R&D investment in the past five years

Building an innovative platform and cultivating innovative talents

Shougang Steel has always attached great importance to and encouraged innovation among all employees. The company fully leverages the leading role of scientific and technological talents to promote innovation, and helps employees to reach achievement transformation, creating a good environment that respects labor, knowledge, talents, and creativity. We have established employee innovation workshops, research management platforms, and other innovative platforms, and organized activities such as technology innovation training camps, employee innovation festivals, multi-level skills competitions, and technical talent open report meetings to continuously promote the deep development of technological innovation, cultivate innovative talents, and improve innovation capabilities.

In 2022, the proportion of R&D personnel in Shougang Steel was **12.59%**, and the proportion of R&D personnel with a master's degree or above was **28.61%**.

In 2022, **7** employee innovation achievements were showcased at the first National Craftsmen Innovation Exchange Conference.

In 2022, **1** special prize, **4** first prizes, **11** second prizes, and **58** third prizes were awarded at the national Machinery, Metallurgy, and Building Materials Industry Workers' Technical Innovation Achievement Exhibition.

In 2022, several participants were awarded the titles of "Shougang Technical Expert" and "Outstanding Contribution Technician" of Hebei Province, and enjoyed the "Special Allowance for Technicians" by the People's Government of Beijing Municipality.

In 2022, **4** employees were awarded the "Post Expert" in the national mechanical metallurgy and building materials industry.

In 2022, **4** employees were awarded Shougang Scientists, including **3** first-level scientists.

In 2022, **3** employees were awarded the "Capital Citizen Learning Star".

Xu Houjun

In 2022, Xu Houjun, the main operator of Zhixin Co. Second Operation Area Rolling Mill, was awarded the honorary title of "Innovation Model" in the "Top 10 Figures of State-Owned Enterprises and Beijing Models" by the State-owned Assets Supervision and Administration Commission of People's Government of Beijing Municipality. He also received the honorary title of "Top 10 Beijing Role Models of 2022" by the Beijing Committee of the Communist Party of China. He has always adhered to independent innovation, and achieved more than 20 first-time trial production results of high-end products, including 3 products that were globally launched, filling the domestic gap.

Employee Innovation Workshop

The Employee Innovation Workshop is an important platform that combines employee technical innovation with management innovation. It is an essential platform for turning creativity into projects, projects into results, and results into benefits. It is also an important platform for resolving technical bottlenecks and stimulating the enthusiasm of employees for innovation. Shougang Steel vigorously promotes the establishment of workshops. Currently, there are 66 employee innovation workshops, including 12 at the municipal level (Beijing), 2 at the industry level, and 29 at the group level. All R&D innovation projects of the company are undertaken by various innovation workshops. By conducting activities such as technical research and discussion, backbone training sessions, evaluation of excellent employee innovation workshops, recognition and rewards for technical innovation achievements, and employee invention competitions, we create a good atmosphere of "Innovation Everywhere, Everyone is a Source of Innovation", injecting innovation power into the company's development.

Employee Innovation Workshop

Technology Innovation Youth Training Camp

Technology Innovation Youth Training Camp

In order to strengthen talent echelon construction and talent reserve development, in 2022, the company held a Technology Innovation Youth Training Camp, where 46 young professional and technical backbone personnel participated in a two-month full-time training and completed seven units of training courses including innovative thinking exploration and professional competence enhancement.

Workers' Innovation Festival

In 2022, the company held the "Innovation Building Dreams, Win-win Future" Workers' Innovation Festival, which included activities such as innovation achievement exhibition, national craftsmanship lecture hall, innovation tour, and workers' invention competition. Through the festival, we strengthen the atmosphere of innovation driven by talents development led by innovation, and promote employees' innovation to a new stage.

Workers' Innovation Festival

Intellectual Property Rights Protection

Shougang Steel was awarded the title of "Beijing Intellectual Property Demonstration Enterprise".

Zhixin Co. was awarded the title of "Hebei Intellectual Property Advantage Enterprise".

In 2022, Shougang Steel and Zhixin Co. were awarded the title of "National Intellectual Property Advantage Enterprise" and entered the forefront of intellectual property strong enterprises.

Shougang Steel attaches great importance to intellectual property rights management. Our goals are to improve the creation quality, protection efficiency, and operation level of intellectual property rights, and to enhance the comprehensive ability and core competitiveness of intellectual property rights. In order to achieve these goals, we have revised and promulgated the *Patent Management System*, and established a leadership group for intellectual property rights management. Additionally, we have established an intellectual property right work system and management system, and built an intellectual property right management network, to promote the in-depth development of intellectual property right work, supported by the active participation of all employees in independent innovation. In 2022, Shougang Steel and Zhixin Co. were awarded the title of "National Intellectual Property Advantage Enterprise" and entered the forefront of intellectual property strong enterprises.

In 2022, Shougang Steel organized the patent layout of key products, completed rapid pre-examination and filing of patents, accelerated the acquisition of patent authorization, and formed a patent protection barrier. In addition, we organized the infringement comparison and analysis of electrical steel related products with target products and formed an analysis report to prevent the infringement of others' patent rights in R&D and production of products.

Innovation Achievements

Shougang Steel has made breakthroughs in high-end product R&D, whole-process manufacturing, process optimization, and user application technology, and has achieved more scientific and technological achievements, created more high-end products, and achieved more precise customer service.

New product R&D

In 2022, 2 products were first launched in the world, 5 products were first launched in China, and 16 high-end materials have been replaced by localization. 2 products were awarded the "Golden Cup Outstanding Product".

New product R&D	
2 products global debut	20SW1200H and ESW1230 were the first electrical steel for new energy vehicles in the world, which surpass the performance of conventional electrical steel and can greatly improve the power density and efficiency of motors.
5 products domestic debut	Five products, represented by HJAC980B2M with high respreading and ultra-high strength and S100VD with high fatigue performance steel for compressor valve plate, were first launched in China.
Localization substitution of 16 high-end materials	16 high-end materials represented by automotive outer plate 490+Z and automotive stabilizer bar steel 34MnB5 have been replaced by localization and supplied in batches.
"Golden Cup" Award	6 products were awarded the "Golden Cup Quality Product". Among them, the "Cold Rolling Oriented Steel Strip (Sheet) 20SQGD070" and "Porcelain Enamel Cold Rolling Low Carbon Steel Sheet and Strip DC06EK (STC1)" were awarded the "Golden Cup Outstanding Product".

Other product R&D

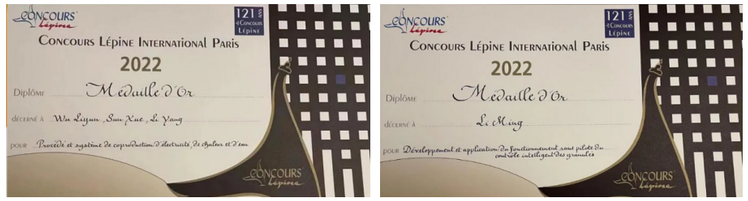
The company has successfully trial-produced chromium-free passivated high-end tinplate, with the corrosion resistance far exceeding similar chromium-containing products. The company achieved a breakthrough in the use of 9Ni steel for ultra-low temperature containers, realizing batch supply.

