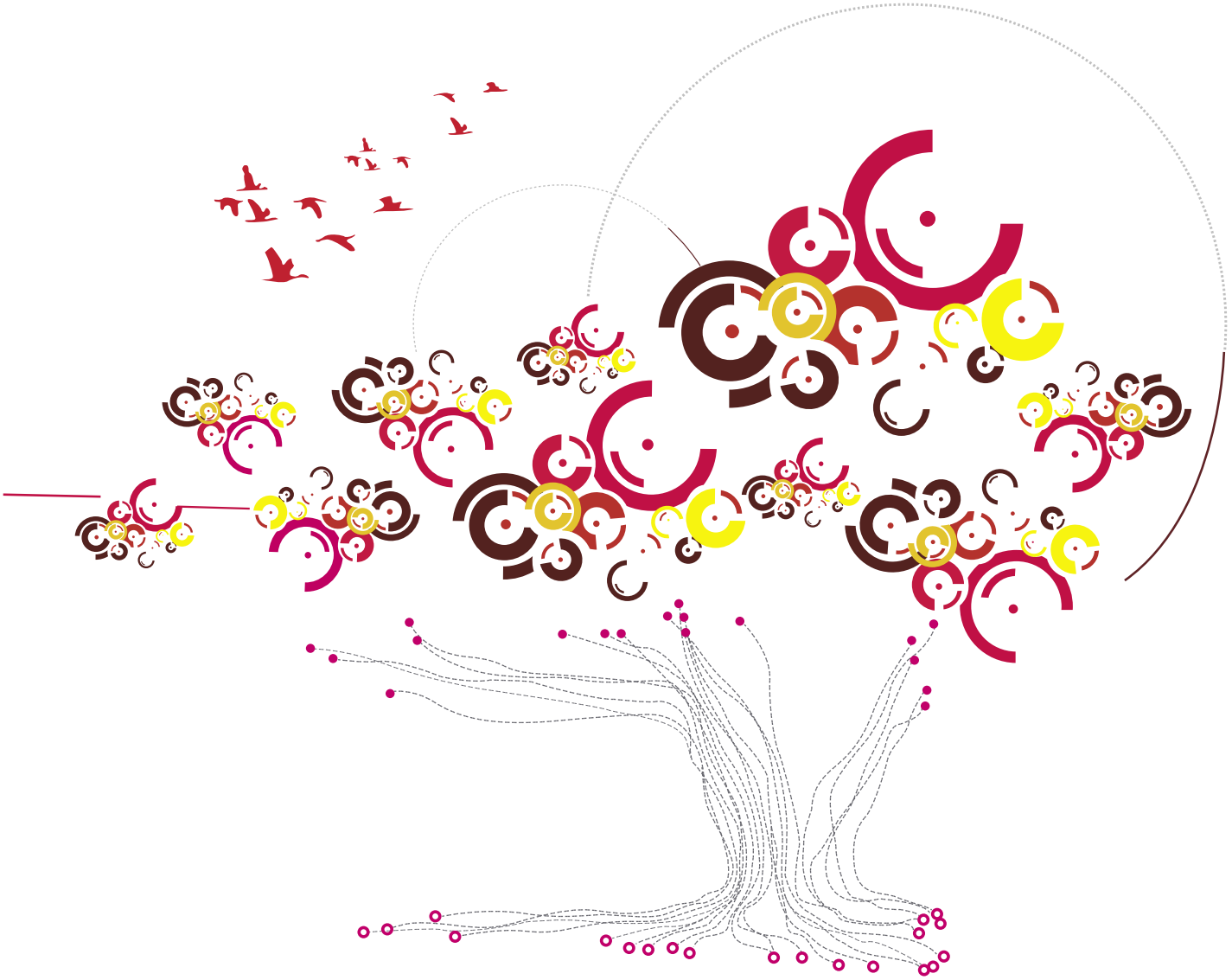
建设生态型钢铁企业
Construct an ecotype steel enterprise

环境报告 2003
ENVIRONMENTAL REPORT



宝山钢铁股份有限公司
BAOSHAN IRON & STEEL CO., LTD.

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Message from the Senior Management

近代社会以来，人类对地球资源的开发和利用，不仅导致部分自然资源面临枯竭，而且环境和生态遭到严重破坏，这成为威胁人类生存和发展的严峻问题。如何保证人类社会的生存和持续发展，是我们面临的巨大挑战。

钢铁产品由于本身具有优良的物理性能和极好的再生性能，成为现代社会大量使用的绿色材料。即便如此，生产过程所消耗的资源和能源数量依然巨大，产生粉尘、SO_2、NO_x、CO_2、VOC、废水等有害物质。钢铁企业的努力程度和绩效，对于环境保护十分重要。

中国钢铁企业正努力采用先进的生产和环保技术、工艺和装备，以实现更低能耗、更少污染。这是现在、以至将来很长时间内国内钢铁行业的必然趋势。

宝山钢铁股份有限公司从建厂之初，就十分重视生态环境的保护，不仅采用了当时国际先进的生产设施和环保装备，而且在25年来的建设和生产过程中，不断改进工艺技术，改善环境管理，持续提升环境绩效。1998年，公司率先在国内冶金行业，通过ISO14001环境管理体系认证；2002年，公司作为上海都市工业观光企业向社会开放，正式入围中国工业旅游示范点。

宝钢股份将一如既往地实践自己的承诺：坚持走新型工业化道路，在快速发展生产的同时，努力营造一流的生态环境。

董事长： 

总经理： 

董事长：谢企华
Chairwoman: Xie Qihua

总经理：艾宝俊
President: Ai Baojun

Since the dawning of modern society, the relentless exploitation of Mother Nature's resources has resulted in the exhaustion of some natural resources and detrimental impact upon ecosystem, which poses severe threats to human being's own survival and development. How to ensure the survival and sustainable development of the human society is the formidable challenge we have to take today.

With its fine physical properties and renewable nature, steel has become a green material in huge demand in the modern society. However, steel production consumes huge amount of energy and resources and generates in the process dust, SO_2, NOx, CO_2, VOC, and waste water and other harmful substances. Therefore, the effort and performance made in environmental protection by steel producers are of great ecological importance.

Steel enterprises in China are striving for a prospect of low energy consumption and minimized pollution by adopting advanced technologies, equipment and processes in production and environmental protection. This will undoubtedly be the dominating trend in the industry for the future.

Baosteel has attached great importance to ecological protection ever since its establishment. For the past 25 years, Baosteel has adopted the state-of-the-art facilities for steel production as well as environmental protection, and spared no effort in improving processing techniques, environment management as well as its eco-performance. In 1998, Baosteel was the first in China's steel industry to obtain ISO14001 certification in environmental management, and in 2002, Baosteel became an exemplary industrial tourist sites open to the general public.

Baosteel will consistently honor its promises by taking the road of enviroment-friendly industrialization, creating a first rate environment while providing more and better quality steel products.

Chairwoman: Xie Qihua

President: Ai Baojun

序　言
Foreword

宝山钢铁股份有限公司（以下简称“宝钢股份”）自建成投产以来，在向社会提供高品质钢材的同时，也时刻把保护环境作为追求目标。

作为一个资源和能源消耗都很集中的企业，宝钢股份生产经营活动与环境有着密切的关联。节约资源和能源，尽量减少环境负荷，是企业的社会责任。向社会公布环境方面的信息，表明我们对保护环境的诚意。通过发布环境报告，宝钢股份希望社会各界能够清楚地了解公司生产中所涉及的环境因素以及我们的做法和效果。

本版环境报告将对公司的历史和生产工艺作简要介绍，系统描述环境政策、环境因素、组织机构、资源和能源消耗、污染预防和控制、环境指标等环境方面的信息。

环境保护是增强企业竞争力，实现可持续发展的必要前提，我们深深懂得环境保护对于企业的意义。我们将定期出版环境报告，希望您给予支持和鼓励。

Ever since her birth, Baosteel has begun her quest of providing society with fine quality steel as well as protecting the environment.

As steel production is an energy and resource intensive process, Baosteel operating activities have close relationship with the environment. Saving energy and resources, and reducing environmental burden are the social responsibilities Baosteel willingly shoulder. This environmental report tells the social public what we are doing in this regard and shows our sincerity and commitment in environmental protection.

The report briefly introduces the Company history and production processes, and describes in a systematical way our environmental policies, environmental aspects, organizational structure, resources and energy consumption, pollution prevention and control, and some environmental index.

Environmental protection can boost corporate competitiveness and is conducive to sustainable development. It is with this understanding that we are publishing this report now and in a regular basis for the future. Your comments and suggestion is invaluable for us.

