



# BeyondECO<sup>®</sup> Steel Low Carbon Emission Products



# SUSTAINABLE DEVELOPMENT VISION

To be the best practitioner of environmental friendliness



**BAOSTEEL**

To be the leader in iron & steel technologies

To be a corporate model of mutual development of employees and the company



**Steel is an important civilization achievement and has made significant contributions to improving the quality of human life.**

In the future, steel will enter a low-carbon era, which is a radical revolution to the traditional steel value chain. It cannot be achieved by one enterprise alone, and requires the joint efforts of steel companies and upstream and downstream enterprises in the industry chain to achieve long-term success. Baosteel adheres to the development path of "innovation, coordination, green, openness, and sharing", and is committed to leading low-carbon development with technological innovation.

**BeyondECO® low-carbon emission steel will help the supply chain achieve green and low-carbon development together.**

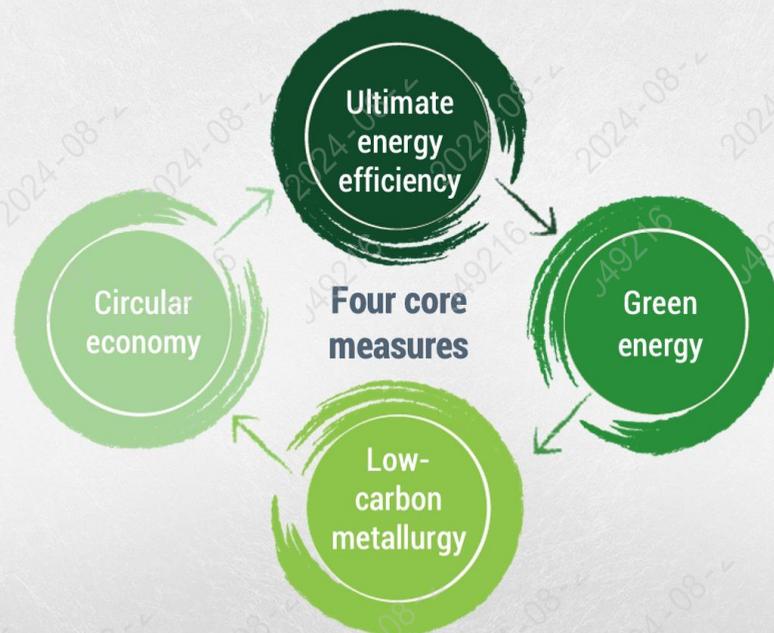
Chairman :

# CARBON NEUTRALITY STRATEGY

## Carbon Neutrality Targets

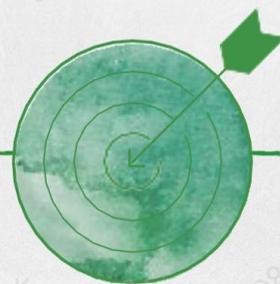


## Four core measures to achieve carbon neutrality



# CARBON NEUTRALITY STRATEGY

## Three Five-Year Decarbonization Plan



There is uncertainty in their contribution to carbon reduction due to constraints in the construction of external green power channels and the progress of low-carbon metallurgical R&D.

