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**SINO STEEL EQUIPMENT &
ENGINEERING CO., LTD.**

OUR SOLUTIONS, YOUR EXPECTATION

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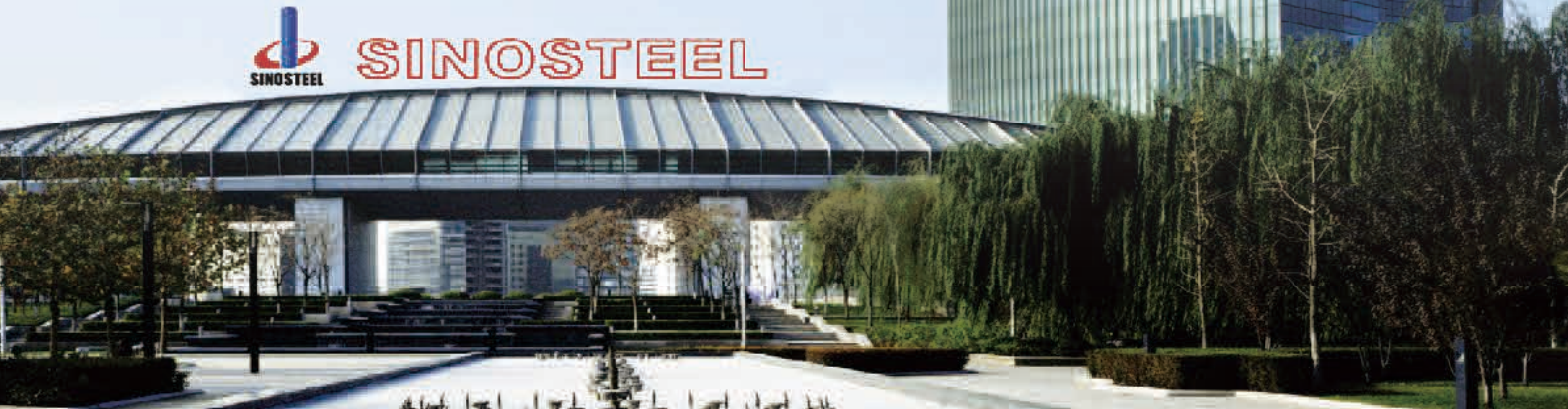
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COMPANY OVERVIEW

Founded in 1972 and incorporated in Sinosteel Group in 1999, Sinosteel Equipment & Engineering Co., Ltd. (abbr. Sinosteel MECC) is the sole operational asset wholly owned by Sinosteel Engineering & Technology Co., Ltd. (stock code: 000928), focusing on industrial engineering & service, municipal engineering and investment, energy saving and environment protection, as well as high-tech businesses.



Sinosteel MECC and its affiliated companies are granted with class-A qualifications for metallurgy and construction engineering design, steel and construction engineering consulting, environmental engineering design, ecology construction and environmental engineering consulting, construction and municipal public engineering general contracting, class-B qualification for highway engineering general contracting and qualifications for special equipment design, equipment integration, equipment supervision, overseas contracting, foreign trade, environmental pollution treatment facility operation, certified by quality, occupational health and safety and environmental systems and running National Engineering Research Centers for Environmental Protection & Industrial Fume Control and for Industrial Fume Dedusting.



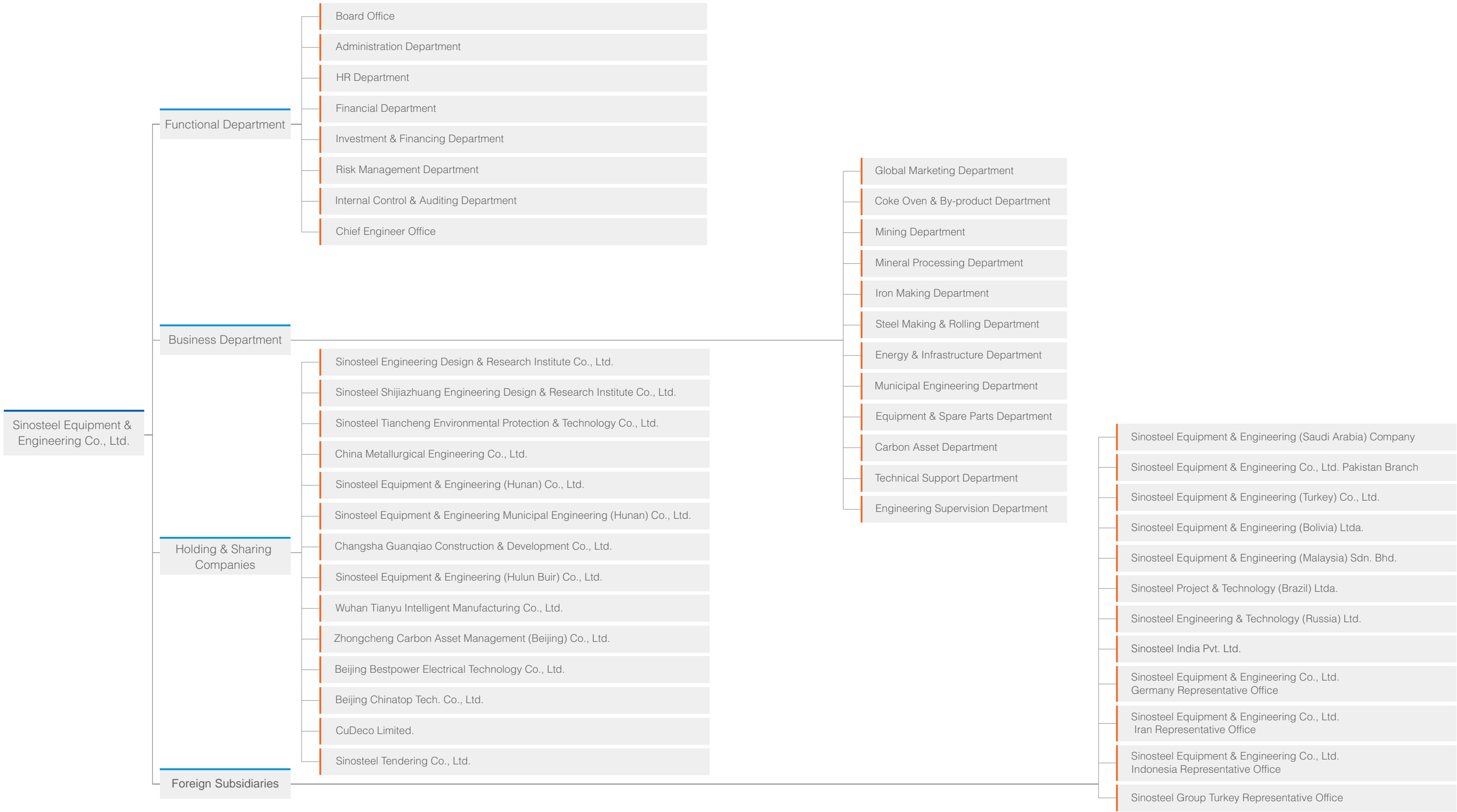
As a well-known engineering company in China, Sinosteel MECC has made outstanding contributions to the development of Chinese metallurgical industry by accomplishing over 500 national key projects for giant steel producers. Being one of the first “go global” companies in China, Sinosteel MECC enjoys high reputation in overseas metallurgical engineering market and has set up a more complete business network in more than 50 countries. Among those records of “largest projects exported by Chinese companies” made by Sinosteel MECC, the TOSYALI 950mm Hot Strip Mill, ISDEMIR No.4 Blast Furnace, JSPL 1.2mtpa Pelletizing Plant and ICDAS 2x600MW Coal-fired Power Plant Projects were awarded respectively National Quality Project Award of the year.

Sinosteel MECC has ranked on top of “China’s Top 100 General Contractors by Turnover” since it was first listed in 2004. Other than being one of the first AAA credit enterprises for overseas contracting, the company was also rated AAA for machinery and electrical products import & export (large complete equipments), AAA for foreign trade and AAAAA for international operation. For several consecutive years, Sinosteel MECC has ranked in the ENR Top 250 International Contractors and Top 250 Global Contractors.