Key technological breakthroughs

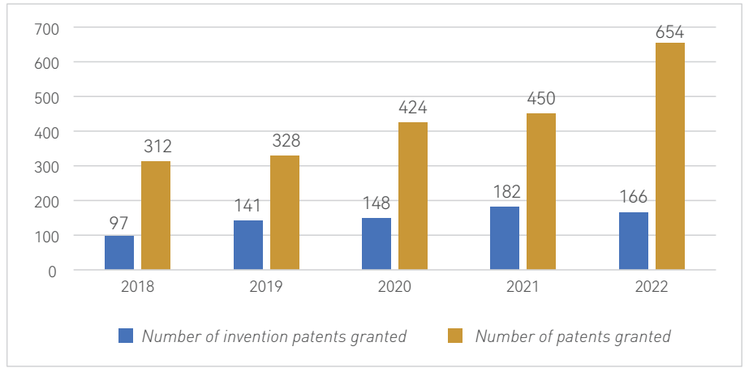
The "large proportion pellet ironmaking technology" of BF with obvious carbon reduction effect in China can be assembled up to 65% in pellet ore. The pioneering technology of "efficient preparation of wide and ultra-thin low-carbon steel strip" has been successfully applied in Jingtang Co. The import substitution project of the distributed control system of the air separation unit was put into operation smoothly, becoming the first successful case of domestic DCS system replacing imported control systems. The achievements of five-in-one efficient cascade recycling system, large proportion pellet ironmaking technology of BF, and the use of lime kiln exhaust CO_2 capture and recovery used for CO_2-O_2 mixed blowing in steelmaking process technology won the third prize of the State-owned Assets Supervision and Administration Commission of the State Council's annual carbon peak and carbon neutrality action typical case in 2022.

Intellectual property

In 2022, the company obtained 654 patents, including 166 invention patents. Two patents "A method and system of electricity, heat and water co-generation" and "R&D and Application of unmanned operation of pellet intelligent control" won gold awards at the 121th International Exhibition of Inventions in Paris. 150 projects participated in the National Exhibition of Inventions.



The 121th International Exhibition of Inventions in Paris



Patents in the past five years

Achievement award

In 2022, Shougang Steel has organized and participated in multiple national key research and development projects, carrying out 78 scientific research tasks. It has won 19 provincial and ministerial-level science and technology awards and 19 provincial and ministerial-level management innovation achievement awards.

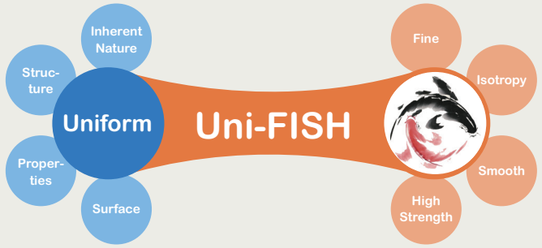
Part of scientific and technological achievements

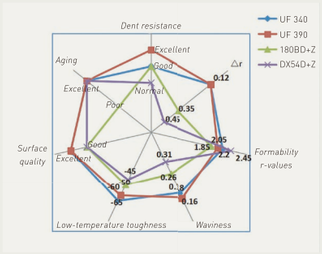
Scientific and technological achievements	Awards
The construction and practice of efficient collaborative steelmaking whole process control system	First prize of Metallurgical Enterprise Management Innovation
Development and application of key technologies for high-aluminum steel and micro-alloyed steel slab continuous casting	First prize of Metallurgical Science and Technology Award by China Iron and Steel Association and The Chinese Society for Metals
Development and application of BF safety, longevity, and self-repair theory and key technologies	First prize of Metallurgical Science and Technology Award by China Iron and Steel Association and The Chinese Society for Metals
Development and integrated application of key technologies for efficient and green connecting between large slab continuous casting and steel rolling	First prize of Metallurgical Science and Technology Award by China Iron and Steel Association and The Chinese Society for Metals
Development and industrialization of high-performance electrical steel for new energy vehicles	First prize of the provincial award for scientific and technological progress in Hebei Province

Case: Shougang's new generation of high-strength automotive body outer panel UF steel series products were first launched in China

Shougang Uni-FISH ultrafine-grained high-strength steel (referred to as UF steel) is the first domestically developed new generation innovative product of the company, and it is also the first domestically developed product for automotive body outer panels since the domestic debut of Shougang DH steel series products.

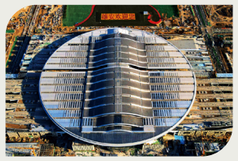
UF steel abandons the traditional solid solution strengthening method of high-strength steel with Mn and P, and adopts fine-grain strengthening and precipitation strengthening as the main strengthening methods. By precise quantitative ratio of micro-alloying elements combined with corresponding heat treatment system, it controls the formation of uniform and fine micro-structure and specific micro-precipitates, which not only improves the strength of the product, but also has the quality and performance advantages of "Four Highs and Two Lows", namely higher dent resistance, higher isotropy, higher surface quality, higher aging resistance, lower-temperature toughness, and lower waviness. The product meets the requirements of the new generation of high-strength automotive body outer panels in terms of forming, stability, painting, dent resistance, and no intermediate coating, which is conducive to achieving thinning and lightweighting of outer panels, bringing more economic, energy-conservation, and low-carbon advantages to users.





Case: Development and application of key manufacturing technology for high-quality heavy plate

In 2022, Jingtang Co. established an integrated control technology and internal quality evaluation system for continuous casting solidification process, high-permeability rolling, and slab ultrasonic detecting, realizing the development of utilizing 400mm thick continuous casting slabs to produce 230mm national standard grade I ultrasonic detecting heavy plate. We developed: a low Nb content design scheme for austenite recrystallization; low temperature controlled rolling and reciprocating water cooling technology; the equipment and production technology for online quenching of high-strength and toughened steel with large thickness; a rapid cooling system combining gap jet, high-density jet, and laminar flow cooling. 23 invention patents, 2 software copyrights, 14 papers, and 2 leading revisions of international standards were authorized.



Xiong'an New Area Train Station

Beijing Winter Olympics Big Air Shougang

The products are applied to more than 40 energy equipment such as the world-wide deepest semi-submerged drilling platform "blue-whale 1#", more than 100 offshore wind farms such as the world's largest coastal wind farm, more than 50 high-rise buildings such as the Xiong'an New Area train station, and more than 30 heavy equipment such as shield tunneling machines in major countries.

Blue-whale I#

Case: Development and application of high-quality ultra-thin DR material efficient manufacturing technology

In 2022, Jingtang Co. overcame the common difficulties of rolling large-width-to-thickness ratio ultra-thin DR materials and developed 415~690MPa grade ultra-thin DR materials, achieving the leading indicators of the thinnest 0.14mm in continuous annealing online secondary cold rolling and the thinnest 0.07mm in offline secondary cold rolling with the maximum width-to-thickness ratio of 11400. Jingtang Co. broke through the technical bottleneck of efficient production of high-cleanliness steel and achieved zero discharging of plating solution, ensuring high-quality and efficient mass production and application of ultra-thin products, meeting the high-tech development needs of international packaging, telecommunications, and new business card industries. The most stringent surface quality requirement of milk powder can DR material products were launched firstly.