# ULTIMATE ENERGY EFFICIENCY

## Year 2023



**100**

energy-saving and low-carbon projects



Energy conservation

**418,000** tons of standard coal



Investment in RMB

**2.38** billion



Carbon reduction

**1.05** million tons of CO<sub>2</sub>

### Technical Energy Savings (10000 tons of standard coal)



Technical energy savings between 2019-2023

83.8% of processes that Energy efficiency is better than benchmark

Energy efficiency improvement plans for 8 categories of general equipment

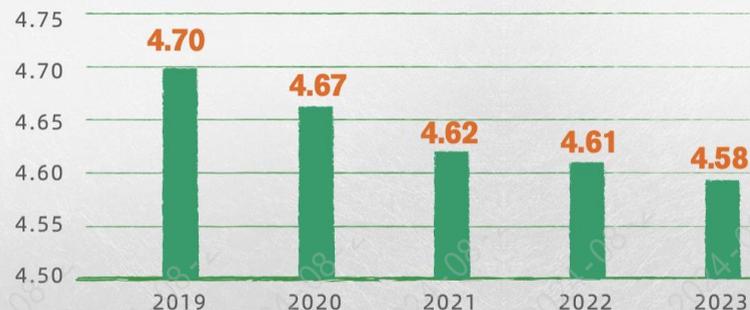


Upgrading of Annular Cooler of Sintering Unit with BACT technology



Digitalized O-TRAP orifice steam trap

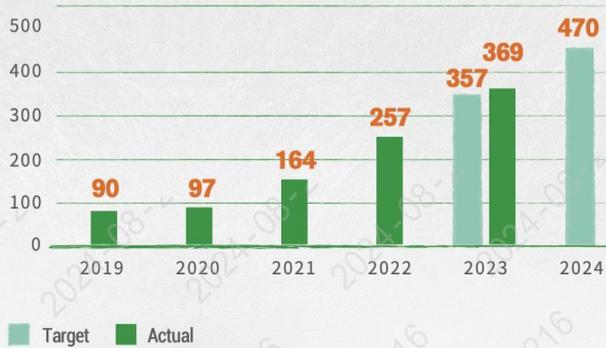
### Comprehensive Energy Consumption (MWH/t crude steel)



Comprehensive energy consumption per ton of crude steel between 2019-2023

# GREEN ENERGY

## Cumulative Installed Capacity of on-site Solar PV (MW)



The world's largest rooftop PV project within steel sector

## Promote Green Power Purchase



## Equity Participation in Utility-scale Renewable Energy Plants

### Zhanjiang Base

In June 2023, successfully won the 400 MW Offshore Wind Power Project in Xuwen with Guangdong Wind Power Co., Ltd, 100% green power for near-zero carbon emissions line.

### Meishan Base

"Jianhu" 700MW fishery-photovoltaic project generate green power that can greatly improve the supply of green power for Meishan Base.

### Target

Equity participation in 1.6 GW renewable energy plants by 2030

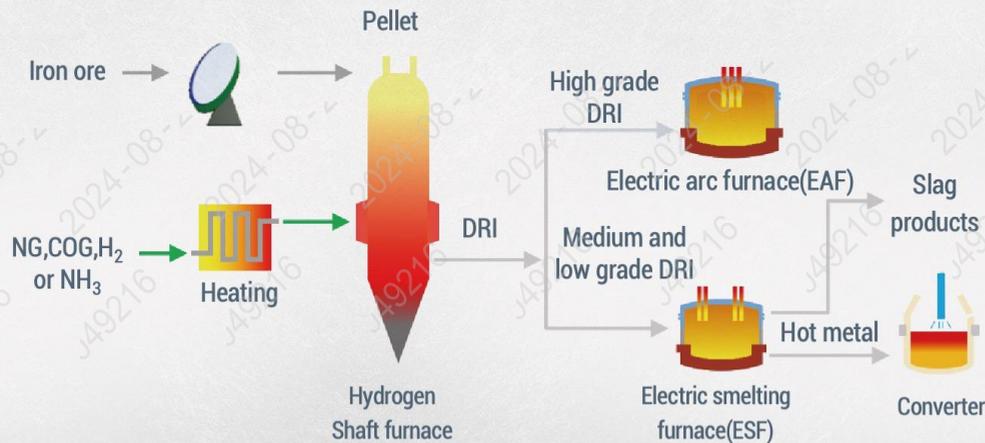
# LOW-CARBON METALLURGY



CO<sub>2</sub> reduction **60%**

## Hydrogen Reduction & Electric Smelting Process (HyRESP)

Shaft furnace was put into operation on Dec 23, 2023  
Under-construction EAF will be put into operation by the end of 2025

