HBIS 河钢

河钢集团 2023
绿色低碳发展报告

HBIS GROUP GREEN AND LOW-CARBON DEVELOPMENT REPORT 2023

绿 色 钢 铁 创 造 更 可 持 续 的 美 好 未 来

CREATING A MORE SUSTAINABLE AND BETTER FUTURE WITH GREEN STEEL

目录 CONTENTS

卷首语
Preface

气候变化是全人类面临的共同挑战，应对气候变化是人类共同事业。2020 年 9 月，习近平主席在第七十五届联合国大会上明确提出中国碳达峰、碳中和目标，向全世界宣示了中国为全球气候保护做出更大贡献和致力于共建人类命运共同体的决心和意志。作为钢铁行业绿色低碳转型的推动者、引领者、示范者，河钢将自身的可持续发展与国家“双碳”目标、社会环境的可持续发展紧密结合，以“为人类文明制造绿色钢铁”为己任，在行业率先发布实施低碳绿色发展行动计划和技术路径，积极探索世界钢铁工业低碳、零碳、负碳发展的最佳路径，致力于构建“人、钢铁、环境和谐共生”的产业生态圈，被评为中国工业碳达峰“领跑者”企业，蝉联世界钢铁行业“可持续发展优胜者企业”称号。

Climate change is a common challenge confronting all human beings, and tackling climate change is a shared mission for mankind. In September 2020, at the 75th session of the United Nations General Assembly, President Xi Jinping announced that China will strive to peak its carbon emissions before 2030 and achieve carbon neutrality before 2060, demonstrating to the world China’s resolve and will in making greater contribution to climate protection and in fostering a global community of shared future. As a promoter, trailblazer and shining example of the green and low-carbon transformation of the steel industry, HBIS has closely integrated its own sustainable development with the national goals of carbon peaking and carbon neutrality, as well as the sustainability of society and environment. Committed to green steel production, HBIS has taken the lead in the industry to release and implement the “Action Plan for Green and Low-Carbon Development” and the technical roadmap, and actively explored the best paths of low-carbon, zero-carbon and negative-carbon development for the world’s steel industry, striving to build an industrial ecosystem featuring “harmonious coexistence of people, steel, and the environment.” HBIS has been recognized as China’s Top Runner for Industrial Carbon Peaking by China Federation of Industrial Economics, and has been awarded the title of Sustainability Champion by the World Steel Association successively.

勇做可持续发展的引领者。自河钢全球首例 120 万吨氢冶金示范工程全线贯通以来，我们从焦炉煤气制氢，到氢能重卡应用，再到引领示范氢冶金变革，一直深耕氢能与钢铁的融合创新、协同发展，深入推进氢能应用研究和科技成果转化，始终引领钢铁行业氢能综合利用的发展方向。我们以数字化赋能精准降碳，在业内率先发布“WisCarbon 碳中和数字化平台”，实现企业碳数据、产品碳足迹的采集、核算及报告，获得世界著名的检验和认证机构——南德意志集团的符合性认证，为钢铁及上下游行业、企业精准降碳提供全流程数字化解决方案。

勇做绿色产业链的推动者。我们充分发挥绿色发展领先优势，聚焦新能源、新材料，积极推进产业间的跨界融合、产业链上下游之间的深度融合，不断构建完善绿色产业链体系。与宝马集团在国内首次开展绿色低碳钢铁供应链战略合作，迈出了钢铁、汽车行业跨领域协同减碳第一步；与长城汽车共建第一家国产品牌汽车绿色供应链，与海尔集团携手共建全国首个绿色低碳家电家居用钢产业链；与必和必拓共同打造二氧化碳捕集、利用与封存工业示范，开启产业链协同降碳新模式，以河钢责任助力绿色产业链高质量发展。

勇做绿色生态圈的示范者。河钢把“绿色低碳”作为企业发展战略的核心内容和自觉的生产运营方式，把绿色作为日常运营的底色，携手各方合力打造可持续发展的绿色生态圈。聚焦绿色制造、绿色产业、绿色产品、绿色采购、绿色物流和绿色矿山，持续深化“六位一体”绿色发展布局；利用“六五环境日”“全国节能宣传周”，广泛开展形式多样、内容丰富的绿色低碳宣传活动，营造浓厚绿色发展氛围；主动投身于生物多样性、生态修复治理等工作，最大程度地降低业务对生态环境的影响，实现生态良性发展。

道虽迩，不行不至。未来，河钢将坚定贯彻习近平生态文明思想，保持战略定力，脚踏实地、久久为功，创新构建更加适应生态文明要求和制造强国战略的钢铁企业绿色发展路径，持续引领钢铁创新发展、绿色发展、高质量发展，为国家“碳达峰、碳中和”目标的实现贡献“河钢方案”，为世界钢铁工业可持续发展做出“河钢贡献”。

Striving to be a trailblazer of sustainable development. Since the full operation of the 1.2-million-ton hydrogen metallurgy demonstration project, which is the first of its kind in the world, HBIS has been deeply engaged in the integrated innovation and coordinated development of hydrogen and steel. From coke oven gas-based hydrogen production to hydrogen-powered heavy-duty trucks and then to the guiding and exemplary role of the Group in promoting the transformation of hydrogen metallurgy, HBIS has pushed forward the research on hydrogen application and the transformation of scientific and technological achievements in a deep-going way, and has always led the development direction of comprehensive utilization of hydrogen in the steel industry. By achieving targeted carbon reduction with digital empowerment, HBIS has taken the lead to release the “WisCarbon Digital Platform for Carbon Neutrality” in the industry. The platform, which realizes the collection, accounting and reporting of corporate carbon data and product carbon footprint, has received the conformity certification from TÜV SÜD, a global leader in testing, inspection, and certification services. Through this platform, HBIS provides full-process digital solutions for targeted carbon reduction for the steel industry and its upstream and downstream sectors as well as enterprises.

Striving to be a promotor of green industry chain. HBIS has given full play to its leading position in the green development, focused on new energy and new materials, actively promoted cross-industry integration as well as the in-depth integration of the upstream and downstream sectors in the industry chain, and constantly built and improved the green industry chain system. HBIS has carried out the first strategic cooperation on green and low-carbon steel supply chain in China with BMW Group, marking the first step towards cross-sectoral collaboration in carbon reduction in steel and auto industries; established the first green supply chain for a domestic auto brand with Great Wall Motor, and joined hands with Haier Group to build China’s first green and low-carbon steel industry chain for household appliances and supplies; and launched a carbon capture, utilization and storage (CCUS) industrial demonstration project of the steel industry with BHP, bringing about a new model for coordinated carbon reduction in the industry chain. Those efforts made by HBIS have facilitated the high-quality development of a green industry chain.

Striving to be a shining example of green ecosystem. HBIS has taken “green and low-carbon development” as the core content of corporate development strategy and conscious production and operation model, and made its day-to-day operation a green one, working together with all parties to create a sustainable and green ecosystem. Focusing on green manufacturing, green industries, green products, green procurement, green logistics and green mining, HBIS has further deepened its “six-in-one” layout for green development. By making use of the “World Environment Day,” which falls on June 5 every year and “China’s National Energy Conservation Week,” HBIS has carried out a wide range of green and low-carbon publicity activities in various forms and with rich contents, so as to create a strong atmosphere for green development. HBIS has taken the initiative to biodiversity protection, ecological restoration and governance, and other relevant work, minimizing the impact of business activities on ecological environment and achieving ecologically sound development.

As an ancient Chinese saying goes, “Even the shortest journey can’t be finished without taking the first step.” In the future, HBIS will thoroughly apply Xi Jinping’s thought on ecological civilization, and maintain firm strategic resolve. With pragmatic and sustained efforts, HBIS will innovatively build a green development path for steel enterprises that is more adapted to the requirements of ecological civilization and the strategy of making China strong in manufacturing, and continue to usher in the steel industry in innovative, green and high-quality development, contributing to the realization of the national goals of carbon peaking and carbon neutrality with “HBIS approach” and the sustainable development of the world’s steel industry.

关于我们
About Us

河钢集团有限公司（简称河钢集团）坚持“高端化、智能化、绿色化”发展，纵向推进钢铁产业链条向高端制造延伸，横向推进同类业务结构性重组，加快实现“钢铁向材料、制造向服务”转型，致力于建设最具竞争力的钢铁企业，成为具有世界品牌影响力，钢铁材料、新兴产业、海外事业与金融服务协同发展的跨国工业集团。2023 年，河钢集团已成为中国第一大家电用钢、第二大汽车用钢供应商，世界第二大钒钛材料制造商。

Insisting on high-end, intelligent and green development, HBIS Group Co., Ltd. (hereinafter referred to as “HBIS”) promotes the extension of the steel industry chain to high-end manufacturing vertically and advances the structural reorganization of similar businesses horizontally, accelerating the transformation from steel to materials and from manufacturing to services. HBIS is committed to building the most competitive steel enterprise and becoming a global industrial conglomerate with international brand influence and coordinated development of steel materials, emerging industries, overseas business and financial services. In 2023, HBIS became the largest home appliance steelmaker and the second largest manufacturer of automotive steel in China, as well as the second largest manufacturer of vanadium-titanium materials in the world.

粗钢产量
Crude steel output
4,134 万吨
41.34 million tons

总资产
Total assets
5,456 亿元
RMB545.6 billion

营业收入
Operating revenue
4,016 亿元
RMB401.6 billion

社会贡献
Social contribution
456 亿元
RMB45.6 billion

全球员工
Total number of employees worldwide
90,000+
90,000+

品牌价值
Brand value
1785 亿元
RMB178.5 billion

世界企业 500 强第 229 位
Ranked 229th in the Fortune Global 500 list

世界钢铁协会会长 / 副会长（2018—2022）
Chairman/Vice Chairman of World Steel Association (2018—2022)

中国跨国公司 100 大第 37 位
Ranked 37th in the Top 100 Chinese Multinational Corporations list

中国企业 500 强第 69 位
Ranked 69th in the Top 500 Chinese Enterprises list

中国钢铁行业第 2 位
Ranked 2nd in the steel industry

中国钢铁工业协会轮值会长
Rotating President of China Iron and Steel Association

河钢集团始终秉承“人、钢铁、环境和谐共生”的绿色发展理念，锚定“双碳”目标，在国内率先发布低碳发展技术路线图，通过实施六大技术路径和建设两大管理平台，力争 2050 年实现碳中和，持续引领行业低碳绿色发展，为国家碳达峰碳中和目标的实现贡献“河钢方案”。

Adhering to the green development idea of “harmonious coexistence of people, steel, and the environment,” and focusing on the goals of carbon peaking and carbon neutrality, HBIS has taken the lead to release the technical roadmap for low-carbon development. Through the implementation of six technological paths and the building of two management platforms, HBIS strives to achieve carbon neutrality by 2050, and continues to usher in the industry in green and low-carbon development, contributing to the realization of the national goals of carbon peaking and carbon neutrality with “HBIS approach”.