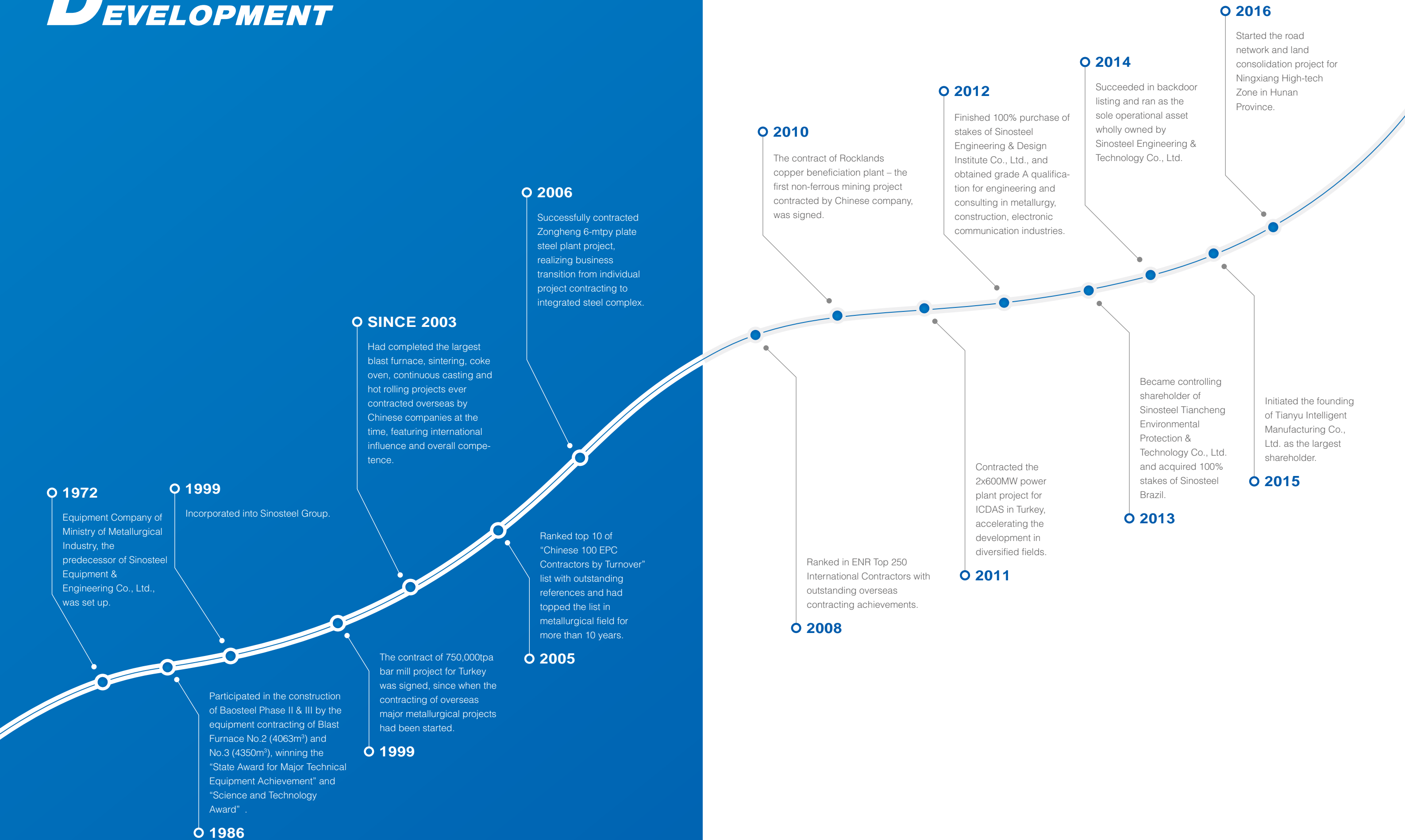
Proficient at steel complex general contracting, Sinosteel MECC has also achieved breakthroughs in mining, power, coal chemical, energy saving and environmental protection fields under the guidance of “internationalization and diversification” development strategy. Meanwhile, a greater focus on emerging industries has been given. By establishing Tianyu Intelligent Manufacturing Co., Ltd. as a joint venture, Sinosteel MECC and Huazhong University of Science and Technology have engaged in cooperation in metal additive manufacturing field, to develop high-end parts and tool and mould manufacturing business in aerospace, high speed rail and nuclear power equipment areas with application of the most advanced 3D technology. To accelerate market exploring in energy saving and environment protection, Sinosteel MECC actively promoted the marketization and industrialization of advanced technology of its holding company - Sinosteel Tiancheng Environmental Protection Science & Technology Co., Ltd., and anticipated market opportunities of coal mine methane and carbon asset management. Given the opportunities of investment and financing system reform and increasing customer demands in infrastructure, Sinosteel MECC has developed municipal works and investment business aiming at PPP and urban rail transit in affiliation with financial institutions.

Focusing on five core capacities building of international contractors, Sinosteel MECC will constantly improve its sustainable development ability and quality in four main business sectors with the guideline of “internationalization and diversification” and gradually turn into diversified business mode of investment, construction and operation, with the purpose of providing better service and creating more value to our customers.

ORGANIZATIONAL STRUCTURE



DEVELOPMENT



CORPORATE CULTURE

UNITED

PRACTICAL

EFFICIENT

ENTERPRISING

***We are consistently committed
to the pursuit of social value***

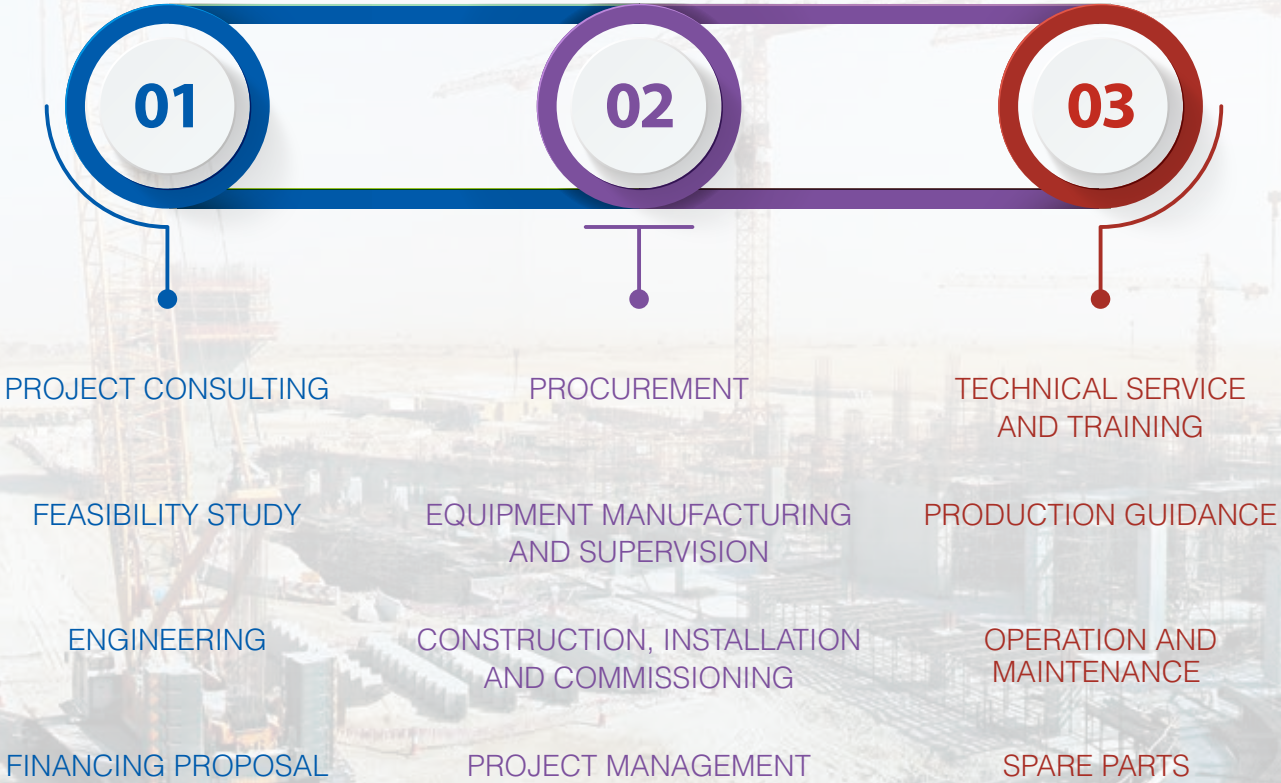
- **United, Practical, Efficient, Enterprising.** We believe in teamwork and encourage harmonious development of our employees, customers and society, so as to achieve the sustainable development of our company.
- **Cooperation, Friendship, Win-win, Development.** Adhering to this operation philosophy, we follow the global trend of economic integration and technological advancement.
- **World-leading contractor.** Focus on metallurgy, we work continuously to increase our competitiveness and develop our business mode to a diversification of investment, operation and production.

BUSINESS SCOPE

INDUSTRIAL ENGINEERING AND SERVICE

As an industry-leading engineering company, we started our exploration of overseas market since 1990s and have established a solid business network in more than 50 countries so far. In new century, we developed diversified business based on traditional advantage, so as to provide our customers in mining, metallurgical, power and coal chemistry industries with overall contracting and support service.

OVERALL SERVICE



» MINING & MINERAL PROCESSING

Specialized in development, processing and comprehensive utilization of ferrous, nonferrous and nonmetallic mining resources, including geological survey, processing and subsequent integrated engineering service. The adoption of modernized processing plant design will realize highly automated operation and maintenance upon the reduction of Opex and energy consumption.

With application of grate-kiln and own-developed travelling grate pelletizing technologies, we offer raw material storage, long distance transportation, processing and smelting of multiple materials based on EPCM contracting.

EPC capacity for mineral processing

Technology	Parameter
Shaft furnace	8m² ~ 16m²
Travelling grate	1.2mtpa ~ 8mtpa
Grate - kiln	0.6mtpa ~ 6mtpa
DRI - gas based	0.4mtpa ~ 2.5mtpa
DRI - coal based	0.06mtpa ~ 0.2mtpa
Electrolytic manganese	0.2mtpa ~ 0.1mtpa
Electrolytic aluminum	0.01mtpa ~ 0.5mtpa
Aluminum oxide	0.1mtpa ~ 1.6mtpa
Copper smelting	0.2mtpa ~ 0.4mtpa



3mtpa Copper Processing Project for CuDeco, Australia



- 1 650,000tpa Iron Ore Processing Plant for Mutun Steel Complex, Bolivia
- 2 10mtpa Iron Ore Feasibility Study for FERAAL, Algeria
- 3 Equipment Supply for Samarco, Brazil
Supply of 4 sets of Ø6.1x12.5m ball mills.