宝山钢铁股份有限公司地处上海市宝山区，厂区占地18.98平方公里，北依长江，东临吴淞口，水陆交通便捷。公司最初为国有独资企业—上海宝山钢铁总厂，2000年2月3日宝钢股份创立，同年12月12日在上海证券交易所上市。

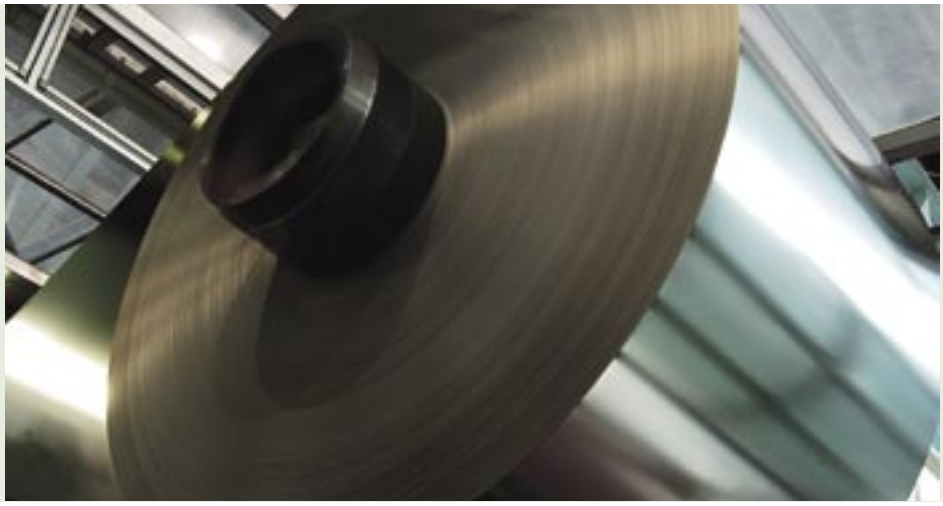
宝钢股份是中国特大型钢铁联合企业，始建于1978年12月23日，一期工程于1985年9月15日建成投产，二期工程于1991年6月建成投产，三期工程于2000年6月建成投产。

Baosteel with an area of 18.98 square kilometers is located in Baoshan District, Shanghai, adjoining Yantze River in the north, and Wusong Mouth in the east, convenient for land and water transport. The Company's predecessor was the state-owned Shanghai Baoshan Iron and Steel Works, which was turned into stock company in February 3, 2000, listed at Shanghai Stock Exchange on December 12 of the same year.

Baoshan Iron & Steel Co. Ltd, the largest integrated steel producer in China, started its construction on December 23, 1978. Phase I project was completed on September 15, 1985, Phase II in June, 1991, and Phase III in June, 2000.

公司基本情况	
固定资产	479.68亿元
员工人数	15325
2003年钢产量	1155万吨
2003年钢材销售量	1105万吨
2003年销售额	441.58亿元
2003年税后利润	70.14亿元

Basic Information of the Company	
Fixed assets	47.968 billion RMB
Number of employees	15325
Steel output 2003	11.55 million ton
Steel sales 2003	11.05 million ton
Sales revenue 2003	44.158 billion RMB
Net profit 2003	7.014 billion RMB



公司目前生产能力为年产钢1100万吨，主要生产工序有：烧结、炼焦、高炉、转炉、电炉、初轧、热轧、冷轧、钢管、线材，以及配套的电厂、制氧、能源介质、运输等辅助工序。

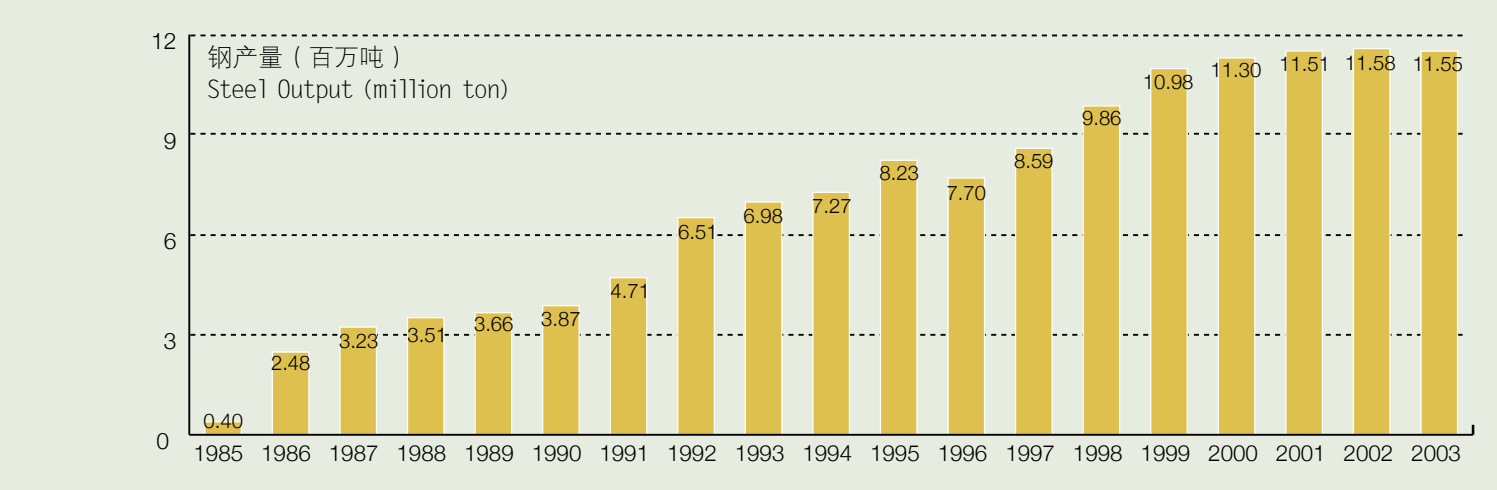
主要产品有热轧板卷、冷轧板卷（普冷板、镀锌板、镀锡板、彩涂板、电工钢）、无缝钢管、高速线材等，广泛应用于汽车、家电、锅炉、船舶、工程机械的制造，以及石油开采、油气输送等行业。

公司致力于生产和环境的协调发展，推行清洁生产，配套完善的环保设施，通过严格管理和全员参与积极推进环境改善。

The Company's annual steel capacity stands at 1.1 million tons. The production processes includes sintering, coking, BF, BOF, EAF, blooming, hot rolling, cold rolling, seamless tube, wire rod and auxiliary processes like power plants, oxygen plants, public utilities and transportation.

The main products are hot rolled sheets, cold rolled sheets (including galvanized, tin plate, color-coated, electrical steel), seamless steel tubes, high-speed wire rod, widely used in automobiles, household appliances, boilers, shipbuilding, machinery, oil exploration and oil and natural gas transfer.

The Company has been bent on well-balanced development of steel production and environmental protection by promoting cleaner production, installing a full set of pollution control facilities, enhancing management and stressing full involvement.



钢铁生产过程的环境因素
Environmental Aspects in Steel Production

2003年主要数据

购入的资源和能源		
种　类	单　位	数　量
铁矿石	万吨	1683.9
煤	万吨	1172.5
白云石、石灰石	万吨	319.3
重油	吨	2402
工业水使用	万立方米	5292

排放的主要污染物		
种　类	单　位	数　量
大气颗粒物	吨	8935
SO_2	吨	20602
COD	吨	621
油类	吨	29.1
氨氮	吨	21.0

Major statistics of year 2003

Resources and energy consumed		
Category	Unit	Volume
Iron ore	Million tons	16.839
Coal	Million tons	11.725
Dolomite, limestone	Million tons	3.193
Heavy oil	ton	2402
Fresh water	Million cubic meters	52.92

Major pollutants discharged		
Category	Unit	Amount
Dust	ton	8935
SO_2	ton	20602
COD	ton	621
Oils	ton	29.1
NH_3-N	ton	21.0