第一阶段：2008 年—2015 年
1st phase: 2008—2015
以建设全球最清洁钢厂为代表的清洁生产之路
The path of clean production represented by the building of the world’s cleanest steel enterprise

第二阶段：2016 年—2020 年
2nd phase: 2016—2020
以超低排放、区位调整为代表的绿色发展之路
The path of green development represented by ultra-low emissions and location adjustment

第三阶段：2021 年—至今
3rd phase: 2021—present
以绿色低碳发展行动计划为代表的低碳发展之路
The path pf low-carbon development represented by the green and low-carbon development

河钢绿色成就

Green Achievements of HBIS

河钢集团牵头成立国家氢冶金标准组织

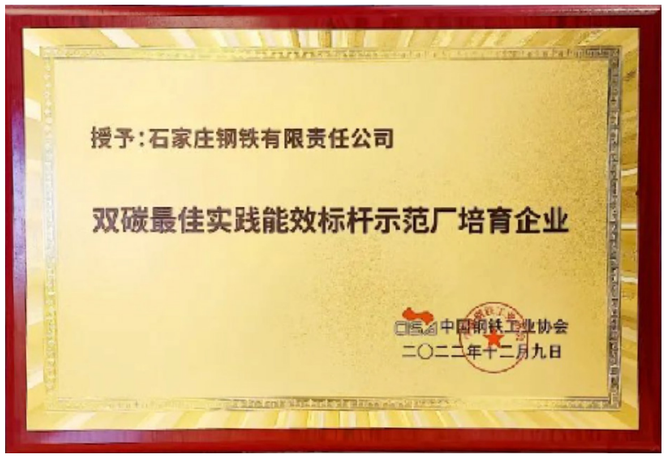
HBIS takes the lead to establish the Joint Working Group on Hydrogen Metallurgy Standards

河钢集团荣获世界钢铁协会低碳生产卓越成就奖

HBIS wins the award of the “Excellence in low-carbon steel production” of the World Steel Association

河钢集团入选 2023 年度中国 ESG 卓越实践

HBIS is selected into China’s Best ESG Practice Cases of 2023



河钢集团所属 7 家子公司入选钢铁行业双碳最佳能效标杆示范厂培育企业

Seven subsidiaries of HBIS are recognized as the “Cultivation Enterprises of Energy Efficiency Benchmark Demonstration Plants for the Best Practice of Carbon Peaking and Carbon Neutrality” by China Iron and Steel Association

河钢集团成为唯一蝉联世界钢铁协会“可持续发展优胜者企业”的中国企业

HBIS becomes the only Chinese enterprise to be honored by the World Steel Association as a “Sustainability Champion”

河钢塞钢获得联合国开发计划署与欧盟联合颁发的“绿色议程”证书

HBIS Serbia is honored with the “Green Agenda” award jointly by UNDP and EU

河钢集团建设全球首例 120 万吨氢冶金示范工程

The world’s first 1.2-million-ton hydrogen metallurgy demonstration project implemented by HBIS

河钢集团入选中国工业碳达峰“领跑者”企业

HBIS is recognized as China’s Top Runner for Industrial Carbon Peaking

河钢绿色低碳发展战略

Green and Low-Carbon Development Strategy of HBIS

强化顶层设计

Strengthening Top-Down Design

河钢集团以为人类文明制造绿色钢铁为愿景，实施低碳绿色发展行动计划和技术路径，构建了节能、减污、降碳、循环、协同的系统化绿色低碳发展战略。

Committed to corporate vision of green steel production, HBIS has implemented the action plan and technological path for green and low-carbon development, developed a systematic green and low-carbon development strategy featuring energy conservation, pollution control, carbon reduction, recycling and synergy.

全方位构建钢铁绿色制造体系

Developing an all-around green manufacturing system for steel

- 形成了绿色制造、绿色产业、绿色产品、绿色采购、绿色物流、绿色矿山为一体的绿色制造体系

  HBIS has developed a green manufacturing system integrating green manufacturing, green industries, green products, green procurement, green logistics and green mining

制定低碳绿色发展行动计划

Formulating an action plan for green and low-carbon development

- 制定《低碳绿色发展行动计划》，确定碳达峰、碳中和总体目标

  HBIS has formulated the *Action Plan for Green and Low-Carbon Development* and set the overall goals of carbon peaking and carbon neutrality

- 在2022年3月率先发布低碳发展技术路线图，2025年碳排放量较峰值降10%以上，2030年碳排放量较峰值降30%以上，力争2050年实现碳中和

  HBIS has taken the lead to release the technical roadmap for low-carbon development in March 2022, aiming at reducing carbon emissions by more than 10 percent from the peak in 2025, more than 30 percent from the peak in 2030, and achieving carbon neutrality by 2050

明确“6+2”低碳发展技术路径

Clarifying the “6+2” technological path for low-carbon development

- 将企业绿色低碳发展，划分为“碳达峰平台期”“稳步下降期”“深度脱碳期”三个阶段

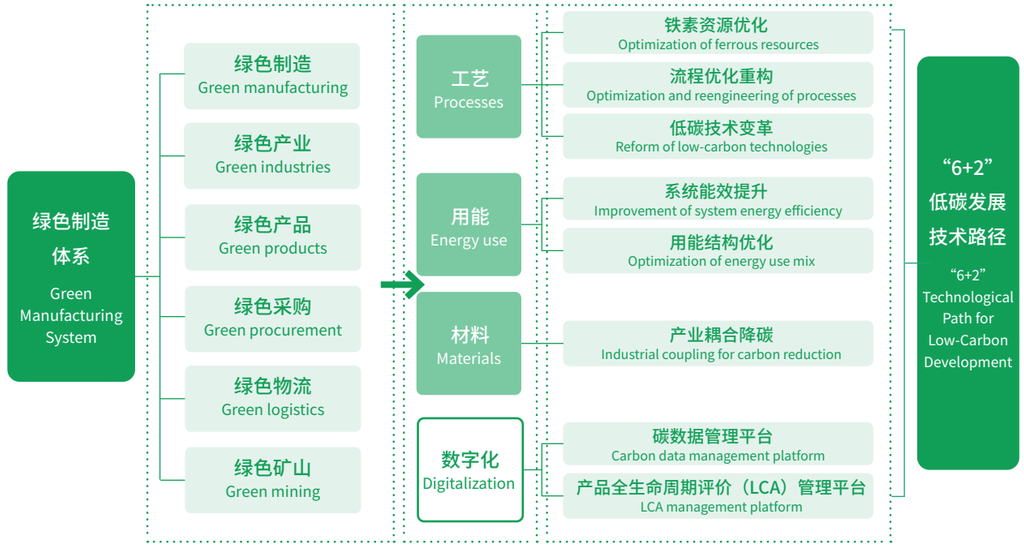
  HBIS has divided the green and low-carbon development of the enterprise into three phases, namely, “carbon peaking plateau period” “steady decline period” and “deep decarbonization period”

- 制定“6+2”低碳发展技术路线图

  HBIS has formulated the “6+2” technical roadmap for low-carbon development

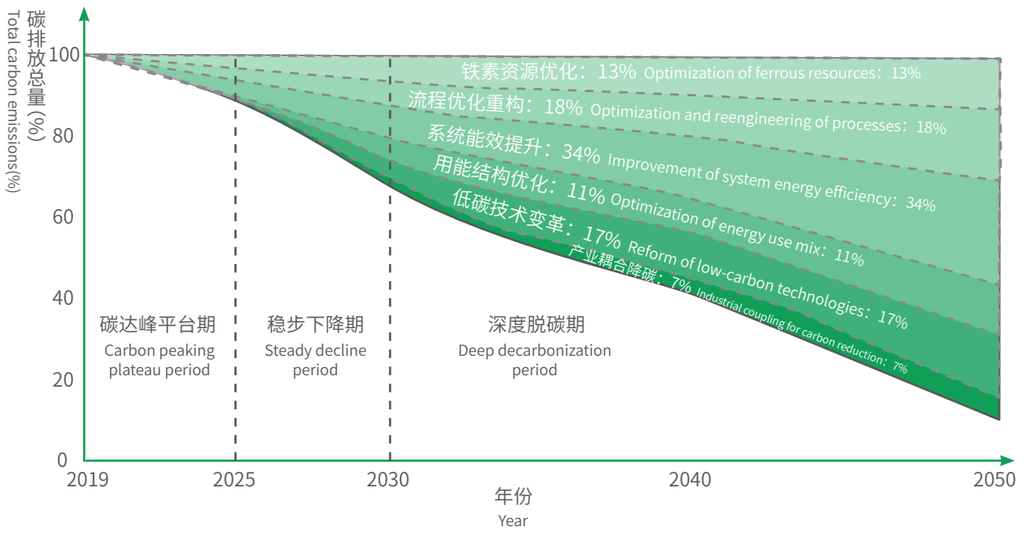
- 自主建设碳数据管理平台和产品全生命周期评价（LCA）管理平台

  HBIS has independently developed the carbon data management platform and the life cycle assessment (LCA) management platform



河钢集团低碳发展技术路线图示意图

Schematic Diagram of the Technological Roadmap for Low-Carbon Development of HBIS



河钢集团低碳发展三大阶段

Three Major Phases of Low-Carbon Development of HBIS

碳达峰平台期（2020—2025）

Carbon peaking plateau period

碳排放总量稳中有降，到 2025 年碳排放总量较峰值下降 10%。期间河钢集团产业布局逐步完善，流程结构不断优化，氢冶金进入工程应用阶段，碳达峰基础逐步夯实。

The total carbon emissions are decreasing steadily, and by 2025, the total carbon emissions will be 10 percent lower than the peak. During this period, the industrial layout of HBIS will be gradually improved; the process structure will be continuously optimized; and, the hydrogen metallurgy technology will enter the stage of engineering application. The foundation for peaking carbon emissions will be gradually strengthened.

稳步下降期（2025—2030）

Steady decline period

到 2030 年碳排放总量较峰值下降 30%。期间河钢集团钢铁生产过程碳排放实现精细管控，工艺流程结构、铁素资源结构、能源结构进一步优化，为实现碳中和奠定基础。

By 2030, the total carbon emissions will be 30 percent lower than the peak. During this period, HBIS will achieve lean control of carbon emissions from the steel production process. The process structure, ferrous resource structure and energy structure will be further optimized, thus laying the foundation for achieving carbon neutrality.

深度脱碳期（2030—2050）

Deep decarbonization period

到 2050 年完成深度脱碳化改造。期间河钢集团生产效率及用能效率发挥到极致，氢冶金、CCUS 技术大规模推广应用，矿山修复、森林碳汇等充分发挥深度固碳效应，碳中和目标顺利实现。

Deep decarbonization will be completed by 2050. During this period, HBIS will maximize its production and energy efficiency, promote the application of hydrogen metallurgy and CCUS technologies on a large scale, and give full play to the effect of deep carbon sequestration through various measures such as ecological restoration of mining areas and carbon sinks, so as to successfully achieve the goal of carbon neutrality.

建立体制机制

Establishing Systems and Mechanisms

成立领导组织机构

Establishing a leading body

- 在集团层面成立可持续发展委员会，设立绿色低碳技术、低碳产品价值实现、碳体系管理、碳交易市场研究、ESG 体系管理、宣传六个工作组

  HBIS has established a sustainable development committee at the Group level, and set up six working groups that are responsible for green and low-carbon technologies, value realization of low-carbon products, carbon system management, carbon trading market research, ESG system management and publicity

建立健全绿色低碳激励机制

Establishing and improving incentive mechanisms for green and low-carbon development

- 全面动员、广泛宣传

  HBIS has intensified its mobilization and publicity efforts

- 建立健全河钢环保指标考核办法

  HBIS has established and improved its assessment measures for environmental protection indicators

- 将碳达峰规划列入年度投资项目预算重点内容

  HBIS has taken carbon peaking planning as a key focus of the annual investment project budget

完善绿色低碳发展研究与支撑体系

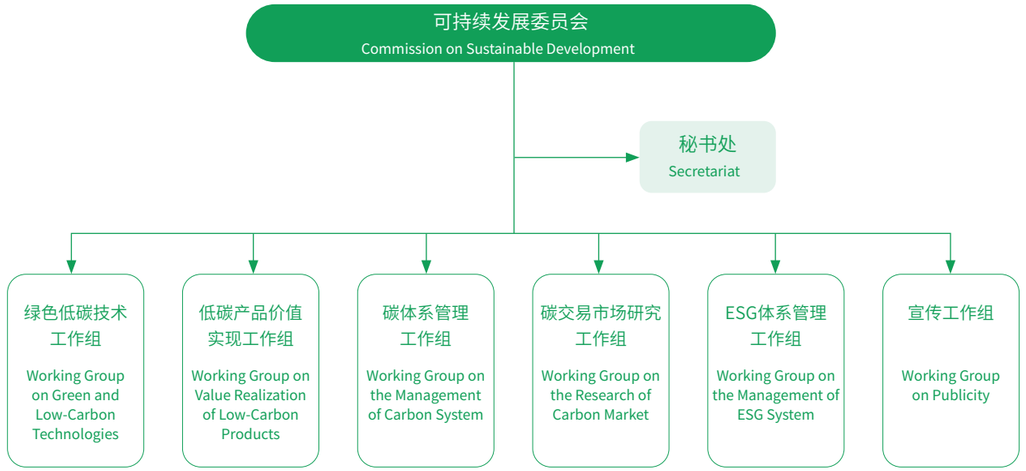
Improving research and support systems for green and low-carbon development

- 在钢铁行业率先成立可持续发展研究中心

  HBIS has taken the lead to establish a research center for sustainable development

- 以河钢材料院、河钢数字、大河环科、河钢工业技术、河钢碳资产 5 家子公司为支撑，推动前沿技术、材料技术、数字赋能等技术研发示范与应用

  Supported by its five subsidiaries, which are HBIS Materials Institute, HBIS Digital Tech, Dahe Eco-Environment Tech, HBIS Industrial Tech and HBIS Carbon Assets. HBIS has promoted the research, demonstration and application of cutting-edge technologies, materials technologies, digital empowerment technologies and other sophisticated technologies



引领行业低碳发展

Ushering in Low-Carbon Development of the Industry

河钢集团着力提升低碳品牌影响力，培育壮大厚植低碳、厚植未来的核心竞争力，与中国金属学会共同主办氢冶金国际研讨会，彰显氢冶金技术“领跑者”国际影响力；发挥氢冶金标准联合工作组组长单位作用，全面启动氢冶金安全规程和标准化评审标准编制工作。

HBIS has been focusing on improving the influence of low-carbon products, and has fostered the low-carbon and future-oriented core competitiveness. HBIS has co-organized the International Symposium on Hydrogen Metallurgy with the Chinese Society for Metals, highlighting the Group's global inference as a leader of hydrogen metallurgy technologies. As the head unit of the Joint Working Group on Hydrogen Metallurgy Standards, HBIS has comprehensively launched the preparation of hydrogen metallurgy safety protocols and standardized review criteria.