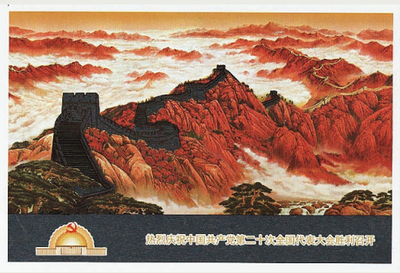
Shougang's high-quality DR material products achieve ultra-thin, green, strength, and full coverage of size specifications, narrowing the gap with the international field. The products are widely used in well-known postcard and metal can production enterprises such as China Post, Suzhou Hycan, and COFCO, achieving the global debut of the Winter Olympics "Cicada Wing Steel" postcard and exclusive supply of 0.07 ~ 0.13mm wide 5G lightweight electrical components.

First in the world: Efficient preparation process of wide and ultra-thin low-carbon steel strip

Technology development: Low interface energy dispersion control technology for inclusions, intermediate package inclusion adsorption and micro-bubble removal technology, control technology of optimal upper backflow flow field in mould, high-quality tinplate surface control technology for ultra-thin DR materials

Innovative integration of production line: "MSA + pure induction soft melting + multi-mode passivation" efficient and environmentally friendly tinplating production line

Unique in China: The only tinplating unit in China with a lead content on the strip surface lower than 30ppm



The 20th CPC National Congress' version of the Cicada Wing Steel postcard "Ode to the Great Wall"

Beijing Winter Olympics mascot sports icon Cicada Wing Steel postcard

Intelligent Manufacturing

100% coverage of basic automation for main production equipment

The digital rate of production equipment exceeds 90%

Intelligent Manufacturing Capability Maturity Assessment is at **level III**

Jingtang Co. was awarded as the **"2022 Intelligent Manufacturing Demonstration Plant"**

Cold-R Co. was awarded **"Beijing Intelligent Manufacturing Bench-mark Enterprise (Intelligent Plant)"**

Shougang Steel actively promotes digital transformation and intelligent manufacturing. The company fully utilizes the strategic opportunities brought by new generation information technologies such as big data, cloud computing, AI, and 5G, and accelerates the automatic, digital, networking, and intelligent transformation of key business processes. We establish a new pattern of digital transformation and intelligent manufacturing with "automatic operation, intelligent equipment, digital control, smart decision-making, and service platformization", and strive to become a benchmark for digital transformation.

The company has built a cross-regional, multi-base and unified production and marketing integration collaborative management platform, and the evaluation level of the integration of information and industrialization has generally reached the "innovation breakthrough stage". We have achieved "one-click steelmaking" "one-click refining" as well as full-process automatic and intelligent inspection of raw material and fuel, leading domestically.

The company continues to promote the construction of smart factories, and the level of work safety and efficiency continues to improve. In 2022, Jingtang Co. proceeded unmanned warehousing and intelligent logistics control projects as planned, completed the unmanned transformation of multiple locations, and put into operation the first independent sniffing robot in the coking industry. 11 sub-projects including 55 use cases of the first phase of Lighthouse Factory of Cold-R Co. were all put into operation. Zhixin Co.'s steel production line for new energy vehicles has achieved overall arrangement for information systems.

Shougang Steel strives to become an "Exporter" and "Leader" of best practice in digital transformation. The company makes full use of advanced technologies such as intelligent remote control, AI, machine vision, AR remote collaboration, and digital twins, to actively promote the implementation of various intelligent manufacturing projects, including digital operation management, intelligent manufacturing, intelligent IoT customer service, and intelligent centralized control for green and safety. The company has gathered 150,000 items of 200T data from various business areas and on-site production processes, and has built a distributed hybrid data warehouse. Moreover, we have pioneered an agile data autonomous analysis model, with the construction of business decision models as the core for big data mining applications, and have carried out the construction of quality, sales, and other professional business decision models and data governance. The construction of 23 business decision models was completed, comprehensively improving the intelligence and automation of process handling and decision-making. In addition, we cultivate digital transformation and data culture of all employees, in order to discover and utilize the value of data assets more effectively.

Intelligent manufacturing awards

Shougang Steel's digital solution was recognized as the excellent case by the Ministry of Industry and Information Technology and China Iron and Steel Association.

The digital application practice won the "Silver Award of China Data Productivity Competition"

The inventory control platform won the "Best Industry Application Award" in the "2022 FanRuan BI Data Analysis Competition".

The "construction and implementation of the big data analysis system for equipment management in iron and steel enterprises" won the second prize of the 36th Beijing Enterprise Management Modernization Innovation Achievement.

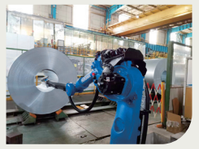
The "construction and operation of the intelligent material measurement management platform" won the second prize of the State-owned Enterprise Management Innovation.

Case: Cold-R Co. creates an intelligent manufacturing benchmark enterprise

Cold-R Co. has comprehensively launched intelligent transformation and upgrading. The company fully implemented intelligent quality management, automatic production process control, digital equipment maintenance, intelligent warehousing and logistics, and intelligent energy and environmental protection, and reduced the number of dangerous positions and achieved unmanned. Thereby, the automation and intelligence level of the production line has improved significantly, the efficiency of warehousing and logistics has optimized continuously, the product quality and customer service have improved constantly, and the company's refined management level has improved steadily. The company has been awarded "Beijing Intelligent Manufacturing Benchmark Enterprise (Intelligent Plant)" by the Beijing Municipal Bureau of Economy and Information Technology.

RGV coil transport trolley

Overhead crane centralized control room



Label sticking robot

Initial performance

- In 2022, the total inventory decreased by 4.7% year-on-year.
- The contract automatic processing rate increased by 10%, and customer satisfaction greatly improved.

Case: Intelligent manufacturing demonstration plant of multi-mode continuous casting and rolling

In 2022, based on new technologies such as 5G, AI, and big data, Jingtang Co. constructed a low-carbon and efficient intelligent manufacturing demonstration plant, with multi-mode continuous casting and rolling (MCCR), high-strength steel pickling, and hot-dip galvanizing, achieving world first-class level. It was selected on the list of Intelligent Manufacturing Demonstration Plant. At the same time, Jingtang Co. formulated and released standards, evaluation criteria, and technical specifications for intelligent factory construction. This award is a recognition of Jingtang Co.'s achievements in the field of digitalization at the national level, and fully demonstrates Jingtang Company's strong strength in the field of intelligent manufacturing in the steel industry.

Implementation performance

- Production efficiency increased by 10.6%; product defect rate decreased by 1.9%; quality objections decreased by 1%; energy efficiency increased by 10%;
- Equipment comprehensive efficiency increased by 10.9%; logistics turnover rate increased by 15%; CO_2 emissions reduced by 9.7%.

Implemented technologies

- Machine vision technology;
- Quality defect identification-control loop technology;
- Equipment vibration feature recognition technology;
- "Fuel gas -wasteheat-electricity-wastewater-salt" five-in-one efficient recycling technology;
- Intelligent dispatching technology for vehicles;
- Multi-link, multi-scenario combination energy comprehensive balance and optimization scheduling technology.

Industry Collaboration

Shougang Steel actively participates in industry exchanges and sharing, and promotes the high-quality development of the steel industry through the formulation of industry standards and cooperation between industry, academia, research, and application. As of the end of the reporting period, we have joined social organizations such as the China Iron and Steel Association, the Solid Waste Disposal and Utilization of New Materials Special Committee of China Society of Building Materials Industry Economy, and the Society for Metals of Beijing, continuously expanding the depth and breadth of industry participation and collaboration.