环境政策
Environmental Policy

公司将环境保护作为企业管理的重要内容，我们的环境方针是：
“控污染、节资源、兴利用，建设生态型钢铁企业”
并做出以下承诺：

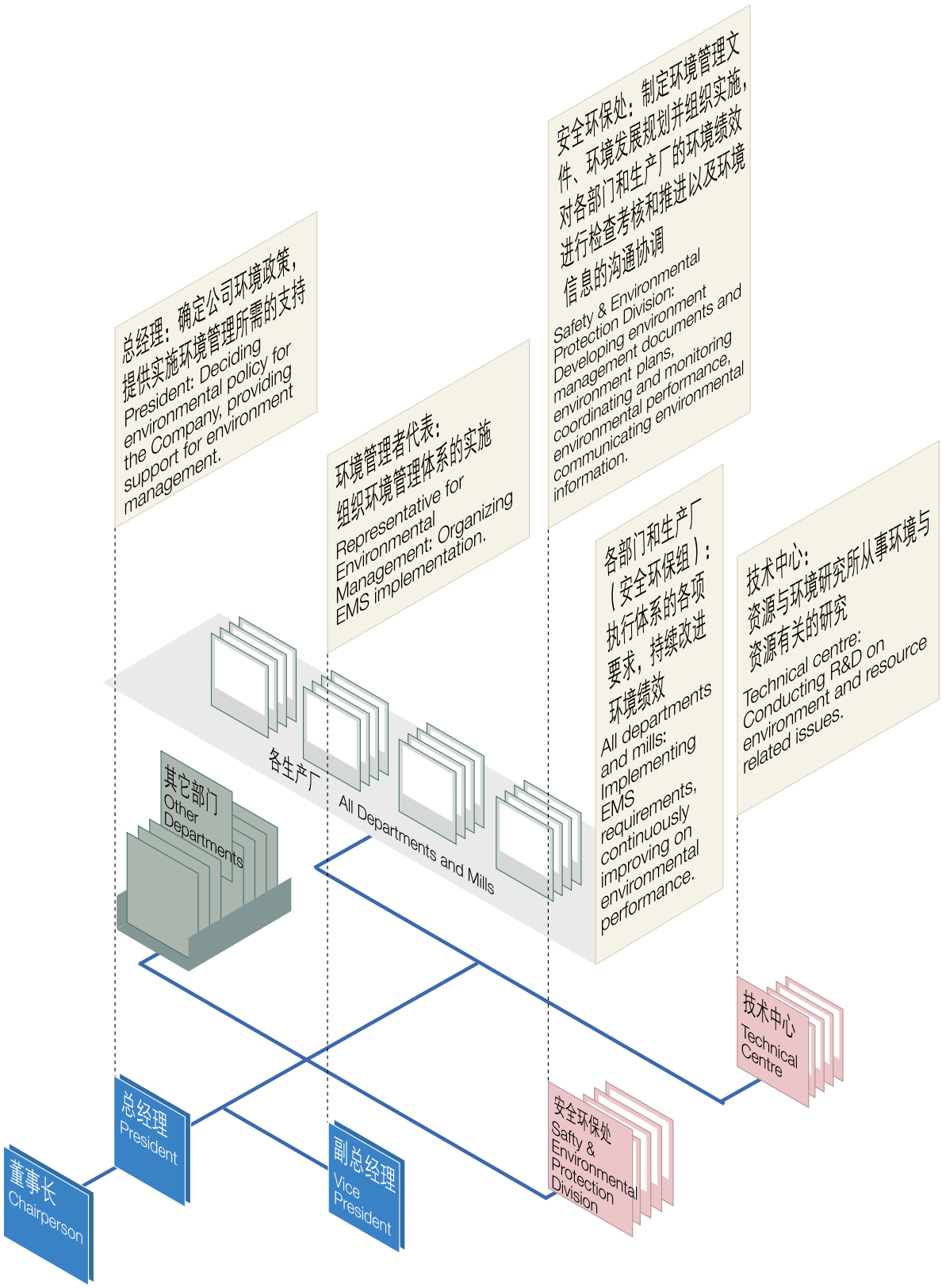
- 从原燃材料、设备、物资的采购，到钢铁冶炼、产品制造、成品外运全过程预防和控制污染，各阶段努力减轻环境负荷，实现持续改进。
- 不断改进工艺，节省资源、能源，推进废物综合利用，推进清洁生产。
- 严格遵守国家和地方的各项环保法律、法规。
- 全员行动建设生态型钢铁企业，与国际社会合作，促进环境保护。

Construct an ecotype steel enterprise through pollution prevention, resources and energy conservation and waste recycling.

Baosteel considers environmental protection to be the essential part of the managerial task. Our environmental policy is summed up as: “Construct an ecotype steel enterprise through pollution prevention, resources and energy conservation and waste recycling.” We make the following commitment:

- Constantly implementing and improving full-process pollution prevention and control from procuring of fuels, raw materials and equipment, to the production and transportation of steel products to reduce environmental burden;
- Constantly improving processes, saving resources and energy, promoting waste reutilization and cleaner production;
- Strictly complying all national and local environment protecting laws and regulations;
- Constructing an ecotype steel enterprise with all stuff involved and joining hands with international communities to promote environmental protection.

组织机构和职责
Organizational Structure and Responsibilities



体系审核
EMS Audits

公司于1996年9月成立了工作小组，按照ISO14000标准建立了环境管理体系，1998年1月在国内冶金行业首家获得ISO14001环境管理体系的认证。

1998年以来，公司每年组织内部体系审核2次，并接受外部组织的监督审核1次，每3年接受外部组织的换证审核1次。

2003年，公司识别污染控制、综合利用、节材、节能4个方面的环境因素5032个，确定重要环境因素570个。145个重要环境因素制定了目标、指标，采取立项改造方式进行控制，其余425个重要环境因素通过运行程序、应急预案得到有效控制，一般环境因素也通过作业指导书进行了控制。

In September 1996, a work team was set up to construct EMS (Evironmental Management System) according to ISO14000 standards under direct instruction of the President. In January 1998, the Company became the first steel producer in China to obtain ISO14001 certification.

Since 1998, the Company has held the internal EMS audit twice a year and the external audit once a year and the external re-certification audit once every three years.

Up to 2003, 2,035 evironmental aspects in such aspects as pollution control, waste reutilization, resources and energy conservation have been indentified, among which 570 factors were marked as important aspects. Objectives, targets, programs have been established to improve 145 factors; the rest 425 factors are brought under effective control through process control and contingency plans. Other ordinary environmental aspects have also been addressed through operation manuals.

员工培训
Staff Training

为保证内部审核的质量，公司邀请专家讲学，目前共培训内部审核员220名。

培训中心每年分别针对管理者、操作者和技术人员，组织环境法律法规、公司环境管理制度、环保技术等方面的培训课程，并鼓励个人根据需求报名参加相应的培训。公司在内部网站上发布环境管理制度、环境技术等资料，方便员工学习。

To ensure the quality of internal audits, the Company invites experts to give lectures and now has 220 trained interanl auditors.

Every year, the Education Center organizes training courses on environmental laws and regulations, EMS and environmental technologies, designed specifically for administrators, operators and technicians. Individuals are encouraged to enter for trainings according to their need. EMS documents and environmental techniques are made available on the intranet for the convenience of study.

环境法规识别与遵守
Regulation Compliance

公司安全环保处负责收集整理与公司有关的环境法律法规和标准，并及时修订公司管理文件，以保证公司的生产经营活动符合法规要求。每年的环境管理体系评审中对环境法律法规的符合性进行评价。

为了更好地保护环境，而不是仅仅符合法规的要求，公司制定了污染物排放内部控制标准，作为项目设计的依据和日常环境管理的要求。

The safety and environmental protection division is responsible for collecting, assorting and issuing environmental laws, regulations and standards relevant to the company on the company intranet. EMS documents are modified in a timely manner to guarantee compliance. Compliance assessment is conducted in the annual EMS audit.

In order to better protect the environment, the Company enacts internal control standards stricter than that by the government for pollutant discharge to guide project designs as well as routine environmental management.

环境检测
Environmental Monitoring

公司的环境检测可分为厂区环境空气质量检测、车间空气质量检测、烟囱排放检测、排放水检测、无组织排放检测等。

目前，在厂区内和厂区边界上设有5个大气自动检测子站，主要检测项目为SO_2、NO_x、TSP、CO，通过公司媒体向社区发布宝钢空气质量状况。同时在厂区内按区域分布设置了18个降尘测点，及时了解厂区的环境情况。

各废水排放点所属的生产车间建有化验室，对排放的废水进行日常检测，以保证达标排放。废水排放点安装流量计，并在线检测pH值和浊度。

2003年度政府环保部门抽查的污染物排放因子全部达到法律法规的要求。

公司正在计划完善重点污染源在线检测系统，以更好地控制污染，提升环境质量。

2003年人工检测情况

类　别	检测因子数量（次）
烟囱排气	1037
废　水	5760
大气环境	569

The environmental monitoring of Baosteel consists of ambient air quality test in the plant, air quality test in workshops, stack emission test, waste water discharge test and fugitive emission test.

For the time being, five automatic ambient air monitor sub-stations are set up inside and on the boundary of the plant, with SO_2, NO_x, TSP and CO as major test items. Baosteel ambient air quality report is announced through corporate media. In the meantime, 18 dust-falling test points are set up to assess air quality within the plant.

Laboratories are equipped in every workshop with wastewater discharge points to conduct daily tests, ensuring that discharge standards are well met. Instruments are placed in the wastewater discharge points to test online the pH value, the flow rate and turbidity.

In 2003, the pollutant discharge factors sampled by government authorities all met the regulation requirements.

The company is now planning to improve the online monitor system at major pollution sources for better pollution control and environment quality.

Manual tests conducted in 2003 are as follows.

Type	Numbers of test factors
Stack emission	1037
Waste water	5760
Ambient air	569

环境投资
Environmental Investment

公司建厂以来，致力于保护生态环境，坚持环保设施和生产设施同步设计、建设和运行。在一、二、三期工程中，公司在环保有关设施上总计投资了43.4亿元，约占总投资的5%。建成环保设施316套，其中除尘器219套，水处理设施64套，固体废物处置和利用设施26套，其它环保设施7套。

为保证环保设施正常运行，并不断提高运行效果，公司每年投入资金进行环保设施改造。1996年以来共实施环保设施改造284项，其中水方面56项，大气方面204项，固体废物方面12项，其它方面12项，总计投入资金4.3亿元。

2003年宝钢股份环境改造项目	
大气环境	原料区域除尘器改造
	原料场洒水装置改造
	石灰窑除尘系统改造
	炼钢电除尘改造
	电厂在线烟气检测系统更新
	铁合金仓库增设除尘系统
	钢管电除尘改造
	钢管修磨增设除尘器
水环境	热轧水处理系统增设撇油装置
	冷轧废水处理后回用
	增设船舶废水接收装置
	钢管废水处理系统改造

Since its establishment, Baosteel has been dedicated to environment protection, insisting in synchronized design, construction and operation of environmental facilities with production facilities. During the three phases of construciton, Baosteel has invested 4.34 billion RMB in total in facilities relevant to environmental protection, about 5% of the total investment. 316 environmental facilities have been constructed, including 219 dust collectors, 64 water treatment facilities, 26 solid waste processing and utilizing facilities and 7 other environmental facilities.