2.5mtpa Pellet Project for ZISCO, Iran

Production of the grate-kiln pellet plant

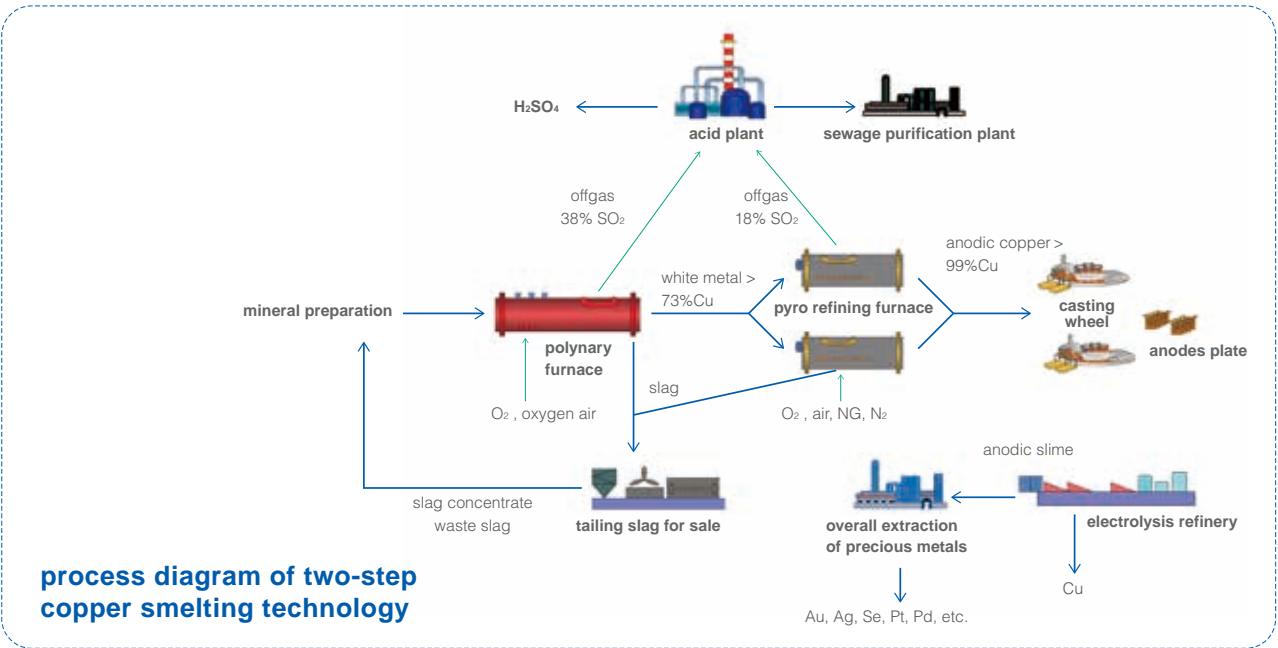


2.5mtpa Travelling Grate Pellet Project for SISCO, Iran

2.5mtpa DRI Project for TOSYALI, Algeria



80,000tpa Electrolytic Manganese Project, Russia



process diagram of two-step copper smelting technology

» METALLURGY

Accomplished over 500 national key projects of sintering, coking, pellet, blast furnace, converter, continuous casting, hot rolling, bar mill, plate mill, etc. for giant steel producers including Baosteel, WISCO, Hebei Steel and Chongqing Steel. The successful completion of numerous overseas projects has also gained us high international reputation.

Sintering

Advanced, mature and reliable technologies are applied to sintering process to improve the productivity of iron making.

- ◉ equipment upgrades
- ◉ sintering expert system
- ◉ sintering flue gas circulating
- ◉ sintering waste heat recovery
- ◉ flue gas purification by activated carbon

Effective suction area: 52m² ~ 600m²



360m² Sintering Project for Liuzhou Iron & Steel

Contract was signed in February 2007 and production started in January 2008.

300m² Sintering Project for ISDEMIR, Turkey



198m² Sintering Project for ISPAT, India

In August 2003, ISPAT awarded Sinosteel MECC the contract and the project was put into production by the end of 2015.

430m² Sintering Project for Baosteel Bayi

In 2010, the largest sintering project in northwestern China broke ground and was completed after 2 years.





Blast Furnace

Experienced and technically advanced in the fields of blast furnace, hot stove, PCI and slag treatment, we apply modernized blast furnace design philosophy, following the economical, practical, productivity-efficient, recycling, energy saving, consumption reducing and environment-friendly principles, to reasonably reduce Capex and Opex.

Effective volume: 380m³ ~ 4350m³

3 x 2350m³ Blast Furnace for Zongheng in Cangzhou

Contract signed in 2007 and only a year after, the three blast furnaces were all put into production consecutively.



3050m³ Blast Furnace for ISDEMIR, Turkey



Stage II 4063m³ Blast Furnace (1986) and Stage III 4350m³ Blast Furnace (1991) for Baosteel



450m³ and 380m³ Blast Furnace for Xingcheng Special Steel



2 x 1350m³ Blast Furnace for Jinshenglan Metallurgical

Application of concentrate feeding, PCI, high blast pressure and oxygen enrichment technologies help accomplish the goals of high quality and productivity, low consumption, longevity, energy saving and environment protection.



Steel Making & Continuous Casting

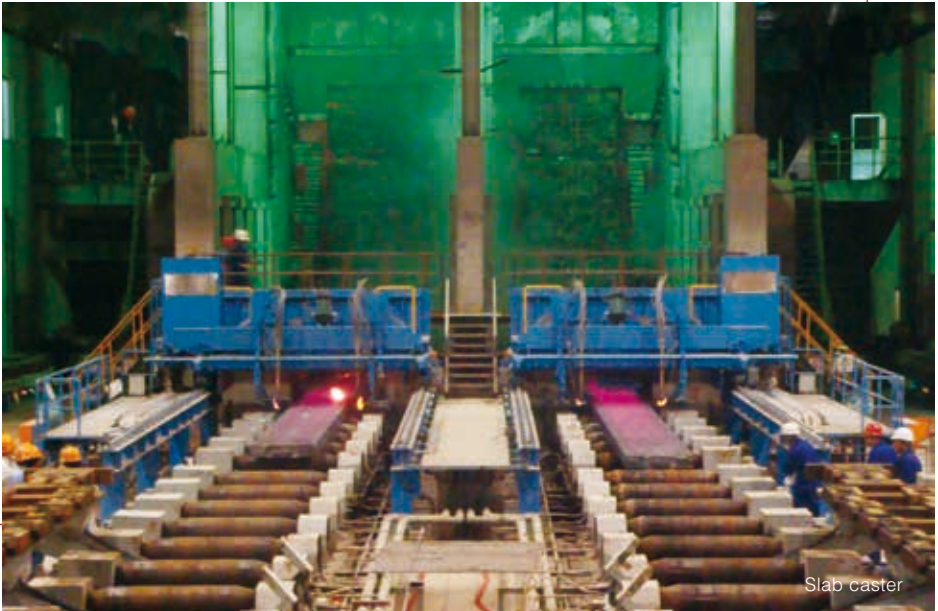
Experienced and highly competent in the fields of hot metal pre-treatment, converter, EAF, slab casting, (round) billet casting, secondary refining, as well as dedusting, water treatment, lime and oxygen generation.

EAF: 20t~240t	CCM: Billet casting Bloom casting Round casting Slab casting
Converter: 40t~300t	
Secondary refining: LF: 15t~250t	Hot metal pre-treatment: Stirring (KR) – desulphurization, dephosphorization, desiliconization, Injecting – desulphurization
Secondary refining: 40t~300t	



6mtpa Steel Making Project for Cangzhou Zongheng Industries

The project consists of 3 x hot metal pre-treatment systems /
3 x 150t converters / 3 x LFs / 3 x slab casters



Panorama of steel making plant of Zongheng complex





Steel Making & Continuous Casting



175t EAF for ICDAS, Turkey



120t LF for ERDEMIR, Turkey



2-strand Slab Caster for TOSYALI, Turkey

Steel Making Project for Tianjin Pipe Group

The project consists of 90t EAF, LF, VOD and round/billet caster.





Steel Rolling

Long Product Rolling Mill

Multiple sizes/grades of bar mill, wire rod mill and section mill.

Capacity

Classification	Main index		Rolling speed
	Specification	Maximum output	
Bar mill	Ø10mm ~ Ø50mm	800,000t	18m/s (max.)
High speed wire rod mill	Ø5.5mm~ Ø30mm	600,000t	110m/s (max.)
Section mill	I-beam: 120mm~220mm Channel beam: 100mm~250mm Angle steel: 80mm~180mm Round steel: Ø40mm~75mm Flat steel: 250mm	600,000t	6m/s (max.)



600,000tpa Section Mill for Liuzhou Iron & Steel

The first continuous section mill designed and manufactured by China successfully started operation in 2005. Products include 10-18 I-beam, 10-12 channel beam, 8-16 angle steel and 40mm-75mm round steel.