Case: High-end magnetic new material development forum was held

On April 7, 2022, the "2022 (1st) High-end Magnetic New Material Development Forum", hosted by the Zhongguancun Stainless and Special Alloy New Material Industry Technology Innovation Alliance, organized by Shougang Steel and China Metallurgical Industry Planning and Research Institute, and supported by The Chinese Society for Metals, was successfully held at Beijing Shougang Park. More than 100 representatives from relevant government departments, industry associations, research institutes, industrial chain application enterprises, and financial institutions attended the forum.

The participating experts gave theme reports on "New Materials for Low-carbon Society - High-end Electrical Steel", focusing on the dual carbon policy and magnetic materials. They also conducted in-depth sharings and discussions from multiple aspects such as macro policies, technological innovation, user needs, and material progress, in order to promote the popularization of high-end magnetic materials research and application and contribute to the construction and development of a low-carbon society in China.

Industry Standards

Shougang Steel establishes the standardization industry benchmark. The company establishes a complete enterprise standard system by focusing on leading standards, and promotes standardization development by undertaking national standards tasks. We also actively participate in the formulation of domestic and international industry technical standards, hold leadership positions in domestic technical standard organizations, and actively integrate with international standards, to vigorously enhance the company's voice in technical standards and promote the internationalization of technical standards. In addition, Shougang Steel actively leads and participates in the formulation of green product design standards and green production evaluation standards for the steel industry, integrating advanced technical indicators and green manufacturing concepts into industry standards, and guiding to achieve high-quality development.


企业标准“领跑者”证书
ENTERPRISE STANDARD FORERUNNER

In 2022, the company participated in the formulation of 46 standards at all levels, among which, 22 standards were the lead formulation. The company led the drafting of 1 industry standard and 2 association standards for hydrogen transportation steel plates and hydrogen transportation pipelines, and chaired the formulation of standards such as *Evaluation Index and Calculation Method for Thickness Accuracy of Sheet and Strip*. The *Analysis Method for Silicon Calcium Alloy Part 2* standard was rated as internationally *advanced*.

Zhixin Co.'s standard *Q/SGZGS 0342-2020 Cold-rolled Grain-oriented Electrical Steel Strip (Sheet)* won the title of "Forerunner" of national Enterprise Standards, and has been awarded for two consecutive years.

Industry-University-Research-Application Cooperation

Shougang Steel promotes the integration of industry, academia, research, and application, and strengthens deep cooperation with universities, research institutions, and upstream and downstream enterprises, to continuously enhance research on cutting-edge technology applications and to fully leverage the collaborative innovation role of joint research and development platforms.

Expert workstations

The company has established 12 expert workstations and hired authoritative experts in the industry such as Zhang Lifeng, Kang Yonglin, and Wang Quanli. We have formed a good mechanism for high-level experts to participate in the company's technological innovation directly, solving technical problems and research topics that require expert assistance, while cultivating high-level scientific and technological talents. In 2022, the company established the Zhang Fuming Expert Workstation and the Wu Shengli Expert Workstation.

Expert workstations

Joint laboratories

Shougang Steel strengthens cooperation with more than 10 universities and research institutes such as University of Science and Technology Beijing, Northeastern University, and Tsinghua University, and establishes joint laboratories and research platforms for relevant research content. The company has established a tinplate laboratory and carried out a series of product research projects with well-known domestic universities and research institutes. The company jointly builds the Hebei Province Steel Laboratory, a high-level innovation platform, with the People's Government of Hebei Province, Tangshan Municipal Government, North China University of Science and Technology, and HBIS. The company and Beijing Institute of Technology have jointly established the Advanced Electromagnetic Materials and Motor Technology Joint Research Center. In 2022, we held the first high-end composite talent training class with University of Science and Technology Beijing, and established a cooperative base for industry-university-research and an internship practice base with Anhui University of Technology.

The first high-end composite technology talent training class

Hisense "Technological Innovation Award"

Changfa Group Hengchuang Thermal Management "Breakthrough Innovation Supplier Award"

Win-win cooperation

Shougang Steel deepens the close cooperation relationship with customers continuously. Based on the principles of "mutual complementarity, resource sharing, mutual benefit, and win-win development", the company establishes joint laboratories with leading enterprises in the industry, and conducts special research on adhesion, sulfur resistance, rust resistance, and stamping forming. By leveraging their respective technological and resource advantages, we realize resource sharing and promote mutual benefit and common development.

Case: Industry-university-research cooperation

In the development and application of cold-rolling ultra-high-strength steel, the "1000MPa -level Advanced High-strength Steel for Automobile Key and Application Demonstration" project in Hebei Province of Jingtang Co. has formed a comprehensive industry-university-research cooperation, leading the development of high-strength steel strategically.

- In cooperation with Yanshan University and China Iron&Steel Research Institute Group, targeted solutions have been provided for the use and service of ultra-high-strength steel.
- The "Blue Elf" project was designed to address the implementation issues of ultra-high-strength hot-dip galvanized steel production lines.
- Independent R&D of "Enhanced Formability Dual-phase Steel (CH Steel) Development" and "TBF/ High-expansion Hole /Martensitic Ultra-high-strength Steel Development and Application Technology Research", specifically address issues such as composition design, production, and application technology of 1000MPa-level ultra-high-strength steel products.

Throughout the industry-university-research cooperation mechanism, Jingtang Co. has formed an open, multi-level, and efficient technological innovation system according to the five-layer project promotion, achieving significant results. The expansion-hole rate of hot-dip galvanized FB steel has been increased from 60% to over 90%. The balanced dual-phase steel with high expansion hole and elongation has been developed.

Case: Strategic cooperation with Hisense

Shougang Steel and Hisense have expanded their cooperation from single-product to all-round collaboration in products, technology, and R&D. Shougang Steel and Hisense have jointly conducted research on the application of new materials such as zinc-aluminum-magnesium coating products and high-strength steel sheet thickness reduction in the household appliance industry, and have achieved bulk supply of zinc-aluminum-magnesium products in commercial air conditioners, establishing a higher-level and deeper-level sustainable strategic partnership. In 2022, Shougang Steel won the "Technological Innovation Award" by Hisense, which has been awarded for two consecutive years.

Public Welfare Activities

Shougang Steel, based on its own development, actively gives back to society, promotes the volunteer spirit of "dedication, friendship, mutual assistance, and progress", fulfills its social assistance responsibilities, and actively carries out social public welfare undertakings.

Volunteer activities. The company has built a three-level volunteer service system including a youth volunteer service team, volunteer service units, and volunteers, creating a "volunteer circle". We serve national events and fulfill social responsibilities, demonstrating the spirit of Shougang in various "urgent, difficult, dangerous, and important" tasks. In 2022, the company has released more than 130 volunteer service projects, recruited more than 3,500 volunteers, and accumulated more than 100,000 volunteer service hours.

Winter Olympics volunteers

Serving national events: The company's volunteers actively participated in and contributed to 14 major national events such as the Beijing Winter Olympics, Beijing Winter Paralympics, China International Fair for Trade in Services in Beijing, Beijing International Horticultural Expo, and the FIS Snowboard World Cup. In addition, we regularly hold volunteer symposiums, commend outstanding volunteers, tell volunteer stories, and establish youth role models. In 2022, 11 young volunteers for the Winter Olympics and 3 members of the Winter Olympics Service Support Youth Strike Team received the Shougang Group's "Special Award for Service Support for the Winter Olympics", and 2 young volunteers were honored as "Outstanding Volunteers" at the China International Fair for Trade in Services.