In order to guarantee the normal functioning of environmental facilities and constantly improve the operation performance, the Company conducts on-going renovations. Since 1996, 284 revamping projects of environmental facilities have been carried out, with 56 items in water, 204 items in air, 12 items in solid waste and 12 items in other areas. The investment amounts to 430 million Yuan.

Baosteel revamping projects in environmental protection in 2003	
Air quality improvement	revamp dust collectors in raw material yard
	revamp watering spraying system in raw material yard
	revamp dust collectors at lime kiln mill
	revamp EP for converter gas dedusting
	replac on-line fume monitors at power station
	add dust collector in ferroalloy warehouse
	revamp EP at the steel tube mill
	install additional dust collectors at steel tube grinding station
Water quality improvemnet	adding oil skimming devices to the waste water treatment system in the hot-rolling mill
	reutilize treated waste water from the cold-rolling mill
	add wastewater receipt devices for watercrafts
	improve tube mill wastewater treatment system

改善大气环境质量
Air Quality Improvement

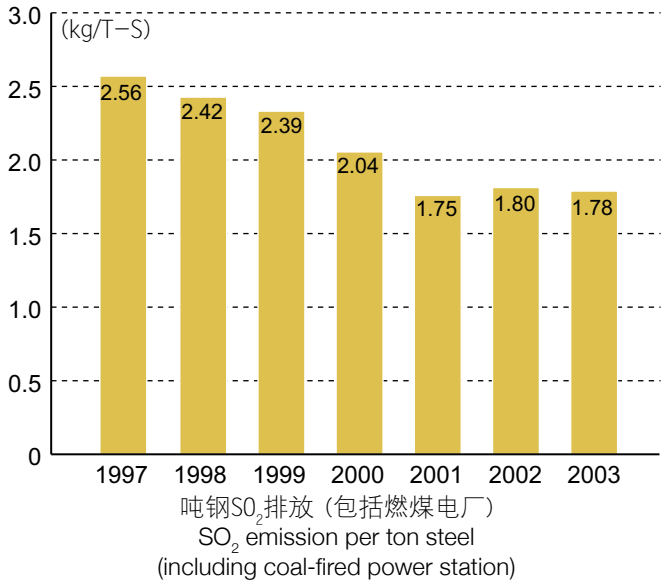
对于钢铁企业，大气污染的预防和控制是环境保护工作的重点内容。通过采用清洁的燃料和先进的装备，减少了大气污染物的产生量，并采用完善的污染治理设施，使污染物的吨钢排放量逐步下降。

燃煤电厂是SO_2的主要排放源，通过使用低硫煤控制SO_2排放量。为了进一步消减SO_2排放，公司已经在2#发电机组引进国际先进的石灰石-石膏法烟气脱硫技术，该项目计划于2005年7月投入运行。

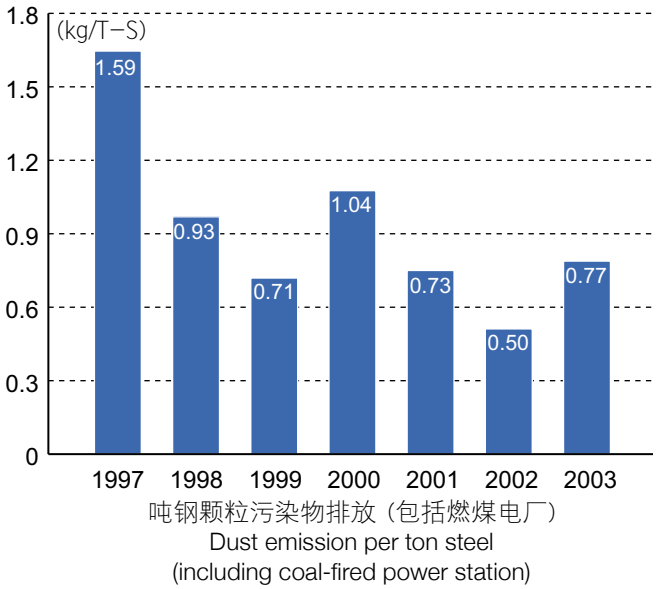
炼焦产生的焦炉煤气是热值高的优质燃料，但是富含H_2S。公司三座焦炉的副产煤气在供用户之前，都进行了高效脱硫，以减少SO_2排放。焦炉煤气的实际脱硫效率大于98%。分离出的硫分用于生产硫氨或硫酸。

NO_x来源于燃烧过程，公司目前主要采用低氮燃烧技术减少NO_x的生成。燃煤发电机组、全燃高炉煤气联合循环燃气轮机发电机组，以及热轧厂的加热炉等采用了这类技术。

作为冶金企业，粉尘污染的预防和控制始终是环境保护的重要内容。为了控制粉尘污染，公司建厂以来共安装了268台除尘器，包括高效的布袋除尘、电除尘和文丘里除尘器，目前除尘器处理能力总计为84万m^3/min。



吨钢SO_2排放（包括燃煤电厂）
SO_2 emission per ton steel
(including coal-fired power station)



吨钢颗粒污染物排放（包括燃煤电厂）
Dust emission per ton steel
(including coal-fired power station)

For iron and steel enterprises, prevention and control of air pollution is the major part of environmental protection. The adoption of clean fuel and advanced equipment reduces the amount of air pollutants and the complete pollution control facilities bring out gradual decrease in the amount of pollutant discharge for per ton steel produced.

Since coal-fired power station is a major source of SO_2 emission, low-sulfur coal is used. In order to further reduce SO_2 emission, Baosteel has introduced the internationally advanced limestone-plaster flue gas desulfurization (FGD) technology into No.2 power unit due for operation in July 2005.

Coke gas generated in coking process is a fuel with high calorific value, but rich in H_2S. Before delivered to end-users, the coke gas from Baosteel's three coke batteries has been desulfurred with the desulfurization rate of over 98%. The isolated sulfur is used in the production of ammonium sulphate and vitriol.

NO_x is generated in the combustion process. The Company now mainly adopts low-nitrogen combustion technology to reduce NO_x. Such technology is employed in coal-fired power units, BF gas turbine power units and reheating furnace of the hot-rolling mill.

For a metallurgical enterprise, prevention and control of dust pollution is always an important part of environmental protection. In order to control dust pollution, Baosteel has installed 268 dust collectors, including efficient bag filters, EPs and ventury wet type dust collectors. Currently the total capacity of dust collectors is 840 thousand m^3/min.

除了安装除尘器，公司采取了其它措施以控制无组织粉尘的逸散。

- 在原料场采取了料堆顶部削平、洒水、喷洒表面凝固剂、设置洗车台、改进皮带清扫器等措施；
- 占厂区面积42.5%的绿地有效地起到阻风挡尘效果；
- 厂内物料输送皮带全部加盖密封，积尘地面及时冲洗；
- 车辆自动冲洗减少扬尘，采用新型清扫车清洁道路；
- 除尘灰等粉料采用真空吸引压送罐车密封运输；
- 土方施工现场对运输车辆清洗，避免带出泥土污染路面；
- 厂内其它尘源也采用了封闭、洒水、冲洗等对应措施；
- 通过先浸泡，后倾倒的工艺改进，从根本上消除了铁水渣倾倒时产生的扬尘。

通过采取各种措施，并加强管理，厂区环境空气年均总悬浮微粒浓度（TSP）达到国家环境空气质量二级标准。

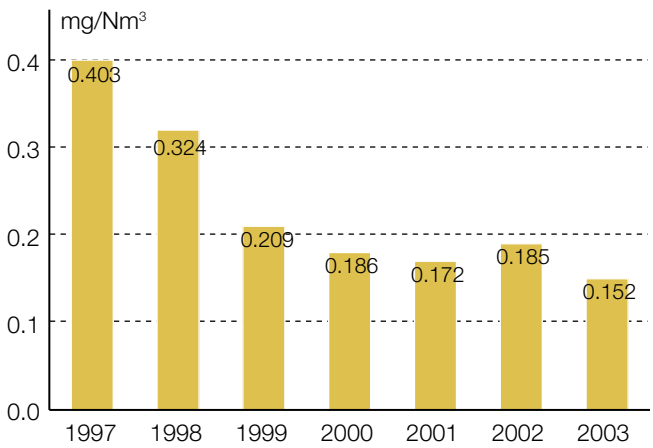
为增进与周边居民的交流，更好地保护环境，减少对社区的环境影响，公司邀请当地的居民参观厂区，并认真听取他们的意见和建议。

Apart from installing dust collectors, Baosteel has taken other measures to control the fugitive dust.