3 x Bar / Wire Rod Mills for ICDAS, Turkey

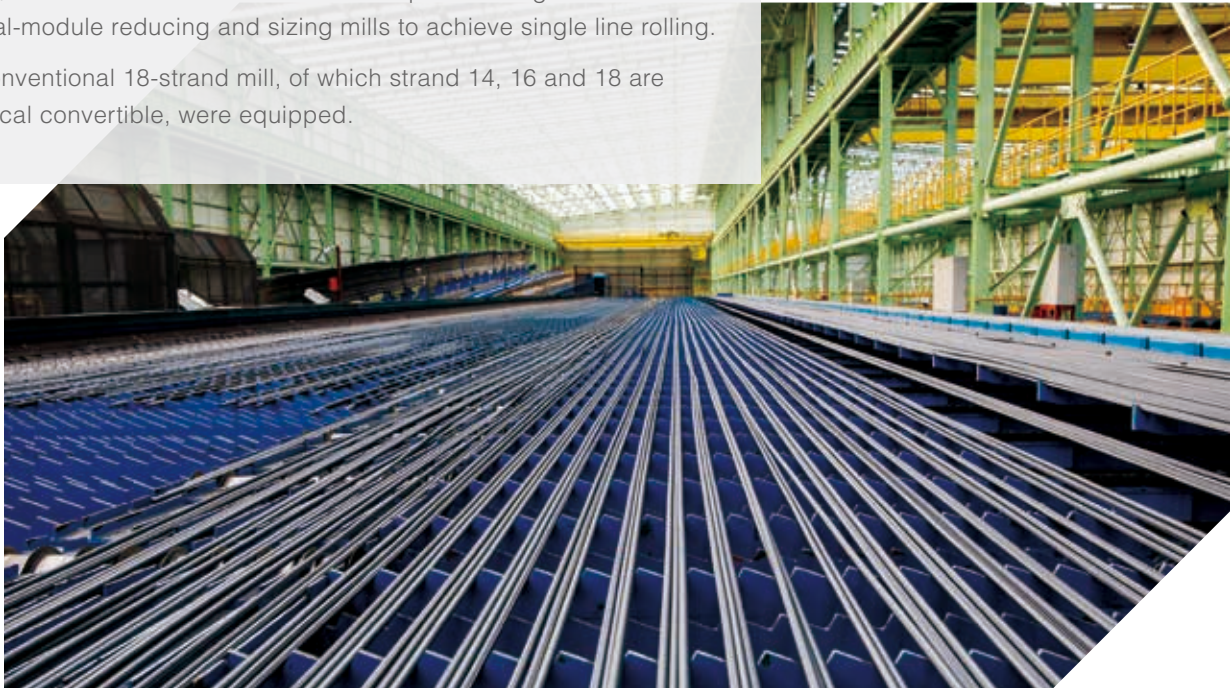
- 750,000tpa wire rod mill
- 750,000tpa bar mill
- 1.2mtpa bar/wire rod mill



600,000tpa High Speed Wire Rod / Bar Mill for TOSYALI, Turkey

The project aimed to produce 600,000tpa Ø5.5-25mm wire rod (including Ø8mm, 10mm and 12mm coil rebar) and Ø8-30mm bar, with maximum rolling speed of 110m/s. Wire rod mill consists of 8-strand pre-finishing mills and 2+2-strand dual-module reducing and sizing mills to achieve single line rolling.

For bar mill, conventional 18-strand mill, of which strand 14, 16 and 18 are horizontal-vertical convertible, were equipped.





Steel Rolling

Flat Product Rolling Mill

New and renovation hot rolling strip and plate rolling projects.

Capacity

Classification		Main index		Rolling speed
		Specification	Maximum output	
Hot rolling	Hot rolling mill	Width: 550mm~2250mm Thickness: 1.2mm~25mm	5,000,000t/a	20m/s(max.)
	Skin pass mill	Width: 2250mm(max.) Thickness: 1.2mm~12.7mm	800,000t/a	400m/min(max.)
	Plate mill	Width: 550mm~2250mm Thickness: 1.2mm~25mm	2,500,000t/a	6m/s(max.)
Cold rolling	Pickling–tandem cold mill	Width: 2500mm~4200mm Thickness: 5mm~100mm	1,500,000t/a	1800m/min(max.)
	Bell annealing furnace	Width: 600mm~1780mm Thickness: 0.15mm~3.0mm Coil weight: 29.6t(max.) Coil outside diameter:	1,000,000t/a	1800m/min(max.)
	Skin pass	2100(max.) Width: 450mm~1665mm Thickness: 0.2mm~2.5mm	750,000t/a	1200m/min(max.)
	Hot galvanizing	Width: 600mm~1650mm Thickness: 0.2mm~3.0mm	350,000t/a	200m/min(max.)
	Cutting line (re-coiling)	Width: 450mm~1650mm Thickness: 1.2mm~25mm	250,000t/a	400m/min(max.)
	Cutting line (transversely)	Width: 450mm~1665mm Thickness: 0.2mm~2.5mm	200,000t/a	150m/min(max.)



4100mm heavy plate mill

4100mm Heavy Plate Rolling Project for Chongqing Iron & Steel

The largest plate mill in western China – construction started in 2007 and operation started up in 2009.



Finished product



Steel Rolling

Flat Product Rolling Mill

950mm Hot Strip Rolling Project for TOSYALI, Turkey



Processing / Finishing Line

Plate processing/finishing line including color coating line, continuous hot galvanizing line, etc.

100,000tpa Color Coating Line for JINDAL, India

Strip and product specification

Thickness: max. 1.0mm, min. 0.14mm
Width: max. 1,250mm, min. 600mm

Coil specification

Inner diameter: Ø508mm
Outer diameter: Ø1500mm
Weight: max. 10t, min. 3t

Speed

Entry section: max. 120m/min
Process section: max. 80m/min
Exit section: max. 120m/min



400,000tpa Continuous Hot Galvanizing Line for Guangzhou JFE Steel Sheet

Strip thickness: 0.3mm-2.3mm (excluding zinc coating)

Strip width: 780mm-1700mm

Max. coil weight: 25t (excluding zinc coating)

Inner diameter: 508mm-610mm

Outer diameter: 700mm-2100mm (excluding zinc coating)

Speed

Entry section: max. 280m/min
Process section: GA max. 150m/min, GI max. 180m/min
Exit section: max. 280m/min





Integrated Steel Complex

6mtpa Integrated Steel Complex for Cangzhou Zongheng Industries Ltd.

Phase I 2mtpa, 2007-2008

- 2350m³ blast furnace
- 240 sinter plant
- 2 x 10 shaft furnace
- 6 x 150 lime kiln
- steel making plant
 - 150t converter
 - 150t LF
 - 2-strand slab caster
- 2 x 1250 hot rolling walking beam furnace
- 165,000m³ blast furnace gas holder

Phase II 4mtpa, 2008-2010

- mechanical material yard
- 2.2mtpa coke oven (4 x 6m x 55 chamber)
- 2 x 2350 blast furnace
- 2 x 240 sinter plant
- 2mtpa pellet plant
 - grate-kiln
- steel making plant
 - 2 x 150t converter, 2 x 150t LF, RH,
 - 2 x 2-strand slab caster
- 2x1780mm hot rolling walking beam furnace
- 50,000m³ blast furnace gas holder

1.5mtpa Steel Complex for ZARAND, Iran

- material yard
- 204m² sinter plant
- 2000m³ blast furnace
- 2 x 120t converter
- 2 x 120t LF + 1 x 120t VD
 - 2 x 6-strand continuous casting
- auxiliary facilities: air compression station, 2 x 15000m³/h oxygen generation, converter gas holder, blast furnace gas holder, TRT, power plant, sewage treatment facility

2.3mtpa Steel Complex for TOSYALI, Algeria

- 2.5mtpa DRI
- 4mtpa travelling grate pellet plant
- steel making plant:

1 x 240t EAF
1 x 240t LF
dedusting system
material handling system
1 x 8-strand continuous casting machine
water treatment system

- 2.25mtpa deformed bar rolling

Panorama of 6mtpa steel complex



200,000tpa Steel Complex for MUTUN, Bolivia

- Iron ore exploitation
- 650,000tpa processing plant
- 410,000tpa pellet plant
- 250,000tpa DRI
- 200,000tpa EAF
- 200,000tpa steel rolling
- auxiliary facilities: air compression station, oxygen generation, 6 x 10MW power plant, 22km natural gas pipeline and regulating station, 107km power supply facility and pump station

3mtpa Integrated Steel Plant

- 2 x 1780 blast furnace
- 1.3mtpa stamp-charging coke oven with CDQ (2 x 5.5m x 65 chamber)
- 25MW power plant
- 3-mtpy bar/wire rod mill
- 2 x 25000m³/h air separation

1mtpa Iron Making for Kunming Iron & Steel

- 2 x 450 blast furnace
- 2 x 90 sinter plant
- material yard



Equipment & Spare Parts Supply

Based on customer-centered philosophy, we provide all-in-one spare parts solutions targeted at actual needs of production in terms of planning, inventory management, manufacturing, inspection, shipment, performance guarantee and operation. We concentrate all efforts on offering our customers the most optimized production support.



Equipments and service that withstand the test of severe working conditions



Professional supervision team, complete quality control

» POWER

Involved mainly in coal-fired, gas-fired, hydropower, wind power solar power, waste incineration, biomass and power grid, we are capable and qualified to provide comprehensive service for power project construction and operation on EPC, BOT and EPCO basis.

2 x 600MW Coal-fired Power Plant Phase II for ICDAS, Turkey

Achieved one-time success in 168-hour test run and gained considerable acclaim of customer, winning the award of “National Quality Project 2016-2017” of China.



2 x 15MW Waste Heat Power Generation Project for TUBATSE, South Africa

Saved 18.7% power consumption for the whole plant and performed an essential role in reducing air pollution and production cost and promoting customer’s sustainable development.



2 x 350MW Power Plant for Guotai Xinhua Mining

Combined heat and power will satisfy the steam and power demands in this captive power plant for fine chemical industrial park, and reasonable utilization of resources help reduce overall power consumption.