Fulfilling social responsibilities: The company has carried out the "Learning from Lei Feng" Volunteer Service Month activity for 10 consecutive years. We go into communities to provide services such as household appliance repairs, voluntary haircuts, and free clinics. We also visit special education schools to care for and support children's growth, and donate sports equipment such as footballs and basketballs to schools. Additionally, we carry out "donating with love" fundraising activities and organize other public welfare activities, including donations, voluntary tree planting, and blood donation.

"Learning from Lei Feng" Volunteer Service Activity - Volunteers went into the community

Issued certificates to the "Top 10 Most Beautiful Youth Volunteers"

Voluntary tree planting activities

Visited schools and donated sports equipment on Children's Day

"Warm Winter Clothes" Clothing Donation

Book donation with love

Purchased poverty alleviation materials and distributed them to employees

Organized the "donating with love" fundraising activity, with a total donation of 867,500 yuan.

Purchased 3.3887 million yuan of poverty alleviation agricultural materials in the paired assistance areas.

Rural revitalization. The company sends two employees to serve as the first secretaries of economically weak villages in Beijing. Under the leadership of the local party committee and government, they fulfill their duties and contribute to the implementation of the rural revitalization strategy. At the same time, through poverty alleviation by consuming, we expand the achievements of poverty alleviation and support rural revitalization. In 2022, we purchased poverty alleviation agricultural materials in the paired assistance areas, totaling 3.3887 million yuan.

Urban Integration

Heating benefiting nearly 10,000 households

Saving 31,500 tonnes of standard coal per year

Reducing CO_2 emissions by 78,600 tonnes

Reducing SO_2 emissions by 477 tonnes

Shougang Steel continuously promotes the efficient recycling of resources from the perspective of the product manufacturing life cycle, and has formed a new development model of internal circulation of the company, regional industry collaboration, and integration into the city.

Qiangang Co. fully utilizes the advantage of abundant industrial waste heat resources to provide heating for surrounding residential areas, schools, hospitals, and other areas, meeting the needs of the people's livelihood and contributing to the clean heating industry in the northern region. Waste heat heating is mainly concentrated in Binhe Village, Yangdianzi Town, with a heating area of over 1.1 million square meters, benefiting nearly 10,000 households, effectively reducing pollutant emissions, saving 31,500 tonnes of standard coal per year, reducing CO_2 emissions by 78,600 tonnes, and reducing SO_2 emissions by 477 tonnes.

As the first large enterprise to settle in Caofeidian, Hebei, Jingtang Co. has driven the transfer of Beijing's productive service industry to Caofeidian, forming an industrial chain with the upstream and downstream of the steel industry, greatly promoting the construction of Caofeidian port cluster including iron ore port, crude oil port, coal port, etc., and becoming a pioneer in the coordinated development of Beijing-Tianjin-Hebei region. Through relocation and adjustment, Jingtang Co.'s demonstration and leading role in the process of relieving non-capital functions of Beijing and the coordinated development of Beijing-Tianjin-Hebei region has gradually emerged: Jingtang Co. has absorbed graduates from universities in Hebei and other places for employment and driven the employment of nearly 20,000 people in related upstream and downstream service industries; Jingtang Co. has jointly built a 300,000-tonne ore terminal in Caofeidian with Qinhuangdao Port Authority, Jingtang Port, Hebei Construction&Investment Group, and Tangsteel; Jingtang Co. has jointly built a coal tar deep processing project with Kailuan Group, and the granulated blast furnace slag project with Tangshan Jidong Cement... A steel industry chain that promotes the coordinated development of the local economy has been formed, promoting the economic and social development of the local area.

Appendix

Key Performance Indicators Form

Economic Indicators	Units	2020	2021	2022
Operating revenue	RMB 10,000	7,995,118.19	13,403,448.61	11,814,218.35
Net profit	RMB 10,000	241,114.28	832,653.11	150,941.54
Profit before tax	RMB 10,000	277,795.24	979,949.93	179,311.39
Total tax	RMB 10,000	235,724.44	555,920.64	305,365.11
Total cash bonus(including tax)	RMB 10,000	/	66,854.24	62,558.95
Cash dividend per 10 shares	RMB	/	1	0.8

Governance Indicators		Units	2020	2021	2022
The average term of office for the directors		Year	3.89	4.33	3.67
Resignation rate of directors, supervisors and senior executives		%	0	0	0
Proportion of independent directors		%	56	56	56
Age standard deviation of directors, supervisors and senior executives		Age	6.24	6.75	7.80
Number of board meetings		Time	8	12	11
Attendance rate of directors		%	100	100	100
Number of directors attending less than 75% of board meetings		Person	0	0	0
Number of meetings of Audit Committee		Time	2	2	2
Number of meetings of Remuneration and Assessment Committee		Time	1	2	1
Total share-proportion of the Top 10 shareholders		%	88.67	85.09	86.78
Share-proportion of senior executives		%	0.000	0.032	0.029
Stock pledge ratio		%	0	0	0
Number of investor communications	Frequency of performance releases	Time	1	3	3
	Investment banking strategy meeting	NOS	0	3	1
	Teleconference	Time	3	7	8
	Investor visits	Person	0	1	4
	Roadshow communication	Time	0	32	66
	Answering investors' questions	NOS	35	68	601
	Investor relations questionnaire survey	NOS	4	10	4
Number of compliance training participants		Person	2,251	4,389	8,768
Compliance training coverage		%	12	25	47
Total time of compliance training		Hour	5,004	9,556	19,156