- In the raw material yard, measures such as pile top chopping, water spraying, spraying surface concretion glue, setting vehicle washing station and improving belt cleaners are taken;
- Greenery which occupies 42.5% of the factory area functions as effective windshield and dustproof;
- Material conveyer belts in the factory are covered and sealed, and dust deposited on the ground is cleaned in time;
- Automatic vehicle washing reduces fugitive dust and better road cleaning cars are used;
- Collected dust is drawn by vacuum to sealed tank cars for transport;
- Vehicle out of earthwork construction field are washed to prevent dirt carry-out;
- Measures such as sealing, spraying and flushing are taken for other dust sources in the factory;
- Dust pollution while dumping molten iron pretreating slag is effectively eliminated with the improved process of soaking before dumping.

Now, the yearly average total suspended particles (TSP) in the plant area meets national level-2 air quality standards.

In order to better protect the environment and reduce environmental impact upon surrounding communities, Baosteel invites nearby residents to visit the plant and seeks their comments and suggestion.



厂区空气总悬浮微粒（TSP）数据
Total suspended particles in the factory (TSP)

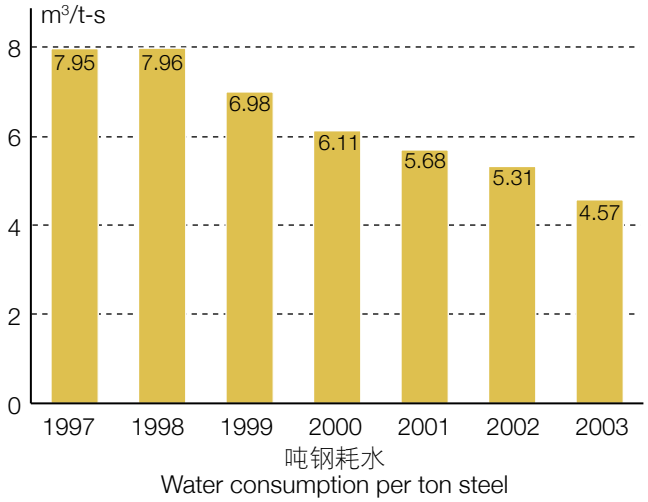
水资源使用和排放
Water Consumption & Discharge

2003年公司取用新水5292万立方米，2003年公司吨钢耗新水4.57m³/t-s。

钢铁生产消耗大量的水资源。通过循环使用、在不同工序间按水质串接使用以及将处理后的废水回用，可以提高水资源的利用效率，进而减少消耗。通过技术改造和严格管理，公司吨钢耗水量从1997年的7.95m³/t-s降到2003年的4.57m³/t-s。

In 2003, fresh water used by Baosteel amounted to 52.92 million m³, equal to 4.57 m³/t-S.

Steel making consumes a great deal of fresh water. By circulatory use, serial use along different processes, and reuse of treated wastewater, the recycling ratio can be improved, and water consumption decreased. Through technology innovation and strict management, the water consumption per ton steel in the company reduced from 7.95 m³/t-s in 1997 to 4.57 m³/t-s in 2003.



吨钢耗水
Water consumption per ton steel

公司生产过程水资源的使用和处理主要分为两部分：冶炼系统和轧钢系统。冶炼系统产生的废水按水质等级串接使用，最终实现零排放。

例如高炉水系统：

炉体净循环冷却 → 炉缸洒水冷却 → 煤气洗涤水系统 → 水渣冲制系统

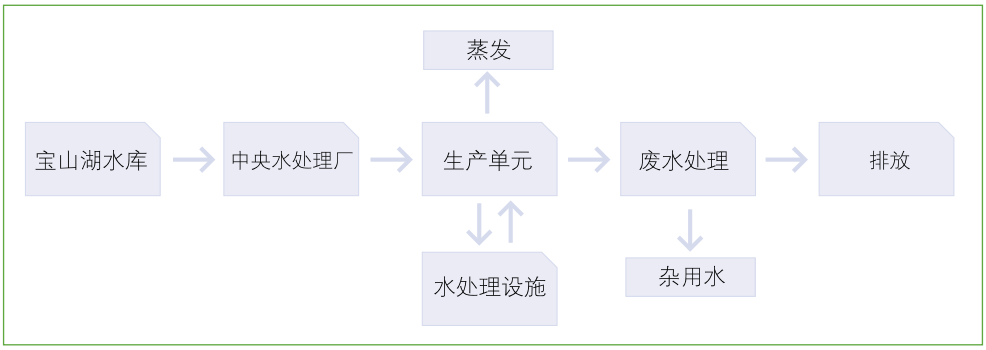
轧钢系统典型流程如下：

轧钢系统废水 → 串接水管 → 二个含油废水集中处理设施 → 原料洒水等

许多生产单元都自有水处理设施，尽量自循环使用。全公司水循环利用率达到97.6%。部分系统外排水在各单元设置的废水处理设施中（气浮、混凝、沉淀、化学氧化还原等）处理后达标排放，从围厂河最终排入长江。

2003年外排废水中污染物浓度COD为49.8mg/L，油为2.3mg/L 。

水资源使用流程图：



2004年8月，原先处理后排放的部分冷轧废水经深度处理后将被回收、利用。同时推进在宽厚板、高炉、炼钢区域采用处理后的废水作为杂用水，以替代新水，并减少外排废水量。

The use and treatment of water during the manufacture process fall mainly into two parts: smelting system and steel rolling system. The former adopts serial use of the wastewater based of different water quality and has realized zero discharge. Take blast furnace water system as an example:

furnace body circulatory cooling → furnace crucible spray cooling → gas washing → slag flushing

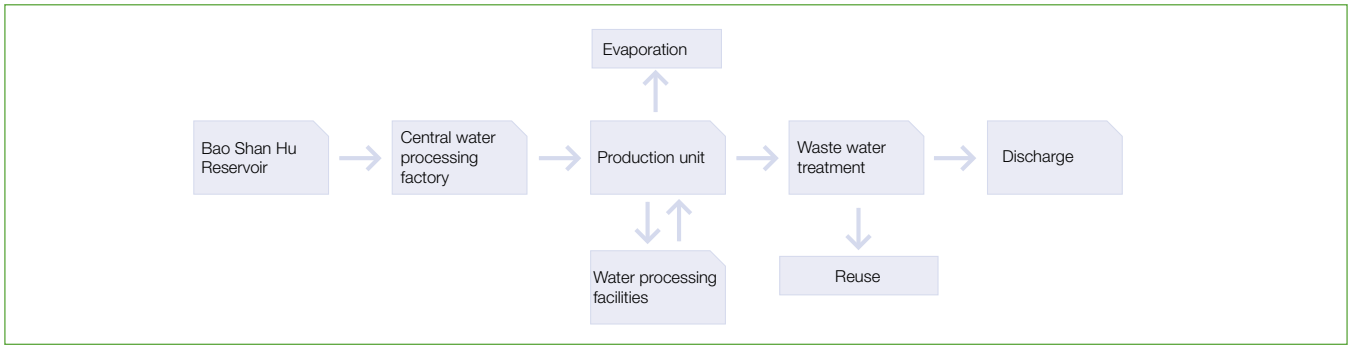
The typical water flow in the steel rolling system is as follows:

steel rolling waste-water treatment → connection pipe → two treatment centres for oil-water → raw material sprinkling, etc.

Water processing facilities are installed in many production units to realize water circulation. The recycling ratio of water in the company reaches 97.6%. Waste water is treated with certain methods such as floatation, coagulation, sedimentation, chemical oxidation and reduction, etc. to meet standards before being discharged into the channel and then to the Yangtze River.

In 2003, the average COD concentration of discharged waste water is 49.8 mg/L, and oil concentration is 2.3 mg/L.

Water usage in Baosteel is illustrated in the following diagram:



After Augest 2004, treated wastewater from the cold-rolling mill, which was discharged in the past will be reused after further treatment. Meantime, some other treated wastewater will be used in the areas of the heavy plate mill, blast furnace and steel-making mill to replace fresh water and reduce waste water discharge.