» COAL CHEMICAL

Focusing on coal gasification, purification and shift, coal comprehensive utilization, fertilizer, acid, alkali and salt projects, we help our customers in coal chemical industry to produce clean energy, reduce environmental pollution and develop more safe, environment-friendly, efficient and economic projects. As a well-known large coking project contractor, we are entirely capable of provide self-designed coke oven, by-product and CDQ systems, by accomplishing numerous EPC/EP projects in China, Japan, Turkey, Indian and Vietnam.

Type	Specification
non-recovery	up to 120 chambers, 500,000tpa for single line
stamp-charging	chamber height up to 6.5m
top-charging	chamber height up to 7.1m



1.5mtpa Stamp-charging Coke Oven for JSW, India

4 x 56-chamber x 4.3m coke oven batteries with by-product and auxiliary facilities



1.3mtpa Top-charging Coke Oven for ISDEMIR, Turkey

2 x 65-chamber x 6m coke oven batteries

150t/h CDQ Project for Liuzhou Iron & Steel

To be equipped with a 1.5mtpa coke oven, the project was finished within only 11 months, creating a record of the shortest construction duration of similar projects in China.



1.2mtpa Coke Oven Project for SUMITOMO, Japan

The largest coke oven project contracted by Chinese company in developed country contains 2 x 65-chamber x 6m coke oven batteries.



7.1m Top-charging Coke Oven for Bohai Coal Coking Company

Designed to produce 300 million tons coke per annum, the project consists of 4 x 7.1m top-charging coke oven batteries with by-product and 2 x 185t/h CDQ facility as well as new coke wet quenching system.



Plant site



Shift

200,000tpa Ethylene Glycol Project for Yangquan Coal Group

With consideration of customer's situation and technical advantage in chemical industry, the project was planned to make full use of abundant local coal resource and maximize the recycling utilization of resources. The successful start-up of this project has contributed to the industrial chain improvement and structure adjustment.

MUNICIPAL ENGINEERING AND INVESTMENT

We are engaged in investment and financing, consulting, construction and operation of the projects in areas of urban public facilities and infrastructure, bridge, tunnel, rail transit, water supply and drainage, water treatment, environmental engineering, gas and heating, piping, landscape, industrial park development, sponge city, etc.



» URBAN INFRASTRUCTURE AND PPP

Mainly involves public infrastructure and environment protection facility projects including road, bridge, municipal sewage and solid waste treatment on the basis of PPP, BOT, BT, TOT and TBT modes.

Sewage Treatment and Reclaiming Project in Hulun Buir (BOT)

sewage treatment capacity: 40,000t/d.reclaimed water: 32,000t/d.30km new sewage pipelines and 17km new reclaimed water pipelines were built. Reclaimed water after treatment are used as industrial and irrigation water by the enterprises of development zone.



High-tech Zone Road Construction and Land Consolidation Project in Hunan (PPP)

Financing, approval, feasibility study, geological survey, engineering, construction and operation are included.



10 x 70W Boiler Centralized Heating Project in Beijing



Integrated Utilization of Solid Waste and Pollution Project

» URBAN RAIL TRANSIT

STRADDLE-TYPE MONORAIL

Devoted to the technology research and engineering application of new rail transit, in particular straddle-type monorail, we provide all-in-one solution and service of rail transit in terms of planning and design, construction, equipment manufacturing, financial service as well as operation and maintenance.



MAIN TECHNICAL SPECIFICATION

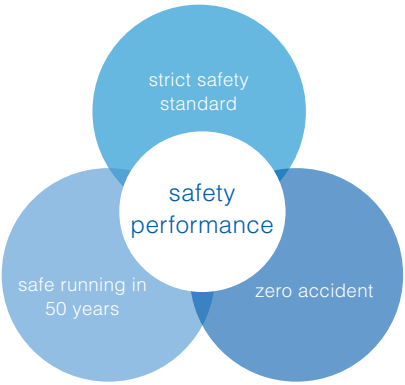
Item	Parameter
maximum running speed	80km/h
maximum slope	60%
minimum curve radius	medium: 60m, small: 40m
distance between tracks	medium:3.7m, small:3.25m
axle-load of vehicle	medium:10t, small:9t
power supply	medium:1500V, small:750V

ADVANTAGES

Landscape efficiency



Good safety performance

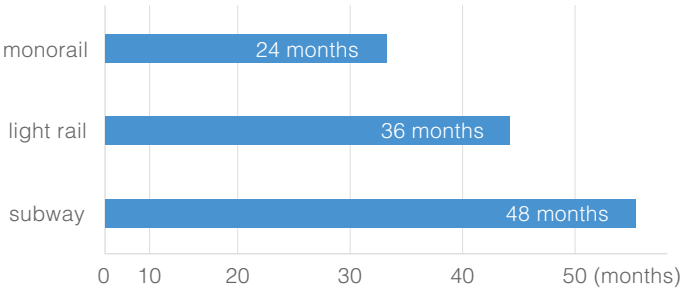


Low construction cost

- equivalent to 1/3 – 1/2 of subway, 20-30% lower than elevated light rail
- less construction area and land acquisition

Short construction duration

- reduce overall construction cost
- guarantee early operation benefit
- improve project feasibility
- gain more business opportunities



Medium transport capacity

Maximum speed is 80km/h and average 30-50km/h, featuring high speed as well as good acceleration and deceleration performance. Transport capacity is 10000-30000 persons/h, between tramcar and subway.

Reduce land occupation

Straddle-type monorail is usually constructed elevated. The pier diameter is only 1.4m, which takes less area. Rail lines could be erected above the greenbelt by center or side of roads, without interrupting road traffic.

Strong adaptability

Maximum grade is 60‰ (subway 30‰) and passes by small radius (minimum curve radius 46m, which of subway is 250m), enables the monorail to adapt to various complex landforms and environments.

Convenient construction

- Pre-construct concrete track beam in temporary work site.
- Erect track beam with crane at night and stop working in daylight.
- Minimize road occupation to reduce construction impact on traffic.



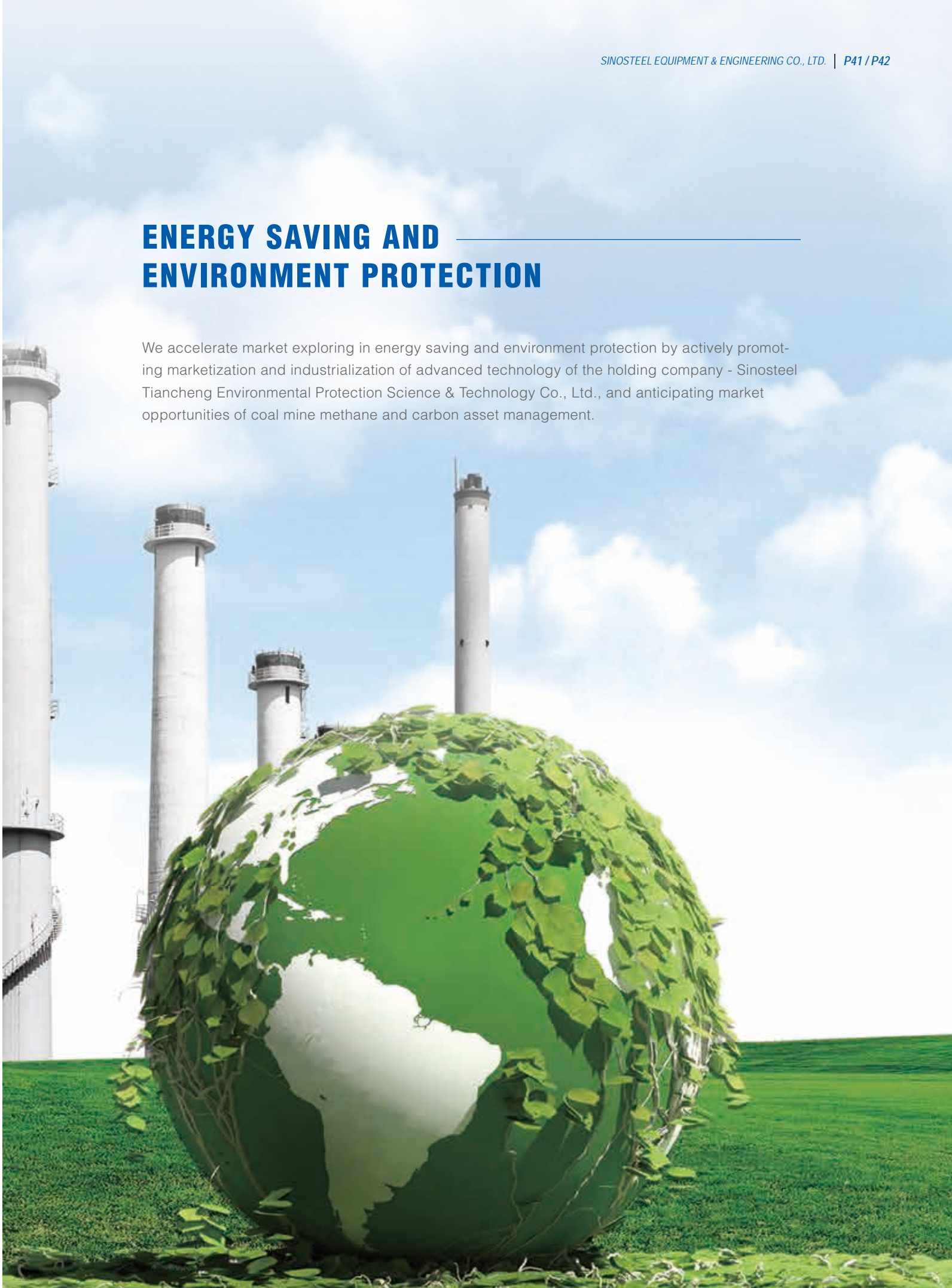
Line II of Chongqing



Line III of Chongqing

ENERGY SAVING AND ENVIRONMENT PROTECTION

We accelerate market exploring in energy saving and environment protection by actively promoting marketization and industrialization of advanced technology of the holding company - Sinosteel Tiancheng Environmental Protection Science & Technology Co., Ltd., and anticipating market opportunities of coal mine methane and carbon asset management.