Environmental Indicators	Units	2020	2021	2022
Environmental investment				
Total investment in environmental protection	RMB 100 million	13.84	5.48	11.22
Environmental pollution incidents	Item	0	0	0
Environmental fines during the reporting period	RMB 10,000	0	0	0
Environment training coverage	%	100	100	100
Environmental protection performance evaluation (The highest grade: A)		A	A	A
Energy consumption				
Natural gas	m^3	160,092,622	241,795,747	214,783,928
Stream	m^3	6,565,797	6,706,799	7,598,898
Coal	Tonne	11,898,889	12,364,202	12,554,736
Energy consumption	Tonne standard coal	12,930,444	13,676,223	13,842,868
Electricity consumption	100 million	140.36	149.18	151.31
Self-provided clean energy generation capacity (photovoltaic power generation)	MW	8.3	13.69	13.69
Annual generation of Self-provided clean energy (photovoltaic power generation)	MWh	10,280	12,160	15,500
Water resources usage				
Annual fresh water consumption	10,000 tonnes	6,044.06	6,318.92	6,696.83
Fresh water intensity (crude steel production based)	m^3/t-crude steel	2.74	2.67	2.83
Amount of water recycled	10,000 tonnes	362,742	393,641	433,087
Water recycled rate	%	98.63	98.67	98.73
Waste gas emissions				
Particulate matter (PM) emissions	Tonne	8,019	5,715	4,908
Sulfur dioxides (SO_2) emissions	Tonne	1,736	2,121	2,212
Nitrogen oxides (NOx) emissions	Tonne	5,533	5,208	5,226
Particulate matter emissions per tonne of steel	Kg/t-crude steel	0.405	0.241	0.211
Sulfur dioxides emissions per tonne of steel	Kg/t-crude steel	0.088	0.089	0.095
Nitrogen oxides emissions per tonne of steel	Kg/t-crude steel	0.280	0.220	0.225
Wastewater				
Chemical oxygen demand in wastewater discharge	Tonne	17.89	16.76	17.87
Ammonia nitrogen(NH3-N) in wastewater discharge	Tonne	0.354	0.336	0.216
Chemical oxygen demand in wastewater discharge per tonne of steel	Kg/t-crude steel	0.001	0.001	0.001
Ammonia nitrogen(NH3-N) in wastewater discharge per tonne of steel	Kg/t-crude steel	0.000	0.000	0.000
Waste materials				
Scrap steel recycling rate	%	100	100	100
Total amount of waste generated	10,000 tonnes	1,121.19	1,247.74	1,238.42
General waste generation	10,000 tonnes	1,086.96	1,202.70	1,192.14
General waste recycled	10,000 tonnes	1,086.96	1,202.70	1,192.14
Hazardous waste generation	10,000 tonnes	34.23	45.04	46.28
Hazardous waste recycled	10,000 tonnes	33.26	43.85	45.32
Clean production				
Comprehensive utilization rate of solid waste	%	99	99	99
Comprehensive utilization rate of steel slag	%	100	100	100
Comprehensive utilization rate of dust	%	100	100	100
GHG emissions				
Direct emissions (Scope 1)	tCO_2e	35,855,259	38,615,904	38,542,164
Indirect emissions (Scope 2)	tCO_2e	3,207,411	4,179,058	3,936,676
Direct/indirect GHG emissions (Scope 1 & 2)	tCO_2e	39,062,670	42,794,962	42,478,839
GHG intensity (Scope 1 & 2)	tCO_2e/t-crude steel	1.97	1.80	1.83

Social Indicators	Units	2020	2021	2022
Signing rate of labor contracts	%	100	100	100
Social insurance coverage	%	100	100	100
Per capita remuneration	RMB 10,000	20.16	26.15	25.84
Per capita income generation	RMB 10,000	440.10	751.10	634.90
Total number of employees	Person	18,166	17,846	18,608
Number of male employees	Person	16,316	16,024	16,675
Number of female employees	Person	1,850	1,822	1,933
Number of employees 50 years or older	Person	2,525	2,581	3,069
Number of employees aged 40-50	Person	3,437	3,426	3,944
Number of employees aged 30-40	Person	9,645	9,741	9,759
Number of employees aged 30 or younger	Person	2,559	2,098	1,836
Proportion of female employees in management	%	16.05	16.27	16.52
Number of ethnic minority employees	Person	851	848	856
Employee turnover rate	%	2.20	2.24	2.54
Total time of volunteer activities	Hour	9,811	15,430	124,125
Donation amount for rural revitalization	RMB 10,000	108.94	105.68	179.94
Training coverage	%	100	100	100
Percentage of employees who regularly receive performance and career development examines	%	100	100	100
Proportion of employees receiving integrity related training	%	100	100	100
Total training hours	Hour	1,331,090	1,260,719	1,316,073
Per capita training hours	Hour	73	71	71
Training hours for male employees	Hour	11,314,267	882,503	1,118,662
Training hours for female employees	Hour	199,663	252,144	197,411

Social Indicators	Units	2020	2021	2022
Training hours for front-line employees	Hour	971,763	672,503	921,251
Training hours for middle management	Hour	266,218	192,144	263,215
Training hours for senior executives	Hour	93,109	126,072	131,607
Physical examination coverage	%	100	100	100
Number of safety training	Person-times	165,136	173,189	193,985
Safety training hours	Hour	699,808	648,412	801,222
Total investment in work safety	RMB 100 million	1.66	1.54	1.37
Working days lost	Day	210	210	0
Occupational disease frequency	%	0	0	0
Number of people with occupational disease	Person	0	0	0
Number of work-related deaths per 100 million revenue	Person	0	0	0
Million working hour injury rate	%	0.099	0.102	0
Number of employees injured in work-related accidents	Person	2	2	0
Number of work safety accidents	NOS	2	2	0
Percentage of products sold or shipped that need to be recalled for safety and health reasons	%	0	0	0
Customer complaint resolution rate	%	100	100	100
Number of product quality promotion training	Person-times	1,032	920	1,194
Customer satisfaction	Scores	97.55	98.45	98.62
Total number of suppliers	NOS	3,377	3,445	3,558
Proportion of suppliers in mainland China (supplier localization ratio)	%	100	100	100
Total number of procurement orders on bidding procurement platform	Item	122,270	146,560	117,191
Procurement amount on bidding procurement platform	RMB 100 million	179.73	307.35	312.06
Proportion of procurement orders on bidding procurement platform	%	98.69	98.99	99.14
Amount of equipment and materials purchased from the local	RMB 100 million	1.16	1.13	1.24
The proportion of equipment and materials purchased from the local	%	9.55	6.96	7.57
Amount of equipment and materials purchased from SMEs	RMB 100 million	13.29	15.51	14.08
The proportion of equipment and materials purchased from SMEs	%	76.42	68.90	67.57
Number of patents granted	PCS	424	450	654
Number of innovation patents granted	PCS	148	182	166
Number of R&D staff	Person	2,454	2,295	2,342
Proportion of R&D staff	%	13.51	12.86	12.59
R&D investments	RMB 10,000	327,119.28	532,148.67	538,607.09
Proportion of R&D investment to operating revenue	%	4.09	3.97	4.56

Content Index

GRI Standards Index

Index	Title of disclosure	Shougang Steel response	
General Disclosures			
GRI 1: Foundation 2021			
GRI 2: General Disclosures 2021			
The organization and its reporting practices			
2-1	Organizational details	About Us	P6
2-2	Entities included in the organization's sustainability reporting	About This Report	P1
2-3	Reporting period, frequency and contact point	About This Report	P1
2-4	Restatements of information	——	
2-5	External assurance	——	
Activities and workers			
2-6	Activities, value chain and other business relationships	About Us, Supply Chain Management, Industry Collaboration	P6, P81, P98
2-7	Employees	Society: Achieving a Better Life—Employee Protection	P60
2-8	Workers who are not employees	——	
Governance			
2-9	Governance structure and composition	Governance: Strengthening the Foundation of Governance—Corporate Governance	P21
2-10	Nomination and selection of the highest governance body	Governance: Strengthening the Foundation of Governance—Corporate Governance	P21
2-11	Chair of the highest governance body	Governance: Strengthening the Foundation of Governance—Corporate Governance	P21
2-12	Role of the highest governance body in overseeing the management of impacts	Governance: Strengthening the Foundation of Governance—Corporate Governance, ESG Management	P21, P23
2-13	Delegation of responsibility for managing impacts	——	
2-14	Role of the highest governance body in sustainability reporting	——	
2-15	Conflicts of interest	Governance: Strengthening the Foundation of Governance—Business Ethics, Annual Report	P25
2-16	Communication of critical concerns	Governance: Strengthening the Foundation of Governance—ESG Management	P23
2-17	Collective knowledge of the highest governance body	——	
2-18	Evaluation of the performance of the highest governance body	——	
2-19	Remuneration policies	Society: Achieving a Better Life—Employee Protection	P61
2-20	Process to determine remuneration	Society: Achieving a Better Life—Employee Protection	P61
2-21	Annual total compensation ratio	——	
Strategy, policies and practices			
2-22	Statement on sustainable development strategy	Message From Chairman	P4
2-23	Policy commitments	Business Ethics, Employee Protection	P25, P61
2-24	Embedding policy commitments	Governance: Strengthening the Foundation of Governance—Business Ethics	P25
2-25	Processes to remediate negative impacts	Business Ethics, Employee Protection	P28, P62
2-26	Mechanisms for seeking advice and raising concerns	Governance: Strengthening the Foundation of Governance—Business Ethics	P25
2-27	Compliance with laws and regulations	Key Performance Indicators Form	P103
2-28	Membership associations	Value: Demonstrating Mission and Responsibility—Industry Collaboration	P98