截至 2023 年 As of 2023

已启动编制国家及行业标准

11 项

Initiated the formulation of 11 national and industry standards

申请氢冶金相关专利

54 项

Applied for 54 patents relating to hydrogen metallurgy

牵头制定降碳产品方法学

5 个

Taken the lead in developing five product methodologies for carbon reduction

6 月 1 日，河钢集团党委书记、董事长于勇应邀出席 2023 工业绿色发展大会开幕式，并作为钢铁产业界唯一代表，在大会主论坛上发表《绿色钢铁创造更可持续的美好未来》的主题演讲，分享河钢绿色低碳发展实践和经验做法。

On June 1, Yu Yong, Party Secretary and Chairman of HBIS, attended the opening ceremony of the Industry Green Development Conference 2023 upon invitation. As the only representative of the steel industry, Mr. Yu delivered a keynote speech titled “Creating a More Sustainable and Better Future with Green Steel” at main forum of the conference, sharing the practices, experience and approaches of HBIS in promoting green and low-carbon development.

河钢集团发布《氢冶金技术发展蓝皮书》

HBIS released the *Hydrogen Metallurgy Technology Development*

9 月 5 日，由中国金属学会和河钢集团共同主办的“2023 年氢冶金国际研讨会”召开。会上，河钢集团党委书记、董事长于勇与中国工程院院士、北京科技大学教授毛新平共同启幕发布了《氢冶金技术发展蓝皮书》。

On September 5, the International Symposium on Hydrogen Metallurgy 2023 co-organized by the Chinese Society for Metals and HBIS was held in Chongli, Hebei Province. At the symposium, Yu Yong, Party Secretary and Chairman of HBIS, and Mao Xinping, academician of Chinese Academy of Engineering and professor of University of Science and Technology Beijing, jointly declared the release of the *Hydrogen Metallurgy Technology Development*.

绿钢亮点 只此“氢”绿，“碳”索未来

Green Steel Highlights: Exploring the Future with Hydrogen and Carbon Reduction Technologies

党的二十大报告指出，“立足我国能源资源禀赋，坚持先立后破，有计划分步骤实施碳达峰行动。” 在全球能源向清洁化、低碳化、智能化发展的趋势下，钢铁行业无论是能源结构创新还是工艺结构创新，氢能应用都是实现低碳，甚至“零碳”排放的最佳途径。

The report to the 20th National Congress of the Communist Party of China (CPC) pointed out that “based on China’s energy and resource endowment, we will advance initiatives to reach peak carbon emissions in a well-planned and phased way in line with the principle of building the new before discarding the old.” As the global energy trend moves towards cleaner, lower-carbon and more intelligent development, the application of hydrogen is the best way to achieve low-carbon or even “zero-carbon” emissions in the steel industry, whether it is innovation in energy mix or process structure.

作为钢铁行业绿色转型的先行者，河钢集团坚定与国家“双碳”战略同向同行，深耕氢能与钢铁的融合创新、协同发展，超前跟踪世界氢冶金技术的研究与发展，与意大利特诺恩等知名企业合作，建设氢冶金示范工程。

As a pioneer in green transformation of the steel industry, HBIS has steadfastly progressed together with the national strategy of carbon peaking and carbon neutrality, and has been deeply engaged in the integrated innovation and coordinated development of hydrogen and steel. Committed to tracking future-oriented R&D of hydrogen metallurgy technology in the world, HBIS has established cooperation relations with Italy-based Tenova and other leading enterprises to joint build hydrogen metallurgy demonstration projects.

2022 年 12 月 16 日，河钢集团张宣科技 120 万吨氢冶金示范工程一期全线贯通，与同等生产规模的传统高炉 + 转炉长流程工艺相比，每年可减少 80 万吨（约 70%）的碳排放，这是全球首例富氢气体（焦炉煤气）零重整竖炉直接还原氢冶金示范工程，标志着我国钢铁行业由传统“碳冶金”向新型“氢冶金”的转变。

On December 16, 2022, the 1.2-million-ton hydrogen metallurgy demonstration project (Phase I) of Zhangxuan Tech, a subsidiary of HBIS, was put into full operation. Compared to the project of the same production size that adopts traditional BF-BOF long-process steelmaking, the demonstration project could reduce carbon emissions by 800,000 tons per year (about 70%). As the world’s first demonstration project adopting the hydrogen-rich gas (coke oven gas) zero-reforming DRI process combined with EAF, it marked the transformation of China’s steel industry from traditional “carbon metallurgy” to new “hydrogen metallurgy”.

扫码走进河钢全球首例 120 万吨氢冶金示范工程

Scan the QR code to learn about the world’s first 1.2-million-ton hydrogen metallurgy demonstration project of HBIS

张宣科技 120 万吨氢冶金示范工程现场

On-site scene of the 1.2-million-ton hydrogen metallurgy demonstration project of Zhangxuan Tech, a subsidiary of HBIS

氢冶金绿色 DRI 产品
Green DRI product of hydrogen metallurgy

2023 年 5 月，河钢全球首例 120 万吨氢冶金示范工程实现安全顺利连续生产绿色 DRI 产品，DRI 产品金属化率达到 94%，关键指标完全达到合格产品标准，可作为高端材料制造高品质洁净原料，是替代电炉废钢特别是高品质废钢的重要原料，这标志着项目一期工程取得圆满成功。

In May 2023, the world’s first 1.2-million-ton hydrogen metallurgy demonstration project of HBIS achieved safe, smooth and continuous production of green DRI products, with a metallization rate reaching 94 percent. The key indicators of those DRI products fully meet the standards of qualified products, which can be used as high-quality clean raw materials for high-end material manufacturing, and is an important raw material for replacing recycled steel scrap for EAF, especially high-quality steel scrap, marking the complete success of the demonstration project (Phase I).

2023 年 11 月 2 日，河钢集团正式出台实施《河钢集团张宣科技建设钢铁工业绿色转型示范区规划纲要》，以全球首例 120 万吨氢冶金示范工程一期达产达效为契机，将张宣科技建设成为钢铁工业绿色转型示范区，努力打造绿色样板、创新标杆、高质量发展典范。

On November 2, 2023, HBIS officially issued and implemented the *Outline of the Plan for Building a Demonstration Zone for Green Transformation of the Steel Industry by HBIS Group Zhangxuan Tech*. Taking the realization of production and efficiency goals of the world’s first 1.2-million-ton hydrogen metallurgy demonstration project (Phase I) as an opportunity, HBIS has strived to build Zhangxuan Tech into a demonstration zone for green transformation of the steel industry, and to create a green paradigm, an innovation benchmark, and a model for high-quality development.

2024 年 3 月 29 日，全球首例“氢基竖炉 - 近零碳排电弧炉”新型短流程项目在河钢集团张宣科技正式启动实施。项目的实施对于推动行业工艺流程创新、能源结构变革、低碳产品产业链协同具有重大引领意义，有效填补我国钢铁工业面向碳中和目标的工艺路径空白，打造我国钢铁工业低碳竞争优势。

On March 29, 2024, the world’s first new-type short-process steelmaking project adopting “hydrogen-based SF-EAF with near-zero-carbon emissions” technology was officially launched and implemented in HBIS Group Zhangxuan Tech. The implementation of the project is of great guiding significance in promoting the industry’s process innovation, energy mix change, and industry chain synergy of low-carbon products, which effectively fills the blank of the technique path of China’s steel industry towards the goal of carbon neutrality, and creates low-carbon competitive advantages for China’s steel industry.

厚植氢能，就是厚植未来。河钢以氢冶金示范工程一期圆满成功为新起点，将把氢能开发利用作为重点发展方向，加快推进低碳冶金技术的革命性创新与突破，积极引领钢铁行业氢能综合利用与发展，打造更加丰富、更加多元的绿色发展场景，释放更具引领性、更强竞争力的“绿动能”。

To effectively develop hydrogen is to establish the leading position in the future. Taking the complete success of the hydrogen metallurgy demonstration project (Phase I) as the new starting point, HBIS will make the development and utilization of hydrogen a key development direction, accelerate the disruptive innovation and breakthroughs in low-carbon metallurgical technology, actively lead the comprehensive utilization and development of hydrogen in the steel industry, create richer and more diversified green development scenarios, and unleash more forward-looking and more competitive “green momentum”.

张宣科技 120 万吨氢冶金示范工程
The 1.2-million-ton hydrogen metallurgy demonstration project of Zhangxuan Tech, a subsidiary of HBIS

01

可持续发展引领者

A Trailblazer of Sustainable Development

必须以更高站位、更宽视野、更大力度来谋划和推进新征程生态环境保护工作，谱写新时代生态文明建设新篇章

——习近平总书记在全国生态环境保护大会上的讲话

It is imperative to plan and promote work concerning ecological and environmental protection on the new journey from a higher position and with a broader vision and greater endeavors, so as to write a new chapter in the building of an ecological civilization for the new era.

—— Excerpts from the speech made by General Secretary Xi Jinping at National Conference on Ecological and Environmental Protection

我们的行动
Our Actions

- ◎ 研发氢冶金
  Conducted R&D of hydrogen metallurgy
- ◎ 推进清洁能源应用
  Promoted the application of clean energy
- ◎ 自主开发碳中和数字化平台
  Developed a digital platform for carbon neutrality independently

工艺结构调整
Adjusting Process Structure

河钢集团积极实施工艺流程结构性变革，推动电炉短流程、研发氢冶金等颠覆性技术应用，建成全废钢电炉短流程特钢厂、全球首例氢冶金示范工程和绿色化智能化新一代大型联合钢厂，开辟出降低碳排放强度的重要路径，引领行业绿色低碳发展。截至 2023 年，河钢集团具备 600 万吨短流程生产能力和 60 万吨氢冶金生产能力。预计到 2030 年，短流程比例达到 27%，其中氢冶金比例达到 10%。

HBIS has taken the initiative to implement structural reform of steelmaking processes, promoted the application of disruptive technologies such as EAF short-process steelmaking, and intensified its efforts to conduct R&D of hydrogen metallurgy. The completion of the construction of the special steel plant adopting EAF short-process steelmaking with recycled steel scrap, the world’s first hydrogen metallurgy demonstration project, and the new generation large-scale integrated steel plant featuring green and intelligent production have opened up important paths to reduce the intensity of carbon emissions, leading the industry in green and low-carbon development. As of 2023, HBIS had boasted six million tons of short-process production capacity and 600,000 tons of hydrogen metallurgy production capacity. The proportion of short-process steelmaking is expected to reach 27 percent by 2030, including 10 percent for hydrogen metallurgy.