» SINOSTEEL TIANCHENG

Focusing on energy saving and environment protection, Sinosteel Tiancheng provides overall solutions including planning, low emission technology and product, harmless recycle and resource recycle for the industries of metallurgy, power, oil and petroleum, municipal, coal, chemical, building material, non-ferrous material, agriculture, etc.

1 National Engineering Research Center

- Ministry of Environmental Protection----National Engineering Research Center for Environmental Protection and Industrial Flue Gas Control
- Ministry of Science and Technology----National Engineering Research Center for Industrial Flue Gas Dedusting
- National Development and Reform Commission----Engineering Laboratory for Flue Gas Multi-pollutant Control Technology and Equipment (co-built)

2 Technology Innovation – National 863 High Technology

Technology and engineering application of flue gas particle efficient control for coal fired power plant boiler

- applied on 220MW unit bag dedusting project in Jiaozuo, Henan Province.
- the first bag dedusting technology of independent intellectual property rights in China.

Main technical indicators
equipment operational resistance≤1200Pa
dust emission 10mg/m³
efficient control of particles PM2.5



Technology and engineering application of flue gas particle efficient control for large coal fired power plant boiler



- applied on 300MW unit bag dedusting project in Shanghai.
- solve the problems of technical specification, flow distribution and big equipment structure safety of bag dedusting project.



Atmospheric Environment Improvement Integral Solution

Innovative patent technology for multi-pollutant co-control of FCC regenerating flue gas



Sinochem Lanxing FCC regenerating flue gas dedusting project



Sinochem Anbang 500,000tpa FCC device with preheating boiler flue gas control project in Qingdao

Intelligent multi-pollutant co-control solution

2x220MW intelligent multi-pollutant co-control project in Wuhan



Pollutant control solution for particular value limit of emission



« Shougang Jingtang 5500m³ blast furnace bin dedusting system project »



Xingneng power plant 2x600MW ultra-low emission project in Shanxi »

Dust source control solution



High temperature source control

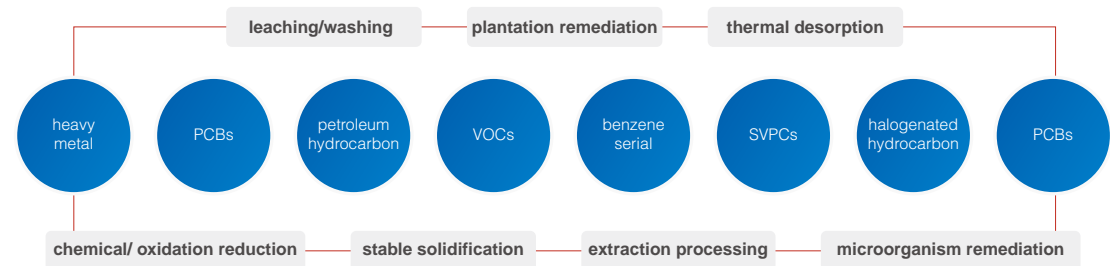


Mobile dust source control



Soil Remediation Technology

Mainly focus on urban industrial abandoned land, slag yard, stacking yard, government-funded remediation project, as well as control and consulting of heavy metal pollution, organic pollution and their co-pollution.



Organic Waste Sanitary Treatment And Resource Utilization

Involves in solid waste treatment industry (biological organic matter) supported by anaerobic fermentation and aerobic composting technologies, with professional technology and qualification.



Waste fruit and vegetable natural gas project in Yunnan



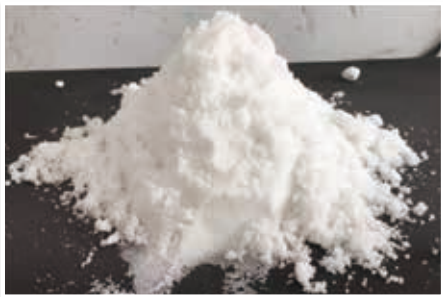
Solar Film Greenhouse

The utilization of new energy saving solar film material featuring high intensity, light weight and high light transmission contributes to the realization of full-closed storage (ash) yard of large span and space.

Widely used in: port dock, mine, industrial storage yard, ash yard and slag yard, as well as disorder dust discharge industries of metallurgy, cement and coal.



Metallurgical Ash Recycling



- Zero-emission and non-pollution of sintering ash sanitary treatment are completely realized.
- The final product - potassium chloride, satisfy national quality requirement on standard agriculture high-grade product.
- By application in the sinter machine head precipitating ash recycle project in Cangzhou, 5800 tons of potassium chloride have been produced from the processing of 16000 tons of sinter ash per year.
- The "potassium salt extraction from sinter machine head dust in metallurgical industry" technology was patented.

» CARBON ASSET MANAGEMENT

With participation in carbon asset management company, we are engaged in carbon trading and management industry to diversify our business in China’s new carbon market environment and seek for new business mode to stay competitive.

Business of Zhongcheng Carbon Asset Management (Beijing) Co., Ltd. includes:

- Low carbon consulting: systematic low carbon planning and environmental asset control solutions
- Project carbon emission reduction development consulting: overall service of low carbon technical consulting and engineering transforming solution
- Carbon emission right consulting and management business
- Carbon emission trading right and financial business

» VENTILATION AIR METHANE RECYCLING

Focusing on the integrated utilization of coal bed gas, low concentration coal gas and ventilation air methane, we provide coal industry companies with solutions to produce clean energy, reduce environment pollution and realize zero emission of coal mine methane. The RTO methane oxidation system generates electricity from high temperature flue gas waste heat, which will reduce power consumption and create good economic benefit. The treatment to coal bed gas dissociates methane oxygen into carbon dioxide and water, filling up the blank of drainage methane recycling with concentration below 9%.

Coal mine ventilation air methane and 15MW low concentration gas power generation project in Yangquan



HIGH - TECH

» INTELLIGENT MANUFACTURING

Originally initiated and invested by Sinosteel MECC, Tianyu Intelligent Manufacturing is a high-tech company mainly involved in sectors of 3D printing, metal parts restore and remanufacturing and industrial intelligent system, integrating manufacturing, equipment research and development, as well as technical service. The R&D team consists of leaders from international prestigious university, experts of concerned field and high-educated youth talents, aiming aggressively to be industry pioneer in high-end intelligent manufacturing equipment and technical service.



Customized High-tech Service

3D printing technology

With the possession of patented integrated casting-forging-milling equipment, services provided include arc/plasma arc/laser casting-forging-milling integrated printing, SLM printing, LENS metal 3D printing, as well as proofing, post-processing, procedure qualification, hot manufacturing process analysis, microstructure analysis and performance evaluation.

Application



Cladding and re-fabrication

The green, eco-friendly, energy-saving and high-tech technology centered on arc/plasma arc/laser cladding and metal remanufacturing will effectively reduce environmental damage due to energy loss in the process of manufacturing, and greatly improve the life cycle of repaired products.



Intelligent Manufacturing Equipments

Arc/laser Micro Casting-forging-milling Composite Additive Manufacturing Equipment

The large micro-casting-forging 3D printing equipment integrating arc/plasma arc/laser, independently developed based on the world's first 3D printing core patent technology.

Metal printing range:
5000 mm x 2000 mm x 1500 mm, including large, medium and small complex samples of different materials.



Laser cladding and remanufacturing equipment

System comprised of the most advanced laser devices, multi-joint robot and control system.



Intelligent Arc/Laser Welding Robot

Automatic remote welding and single energy beam automatic welding with high precision and steadiness.



Automated Stereoscopic Warehouse Logistics System

Mainly consisting of high story shelf, conveying system, stacker crane, robot sorting workstation, auto-control equipment, computer management devices, the system is capable of automatic loading and unloading operations on command, as well as automatic goods inventory management.



Technical Advantages

The inherent defects of conventional 3D printing can be effectively solved by the new integrated casting, forging and milling technology.

·HIGH PERFORMANCE·

Compared with conventional additive shaping technology, the composite micro-casting and forging process adopting additive and material shaping is able to refine columnar crystals from conventional additive shaping process into forged equiaxed fine crystals, resulting in decreased cracks and providing better performance than forging pieces. The congenital deficiency of anisotropy of conventional additives is thus overcome, and impact toughness of conventional additives is increased by 2 times.

·HIGH EFFICIENCY·

The deposition rate is high as 10 - 30 kg/h, making it one of the most effective deposition shaping technologies at present.

·HIGH COMPETITIVENESS·

The competitiveness of technology is higher than other deposition technologies due to its high performance, efficiency and utilization rate of energy and materials, as well as the low cost of heat source, silk materials and operation.

·INNOVATIVE AND REVOLUTIONARY·

- **Method innovation:**the first to put forward the new technology of integrated casting, forging and milling manufacturing of additives, materials and reduction composites.
- **Theoretical innovation:**the establishment of section model and path planning software of additive shaping and composites achieves parallel manufacturing of shape and material creation featuring high performance and multi-functional parts.
- **Equipment innovation:**the micro-forging unit and high-efficiency micro-casting unit of synchronous composite flexible shaping processing are available for the integration of the casting, forging and milling manufacturing units.