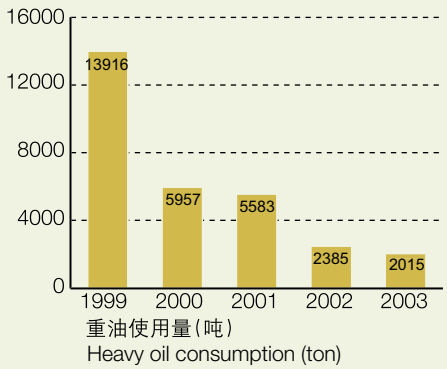
能源使用和节约
Energy Consumption & Conservation

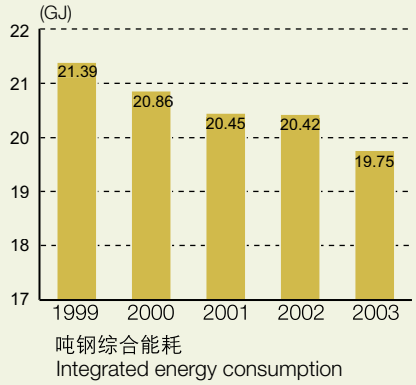
钢铁企业是能源密集型产业，2003年公司消耗的能源总量为$2.28x10^8$ GJ。外购能源中煤炭约占99％。

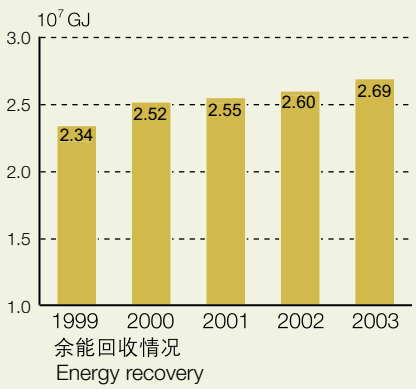
公司能源委员会定期举行会议，讨论提高能源利用效率、完善能源回收设施，制定中期和长期的节能计划。通过技术改造和提升能源管理水平，公司1999年~2003年，吨钢综合能耗下降了7.66％。

公司重视副产煤气的综合利用，以提高能源的利用效率。焦炉煤气已实现100%利用，并部分供应附近居民生活使用。高炉煤气用于发电以及各类加热设备，目前放散率仅为0.13％。转炉煤气采用OG和LT两种方法回收，回收率均在100m^3/t-S以上。

公司注重余压余热的回收利用，2003年余能回收总量为$2.69x10^7$ GJ，占公司能源购买量的12％。







Steel production is an energy intensive industry. In 2003, energy consumed in Baosteel amounted to 2.28×10^8 GJ. Coal accounts for 99% of the outsourced energy.

The Company energy committee holds regular meetings to discuss how to improve the energy efficiency and revamp energy recovery facilities and to make mediate-term and long-term energy-saving plans. Through technology renovation and improvement in energy management, the integrated energy consumption per ton steel decreased by 7.66% from 1999 to 2003.

The Company attaches great importance to comprehensive use of the by-product gas in order to improve energy efficiency. Coke battery gas has been 100% utilized and partly supplied for residential use in nearby region. BF gas is used for power and heat generation with a discharge rate of only 0.13%. Converter gas is treated through OG and LT processes with a recovery rate over $100 m^3/t\text{-}S$.

The company also pays attention to recovery energy from residue pressure and heat. In 2003, recoveried energy reached 2.69×10^7 GJ, 12% of energy purchase.

先进的节能生产工艺、完善的能源回收设施是减少能源消耗的必要条件。公司从建厂以来就致力于能源节约与温室气体减排的工作，这方面的主要措施有：

采用省能的钢铁流程	提高连铸比。公司300吨转炉连铸比为78.58％，250吨转炉及150吨电炉100%全连铸。
	推进连铸坯热送热装，2003年热装比75.9％，热装温度大于500℃。
优化能源管理	能源中心对能源在各个生产工序的使用做最优化的规划和调度，有效提高能源利用效率，并降低能源成本。
提高成材率	2003年钢铁综合成材率为92.6％，比2002年提高0.5个百分点。
加强能源回收利用	烧结烟气余热利用。公司在二期烧结工程中，回收利用烧结机的烧结烟气和环式冷却机废气的余热。2003年余热锅炉实际蒸汽产生量为66.5kg蒸汽/吨烧结矿，年回收能量9.24x10^5 GJ。
	干法熄焦。从焦炉出来的红热焦炭，采用氮气循环冷却，通过热交换将多余的热量生产蒸汽发电。目前公司3座焦炉全部采用干法熄焦技术。2003年回收能源1.01x10^7 GJ。
	高炉煤气采用余压发电设施， 2003年回收能源3.36x10^6 GJ。
实施节能新技术	1997年引进燃气–蒸汽联合循环热电装置，使用低热值的高炉煤气作为燃料，避免了高炉煤气的放空燃烧，节约了能源，同时采用低氮氧化物燃烧技术，减少污染物排放。2003年发电量8.6亿千瓦小时。
	2003年通过对钢包烘烤器进行蓄热式改造，节约焦炉煤气46.8%。

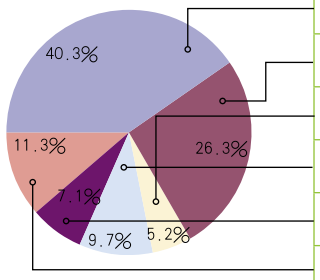
Advanced energy-saving technology and perfect energy recovery facilities are key to reducing energy consumption. Since its establishment, Baosteel has been dedicated to saving energy and reducing greenhouse gases with effective measures as follows:

Adopting energy-saving processes	Increase continuous casting ratio for 300-ton converter to 78.58%, and 100% for 250-ton converter and 150-ton EAF;
	Promote hot loading of cast. In 2003 the hot loading rate reached 75.9% with the loading temperature over 500°C;
Optimizing energy management	Energy management centre optimize energy usage in different units to improve energy efficiency and reduce cost;
Improving yield ratio	The comprehensive steel yield ratio was 92.6% in 2003, 0.5% increase over 2002.
Enhancing energy recovery	Energy recovery from sinter fume. A boiler is installed at Phase II sinter unit to produce steam from waste heat of sintering fume and circular sinter cooler exhaust. In 2003, the steam produced reached 66.5 kg steam per ton sinter, 9.24×10^5 GJ.
	CDQ (Coke dry quenching). The red hot cokes from coking batteries are cooled with circulating nitrogen, and the heat from heat exchanger was used to generate power. CDQ technique is employed in all the three coking batteries now and the energy recoveried reached 1.01×10^7 GJ in 2003.
	Residue pressure of BF gas is used to generate power as 3.36×10^6 GJ in 2003.
Implementing energy-saving technology	In 1997 the advanced combustion gas turbine power units using low-heat BF gas as fuel ware introduced in Baosteel to prevent the BF gas from discharging into the air after burning. At the same time, the technology of low-nitrogen oxide combustion greatly reduces pollutant discharge. Power generated with this technology was 860 million kwh in 2003.
	In 2003, by installing regenerative burner system for ladle baking in steel making mill the consumption of coking gas has reduced 48% than before.

固体废弃物处理和利用
Solid Waste Recycling & Deposal

钢材的生产过程会产生许多固态和半流动性的废物。2003年公司固体废物的产生量为630万吨，吨钢排放量为：0.55t/t-S。其中钢渣和高炉渣占总量的66.7%，污泥和粉尘占16.8%，粉煤灰占5.2%。

2003年各类固体废物的利用途径如下表：

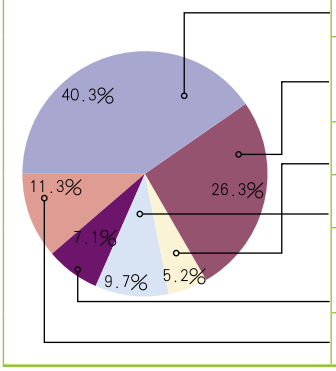


种　类	利用量（万吨）	主要利用方式
高炉渣	254	磨细替代水泥
钢渣	166	回烧结利用、回填、筑路、建筑材料、水泥原料
粉煤灰	33	商品混凝土原料、回填料
污泥	58	回烧结利用，水泥原料
粉尘	44	回生产利用，水泥原料、外销给其他钢厂原料
其他废物	63	分选后分别处理、利用

对这些废物进行合理的处理和利用，可以节约资源，减轻环境负荷。经过多年的实践，公司形成了系统的废物处理和利用工艺。

Large quantities of solid and semi-fluid wastes are generated in the steel manufacture process. In 2003 Baosteel produced 6.3 million tons of solid wastes, 0.55t/t-S. Steel slag and BF slag occupy 66.7% of the total, sludge and dust 16.8% and coal ash 5.2%.

Usages of solid wastes in 2003 are in the following forms:



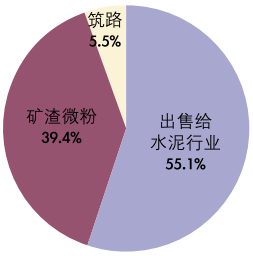
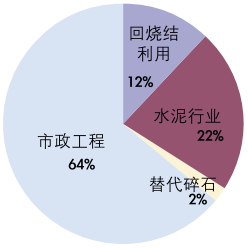
Type	Utilizated volume (million ton)	Major usage
BF slag	2.54	Ground fine to replace cement
Steel slag	1.66	Recycled in sinter plant, backfilling, road building, construction material and raw material for cement
Coal ash	0.33	Used as raw material for concrete and backfilling material
Sludge	0.58	Recycled in sinter plant and as raw material for cement
Dust	0.44	Recycled in production and as raw material for cement, and sold to other steel mills.
Other waste	0.63	Disposed or utilized after separation and selection

Proper utilization and deposal of the wastes can save resources and reduce the environmental burden. After years of practice, Baosteel has established systematic technology in waste deposal and utilization.