案例
Case

建成国内首家全废钢电炉短流程特钢企业——石钢新区
HBIS completes the construction of Shisteel New Plant, China’s first special steel plant adopting EAF short-process steelmaking with recycled steel scrap

河钢集团集成应用 70 多项国际先进的节能减排技术，建成国内首家“全废钢电炉短流程”绿色低碳特钢企业——石钢新区，实现零煤、零焦清洁生产，能耗和污染物排放大幅降低，成为钢厂与城市协同发展的示范。2023 年，石钢公司在生态环境部 2022 钢铁行业绿色发展水平评估中，获得最高级别的“绿色发展领先水平”评价。

By integrating and applying more than 70 internationally advanced energy-saving and emission reduction technologies, HBIS has completed the construction of Shisteel New Plant, China’s first green and low-carbon special steel plant adopting “EAF short-process steelmaking with recycled steel scrap”, realizing zero-coal, zero-coke clean production, and greatly reducing energy consumption and pollutant emissions. Shisteel New Plant has become a demonstration project of coordinated development of the steel plant and the city. In 2023, Shisteel Company won the highest rating of “leading level in green development” in the 2022 green development level assessment of the steel industry conducted by the Ministry of Ecology and Environment.

石钢公司厂区环境
Plant environment of Shisteel Company

案例
Case

建成世界领先长流程绿色钢厂——唐钢新区

HBIS completes the conduction of Tangsteel New Plant, the world's leading green steel plant adopting long-process steelmaking

河钢集团从长流程工艺设计层面应用冶金流程工程学原理，将下属唐钢新区打造成环保绿色化、工艺前沿化、产线智能化、流程高效化、产品高端化的世界级现代化沿海钢铁工厂，污染物排放比行业超低排放标准再下降 10%。

By applying metallurgical process engineering at the long-process steelmaking level, HBIS has built the affiliated Tangsteel New Plant into a world-class modern coastal steel plant featuring environmentally-friendly manufacturing, sophisticated process, intelligent production line, high-efficient work flow and high-end products. Tangsteel New Plant has achieved a further 10 percent reduction in pollutant emissions compared with the industry's ultra-low emission standards.

唐钢新区场景

Scene of Tangsteel New Plant

推广绿色用能

Promoting the Use of Green Energy

河钢集团以氢能、绿电和全钒液流电池储能为突破口，推进清洁能源替代，加快发展非化石能源，逐步构建多元互补清洁能源体系，实现能源结构的转型和升级。

By seeking to make breakthroughs in hydrogen, green electricity and all-vanadium redox flow battery energy storage, HBIS has promoted substitution of clean energy, accelerated the development of non-fossil energy, and gradually developed a diversified and complementary clean energy system, striving to achieve transformation and upgrading of energy mix.

加快氢能应用

Accelerating the Application of Hydrogen

河钢集团在业内率先实施“焦炉煤气制氢 + 加氢服务网点 + 氢能重卡运营单元”氢能物流一体化运营，大宗物料和产品清洁运输比例达 80% 以上；建成我国钢铁行业首批 3 座固定式加氢站，率先建成我国第一条“柴改氢”绿色物流链；建成了高富氢气体高炉喷吹低碳冶炼技术示范。

HBIS has taken the lead in the industry to implement the hydrogen-powered integrated operation featuring “coke oven gas-based hydrogen production + hydrogen refueling service outlets + operation unit of hydrogen-powered heavy-duty trucks”, achieving a clean transportation ratio of over 80 percent for bulk materials and products. HBIS has completed the construction of the first batch of three fixed hydrogen refueling stations in the steel industry, built China's first “diesel to hydrogen” green logistics chain, and completed the construction of the demonstration project adopting the high hydrogen-rich injection blast furnace smelting technology.

固定式加氢站

Fixed hydrogen refueling station

大宗物料和产品清洁运输比例达

80% 以上

Achieving a clean transportation ratio of over 80 percent for bulk materials and products

建成我国钢铁行业首批固定式加氢站

3 座

Completed the construction of the first batch of three fixed hydrogen refueling stations in the steel industry

河钢集团氢能重卡投运全国首发式

China Debut Ceremony of HBIS Hydrogen Heavy Truck Commissioning

扩大绿电使用比例

Increasing the Use of Green Electricity

河钢集团设立河钢售电公司，对接河钢各子公司绿电需求并实施绿电交易，使河钢集团成为钢铁行业最早实现绿电交易的企业，截至 2024 年 5 月，平台累计交易绿电达 17.76 亿度，减少二氧化碳排放量 105.5 万吨，占比预计在 14.8% 左右，绿电交易量行业领先；积极开发可再生能源发电，已建成投运 32.25MW 分布式可再生能源项目，计划 2025 年将建成 350MW。

HBIS has established HBIS Electricity to meet the green electricity demands of its subsidiaries and to carry out green electricity trading. As the first enterprise in the industry to realize green electricity trading, As of May 2024, the platform’s cumulative trading volume of green power had amounted to 1.776 billion kWh, which was equivalent to reducing CO_2 emissions by 1.055 million tons. With an expected proportion of about 14.8 percent of the total purchased power, the trading volume of green power conducted by the platform took a leading position in the industry. HBIS has taken the initiative to develop renewable energy-based electricity generation. A total of 32.25MW of distributed renewable energy projects have been completed and put into operation, and 350MW is planned to be completed by 2025.

累计交易绿电

17.76 亿度

Cumulative trading volume of green power had amounted to 1.776 billion kWh

可降低二氧化碳排放量

105.5 万吨

Reducing CO_2 emissions by 1.055 million tons

已建成投运分布式可再生能源项目

32.25 MW

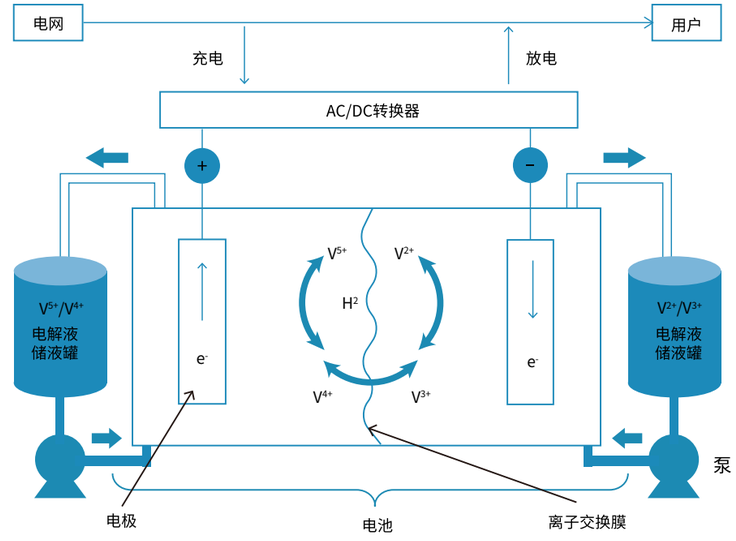
A total of 32.25 MW of distributed renewable energy projects have been completed and put into operation

布局液流电池储能产业

Establishing Business Presence in Flow Battery Energy Storage Industry

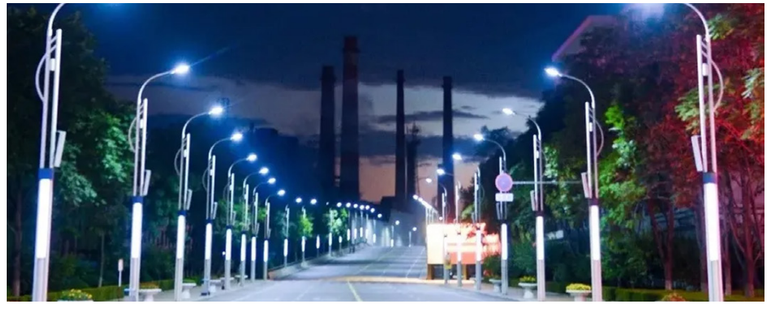
河钢集团积极探索全钒液流电池等储能技术应用，提高可再生能源利用率，建成 5kW/20kWh 全钒液流电池储能系统，实现河北省能源综合利用新突破；正在实施 5,000 立方米 / 年钒电解液、100 兆瓦 / 年钒电池储能装备制造、20,000 立方米 / 年钒电解液三期项目建设，支撑风光储氢一体化产业基地建设，满足河北不同储能场景对全钒液流电池储能技术的需求。2023 年 6 月，承德钒钛新材料产业园区高纯钒产线正式投产运行。

HBIS has actively explored the application of energy storage technologies such as all-vanadium redox flow battery, improved the utilization rate of renewable energy, and built the 5kW/20kWh all-vanadium redox flow battery energy storage system, achieving new breakthroughs in comprehensive energy use in Hebei Province. HBIS is currently working on the construction of the 50,000 cubic meter/year vanadium electrolyte project, the 100MW/year vanadium battery energy storage equipment manufacturing project, and the 20,000 cubic meters/year vanadium electrolyte project (Phase III), and has supported the construction of the industry base featuring the integration of wind power, PV power, energy storage and hydrogen, so as to meet the demands of all-vanadium redox flow battery energy storage technology in different energy storage scenarios in Hebei Province. In June 2023, the high-purity vanadium production line at the Chengde Vanadium Titanium New Materials Industrial Park was officially put into operation.



液流电池储能流程示意图

Schematic diagram of flow battery energy storage process



5kW/20kWh 全钒液流电池储能系统正式投用

The 5kW/20kWh all-vanadium redox flow battery energy storage system is officially put into use

强化攻关技术
Intensifying Research on Key Technologies

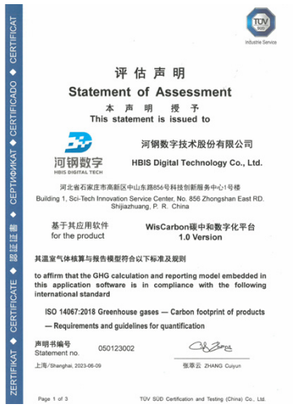
河钢集团结合国际国内碳市场形势的快速变化，加快新一代信息技术应用与制造业融合发展，以数字赋能企业绿色低碳转型；发挥自身技术、资源优势，攻破一批颠覆性、示范性、关键性技术，支撑绿色低碳行动实施，确保实现“双碳”目标。

Taking the rapidly changing situation in the international and domestic carbon markets into consideration, HBIS has accelerated the integrated development of the new generation IT application and the manufacturing industry, promoting green and low-carbon transformation of the enterprise with digital empowerment. By giving the play to its own technological strengths and advantageous resources, HBIS has made breakthroughs in a number of disruptive, demonstrative and critical technologies, and intensified its efforts to implement the green and low-carbon initiatives, ensuring the realization of the goals of carbon peaking and carbon neutrality.

数字驱动转型
Boosting Digital-Driven Transformation

河钢集团依托钢铁行业强大背景和工业制造业场景优势，坚持走“工业互联网 +”全产业链数字化的发展道路，自主开发碳中和数字化平台，实现碳数据资产化，为企业实现双碳目标提供支撑。

Relying on strong strengths of the steel industry and advantages of industrial manufacturing scenarios, HBIS has pursued the “Industrial Internet Plus” digital development path of the whole industry chain, developed an independent digital platform for carbon neutrality, and realized carbon data assetization, facilitating the achievement of carbon peaking and carbon neutrality goals of the enterprise.