Index	Title of disclosure	Shougang Steel response	
Stakeholder engagement			
2-29	Approach to stakeholder engagement	Governance: Strengthening the Foundation of Governance—ESG Management	P23
2-30	Collective bargaining agreements	Society: Achieving a Better Life—Employee Protection	P60
GRI 3: Material Topics 2021			
3-1	Process to determine material topics	Governance: Strengthening the Foundation of Governance—ESG Management	P24
3-2	List of material topics	Governance: Strengthening the Foundation of Governance—ESG Management	P24
3-3	Management of material topics	Governance: Strengthening the Foundation of Governance—ESG Management	P24
GRI 201: Economic Performance 2016			
201-1	Direct economic value generated and distributed	Key Performance Indicators Form, Annual Report	P103
201-2	Financial implications and other risks and opportunities due to climate change	Environmental protection: Practicing and Leading By Example—Low-carbon Development	P45
201-3	Defined benefit plan obligations and other retirement plans	Society: Achieving a Better Life—Employee Protection	P61
201-4	Financial assistance received from government	Annual Report	
GRI 202: Market Presence 2016			
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	——	
202-2	Proportion of senior management hired from the local community	——	
GRI 203: Indirect Economic Impacts 2016			
203-1	Infrastructure investments and services supported	Value: Demonstrating Mission and Responsibility—National Strategic Projects Participation, Public Welfare Activities	P86, P101
203-2	Significant indirect economic impacts	Value: Demonstrating Mission and Responsibility—Public Welfare Activities	P102
GRI 204: Procurement Practices 2016			
204-1	Proportion of spending on local suppliers	Key Performance Indicators Form	
GRI 205: Anti-corruption 2016			
205-1	Operations assessed for risks related to corruption	——	
205-2	Communication and training about anti-corruption policies and procedures	Governance: Strengthening the Foundation of Governance—Integrity Construction	P25
205-3	Confirmed incidents of corruption and actions taken	Governance: Strengthening the Foundation of Governance—Integrity Construction	P28
GRI 206: Anti-competitive Behavior 2016			
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	Governance: Strengthening the Foundation of Governance—Business Ethics	P25
GRI 207: Tax 2019			
207-1	Approach to tax	Governance: Strengthening the Foundation of Governance—Risk Management	P30
207-2	Tax governance, control, and risk management	Governance: Strengthening the Foundation of Governance—Risk Management	P30
207-3	Stakeholder engagement and management of concerns related to tax	Governance: Strengthening the Foundation of Governance—Risk Management	P30
207-4	Country-by-country reporting	——	
GRI 301: Materials 2016			
301-1	Materials used by weight or volume	——	
301-2	Recycled input materials used	Environmental protection: Practicing and Leading By Example—Circular Economy	P39
301-3	Reclaimed products and their packaging materials	Environmental protection: Practicing and Leading By Example—Circular Economy	P40
GRI 302: Energy 2016			
302-1	Energy consumption within the organization	Key Performance Indicators Form	P104
302-2	Energy consumption outside of the organization	Key Performance Indicators Form	P104
302-3	Energy intensity	Key Performance Indicators Form	P104
302-4	Reduction of energy consumption	Environmental protection: Practicing and Leading By Example—Circular Economy	P39
302-5	Reductions in energy requirements of products and services	Environmental protection: Practicing and Leading By Example—Circular Economy	P39
GRI 303: Water and Effluents 2018			
303-1	Interactions with water as a shared resource	Environmental protection: Practicing and Leading By Example—Circular Economy	P42
303-2	Management of water discharge-related impacts	Environmental protection: Practicing and Leading By Example—Circular Economy	P42
303-3	Water withdrawal	Environmental protection: Practicing and Leading By Example—Circular Economy	P42
303-4	Water discharge	Environmental protection: Practicing and Leading By Example—Circular Economy	P42
303-5	Water consumption	Environmental protection: Practicing and Leading By Example—Circular Economy	P42
GRI 304: Biodiversity 2016			
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Environmental protection: Practicing and Leading By Example—Biodiversity	P52
304-2	Significant impacts of activities, products, and services on biodiversity	Environmental protection: Practicing and Leading By Example—Biodiversity	P52
304-3	Habitats protected or restored	Environmental protection: Practicing and Leading By Example—Biodiversity	P52
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	——	
GRI 305: Emissions 2016			
305-1	Direct (Scope 1) GHG emissions	Environmental protection: Practicing and Leading By Example—Low-carbon Development	P44
305-2	Energy indirect (Scope 2) GHG emissions	Environmental protection: Practicing and Leading By Example—Low-carbon Development	P44
305-3	Other indirect (Scope 3) GHG emissions	——	
305-4	GHG emissions intensity	Key Performance Indicators Form	P105
305-5	Reduction of GHG emissions	Environmental protection: Practicing and Leading By Example—Low-carbon Development	P44
305-6	Emissions of ozone-depleting substances (ODS)	——	
305-7	Nitrogen oxides (NOx), sulfur oxides (SOX), and other significant air emissions	Environmental protection: Practicing and Leading By Example—Environmental Management	P36
GRI 306: Waste 2020			
306-1	Waste generation and significant waste-related impacts	Environmental protection: Practicing and Leading By Example—Circular Economy	P40
306-2	Management of significant waste-related impacts	Environmental protection: Practicing and Leading By Example—Circular Economy	P40
306-3	Waste generated	Environmental protection: Practicing and Leading By Example—Circular Economy	P40
306-4	Waste diverted from disposal	Environmental protection: Practicing and Leading By Example—Circular Economy	P40
306-5	Waste directed to disposal	Environmental protection: Practicing and Leading By Example—Circular Economy	P40
GRI 308: Supplier Environmental Assessment 2016			
308-1	New suppliers that were screened using environmental criteria	Society: Achieving a Better Life—Supply Chain Management	P81
308-2	Negative environmental impacts in the supply chain and actions taken	Society: Achieving a Better Life—Supply Chain Management	P81
GRI 401: Employment 2016			
401-1	New employee hires and employee turnover	Key Performance Indicators Form	P105
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	Society: Achieving a Better Life—Employee Protection	P61
401-3	Parental leave	Society: Achieving a Better Life—Employee Protection	P61
GRI 403: Occupational Health and Safety 2018			
403-1	Occupational health and safety management system	Society: Achieving a Better Life—Health and Safety	P69