Applications



critical load bearing
parts of aircraft



gas turbine engine
transition section



automobile fender mold

PATENT TECHNOLOGY

Since 2006, the inventions and patents of “passivepower compensation method” , “pneumatic slag skimming device” , “hot metalpretreatment facility” developed by Sinosteel MECC as patentee have been proven to be effective in practical application and enormously reduced Opex and Capex for customers.

- Passive power compensation method
- Pneumatic slag skimming device
- Coke oven chamber automatic pressure adjustment device
- Hot metal pretreatment facility
- System of carbon dioxide removal and fabrication of ammonium sulphate compound fertilizer and precipitated calcium carbonate
- Exchange shutter and automatic conversion device for coke oven heating system
- Narrow side adjustment device and hot width adjustment device for continuous casting
- Circular cooler sealing device and circular cooler
- Grate bar and thermal insulator for sinter pallet
- Hot metal pretreatment facility and method
- Sinter machine distribution shutter
- Grate machine hood temperature and pressure auto-control system
- Pallet replacement device

MAIN PROJECT REFERENCES

MINING

No.	Name of Project	Customer	Time
1	1.7mtpa platinum ore beneficiation project	TGK, Russia	2016-2018
2	60,000tpa rare earth pilot plant project	Nothern Minerals, Australia	2016-2018
3	Gara Djebilet 10mtpa iron ore FS	FERAAL, Algeria	2016-2018
4	300,000tpa balline garnet beneficiation project	Garnet International Group, Singapore	2016-2018
5	Afema 1tpa gold mine processing project	Taurus Gold Limited, Côte d'Ivoire	2014-2016
6	Paergang 3.8mpta iron ore processing project	Baosteel Bayi Iron & Steel, China	2013-2015
7	1mpta iron ore beneficiation project	Foskor General Nice, South Africa	2013-2014
8	1.25mtpa iron ore BFS and engineering	Santa Fé, Chile	2012-2014
9	Rocklands 3mtpa copper processing project	CuDeco, Australia	2011-2016
10	P4P (4th pellet plant) equipment supply	Samarco, Brazil	2011-2014
11	1.5mtpa ISUA iron ore FS	ISUA, Greenland	2010-2012
12	7mtpa iron ore grinding and dewatering equipment supply	VALE, Brazil	2008-2013

MINERAL PROCESSING

No.	Name of Project	Customer	Time
1	1.2mtpa pellet plant	Shandong Shiheng Iron & Steel Group, China	2017
2	400,000tpa pellet plant of steel complex	Mutun, Bolivia	2017-2019
3	2.5mtpa DRI Plant	Qatari, Algeria	2016-2018
4	4mtpa pellet plant	Tosyali, Algeria	2016-2018
5	2.5mtpa DRI plant	Tosyali, Algeria	2015-2017
6	2.5mtpa pellet plant (travelling grate)	SISCO, Iran	2014-2017
7	2.5mtpa pellet plant	ZISCO, Iran	2013-2016
8	2.4mtpa pellet plant	Baotou Iron & Steel Group, China	2012
9	2.4mtpa pellet plant	Perwaja, Malaysia	2012
10	2x2.4mtpa oxide pellet plant	Sinosteel Binhai Industries, China	2012
11	2mtpa oxide pellet plant FS and test	Yili Mining Co., Ltd., China	2011
12	7mtpa pellet plant equipment supply	Samarco, Brazil	2011-2012
13	10mtpa pellet plant FS and test	Samarco, Brazil	2011-2012
14	1.2mtpa oxidepellet plant	NMDC, India	2010-2016
15	1.2mtpa oxide pellet plant	Jindal Saw, India	2010-2012
16	2mtpa oxide pellet plant (P)	Shoucheng Mining Co., Ltd., China	2010
17	2mtpa pellet plant	Tianjin Iron & Steel Corporation, China	2009-2010
18	2mtpa pellet plant	Tangshan Iron & Steel - Qinglong Pellet Co., Ltd., China	2008-2010
19	2mtpa pellet lant	Handan Iron & Steel Corporation, China	2008-2009
20	2mtpa pellet plant	Cangzhou Zongheng Industries, China	2008-2009
21	1.2mtpa pellet plant	MSPL, India	2007-2008

SINTERING

No.	Name of Project	Customer	Time
1	2x300m² sintering project	MMK, Russia	2016-2018
2	2x180m² sintering and raw material yard construction project	Allian Steel Sdn. Bhd., Malaysia	2016-2018

SINTERING

No.	Name of Project	Customer	Time
3	sintering flue gas desulfurization revamping project	MMK, Russia	2014-2015
4	pallet for sinter machine ravamping	Kryvyi Rih, Ukraine	2014
5	360m² sinter plant	Jinshenglan Metallurgy Technology Co., China	2013-2014
6	265m² sinter plant	Rockcheck Steel Group , China	2013-2014
7	260m² sinter plant	Xinxing Iron & Steel Co., Ltd., China	2011-2012
8	360m² sinter plant	Liuzhou Iron & Steel Corporation, China	2011-2012
9	2x240m² sinter plant	Hanzhong Iron & Steel Corporation, China	2009-2011
10	360m² sinter plant	Chongqing Iron & Steel Corporation, China	2010-2011
11	300m² sinter plant	Kunming Iron & Steel Co., Ltd., China	2010-2011
12	430m² sinter plant	Baosteel Bayi Iron & Steel Co., Ltd., China	2010-2011
13	90m² sinter plant	Monnet, India	2010-2012
14	360m² sinter plant	Liuzhou Iron & Steel Corporation, China	2009-2010
15	2x360m² sinter plant	Chongqing Iron & Steel Corporation, China	2008-2010
16	360m² sinter plant	Liuzhou Iron & Steel Corporation, China	2007-2008

BLAST FURNACE

No.	Name of Project	Customer	Time
1	630m³ Blast Furnace Revamping Project	Binxin Iron & Steel Co., Ltd., China	2015-2016
2	550m³ Blast Furnace Revamping Project	JSW, India	2015
3	2x1350m³ Blast Furnace	Hubei Jinshenglan Metallurgy Technology Co., China	2015-2016
4	4x2500m³ Blast Furnace	Cangzhou Zongheng Industries Ltd., China	2013-2015
5	2000m³ Blast Furnace	ZISCO,Iran	2013-2017
6	2x1780m³ Blast Furnace	Hebei Iron & Steel Group, China	2012-2013
7	900m³ HBS	Acerias Paz del Rio, Columbia	2012-2013
8	2000m³ Blast Furnace	Chongqing Iron & Steel Group, China	2011-2013

BLAST FURNACE

No.	Name of Project	Customer	Time
9	550m³ Blast Furnace	Monnet, India	2009-2012
10	1080m³ Blast Furnace	Hanzhong Iron & Steel Group, China	2009-2011
11	3x2350m³ Blast Furnace	Cangzhou Zongheng Industries Ltd., China	2007-2009
12	3050m³ Blast Furnace	Isdemir, Turkey	2005-2010

STEEL MAKING & CCM

No.	Name of Project	Customer	Time
1	200x1600mm one tension leveller &one slab CCM project	Jiangsu Changqiang Iron and Steel Co.,Ltd, China	2016-2017
2	2.4mtpa steel making & CCM	Tosyali, Algeria	2015-2017
3	120t BOF primary dusting modification project	Tianjin Rockcheck Steel Group, China	2015-2016
4	7-strand billet caster for 120t & 150t coverter	Liuzhou Iron & Steel Co., China	2013
5	hot metal pre-treatment 3x180t BOF and LF project	Cangzhou Zongheng Industries Ltd., China	2013-2015
6	2x120t BOF project	ZISCO, Iran	2012-2015
7	120t VD, KR desulfurization project	Tianjin Rockcheck Steel Group, China	2012-2014
8	7-strand billet caster	Liuzhou Iron & Steel Group, China	2012-2013
9	150t LF project	Zhongtie Equipment Manufacturing & Material Co., Ltd., China	2012-2013
10	2x150t BOF project (EPC)	Liuzhou Iron & Steel Group, China	2011-2012
11	steel making project --100t EAF, 100LF, 30t EAF, 40t LF and auxiliary facilities	Sinosteel Hengyang Machinery Co., Ltd.,China	2009-2010
12	4-strand billet caster -- 120mm x120mm, 150mm x 150mm	Thai Nguyen Iron and Steel Corporation, VietNam	2008-2011

STEEL MAKING & CCM

No.	Name of Project	Customer	Time
13	170mm x 425 ~ 800mm x 10mm slab caster	Tosyali, Turkey	2008-2009
14	2-strand slab caster -- 230mm x 1650mm 1-strand slab caster -- 300mm x 2500mm	Chongqing Iron & Steel Group, China	2008-2009
15	KR desulphurization project -- 2×100t + 2×150t	Xingcheng Special Steel Corporation, China	2007-2009
16	6mpta steel making project	Cangzhou Zongheng Industries Ltd., China	2007-2009
17	120t LF project	Erdemir, Turkey	2006-2007