WisCarbon 碳中和数字化平台获得 TÜV 南德颁发的温室气体管理软件产品符合性认证，成为国内钢铁行业首家获得国际权威认证的平台

WisCarbon Digital Platform for Carbon Neutrality obtains the conformity certification of TÜV SÜD for greenhouse gas management software product, becoming the first platform in the steel industry to obtain international authoritative certification

最新发布 WisCarbon 碳中和数字化平台 2.0 版本强力推出 6 款新产品，并构建“5+8+4”碳中和数字化系统解决方案

The newly released WisCarbon Digital Platform for Carbon Neutrality (Version 2.0) grandly launched six new products, committing to developing the “5+8+4” digital system solution for carbon neutrality

提升碳中和全流程数字化解决方案能力
Improving the full-process digital solution capabilities for carbon neutrality

- 自主研发 WisCarbon 碳中和数字化平台，为钢铁产业链精准降碳提供全流程数字化解决方案服务

  HBIS has independently developed the WisCarbon digital platform for carbon neutrality, providing full-process digital solutions and services for targeted carbon reduction in the steel industry chain

- 建成钢铁产品 LCA 碳足迹评价体系，牵头起草钢铁产品碳足迹评价技术规范团体标准

  HBIS has developed a LCA system for carbon footprint of steel products, and taken the lead to draft the group standard for technical specifications for carbon footprint assessment of steel products

- 数字化平台获世界著名的检验和认证机构认证，完成 12 款产品碳足迹认证，为宝马、奔驰、舍弗勒等客户产出碳足迹证书

  The digital platform of HBIS has received the conformity certification from the leading agencies in testing, inspection, and certification services, completed carbon footprint certification for 12 products, and issued carbon footprint certificates for BMW, Mercedes-Benz, Schaeffler, and other clients

- 成立专业公司负责平台运营和市场化，为行业精准降碳提供服务

  HBIS has established a specialized company responsible for the operation and marketization of the digital platform, providing services for targeted carbon reduction in the industry

在业内率先建设企业碳排放管理体系
Taking the lead in the industry to establish corporate management system for carbon emissions

- 以河钢集团所属公司为应用场景，建成碳排放管理绩效体系，按照“策划、实施、检查、改进”思路，形成三级数据流转台账，为数据准确计量、管理精准高效提供保障，填补行业体系建设空白

  Taking its affiliated companies as application scenarios, HBIS has established a management performance system for carbon emissions and formed a three-level data transfer ledger in accordance with the idea of “planning, implementation, inspection and improvement” to provide guarantee for precise data measurement and accurate and efficient data management, filling in the gaps in the development of industry systems

加强碳数据统一管理，推动碳数据资产化
Strengthening unified management of carbon data and promoting carbon data assetization

- 成立碳资产管理公司，服务于内部碳资产管理

  HBIS has established a carbon assets management company to provide services for internal carbon assets management

- 拓展 WisCarbon 碳资产平台功能，开展碳资产储备和开发，为钢铁企业未来进入全国统一碳市场交易、应对国际低碳贸易壁垒等形成基础支撑

  HBIS has expanded the functions of the WisCarbon carbon assets platform, and intensified its efforts to enhance carbon assets reserve and development, providing basic support for steel enterprises to enter the national unified carbon market trading and cope with international low-carbon trade barriers in the future

- 印发实施《河钢集团模拟全国碳市场交易工作方案》，在行业内率先启动模拟全国碳市场交易工作

  HBIS has printed, issued and implemented the *Work Plan of HBIS for Simulated National Carbon Market Trading*, becoming the first enterprise in the industry to launch simulated national carbon market trading

打造创新优势
Creating Innovation Strengths

自绿色低碳发展战略实施以来，河钢集团累计投资 305 亿元，实施 500 余项重点节能减排项目，获绿色低碳领域国家科技进步奖 2 项、河北省科学技术进步奖 3 项，连续 3 年荣获环境保护科学技术奖一等奖，入围 2022 年“科创中国”先导技术榜单，“钢铁行业多工序多污染物超低排放控制技术”被认定为“取得我国钢铁行业超低排放核心技术的重大突破”，入选 2019 年中国生态环境十大科技进展。

Since the implementation of the green and low-carbon development strategy, HBIS has cumulatively invested RMB30.5 billion to conduct more than 500 key energy-saving and emission reduction projects, and won 2 prizes of the State Scientific and Technological Progress Award in the green and low-carbon field, 3 prizes of the Scientific and Technological Progress Award of Hebei Province, and first prize of the Scientific and Technological Award for Environmental Protection for 3 years in a row. HBIS has been shortlisted in the 2022 “Innovation China” list for advanced technologies. “Multi-process and multi-pollutant control technology for ultra-low emissions in the iron and steel industry” has been recognized as “a major breakthrough in core technology for ultra-low emissions in China’s iron and steel industry”, and selected as one of the top 10 scientific and technological advances in China’s ecological environment in 2019.

河钢集团获国家科技进步奖
HBIS wins the State Scientific and Technological Progress Award

河钢集团入围 2022 年“科创中国”先导技术榜单
HBIS is shortlisted in the 2022 “Innovation China” list for advanced technologies

首创亚熔盐法高效清洁利用等技术研究，解决了固废处理、末端治理等世界性难题
HBIS pioneers research on technologies such as the efficient and clean utilization of sub-molten salt method, solving worldwide problems such as solid waste treatment and end-of-pipe (EOP) treatment

特材行业唯一应用 DRI 产品研制的绿色低碳热锻模具钢锻材，达到国内领先水平，成功替代进口
As the only green and low-carbon hot-work die steel forgings developed by DRI products in the special materials industry, the die steel forgings have reached the leading level in China and successfully replaced similar imported products

绿色低碳科技创新体系
Green and low-carbon science and technology innovation system

- 相继联合中科院、北科大、昆士兰大学等国内外知名院校和企业，开展大气污染控制耦合能质增效技术、CCUS、绿氢制备、氢冶金等前沿绿色低碳技术研究

  HBIS has successively joined hands with leading institutions and enterprises both at home and abroad, such as the Chinese Academy of Sciences, University of Science and Technology Beijing, and University of Queensland, to carry out research on cutting-edge green and low-carbon technologies, such as air pollution control coupled with energy quality and efficiency technology, CCUS, green hydrogen production and hydrogen metallurgy

- 成立世界钢铁发展研究院，探索钢铁工业未来可持续发展路径

  HBIS has established World Steel Development Research Institute to explore sustainable development path for the steel industry in the future

- 成立河北省生态环境领域第一家国资国企平台——大河生态环境科技有限公司，打造生态环境领域最具技术创新力和市场竞争力的示范应用平台

  HBIS has established Dahe Eco-Environment Tech, the first platform backed by state-owned assets and state-owned enterprises in eco-environment field in Hebei Province, to create the most technologically innovative and market-competitive demonstration and application platform in eco-environment field

绿色低碳重点专项课题
Key and special research projects for green and low-carbon technologies

- 相继主持“钢铁行业多工序多污染物协同控制技术”“水资源高效利用国家重点研发计划”等多项国家重点专项项目

  HBIS has led a number of research projects including the “Multi-process and multi-pollutant control technology for ultra-low emissions in the iron and steel industry”, and the “National key R&D project on efficient use of water resources”

- 在行业内率先研发源头－过程－末端全过程协同控制技术，建设钢铁行业全过程控制超低排放技术体系，为全行业提供超低排放标准参照

  HBIS has taken the lead in the industry to conduct research on the source-process-terminal full-process synergistic control technology, and established the ultra-low emission technological system for full-process control in the steel industry to provide an industry-wide reference for ultra-low emission standards

关键性减排技术应用
Application of key emission reduction technologies

- 成功研发具有国际领先水平的 CCUS 技术，将二氧化碳捕集并精制成工业级液体二氧化碳和食品级液体二氧化碳，并在河钢产线投入应用

  HBIS has successfully developed internationally leading CCUS technology to capture and refine carbon dioxide into industrial-grade liquid carbon dioxide and food-grade liquid carbon dioxide, and have put it into use in the Group’s production lines

- 牵头成立“河北省 CCUS 产业技术联盟”，形成可复制、可推广的钢铁行业深度脱碳全流程、一体化解决方案

  HBIS has taken the lead to establish the “CCUS Industrial Technology Alliance of Hebei Province”, and developed a replicable and scalable full-process, integrated solution for deep decarbonization of the steel industry

02

绿色产业链推动者

A Promotor of Green Industry Chain

发展绿色低碳产业，健全资源环境要素市场化配置体系，加快节能降碳先进技术研发和推广应用。

——习近平总书记在中国共产党第二十次全国代表大会上作报告

We will boost green and low-carbon industries and improve the system for market-based allocation of resources and environmental factors. We will accelerate the R&D, promotion and application of advanced energy-saving and carbon emission reduction technologies.

——Excerpts from the report presented by General Secretary Xi Jinping to the 20th CPC National Congress

我们的行动
Our Actions

- ◎ 实施《河钢集团低碳排放产品发展规划（2023—2026）》
  Implemented the *Development Plan of HBIS for Low-Carbon-Emitting Products (2023—2026)*
- ◎ 建立低碳产业链系统布局
  Established a systematic layout of the low-carbon industry chain
- ◎ 打造“绿色工厂”“双碳最佳实践能效标杆示范厂”
  Built “Green Factories” and “Energy Efficiency Benchmark Demonstration Plants for the Best Practice of Carbon Peaking and Carbon Neutrality”
- ◎ 发展绿色金融
  Developed green finance

提供绿色产品
Providing Green Products

河钢集团把握全球“绿钢”市场发展机遇，加强与产业链上中下游企业合作，从产品设计、使用和全生命周期碳排放评估入手，加快绿钢产品研制，推动全产业链、全过程的绿色低碳协同发展，构建低碳产业生态圈。

Seizing the development opportunities of the “green steel” market, HBIS has enhanced cooperation with enterprises in the upstream and downstream industry chain. Starting from the design, use and life cycle carbon emissions assessment of products, HBIS has accelerated the development of green steel products, and promoted coordinated green and low-carbon development across the entire industry chain and the whole process, striving to build a low-carbon industrial ecosystem.

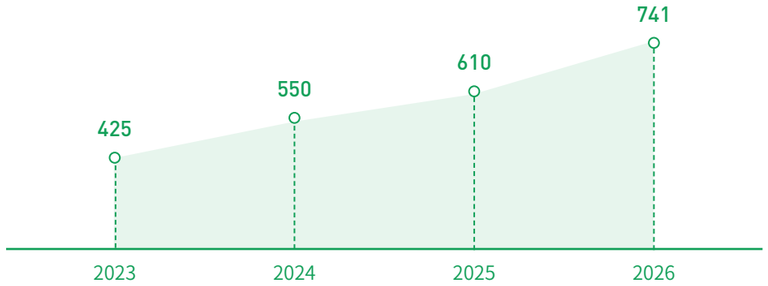
绿色产品布局
Establishing Business Layout for Green Products

河钢集团于2023年9月1日正式实施《河钢集团低碳排放产品发展规划（2023—2026）》[1]，与“6+2”低碳发展技术路线图一脉相承，致力构建形成“6+6+5”的低碳排放钢、绿钢、近零碳排钢产品矩阵，打造河钢HINEX Steel®低碳排放产品品牌。

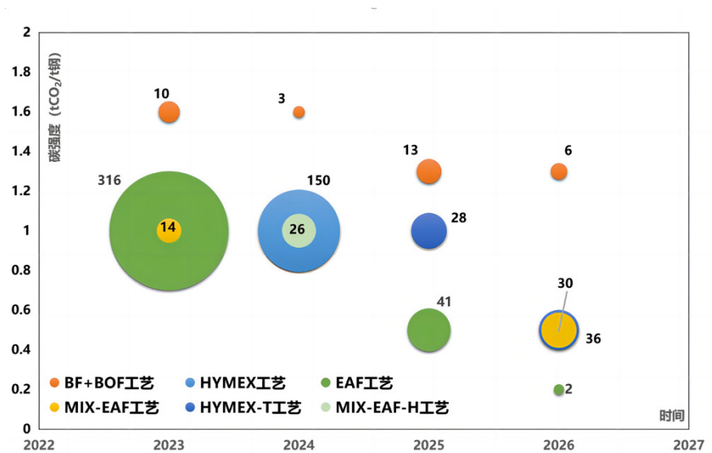
On September 1, 2023, HBIS officially implemented the *Development Plan of HBIS for Low-Carbon-Emitting Products (2023—2026),* which is consistent with the Group’s “6+2” technical roadmap for low-carbon development, striving to build a “6+6+5” product matrix of low-carbon-emitting steel, green steel, and near-zero-carbon-emitting steel and to create the low-carbon-emitting product brand of HINEX Steel®.

[1] 规划以 2023 年至 2026 年为第一阶段，未来将持续高标准推进发展规划提档升级、滚动实施。
The *Low-Carbon Product Development Plan of HBIS* takes 2023—2026 as the first phase. HBIS will continue to promote the upgrading and rolling implementation of the development plan at a higher standard in the future.