Index	Title of disclosure	Shougang Steel response	
403-2	Hazard identification, risk assessment, and incident investigation	Society: Achieving a Better Life—Health and Safety	P73
403-3	Occupational health services	Society: Achieving a Better Life—Health and Safety	P73
403-4	Worker participation, consultation, and communication on occupational health and safety	Society: Achieving a Better Life—Health and Safety	P73
403-5	Worker training on occupational health and safety	Society: Achieving a Better Life—Health and Safety	P73
403-6	Promotion of worker health	Society: Achieving a Better Life—Health and Safety	P73
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Society: Achieving a Better Life—Health and Safety	P73
403-8	Workers covered by an occupational health and safety management system	Society: Achieving a Better Life—Health and Safety	P73
403-9	Work-related injuries	Key Performance Indicators Form	P106
403-10	Work-related ill health	Society: Achieving a Better Life—Health and Safety	P73
GRI 404: Training and Education 2016			
404-1	Average hours of training per year per employee	Society: Achieving a Better Life—Talent Development	P68
404-2	Programs for upgrading employee skills and transition assistance programs	Society: Achieving a Better Life—Talent Development	P67
404-3	Percentage of employees receiving regular performance and career development reviews	Society: Achieving a Better Life—Talent Development	P68
GRI 405: Diversity and Equal Opportunity 2016			
405-1	Diversity of governance bodies and employees	Society: Achieving a Better Life—Employee Protection	P60
405-2	Ratio of basic salary and remuneration of women to men	——	
GRI 406: Non-discrimination 2016			
406-1	Incidents of discrimination and corrective actions taken	Society: Achieving a Better Life—Employee Protection	P60
GRI 407: Freedom of Association and Collective Bargaining 2016			
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	Society: Achieving a Better Life—Employee Protection	P60
GRI 408: Child Labor 2016			
408-1	Operations and suppliers at significant risk for incidents of child labor	Society: Achieving a Better Life—Employee Protection	P60
GRI 409: Forced or Compulsory Labor 2016			
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	Society: Achieving a Better Life—Employee Protection	P60
GRI 410: Security Practices 2016			
410-1	Security personnel trained in human rights policies or procedures	——	
GRI 411: Rights of Indigenous Peoples 2016			
411-1	Incidents of violations involving rights of indigenous peoples	No incidents of violations involving rights of indigenous peoples happened	
GRI 413: Local Communities 2016			
413-1	Operations with local community engagement, impact assessments, and development programs	Value: Demonstrating Mission and Responsibility—National Strategic Projects Participation, Public Welfare Activities	P86, P101
413-2	Operations with significant actual and potential negative impacts on local communities	Value: Demonstrating Mission and Responsibility—National Strategic Projects Participation, Public Welfare Activities	P86, P101
GRI 414: Supplier Social Assessment 2016			
414-1	New suppliers that were screened using social criteria	Society: Achieving a Better Life—Supply Chain Management	P81
414-2	Negative social impacts in the supply chain and actions taken	Society: Achieving a Better Life—Supply Chain Management	P81
GRI 415: Public Policy 2016			
415-1	Political contributions	——	
GRI 416: Customer Health and Safety 2016			
416-1	Assessment of the health and safety impacts of product and service categories	——	
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	Society: Achieving a Better Life—Quality Assurance	P80
GRI 417: Marketing and Labeling 2016			
417-1	Requirements for product and service information and labeling	Society: Achieving a Better Life—Customer Service	P74
417-2	Incidents of non-compliance concerning product and service information and labeling	Society: Achieving a Better Life—Customer Service	P74
417-3	Incidents of non-compliance concerning marketing communications	Society: Achieving a Better Life—Customer Service	P80
GRI 418: Customer Privacy 2016			
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	Governance: Strengthening the Foundation of Governance—Risk Management	P30

SDGs Index

SDGs	Brief introduction	Shougang Steel response
1	No Poverty: End poverty in all its forms everywhere.	Value: Demonstrating Mission and Responsibility—Public Welfare Activities
3	Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.	Society: Achieving a Better Life—Employee Protection
4	Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	Value: Demonstrating Mission and Responsibility—Public Welfare Activities
5	Gender Equality: Achieve gender equality and empower all women and girls.	Society: Achieving a Better Life—Employee Protection
6	Clean Water and Sanitation: Ensure availability and sustainable management of water and sanitation for all.	Environmental protection: Practicing and Leading By Example—Circular Economy
7	Affordable and Clean Energy: Ensure access to affordable, reliable,sustainable and modern energy for all.	Environmental protection: Practicing and Leading By Example—Circular Economy, Low-carbon Development, Green Products
8	Decent Work and Economic Growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	Society: Achieving a Better Life—Employee Protection
9	Industry, Innovation and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	Value: Demonstrating Mission and Responsibility—Intelligent Manufacturing
10	Reduced Inequalities: Reduce inequality within and among countries.	Society: Achieving a Better Life—Employee Protection
11	Sustainable Cities and Communities: Make cities and human settlements inclusive,safe, resilient and sustainable.	Value: Demonstrating Mission and Responsibility—Urban Integration
12	Responsible Consumption and Production: Ensure sustainable consumption and production patterns.	Society: Achieving a Better Life—Quality Assurance Environmental protection: Practicing and Leading By Example—Green Products
13	Climate Action: Take urgent action to combat climate change and its impacts.	Environmental protection: Practicing and Leading By Example—Low-carbon Development Society: Achieving a Better Life—Supply Chain Management
14	Life Below Water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	Environmental protection: Practicing and Leading By Example—Biodiversity
15	Life on Land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	Environmental protection: Practicing and Leading By Example—Biodiversity
16	Peace, Justice and Strong Institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.	Governance: Strengthening the Foundation of Governance—Business Ethics
17	Partnerships for the Goals: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.	Value: Demonstrating Mission and Responsibility—Industry Collaboration

Feedback Form

Dear readers,

Thank you for taking the time to read the 2022 Shougang Steel Sustainability Report! We attach great importance to and look forward to hearing your feedback on this report. Your opinions and suggestions are an important basis for us to continue to promote sustainable development management and practice. We wold appreciate if if you provide valuable comments and suggestions by completing relevant questions in the feedback form, and please sent it back to us in the following way:

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1. Which type of stakeholder do you belong to?
☐ Shareholders and investors ☐ Company management ☐ Employees ☐ Customers ☐ Suppliers ☐ Government and regulatory agencies ☐ Community organizations, non-governmental organizations ☐ Industry partners, industry associations, and research institutions ☐ Media ☐ Other (please specify)

2. Please comment on the response and disclosure of this report to the concerns of stakeholders:
☐ Great ☐ Good ☐ General ☐ Poor ☐ Very poor

3. Please comment on the clarity, accuracy, and completeness of the information, indicators, and data disclosed in this report:
☐ Great ☐ Good ☐ General ☐ Poor ☐ Very poor

4. Please comment on the readability of this report:
☐ Great ☐ Good ☐ General ☐ Poor ☐ Very poor

5. Please make a comprehensive evaluation of this report:
☐ Great ☐ Good ☐ General ☐ Poor ☐ Very poor

Open Questions:
1. What suggestions do you have for Shougang Steel's work related to sustainable development work and report release?
2. What deficiencies do you think exist in this report?
3. What else sustainable development information do you think needs to be disclosed in this report?