厂内利用

烧结厂是主要的厂内废物利用场所，所利用的固体废物有除尘灰、含铁污泥、石灰石清洗污泥、粉化的钢渣等。采用粉煤灰制成钢水保温剂，除尘灰作为铁水脱硅剂，除尘焦粉用于高炉喷吹等厂内利用途径也取得了良好的环境和经济效果。

2003年，公司内部利用的固体废物为146万吨，占发生量的23.2%。

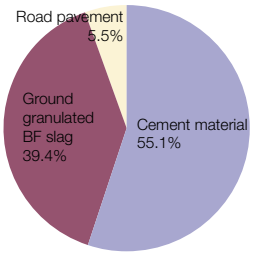
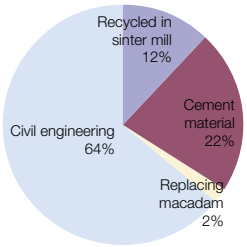
高炉渣  	高炉冶炼产生的高温液态渣经过水淬后成为高炉水渣，发生量约占到公司固体废物总量的40.3%。 高炉水渣磨细后可以部分替代水泥作为混凝土原料，替代比例可以达到70%。矿渣微粉混凝土光洁度高、后期强度高，耐侵蚀，广泛用于海洋工程、大型基础工程、高层建筑、机场、道路等。 2000年建成年产50万吨的水渣磨细生产线。公司矿渣微粉已应用于上海磁悬浮工程、卢浦大桥、上海科技馆以及隧道等工程。水渣磨细生产线二期扩建工程于2003年10月建成，总计生产能力达到100万吨/年。 少量空气冷却的高炉渣作为路基材料应用于市政工程，或用于制作矿渣棉。
钢渣  	钢渣的发生量约占到公司全部固体废物的26.3%。转炉炼钢过程产生的钢渣，主要成分为硅、钙、铁。采用磁选方法分离钢渣中的渣和铁，铁块在厂内作为废钢资源使用，余下的钢渣采用多种途径进行厂内和厂外利用。 公司开发了滚筒法钢渣处理技术。高温液态钢渣倒入滚筒后，急速冷却、破碎，同时完成渣与钢的分离。该种工艺占地少，污染小，处理后的钢渣稳定性好，可直接用于公路路基、修筑堤坝、制作钢渣砖等。
粉煤灰利用	电厂采用煤作为燃料。2003年共产生粉煤灰33万吨，大部分磨细后作为混凝土原料，少部分用于筑路和回填。
冷轧废酸的处理	公司有三条冷轧生产线，钢板的清洗会产生大量含铁废盐酸，全部采用焙烧的方法生产盐酸和氧化铁粉。盐酸回用于生产，氧化铁粉则出售用于制作铁磁性材料。
炼焦副产煤气的处理和利用	炼焦过程产生的荒煤气配套了系统的焦炉煤气精制设施，通过冷却、洗涤除去H_2S等有害物质，将清洁煤气作为能源供给用户。分离出的化学物质再加工成各种市场畅销的化工产品，消除污染，节约资源，同时取得了经济收益。煤气的处理和化工产品生产由宝钢集团的子公司—化工公司负责运营。

Internal utilization

Sinter plant is the major place in the factory to recycle solid wastes like collected dust, ferrous sludge, limestone washing sludge and pulverized steel slag.

Coal ash is used to make thermal insulator for molten steel, collected dust is used as desilicon flux for molten iron and collected coke dust is injected into blast furnace. All these usages have achieved good environmental performance and economic returns.

In 2003, the Company utilized 1.46 million tons of solid wastes, 23.2% of the total.

BF slag 	Molten slag from blast furnaces turns into granulated slag by water quenching, accounting for about 40.3% of the solid wastes generated in Baosteel. Ground granulated BF slag can replace 70% cement as a raw material in making concrete, which featured high smoothness, anaphase strength and erosion resistance. It is widely used in ocean projects, large infrastructures, high-rise buildings, airports, roads and so on. In 2000, a slag grinding line was built with an annual capacity of 500 thousand tons. The product is used in Shanghai magnetic suspension railway project, Lupu Bridge, Shanghai Science and Technology Museum and tunnel project. The Phase II expansion was completed in October 2003, increasing the production capacity to 1 million tons a year. Air-cooled BF slag are either used as roadbed material for civil projects or used to make slag cotton.
Steel slag 	Steel slag occupies 26.3% of the total solid wastes generated in the Company, mainly containing silicon, calcium, and iron. Magnetic selection is used first to separate slag and iron. Iron blocks can be used internally as scrap and slag is utilized in different ways. Baosteel has developed the rotating drum technique to treat steel slag, that is, pour the high-temperature liquid steel slag into a drum for quenching and crushing and separating. This technology requires little area and produces little pollution. The steel slag treated possesses high stability and can be used for roadbed, bank building and brick making.
Usage of coal ash	The power station takes coal as fuel and produced 330,000 tons of coal ash in 2003. The majority of it is used to make concrete and the rest for road building and backfilling.
Recycling of waste acid from the cold-rolling mill	There are three cold-rolling mills in the company. During steel sheet cleaning, a large quantity of waste ferrous hydrochloric acid is generated and is made into hydrochloric acid and ferric oxide powders through burning. The former can be used again in manufacture while ferric oxide powder is sold to make ferromagnetic material.
Treatment and utilization of coking by-product gas	Crude gas from coking batteries is refined into clean gas as energy resource after the cooling and rinsing process to eliminate H_2S and other harmful substances. The separated chemicals are reprocessed into popular chemical products. By doing this, pollution is prevented, resources are saved and economic returns are achieved. The Chemical Company, a subsidiary of Baosteel group is engaged in the gas processing and chemical production.

2003年清洁煤气的加工量、煤气成分以及化学品生产量如下表：

焦炉煤气				
项　目（g/m^3）	H_2S	HCN	NH_3	BTX
处理前	4.49	1.05	8.15	32.69
处理后	0.097	0.060	0.045	1.78
精制煤气制备量（km^3）		2211047		

化学品生产（吨）						
硫　铵	纯　苯	精　萘	沥青焦	无水氨	古马隆树脂	硫　酸
43430	72211	10206	52457	12748	1927	21188

Clean gas volume in 2003, gas composition and output of chemical products are shown in the following table:

Gas from coking furnaces				
Item (g/m^3)	H_2S	HCN	NH_3	BTX
Pre-processing	4.49	1.05	8.15	32.69
Post-processing	0.097	0.060	0.045	1.78
Volume of clean gas (km^3)				2211047

Production of chemical products (ton)						
Ammonium sulphate	Pure benzene	Refined naphthalene	Coked asphalt	Water- free ammonia	Maron resin	Vitriol
43430	72211	10206	52457	12748	1927	21188

绿色采购
Green Procurement

公司严格按国家环保、安全法律法规进行采购。在采购危险品的过程中，实行专业人员严格监控，包括：采购、运输、储存、领用、回收、处置等。

公司使用低污染燃料，采购的发电用煤要求含硫量<0.7%，灰分<9.5%。

公司控制使用对环境造成污染和对人体有危害的材料。在卷钢表面处理和涂层处理时，减少使用含Cr^{6+}、P、Pb的物质；增加了冷普防锈纸环保指标，对亚硝酸盐的控制指标为1 mg/m^2，并进行定期检测。

公司优先购买节能型和节约资源的材料。使用改进反射率的节能型天棚灯，用照明效果相同的400w代替原来1000w的灯具；使用高效水处理药剂，使循环水系统减少补水量。

向供应商宣传公司的环境方针，积极鼓励和协助供应商开展绿色材料的开发和研制。

Procurement in the Company is in strict accordance with national environmental protection and safety laws and regulations. Strict supervision by specialized personnel is ensured through all the process of procuring hazardous materials, including purchase, delivery, storage, dispatch, collection and disposal.

Use low-pollution fuels. The rate of sulfur content in thermal coal purchased shall be less than 0.7%, and the ash content less than 9.5%.

Control the use of materials that may cause environmental pollution and are harmful to human body. Reduce the use of materials containing Cr^{6+}, P and Pb during surface treatment and coating process; raise the environmental protection index of rust-resistant paper in the cold strip mill by controlling the index for nitrite under 1 mg/m^2 and testing it on a regular basis.

Purchase preferentially energy-saving and resource-saving materials. For example: buying energy-saving sunshade lights with improved reflection rate; replacing normal 1000w lights with 400w ones of the same illumination effect; using powerful water-treatment chemicals to reduce fresh water consumption.

Publicize Baosteel environmental policy to suppliers, encouraging and assisting them in the R&D of green materials.