《河钢低碳产品规划》中集团将具备的低碳排放产品生产能力
Production Capacity of Low-Carbon-Emitting Products Accordance to the *Low-Carbon Product Development Plan of HBIS*



低碳排放产品生产能力（万吨）
Production capacity of low-carbon-emitting products (10,000 tons)



低碳排放产品年度推进实施路线图
Implementation roadmap for low-carbon-emitting products by year

“6+6+5”低碳排放产品矩阵

“6+6+5” Product Matrix of Low-Carbon-Emitting Products

六种工艺组合协同推进

Promoting six processes in a coordinated manner

高炉转炉长流程工艺（BF+BOF）、氢冶金电炉工艺（HYMEX）、全废钢电炉工艺（EAF）、混合电炉工艺（MIX-EAF）、氢冶金电炉生产汽车板组合工艺（HYMEX-T）和混合电炉生产汽车板组合工艺（MIX-EAF-H）

The six process are BF+BOF, HYMEX, EAF, MIX-EAF, HYMEX-T and MIX-EAF-H

六类产品需求协同推进

Promoting demands of six product series in a coordinated manner

选择具备专业化、特色化、精品化、高端化的优势产品系列，结合下游行业、企业对低碳排放钢产品的要求，重点打造高档次汽车板，高档次家电板，高强度建筑用钢，高级别船舶、能源用钢，高品质轴承钢、齿轮钢，高端装备用钢等六类 30 余个典型牌号产品

Combining the requirements of downstream industries and enterprises for low-carbon emissions steel products, HBIS chooses advantageous product series that are specialized, featured, high-quality and high-end and focuses on creating more than 30 typical brand products in six categories, including high-end auto sheets, high-end home appliance sheets, high-strength construction steel, high-grade ship and energy steel, high-quality bearing steel and gear steel and high-end equipment steel

五个低碳排放等级协同推进

Promoting five low-carbon emissions grades in a coordinated manner

河钢低碳排放产品标识为 HINEX Steel®，划分 L1.6、L1.3、G1.0、G0.5、Z 五个低碳排放产品等级，其中 L 定义为低碳排放钢、G 定义为绿钢、Z 定义为近零碳排钢

The identification of low-carbon-emitting products of HBIS is HINEX Steel®, consisting of five grades of L1.6, L1.3, G1.0, G0.5, and Z, of which L is defined as low-carbon-emitting steel, G is green steel, and Z is near-zero-carbon-emitting steel

HINEX Steel

HINEX L1.6　HINEX G1.0　HINEX Z

HINEX L1.3　HINEX G0.5

河钢集团低碳排放产品标识及等级

Identification and grade of low-carbon-emitting products of HBIS

河钢正式启用低碳排放产品品牌标识 HINEX Steel®

HBIS officially launches the brand logo of HINEX Steel® for low-carbon-emitting products

“三统一”原则
“Three-Unification” Principle

“核算边界及规则统一”
Unification of accounting boundary and rules

即统一遵循 ISO 14064 方法学及国家相关核算报告与指南，按照“企业温室气体排放核算方法、特定产品减排量优先分配原则、核算碳排放强度、第三方认证”总体流程。

Following the ISO 14064 methodology and relevant national accounting reports and guides, and adhering to the overall process of “enterprise greenhouse gas emissions accounting method, principle of priority allocation for emissions reduction of specific products, carbon emissions intensity accounting and third-party certification”.

“标识及解析体系统一”
Unification of identification and resolution system

即设计低碳排放产品的统一品牌标识，并建立基于工业互联网的统一标识解析体系，构建钢材产品在产业链全生命周期数字孪生，确保每吨钢材产品均具有唯一标识编码的产品数字护照。

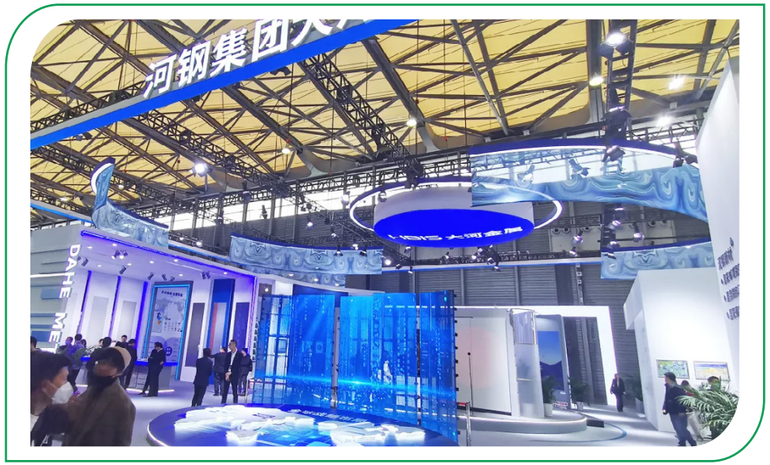
Designing unified brand identification for low-carbon-emitting products, developing the industrial Internet-based unified identification resolution system, building life cycle digital twin for steel products in the industry chain, and guaranteeing that each ton of steel product has a product digital passport with a unique identification code.

“平台及认证体系统一”
Unification of platform and certification system

即依托 WisCarbon 碳中和数字化平台，构建统一的低碳排放产品认证体系，并实行统一管理，统筹低碳排放产品认证工作。

Relying on the WisCarbon digital platform for carbon neutrality to develop a unified low-carbon-emitting product certification system; and, conducting unified management on the work of low-carbon-emitting product certification.

我国首卷大转炉高比例 DRI 超低排放汽车用钢在河钢下线
China’s first roll of large converter steel with high-proportion DRI ultra-emission used for automobile is produced at HBIS



河钢集团以多款低碳环保涂镀产品亮相中国家电及消费电子博览会
Several low-carbon and environmentally-friendly products developed by HBIS are exhibiting at the Appliance & Electronics World Expo (AWE)

构建低碳产业生态圈

Building Low-Carbon Industrial Ecosystem

河钢集团建立了“上游低碳原料－中游低碳工艺产品－下游低碳应用”低碳产业链的系统布局，聚力打造“深度融合，绿色发展”的产业链协同典范。

HBIS has established a systematic layout of the low-carbon industry chain featuring “low-carbon raw materials in the upstream industry chain, low-carbon process products in the midstream industry chain and low-carbon applications in the downstream industry chain”.HBIS has been focusing on creating an industry chain synergy model of “deep integration and green development”.

河钢与浦项联手打造“高端化、智能化、绿色化”世界级汽车板高地

HBIS cooperates with POSCO Holdings to create a “high-end, intelligent and green” world-class highland for auto sheets

- 与必和必拓签署《共同应对气候变化战略合作谅解备忘录》，在氢气直接还原铁、钢渣处理及循环利用，以及铁矿石块矿使用等重点领域深入合作

  HBIS has signed the *Memorandum of Understanding on Strategic Cooperation to Jointly Tackle Climate Change* with BHP, focusing on in-depth cooperation in key fields including hydrogen DRI, treatment and recycled use of steel slag, and use of iron ore lumps

- 在能源领域，加强与中石油合作，加快构建零煤、零焦的清洁能源结构；与中石化签署共建绿色氢能产业链战略合作框架协议，共同研究氢冶金示范工程绿氢供应综合解决方案

  In the field of energy, HBIS has enhanced cooperation with CNPC to accelerate the building of a zero-coal, zero-coke clean energy mix; and signed a cooperation framework agreement on jointly building a green hydrogen industry chain with Sinopec to conduct joint research on integrated solutions for green hydrogen supply for hydrogen metallurgy demonstration projects

- 携手浦项控股推动河钢浦项汽车板合资项目竣工投产，打造“高端化、智能化、绿色化”世界级汽车板高地

  HBIS has cooperated with POSCO Holdings to promote the completion and commissioning of HBIS-POSCO auto sheet joint venture project, creating a “high-end, intelligent, and green” world-class highland for auto sheets

- 与宝马集团开展绿色低碳钢铁供应链战略合作，成为跨行业协同降碳典型

  HBIS has conducted a strategic cooperation with BMW in green and low-carbon steel supply chain, becoming a model for cross-industry collaborative carbon reduction

- 与长城汽车共建第一家国产品牌汽车绿色供应链

  HBIS has built the first green supply chain for domestic auto brands with Great Wall Motor

践行绿色生产
Implementing Green Production

河钢集团全面部署绿色生产，提高能源使用效率，降低能源成本；有效管控三废排放，建设环境友好型企业；推进运输方式向低污染、低消耗、低排放和高效能、高效率、高效益转变，坚决打赢打好蓝天、碧水、净土三大保卫战。2023 年，集团全年环保投资 30 亿元，累计有 5 家子分公司环保绩效全面创 A。

HBIS has comprehensively deployed green production, improved energy use efficiency and reduced energy costs; effectively controlled wastewater, waste gases and solid waste and strived to build an environmentally-friendly enterprise; promoted the transformation of transportation model to low pollution, low consumption, low emissions, as well as high effectiveness, high efficiency and high benefits, making resolute efforts to keep the skies blue, waters clear and lands clean.In 2023, the Group invested RMB3 billion in environmental protection throughout the year and a cumulative of 5 subsidiaries and branches achieved A-level environmental performance.

节约能源资源
Saving Energy and Resources

能源高效利用 Promoting Efficient Use of Energy

河钢集团通过加强能源管理，攻克关键技术等方法，不断提升能源利用效率，研发的高频电磁阻垢仪在承德钒钛应用，有效抑制结垢并减少系统排污水量 60%，技术入选 2023 年度《国家鼓励的重点节水技术装备目录》。2023 年，河钢集团 7 家所属企业获评中钢协“双碳最佳实践能效标杆示范厂培育企业”，数量占比居钢铁行业首位。

HBIS has continued to improve efficiency of energy use by strengthening energy management and making breakthroughs in key technologies. The high-frequency electromagnetic scale inhibition instrument developed by the Group which can effectively inhibit scaling and reduce the volume of wastewater discharged from the system by 60 percent is applied in Chengde Vanadium Titanium. This technology was selected into the *Directory of Industrial Water-Saving Processes, Technologies and Equipment Encouraged by the State (2023)*. In 2023, seven enterprises affiliated to HBIS were awarded the title of “Cultivation Enterprises of Energy Efficiency Benchmark Demonstration Plants for the Best Practice of Carbon Peaking and Carbon Neutrality” by China Iron and Steel Association, ranking the top in the industry in terms of award number.

发展循环经济 Developing Circular Economy

河钢集团努力打造高效闭环回收体系，综合提升能源再利用水平。2023 年，集团研发的钢铁企业含锌固废全量回收装备及技术入选《国家工业资源综合利用先进适用工艺技术设备目录（2023 年版）》。

HBIS has strived to build an efficient closed-loop recycling system and comprehensively improved the level of energy reuse. In 2023, the equipment and technology for full recovery of zinc-containing solid waste developed by HBIS for application in steel companies were selected into *National Directory of Advanced and Applicable Processes, Technologies and Equipment for Comprehensive Utilization of Industrial Resources (2023 Version).*

减少三废排放
Reducing Wastewater Discharge, Waste Gas Emissions and Solid Waste Discharge

河钢集团按照新出台的创 A 标准要求，实施超低排放改造和环境治理提升，有效减少废气、废水、固体废弃物排放。2023 年，河钢集团实现吨钢二氧化硫排放量、吨钢氮氧化物排放量、吨钢烟粉尘排放量分别较去年同期优化 10.5%、19%、13.6%。

In accordance with the newly-introduced A-level standards, HBIS has implemented ultra-low emission transformation and environmental governance improvement to effectively control waste gases, wastewater, and solid waste. In 2023, HBIS achieved improvement in sulfur dioxide emissions per ton of steel, nitrogen oxide emissions per ton of steel, and smoke and dust emissions per ton of steel by 10.5 percent, 19 percent and 13.6 percent respectively compared with the same period last year.