STEEL ROLLING

No.	Name of Project	Customer	Time
1	spiral pipe mill project	Tosyali, Algeria	2016-2018
2	2.3mtpa steel rolling project	Tosyali, Algeria	2015-2018
3	200,000tpa non-oriented silicon steel continuous annealing project	Baotou Iron & Steel Group, China	2013-2014
4	1mtpa bar mill project 800,000tpa bar mill project 2x600,000tpa wire mill project	Anhui Shoukuang Dachang Metal Material Co., Ltd., China	2012-2015
5	600,000tpa wire rod mill project	Tosyali, Turkey	2012-2014
6	2x600,000tpa wire mill project	Tangshan Donghua Iron & Steel Co., Ltd., China	2012-2014
7	1mtpa large size bar mill Project	Tianjin Rockcheck Steel Group, China	2011-2012
8	2×850,000tpa bar mill 600,000t high speed wire rod mill	Baosteel Bayi Iron & Steel Co., Ltd., China	2010-2012
9	1250mm cold mill technology renovation project 600,000tpa bar mill	Liuzhou Iron & Steel Group, China	2009-2012
10	950mm hot strip mill	Tosyali, Turkey	2008-2009
11	4100mm plate mill	Chongqing Iron & Steel Group, China	2007-2009
12	1.2mtpa bar mill and walk-beam heating furnace 750,000tpa wire rod mill 750,000tpa bar mill	ICDAS, Turkey	2007-2008 2001-2003 1999-2001

POWER

No.	Name of Project	Customer	Time
1	2x660MW inferior coal thermoelectric project	Yangquan Coal Industry (Group) Co., Ltd., China	2016-2018
2	Yangquan Sangzhang ventilation air methane and 15MW low concentration gas power generation project	Fortman (Beijing) Clean Energy Technology Co., Ltd., China	2016-2017
3	2x55MW coal fired power plant	Pt. Bosowa Maros Energy, Indonesia	2016-2018
4	132kV substations project	IESCO, Pakistan	2016-2017
5	400kV substation project	Tosyali, Algeria	2016-2017
6	power plant turbine overhaul	Tubatse Chrome (Pty.) Ltd., South Africa	2016
7	ADB-65 500kV transmission line project	NTDC, Pakistan	2015-2017
8	1500t/d municipal solid waste incineration power plant	PT. CPS Indonesia Medan	2015-2018
9	4x132kV substations project	GEPCO, Pakistan	2014-2016
10	waste pressure power generation project for 1850m³/1707m³/2100m³/2500m³ blast furnaces	Erdemir/Isdemir, Turkey	2014-2016
11	6MW saturated steam power generation project	Tangshan Donghai Iron & Steel Group, China	2013
12	2x350MW power plant Phase I	Xinjiang Guotai Xinhua Mining Co., Ltd., China	2013-2016
13	No.7 power plant revamping and expansion project	WISCO, China	2013-2014
14	saturated steam waste heat power generation project	Hanzhong Huafu New Energy Co., Ltd., China	2013-2014
15	12MW low temperature steam power generation project	Baosteel Bayi Iron & Steel Co., Ltd., China	2012-2013
16	25MW sintering waste heat 60MW coal gas power genration project	Chengde Iron & Steel Group, China	2012-2013
17	combined steam and coal gas power generation project	Baotou Iron & Steel Group., China	2012-2013
18	2x50MW+2x30MW coal fired units 15MW waste heat recovery power generation project	Anhui Shoukuang Dachang Metal Material Co., Ltd., China	2012-2013
19	50MW+12MW waste coal gas recycling power generation project	Donghua Iron & Steel Co., Ltd., China	2012
20	BF top pressure recovery tpower generation project	Baotou Iron & Steel Co., Ltd., China	2012
21	2x600MW coal fired power plant Phase II	ICDAS, Turkey	2011-2014
22	2x15MW ferrochrome furnace waste heat power generation project	Tubatse, South Africa	2011-2013
23	2x7MW coal fired power plant	PT. PP(Persero), Indonesia	2011-2013

POWER

No.	Name of Project	Customer	Time
24	2x30MW gas fired power plant	WISCO Ersteel, China	2011
25	TRT for 1080m³ blast furnace	Pingxiang Iron& Steel Co, Ltd., China	2011
26	35MW turbo generator 2x350m² sinter machine waste heat recovery project	Chengde Iron & Steel Group, China	2010-2011
27	2x180m² sinter machine waste heat recovery 3x25MW & 3x180t/h turbo generator power plant	HBIS Rongxin Iron & Steel Co., Ltd., China	2010-2011
28	1080m³ blast furnace TRT 15MW / 75t turbo generator power plant	Pingxiang Iron & Steel Co., Ltd., China	2010-2011

COAL CHEMICAL

No.	Name of Project	Customer	Time
1	1.2mtpa coke oven relocation project	Hebei Xuyang Coking Co., Ltd., China	2017-2018
2	salt extraction from desulfurization waste project	JSW Vijayanagar Plant, India	2016-2017
3	No.5 coke oven overhaul project	Maanshan Iron & Steel Co., Ltd., China	2015-2016
4	200,000tpa ethylene glycol project	Yangquan Coal Industry (Group) Co., Ltd., China	2014-2016
5	coke oven wall repair project	Essar Algoma Inc., Canada	2013-2014
6	3mtpa coke oven & by-product	Hebei Bohai Coal Coking Co., China	2013-2016
7	960,000tpa stamp-charging coke oven & by-product	Dingzhou Tianlu New Energy Co., Ltd., China	2013-2014
8	1.3mtpa coke oven & by-product	Anhui Shoukuang Dachang Metal Material Co., Ltd., China	2012-2015
9	1x2.3mtpa coal moisture project	Liuzhou Iron & Steel Group, China	2012-2015
10	1.0mtpa coke oven & by-product	JSW Dolvi, India	2011-2014
11	1.0mtpa coke oven & by-product	JSW Ispat, India	2011-2013
12	2x140t/h CDQ	Baotou Iron & Steel Group, China	2011-2013
13	425,000tpa non-recovery coke oven	Usha Martin, India	2010-2013
14	2x110t/h CDQ	Liuzhou Iron & Steel Group, China	2009-2010

COAL CHEMICAL

No.	Name of Project	Customer	Time
15	1.9mtpa coke oven with by-product	JSPL, India	2008-2017
16	2.2mtpa coke oven with CDQ and by-product	Cangzhou Zongheng Industries Ltd., China	2008-2010
17	300,000tpa coke Oven	Thai Nguyen Iron & Steel Corporation, Vietnam	2008-2009
18	1.9mtpa coke oven with by-product	JSW Vijayanagar, India	2007-2011
19	500,000tpa non-recovery coke oven	JSW Salem, India	2007-2008
20	1.2mtpa coke oven	Sumitomo Wakayama, Japan	2006-2009
21	1.5mtpa coke oven with by-product	JSW Vijayanagar, India	2006-2008
22	45000m³/h coke oven gas cleaning project	ArcelorMittal Temirtau, Kazakstan	2005-2006
23	1.3mtpa coke oven	Isdemir, Turkey	2004-2007

ENERGY SAVING & ENVIRONMENT PROTECTION

No.	Name of Project	Customer	Time
Metallurgical			
1	150t direct current furnace dedusting project	Baosteel	2016
2	5mtpa pelletizing flue gas desulfurization and dedusting project	WISCO Resource and Mining Co., Ltd.	2014
3	180t converter PM2.5 purification project	WISCO Echeng Iron & Steel Co., Ltd.	2014
4	265m² sinter machine desulfurization and wet electric precipitation project	Shandong Iron & Steel Co., Ltd. Laiwu Branch	2014
5	5500m³ blast furnace bin dedusting system project	Shougang Jingtang United Iron & Steel Co., Ltd.	2007-2008
6	300t converter and LF fume control project	Shougang Jingtang United Iron & Steel Co., Ltd.	2007-2008
7	550m² sinter machine discharge end and proportioning bin bag dust removal project	Shougang Jingtang United Iron & Steel Co., Ltd.	2007
8	7.63m coke oven discharging and grinding station dedusting project	Shanxi Taigang Stainless Steel Co., Ltd.	2006

ENERGY SAVING & ENVIRONMENT PROTECTION

No.	Name of Project	Customer	Time
9	1.5mtpa stainless steel dedusting and fume control project	Shanxi Taigang Stainless Steel Co., Ltd.	2005-2006
Energy and municipal			
1	2×50MW flue gas dedusting, desulfurization and denitrification project	Guodian Shenyang Thermalpower Co., Ltd.	2015
2	2×600MW electrostatic-bag precipitator project	Shanxi Xingneng Power Co., Ltd.	2014
3	2×220MW unit desulfurization and denitrification project	Wuhan Steel and Power Co., Ltd.	2012
4	500t electrostatic-bag precipitator project	Shenzhen Nanshan solid waste incineration power plant	2010
5	220MW unit electrostatic-bag precipitator upgrade project	Shenhua Jiaozuo Power Plant	2003
Petroleum and Chemical			
1	250,000tpa FCC regenerating flue gas particle purification project	Sinochem Yangzhou Petrochemical Co., Ltd.	2016
2	500,000tpa FCC regenerating flue gas purification project	Sinochem Qingdao Anbang Refinery Co., Ltd.	2015-2016
3	200,000tpa FCC regenerating flue gas purification project	Sinochem Lanxing Petroleum Co., Ltd.	2015
Resourceful utilization and others			
1	heavy metal polluted soil remediation project	Hubei Huangmailing Phosphor-chemical Co., Ltd.	2017
2	waste fruit and vegetable natural gas and organic fertilizer project	Yunnan Runtu Agricultural Environment Protection Technology, Co., Ltd.	2016-2017
3	oxide pellet Material Yard Project	Shougang Iron & Steel Co., Ltd.	2016-2017
4	sinter machine head precipitating ash recycle project	Cangzhou Zhongtie Equipment Manufacturing and Material Co., Ltd.	2015-2016