厂区绿化
Afforestation of the Factory

公司厂区面积18.98平方公里，绿地面积42.5%。大面积的绿地不仅美化了厂区环境，同时起到降温、保湿、挡风、抑尘、吸噪等作用，显著改善了员工的工作和休息环境。

自建厂以来，公司一直重视绿地建设，进行系统的规划和实施。绿地建设因地制宜，以发挥生态功能为主，以绿为景。

公司绿地有以下特点：

- 多层次绿化，草本、灌木、乔木混合种植，增加植物数量，层次分明；
- 墙面、支架、灯柱、屋顶种植攀援植物，形成立体绿化；
- 多品种绿化。厂区内人工种植的植物423种，绿地景色富于变化，而且增加了物种多样性；
- 将落叶枯枝粉碎后改良土壤，增加土壤肥力，减少化学肥料使用，有利于土壤生态；
- 适当增加蜜源性植物比例，以利于害虫天敌的生存，减少农药使用，目前厂区内有鸟类63种，形成鸟语花香的环境；
- 饲养梅花鹿、孔雀等动物，除增加观赏情趣，也作为环境指示生物。现在梅花鹿已繁殖到120多头，孔雀200多只。
- 安放人工鸟巢，保护益鸟，以形成良性生物链；
- 由于生产工序的不同，厂区内污染程度不同，相应种植不同种类的植物，以吸附分解污染物。

经过不断建设和维护，厂区内绿草如茵，林木葱郁，鲜花常开，形成了优美的绿地景观和良好的生态环境。

Baosteel has an area of 18.98 square kilometers, 42.5% is greenbelt. Large patches of greenbelt obviously improve the working environment since they not only beautify the factory environment, but also have the functions of lowering the temperature, preserving moisture, keeping out the wind, holding dust and absorbing noises.

Since its establishment, Baosteel has always attached importance to greenbelt construction and has made systematic plan and implementation. In Baosteel, the greenbelt is built to local conditions, emphasizing the ecologic function and the green scenery.

Greenbelt in Baosteel possesses the following features:

- Multilevel afforestation, rich and clear layers of herbage, bush and arbor;
- Stereoscopic afforestation with climbing plants on walls, stands, lamp poles and roofs;
- Afforestation with various breeds. There are 423 breeds planted in the factory that add varieties of the species and enrich the scenery;
- Improving the land quality and fertility with crushed leaves and sticks, and reducing the use of chemical fertilizers for the benefit of soil ecology;
- Increasing the percentage of honey source plants so that pests' natural enemies can survive and pesticides can be less applied. Currently there are 63 kinds of birds in the factory;
- Spotted deer, peacocks and other animals are raised to enhance the beauty of scenery and as an indication of environmental soundness. Now spotted deer have increased to more than 120, and peacocks more than 200.
- Placing manmade birds' nests to protect beneficial birds and enhance benign biological chain;
- Different kinds of plants are grown to absorb and degrade pollutants in areas with different degrees of pollution due to the difference of manufacture procedures;

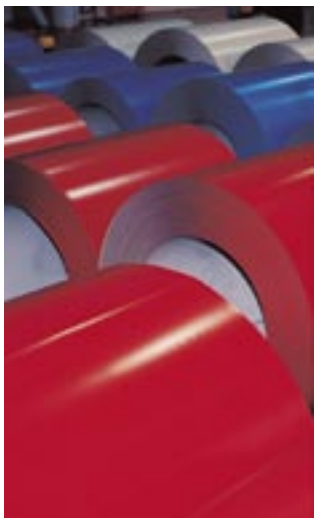
Thanks to continuous construction and maintenance, Baosteel has formed exquisite green scenery and fine ecological environment with carpets of green grass, verdant trees and blossom flowers all the year round.

环境友好产品
Environment-friendly Products

钢铁产品广泛应用于建筑、家电、汽车等领域，并由于本身的特性成为有益环境的材料。作为上游供货商，公司不仅向各类用户提供满足要求的产品，并且努力开发环境友好产品，进一步减少资源能源的消耗和环境负荷。

Steel products as an environmental friendly material is widely used in fields of construction, electrical household appliances and automobiles. Baosteel not only strives to provide high quality product to it customers, but also exerts its best to develop environment-friendly products to further reduce energy and resource consumption and relieve environmental burdens.

环境无毒产品	
电工钢	公司是全球最先开发出水性自粘接涂层电工钢新产品的企业之一。用水性涂层替代了以前业界使用的溶剂型涂层，因而解决了生产过程中大量使用有毒有害溶剂的问题。
无铬耐指纹钢板	公司开发了耐蚀性、耐指纹性、接地性、涂装性优良的无铬耐指纹镀锌钢板，广泛用于电脑机箱、AV产品的壳体、底盘上，并将进一步扩大应用范围。
减少环境污染	
减振复合钢板	减振复合钢板是由金属/高分子阻尼材料/金属复合而成的材料，它有效地把金属材料和高分子材料结合起来使用，使其既保持了金属材料原有的加工成型等各类特性，又具有高分子阻尼材料的阻尼特性，是振动、噪声场合替代金属材料使用的理想环保产品。公司从上世纪90年代开始研制、试生产减振复合钢板，目前已具备批量生产能力，产品主要应用于汽车、家电、工程机械和建筑等行业。
电镀锌预磷化钢板	电镀锌预磷化钢板。表面覆有无机润滑膜的电镀锌预磷化钢板可有效减少钢板冲压过程中各类有机润滑物质的应用，减少清洗剂的使用，从而减轻了油污和清洗剂对环境的污染，其自身又具有良好的耐蚀性。
减少资源、能源消耗产品	
镀锡板DI材	DI材，又称DWI材（Drawing and Wall Ironing），其含义是可冲压并变薄拉伸的材料。目前公司成功开发的用于制造两片钢罐的镀锡板DI材主要是用于取代铝合金DI材。与铝合金DI材相比，镀锡板DI材是环境友好产品，由其制造的两片钢罐在野外环境下1年就可降解，是两片铝罐在同样条件下降解速度的10倍。 同时，由于镀锡板DI材生产能耗低于铝合金DI材，因此，使用镀锡板DI材可节约大量能源。并且前者强度远高于后者，持续减薄、降低成本的空间更大，节约的能源也更多。 公司生产的两片钢罐广泛用于饮料行业，2003年产量达到4.9亿罐。
汽车板轻量化	汽车板轻量化主要是开发各类高强度钢板，通过钢板的减薄，实现车身减重并最终实现节能的目标。近年来，为适应汽车发展的这一要求，公司先后成功开发了热轧高强度钢板、冷轧高强度IF钢、冷轧高强度低合金钢、冷轧TRIP钢、冷轧双相钢、冷轧烘烤硬化钢，近期公司汽车板开发的主要方向是强度级别更高的钢板。
提高汽车板使用寿命	汽车的耐腐蚀寿命是一个很重要的指标，并有法规的要求，如12年不腐蚀穿孔。为适应这一趋势，近年来公司开发了一系列汽车用镀锌产品，采用纯锌、锌铁或锌镍镀层。



Non-noxious products	
Electrical steel	Baosteel is among the first group of enterprises that developed electrical steel with aqueous self-adherent coating to replace solvent coating in the world, greatly reducing the use of poisonous solvent in the manufacturing process.
Chrome-free and fingerprin-proof steel sheet	Featuring high erosion resistance, fingerprint resistance, good earth connecting and easy coating, chrome-free and fingerprint-proof galvanized steel sheet is widely applied in computer shells, shells and chasses for AV products and will be used in wider areas.
Products reducing environmental pollution	
Vibration-reducing compound steel sheet	Vibration-reducing compound steel sheet, a metal/macromolecule damp material/metal compound material with the forming characteristics of metal and added damping feature of macromolecule, is an ideal environmental friendly product for vibrating and noisy environment. Since 1990s, Baosteel has started research and trial manufacture of vibration-reducing compound steel sheet. Now Baosteel has the capacity of commercial production for industries like automobile, household appliance, engineering machinery and construction.
Pre-phosphorated galvanized steel sheet	Pre-phosphorated galvanized steel sheet. with inorganic lubricating coating can effectively reduce the use of pollutant organic lubricants and rinses in the punching process in addition to its high erosion resistance.
Products reducing resource and energy consumption	
DI tin-plate	DI tin plate, also called DWI (Drawing and Wall Ironing) material, is a material that can be thinned and extended by pressing. Baosteel has now succeeded in developing environment-friendly DI tin plate for two-flake drink can as a substitute for aluminum alloy DI material.. The two-flake steel can made of this product can be degraded within 1 year in the open, 10 times faster than that made aluminum under the same circumstances. Besides, DI tin plate consumes less energy, and possesses higher strength which means more potential in reducing thickness and cost. Two-flake steel can made of Baosteel DI can plate is widely used in drink industry with an output of 490 million cans in 2003.
Lighter auto sheet	High-strength and lighter auto sheet can save energy through reduced weight of car bodies. To this end, in recent years, Baosteel has succeeded in developing hot-rolled high-strength steel plate, cold-rolled high-strength IF steel, cold-rolled high-strength low alloy steel, cold-rolled TRIP steel, cold-rolled bi-phase steel and cold-rolled baking hardened steel. More recently, Baosteel is targeted at developing steel with higher strength level.
Auto sheet longivity	Erosion resistant time of automobile is a vital parameter for vehicles. It is ruled by relevant regulations that eroded puncture not appear in 12 years. To meet the requirement, in recent years Baosteel has developed a series of galvanized products for automobiles with pure zinc, zinc-iron or zinc-nickel coating.

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