废气
Waste Gases

- 积极开展重点区域、重点时段、重点因子、重点问题、重点行业综合治理攻坚

  HBIS has actively carried out comprehensive management and tackled challenges of key areas, key periods, key factors, key issues and key industries

- 集团旗下唐钢新区、邯宝公司和河钢中厚板严格落实生态环境部《推进超低排放改造实施意见》，被评为环境绩效 A 级企业，并成功通过 2023 年 A 级复核

  Tangsteel New Plant, Hanbao Steel Plant and HBIS Medium & Heavy Steel Plate, all of which are affiliated to the Group, have strictly implemented the *Implementation Opinions on Promoting Ultra-Low Emission Transformation* issued by the Ministry of Ecology and Environment. They were rated as A-level enterprises in environmental performance and successfully passed the 2023 A-level review

废水
Wastewater

- 重视推动各子公司加强废水管理，同时加强废水深度治理设备设施运行维护，确保高效运行，增加回用水量

  HBIS has promoted all subsidiaries to strengthen wastewater management, and strengthened the operation and maintenance of the equipment and facilities used for in-deep management of sewage in the meantime to ensure efficient operation and increase the volume of reuse water

废弃物
Solid waste

- 按照标准建设危废库，贮存暂时无法处置或综合利用的危废，委托外部单位合规处置，积极探索危废处置和综合利用技术

  HBIS has constructed hazardous waste warehouses in accordance with standards to store hazardous waste that cannot be disposed of or comprehensively utilized for the time being. It entrusts external units with compliant disposal and actively explores the technology for disposal and comprehensive utilization of hazardous waste

- 各子公司均建有固废管理制度，一般固体废物采取自行利用、委托利用的方式实现 100% 循环利用；危险废物除了自行利用的部分外，全部委托有资质的厂家进行处置

  Each subsidiary has established a solid waste management system with ordinary solid waste 100 percent recycled through self-use or entrusted use. Hazardous waste, except for self-use, is entrusted to qualified venders for disposal

“三废”排放绩效

Management Performance of Wastewater Discharge, Waste Gas Emissions and Solid Waste Discharge

废气污染物排放量
Amount of waste discharge

16,387.17 吨
16,387.17 tons

废水排放量
Discharge of wastewater

8,142,117 吨
8,142,117 tons

废弃物排放量
Discharge of solid waste

12,015,190 吨
12,015,190 tons

案例
Case

石钢公司实现污水“零排放”

Shisteel Company realizes “zero” discharge of wastewater

石钢公司水处理中心项目采用 RO 浓盐水处理、浓缩分盐、蒸发结晶等先进工艺，确保污水 100% 循环利用，实现工业污水“零”排放。2023 年，该项目消纳城市中水能力达到 260 余万吨，减排 COD95 吨、氨氮 5 吨、总氮 36 吨。

The water treatment center project of Shisteel Company uses advanced technologies such as RO strong brine treatment, concentration and salt separation and evaporative crystallization to ensure 100 percent recycling of sewage and achieve “zero” discharge of industrial sewage. In 2023, the urban reclaimed water consumption capacity of this project reached more than 2.6 million tons, reducing COD emissions by 95 tons, ammonia nitrogen emission by five tons and total nitrogen emission by 36 tons.

石钢公司水处理中心
Water treatment center of Shisteel Company

绿色低碳运输

Promoting Green and Low-Carbon Transportation

河钢集团不断推进清洁运输工作，推广新能源运输方式，淘汰高排放运输工具，完善清洁运输管理。

HBIS has continued to advance clean transportation, promoted new energy transportation modes, phased out high-emission transportation vehicles and enhanced clean transportation management.

一体式新能源重卡后场倒运场景
Integrated transportation scenario of new energy heavy-duty trucks

培育绿色工厂

Cultivating Green Factories

树立示范标杆

Setting High Standard and Prime Example

河钢集团高标准、严要求地将基础设施、管理体系、能源投入、环境排放等多个指标融入企业绿色发展的全流程，打造低碳绿色“未来工厂”。截至 2023 年，集团累计有国家级“绿色工厂”4 家，中钢协“双碳最佳实践能效标杆示范厂”培育企业 7 家，河北省“无废企业（工厂）”2 家。

HBIS has integrated a number of indicators such as infrastructure, management systems, energy inputs, and environmental emissions into the full-process of green development of the enterprise in accordance with high standards and strict requirements, striving to create green and low-carbon “future factories” . As of 2023, the Group had boasted four national-level “green factories”; seven of its enterprises had been awarded the title of “Cultivation Enterprises of Energy Efficiency Benchmark Demonstration Plants for the Best Practice of Carbon Peaking and Carbon Neutrality” by China Iron and Steel Association; and, two of its subsidiaries had been recognized as “Waste-Free Enterprises (Factories)” of Hebei Province.

河钢集团国家级“绿色工厂”名录（4 家）

Directory of the Four National-Level “Green Factories” of HBIS

唐钢公司
Tangsteel Company

衡板包装
Hengstrip Packaging

石钢公司
Shisteel Company

邯钢公司
Hansteel Company

环境应急管理

Enhancing Environmental Emergency Management

河钢集团各子公司严格按照要求编制应急预案，并在地方政府部门备案，确保公司一旦发生突发环境事件，及时、科学、有效予以应对。在预警响应方面，严格落实重污染天气应急管控措施，A 级企业积极配合地方政府开展自主减排，尚未获得 A 级环保绩效的企业严格执行“一厂一策” 应急管控减排措施。2023 年，集团突发环境事件和重大环境违法事件为“零”，环保行政处罚为“零”。

All subsidiaries of HBIS have developed emergency plans in strict accordance with the requirements and filed them in local government authorities to ensure response to environmental emergencies in a timely, scientific and effective manner. In terms of early warning response, efforts have been made to strictly implemented emergency management and control measures to deal with heavy pollution weather. A-level enterprises have actively cooperated with local governments to carry out independent emission reduction. Those having not achieved A-level environmental performance have strictly implemented the “One Factory, One Policy” measure for emergency management and control and emission reduction. In 2023, the numbers of the Group’s environmental emergency and major environmental violation were “zero” with “zero” environmental administrative penalty.

风险监测预警系统应用指挥中心
Application command center for risk monitoring and early warning system

发展绿色金融

Developing Green Finance

国家供给侧改革战略实施，推动制造大国向制造强国迈进，河钢集团转型升级、绿色低碳、创新智造提档加速，提供新课题和新方向。河钢集团作为河北省绿色金融专业委员会的理事单位之一，将低碳绿色发展与绿色金融创新相结合。

The implementation of the national strategy of supply-side reform has fostered the transition of China from being a big manufacturer to a strong manufacturer. HBIS has accelerated the pace of corporate transformation and upgrading, green and low-carbon development, and innovation and smart manufacturing. New issues have been addressed and new priorities have been determined. As one of the director units of Hebei Provincial Green Finance Committee, HBIS has integrated green and low-carbon development with innovation in green finance.

绿色项目贷款
Loans for Green Projects

退城搬迁转型升级是河钢集团坚决贯彻习近平总书记关于“坚决去、主动调、加快转”重要指示精神、认真落实省委省政府关于加快河钢区位调整实现转型升级决策部署、实现企业生存和城市发展统筹兼顾的重要体现，是绿色金融最好的应用场景。截至目前，河钢集团已完成对唐钢新区、邯钢新区、石钢新区的建设。

The relocation, transformation and upgrading of industrial projects is a significant manifestation of the Group's resolute implementation of the spirit of important instructions on "relocate resolutely, adjust initiatively, and transform quickly" made by General Secretary Xi Jinping, as well as the earnest implementation of the decisions and plans made by the CPC Hebei Provincial Committee and the People's Government of Hebei Province to accelerate the location adjustment of HBIS and achieve transformation and upgrading. Moreover, it is an important embodiment of the Group in realizing both corporate business growth and urban development, and is the best application scenario for green finance. As of present, HBIS had completed the construction of Tangsteel New Plant, Hansteel New Plant and Shisteel New Plant.

绿色贸易融资
Green Trade Financing

河钢集团以废钢回收利用为切入点，围绕废钢采购、物流和加工制造，通过对接废钢上游散户资源，扩大废钢采购货源渠道，引入信贷资源和金融服务。

HBIS has taken scrap steel recycling as the entry point, focused on the procurement, logistics, processing and manufacturing of scrap steel, expanded scrap steel procurement source channels by connecting with upstream retail scrap steel resources. The Group has also introduced credit resources and financial services.

绿色债券
Green Bonds

河钢集团顺应国家宏观纲领性政策，深入研究并匹配绿色金融政策。截至 2023 年末，存续 5 只绿色债券，合计金额 55 亿，债券品种涵盖绿色企业债、绿色中期票据、永续票据、私募债和碳中和绿色公司债。

Abiding by national macro and programmatic policies, HBIS has conducted in-depth research. As of the end of 2023, HBIS had 5 outstanding green bonds, with a total volume of RMB5.5 billion in line with green financial policies. The bond types include green corporate bonds, green medium-term notes (MTN), perpetual notes, private placement bonds and green corporate bonds for carbon neutrality.

存续绿色债券
5 只
Issued five green bonds

合计金额
55 亿元
A total amount of RMB5.5 billion in line with green financial policies

名词解释——绿色债券

将募集资金专门用于支持符合规定条件的绿色产业、绿色项目或绿色经济活动，依照法定程序发行并按约定还本付息的有价证券。

Explanation of Term – Green Bonds

Refer to securities issued in accordance with legal procedures and have capital and interest repaid; and for which the raised funds are exclusively used to support green industries, green projects or green economic activities.

绿色租赁
Green Lease

河钢集团及子公司与租赁公司从不同的方面探索合作模式，积极尝试“资金用途绿”“租赁物绿”。河钢租赁公司基于“租赁物绿”的方式，通过直接租赁的模式帮助邯钢公司完成 100 余辆新能源汽车的采购，助力其完成环保创 A 评比事项。

HBIS, subsidiaries of the Group, and HBIS Leasing have jointly explored cooperation models from all aspects,and actively tried "Green Use of Funds" and "Green Lease Holds" models. Based on the "Green Lease Holds" model, HBIS Leasing has helped Hansteel Company complete the purchase of more than 100 new energy vehicles through direct leasing, supporting it complete the A-level environmental protection evaluation.

绿色保险
Green Insurance

河钢集团与中国人保资产公司合作开展 40 亿元“唐钢集团基础设施债券投资计划”，开展绿色低碳投资，大力填补绿色基础建设的资金缺口，具有重要的示范意义。

HBIS and PICC AMC have cooperated to launch the RMB4 billion "Tangsteel Infrastructure Bond Investment Plan", which has important demonstration significance, to carry out green and low-carbon investment and to vigorously fill the financing gap of green infrastructure construction.

03

绿色生态圈示范者

Shining Example of Green Ecosystem

要着力提升生态系统多样性、稳定性、持续性，加大生态系统保护力度，切实加强生态保护修复监管，拓宽绿水青山转化金山银山的路径，为子孙后代留下山清水秀的生态空间。

——习近平总书记在全国生态环境保护大会上的讲话

Efforts should be made to improve the diversity, stability and sustainability of the ecosystem, to protect it in an intensified manner, effectively strengthen the supervision of ecological system conservation and restoration, expand the path of transforming lucid waters and lush mountains into invaluable assets, so as to leave a beautiful ecological environment for future generations.

—— Excerpts from the speech made by General Secretary Xi Jinping at National Conference on Ecological and Environmental Protection

我们的行动
Our Actions

- ◎ 举办环保宣传活动
  Held environmental protection publicity activities
- ◎ 推行无纸化办公
  Promoted paperless office practices
- ◎ 倡导绿色出行
  Advocated green travel
- ◎ 开展生物多样性管理计划（BAP）
  Conducted the Biodiversity Action Plan (BAP)

宣传低碳理念
Publicizing Low-Carbon Idea

河钢集团坚持把绿色低碳理念融入日常运营中，在全集团开展环保理念宣传活动，增强员工低碳意识；打造一批具备专业化能力的环保技术人才，为绿色发展提供人才支撑，全力推动企业实现绿色低碳转型升级。

Insisting on integrating green and low-carbon philosophy into day-to-day corporate operations, HBIS has conducted various activities for publicizing the environmental protection idea company-wide to raise the low-carbon awareness of employees. HBIS has cultivated a batch of environmental tech personnel with specialized competence, providing talent support for green development. Intensified efforts have been made to promote the Group to achieve green and low-carbon transformation and upgrading.

加强环保宣贯
Strengthening Publicity and Implementation of Environmental Protection Initiatives

河钢集团通过举办“六五环境日”“全国节能宣传周”等环保宣传活动，在微信公众号刊发绿色主题文章，向全体员工宣传绿色低碳理念，营造浓厚的绿色发展氛围。

HBIS has organized environmental protection publicity activities such as the activities relating to the “World Environment Day” and China’s “National Energy Conservation Week” ,and published green-themed articles at the official WeChat account to promote the green and low-carbon idea to all of its staff and create a strong atmosphere of green development.

案例 Case

唐钢公司开展“节能宣传周”主题宣传活动
Tangsteel Company conduct themed campaign to publicize “National Energy Conservation Week”

2023年，唐钢公司积极响应全国节能宣传周，以“节能降碳 你我同行”为主题，通过微信公众号平台展示一系列节能降碳的成果。

In 2023, Tangsteel Company actively responded to the campaign of National Energy Conservation Week. Taking “Joint hands towards energy conservation and carbon reduction” as the theme, Tangsteel showcased a series of energy conservation and carbon reduction achievements at its official WeChat account.

一系列绿色低碳“技能卡”
A series of green and low-carbon “skills cards”

员工浏览环境日环保展板

Employees browse the information on the display boards for the campaign of World Environment Day

员工领取环境日手册

Employees receives the World Environment Day-themed brochure

环保人才培养

Cultivating Environmental Protection Personnel

河钢集团持续在绿色低碳转型的主战场加强人才队伍建设，通过开展环保培训、共建人才培养基地等举措，着力打造绿色高质量发展的人才高地。2023年，集团环保培训投入55.58万元，开展环保培训585次，环保培训时长达1,340小时。

HBIS has continuously strengthened the construction of talent teams in the main battlefield of green and low-carbon transformation, focused on creating a talent highland for green and high-quality development though various measures such as training of environmental protection personnel and joint building of talent base. In 2023, the Group invested RMB555,800 in environmental protection, and organized 585 sessions of environmental training, with a total training time reaching 1,340 hours.

张宣科技与北京科技大学共建新金属材料与绿色冶金研发中试基地、人才培养实训基地

Pilot test base for new metal materials and R&D of green metallurgy & vocational training base for talent cultivation jointly built by Zhangxuan Tech and University of Science and Technology Beijing

践行绿色办公

Implementing Green Office Practices

河钢集团号召全体员工树立“勤俭节约，助力节能降耗”的意识，大力推行绿色办公，倡导和带动全体员工从自身做起，从身边小事做起。

HBIS has called on all staff to establish the awareness of “hard work and thrift facilitate energy conservation and consumption reduction”, vigorously implemented green office practices, and advocated and encouraged its employees to play their due part through everyday habits.

降耗 Consumption reduction

- 通过“河钢在线”一体化办公平台实现文件传递、在线签署等功能，实现各单位之间报表互通、数据同步

  HBIS has realized document delivery, online signing and other functions through the “HBIS Online” integrated office platform, promoted paperless office practices, and achieved information connectivity and data synchronization among units

- 推行线上会议，减少差旅次数，间接降低碳排放

  HBIS has promoted online meetings and reduced business travel frequency to indirectly cut carbon emissions

节能 Energy conservation

- 推广使用光伏发电以替代传统能源

  HBIS has promoted the use of PV power as an alternative to traditional energy sources

- 倡导随手关灯、室温适宜时不使用空调、调低电脑屏幕亮度等绿色办公的方式，减少非必要能耗

  HBIS has advocated green office practices such as turning off lights when leaving and air-conditioning facilities when the room temperature is appropriate, and lowering the brightness of computer screens to reduce non-essential energy consumption

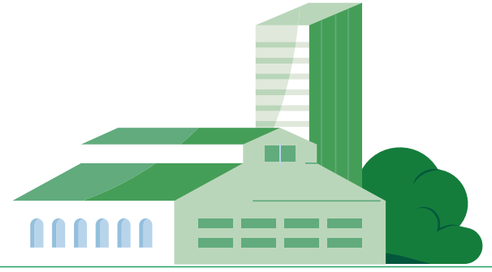
案例 Case

建设碳普惠体系，倡导低碳乐活新方式

HBIS develops carbon inclusive system, encourages employees to enjoy low-carbon lifestyle

河钢集团遵循“场景识别－行为量化－行为激励”的总体思路，基于WisCarbon碳中和数字化平台，开发碳普惠（CGsp）子平台，建设惠及员工的企业碳普惠体系。

Following the general guidelines of “scenario recognition, behavior quantification, behavior motivation”, HBIS has developed a sub-platform of Carbon Generalized System of Preferences (CGsp) based on the WisCarbon Digital Platform for Carbon Neutrality, as well as a carbon inclusive system benefiting all employees.



河钢集团碳普惠 APP

Carbon Inclusion App of HBIS

乐享绿色出行

Enjoying Green Mobility

河钢集团努力践行绿色出行理念，完善新能源车充电设施，倡导员工通过乘坐公交、地铁，驾驶新能源车辆等方式出行。截至2023年，唐钢新区、邯钢新区、石钢公司大量引进新能源通勤班车，减少化石能源燃烧产生的碳排放。

HBIS has intensified its efforts to promote the idea of green mobility, improved charging facilities for new energy vehicles, advocated employees to travel by bus and subway or drive new energy vehicles and so on. As of 2023, Tangsteel New Plant, Hansteel New Plant and Shisteel Company had introduced a large number of commuter shuttle vehicles to reduce carbon emissions resulted from the use of fossil energy.

唐钢公司通勤班车

Commuter shuttle vehicles of Tangsteel Company

开展环保公益

Conducting Public Welfare Initiatives for Environmental Protection

河钢集团持续推进绿色公益，通过闲物置换、义务植树等活动，以实际行动为地球环境保护贡献一份力量。

HBIS has kept promoting green public welfare initiatives and made contributions to environmental protection of the Earth by taking practical actions through the exchange of idle goods, voluntary tree planting and other activities.

舞钢公司开展义务植树活动

Employees of Wusteel Company conduct voluntary tree planting activity

邯钢公司开展义务植树活动

Employees of Hansteel Company conduct voluntary tree planting activity

保护生态环境

Protect the Ecological Environment

河钢集团秉持“生态优先、绿色发展”的环保理念，主动投身于生物多样性、生态修复治理等工作，最大程度地降低业务对生态环境的影响，实现生态良性发展，守护绿色家园。

Insisting on the principle of prioritizing eco-environmental conservation and pursuing green development, HBIS has actively engaged in biodiversity protection and ecological restoration and governance to minimize the impact of corporate business on ecological environment, achieve benign ecological development, and protect our green homeland.

建设绿色矿山

Building Green Mines

河钢集团坚持“资源开发规划与生态环境保护同步、矿山开采利用与生态修复治理同步”的理念，加快矿山转型升级高质量发展步伐；坚持“因地制宜，靶向治理”，大力实施植绿复绿，共同呵护绿水青山。截至2023年，黑山铁矿、柏泉铁矿被纳入全国绿色矿山名录，司家营铁矿、中关铁矿、石人沟铁矿、庙沟铁矿被纳入省级绿色矿山名录库。

Adhering to the idea of “synchronization of resource development planning with ecological and environmental protection, and synchronization of mine exploitation and utilization with ecological restoration and governance”, HBIS has accelerated the transformation, upgrading and high-quality development of mines. Insisting on the principle of “adaptation to local conditions and targeted governance”, HBIS has vigorously carried out greening and ecological restoration initiatives, and made joint efforts to protect lucid waters and lush mountains. As of 2023, Heishan Iron Mine and Baiquan Iron Mine had been included in the national director of green mines, and Sijiaying Iron Mine, Zhongguan Iron Mine, Shirengou Iron Mine and Miaogou Iron Mine had been included in the provincial directory of green mines.

柏泉铁矿

Baiquan Iron Mine

中关铁矿

Zhongguan Iron Mine

案例 Case

河钢矿业推进生态修复治理

HBIS Mining enhances ecological restoration and governance

河钢矿业持续推进生态修复治理，2023年，河钢矿业投入矿山生态修复（绿化）费用近4,000万元，完成生态修复（绿化）面积 121.9 万㎡，矿山地质环境与地貌景观得到有效治理。

HBIS Mining has kept enhancing ecological restoration and governance. In 2023, HBIS Mining invested nearly RMB40 million in the ecological restoration (greening) of the mines, and completed an ecological restoration area of 1.219 million square meters. Both the geological environment and the landscape of the mines have been effectively governed.

庙沟铁矿尾矿库全景

Full view of the tailings pond of Miaogou Iron Mine of HBIS Mining

生物多样性保护
Protecting Biodiversity

案例 Case

河钢物流“万顺 118”轮装载生态鱼礁，助力海域生态修复
HBIS Logistics “Wanshun 118” facilitates eco-restoration of sea area with ecological reefs

2023 年 1 月，装载生态鱼礁的“万顺 118”轮在河钢物流曹妃甸公司顺利离泊，此单生态鱼礁将在曹妃甸海域投放，用于曹妃甸周边海域生态修复和环境保护，为提高海洋生物资源数量、创造人与自然和谐相处的环境贡献河钢力量。

In January 2023, the “Wanshun 118” ship carrying ecological reefs successfully departed from Caofeidian Company of HBIS Logistics. The ecological reefs of this order would be freed into the Caofeidian sea area to restore the ecology and protect the environment of the waters surrounding Caofeidian, aiming to improve the quantity of marine biological resources and create an environment of harmony between man and nature with HBIS strength.

曹妃甸公司“万顺 118”轮离泊
“Wanshun 118” ship carrying ecological reefs successfully departs from the port

案例 Case

河钢南非矿业与克鲁格国家公园形成整体化生态系统
PMC, KNP develop a holistic ecological system for flora and fauna protection

河钢南非矿业在生物多样性保护方面积极作为，与克鲁格国家公园（KNP）保护区之间形成了动植物整体化的生态系统，并开展生物多样性管理计划（BAP），密切关注所处地区的自然环境和生物保护情况。2023年，河钢南非矿业实施反偷猎计划，在全矿区范围内安装影像收集系统，被诱捕的动物数量减少91%。

Palabora Mining Company (Pty) Ltd. (PMC), a subsidiary of HBIS Resources in South Africa, has taken the initiative to protect biodiversity, developed a holistic ecological system for the protection of flora and fauna in the belt between its plant area and the Kruger National Park (KNP) reserve, conducted the Biodiversity Action Plan (BAP), and paid close attention to the natural environment and biological conservation of the area in which it is located. In 2023, PMC implemented an anti-poaching plan and installed an image pick-up system covering the whole mining area, resulting in significantly reduced poaching incidents and a 91 percent reduction in the number of trapped animals.

矿区内出现的野生大象
A wild elephant in the mining area

矿区内出现的野生狒狒
Wild baboons in the mining area

矿区员工救助野生狮子
An employee of the mine is helping a wild lion

矿区内出现的斑马
A zebra in the mining area

未来展望
Future Prospect

锚定低碳，领跑未来。河钢集团将继续坚决贯彻习近平生态文明思想，秉承“人、钢铁、环境和谐共生”的绿色发展理念，把绿色低碳作为企业最重要的“幸福不动产”和“价值创造源泉”，以践行“双碳”战略为牵引，畅通“绿水青山”与“金山银山”双向转化通道，持续培育壮大厚植低碳、厚植未来的核心竞争力，释放更具引领性、更强竞争力的“绿动能”，让世界因绿色钢铁而更加美好！

To focus on low-carbon development is to secure a leading industry position in the future. Adhering to the green development idea of“harmonious coexistence of people, steel, and the environment”, HBIS will continuously and thoroughly apply Xi Jinping’s thought on ecological civilization, and take the green and low-carbon development as the most important “real estate for a happy life” and “source of value creation” of the enterprise. Following the strategy of carbon peaking and carbon neutrality, HBIS will smooth the two-way transitional channel between “lucid waters and lush mountains” and “invaluable assets”, foster the low-carbon and future-oriented core competitiveness, and unleash more forward-looking and more competitive “green momentum”, making the world a better place with green steel!

关键绩效
Key Performance Indicators

指标名称 Indicator	单位 Indicators	2021	2022	2023
环保总投资 Total investment in environmental protection	万元 RMB10,000	548,253	310,017	300,000
环保培训投入 Investment in environmental protection training	万元 RMB10,000	34.61	28.00	55.58
环保培训人次 Number of participants of environmental protection training	人次 Person-time	11,566	9,373	14,842
环保培训时长 Total hour of environmental protection training	小时 Hour	1,044	687	1340
环保培训次数 Number of environmental protection training	次 Time	169	203	585
新建项目环评通过率 EIA pass rate for new projects	%	100	100	100
废气污染物排放量 Waste discharge	吨 Ton	—	17,690.37	16,387.17
废水排放量 Discharge of wastewater	吨 Ton	7,777,561	8,731,405	8,142,117

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