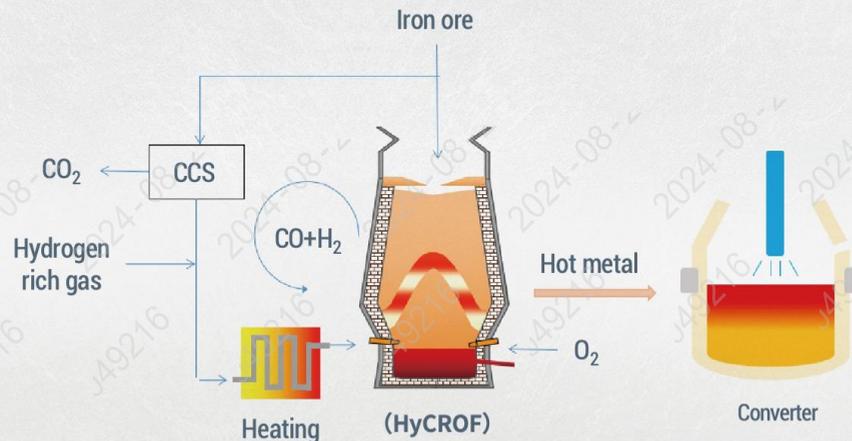


1.0 million t/a HDRI+1.8 million t/a EAF, Capex ~6 billion RMB

## LOW-CARBON METALLURGY

CO<sub>2</sub> reduction 30%

### Hydrogen-enriched Carbonic oxide Recycling Oxygenate Furnace (HyCROF)



HyCROF demo project at Bayi iron & steel, Baosteel focuses on evaluate feasibility of building multi million ton CCS cluster project in East China



Baosteel, Sinopec, Shell, and BASF signed a joint research agreement on the four party CCUS cooperation project in East China. During the joint research period, the four parties will jointly evaluate the feasibility of building China's first open multi million ton CCUS cluster project in East China from the perspectives of technology, business, and policy.



Baosteel and ExxonMobil signed a Memorandum of Understanding (MOU) on low-carbon solutions cooperation in Shanghai. Both parties will explore business opportunities in low-carbon solutions, including potential low-carbon energy solutions, carbon capture and storage (CCS) value chain, and certification of Baosteel's low-carbon footprint products.

# CIRCULAR ECONOMY

## Scrap Direct Supply and Procurement Agreement



Dongfeng Hongtai and Wuhan base signed cooperation agreement on scrap steel recycling, recycled scrap will be manufactured into vehicles part

## High Scrap Ratio Recycled Steel Development



**China's First Ultra-Low Carbon Emission Steel X-GPa® Part**  
Baosteel works with strategic user FAW Hongqi to successfully complete the application demonstration of ultra-low carbon emission X-GPa® DH980 on the reinforcement of the left and right sills in MPV

## GREEN LOGISTICS

Over 80% of the transportation volume of bulk materials and products entering and leaving Baosteel is carried by railway, waterway, pipeline or tubular belt conveyors

### Upstream Raw Material Transportation



shipment of iron ore



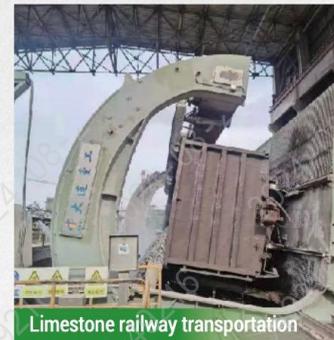
shipment of coal



shipment of scrap



shipment of slag



Limestone railway transportation

### Downstream Transportation of Steel Products



Hydrogen heavy-duty trucks



Coil transportation by railway



Electric trucks



Lithium-ion battery swap station



New energy fork truck

# GREENHOUSE GAS EMISSIONS

GHG emissions(Scope 1&2) in 2023

**11,174** million ton CO<sub>2</sub>e

GHG emissions intensity in 2023

**2.04**

tCO<sub>2</sub>e/t crude steel

Compared to year 2020

2.13tCO<sub>2</sub>e/t

**4%** ↓

note: Detail GHG emissions(Scope 3) in sustainability report

tCO<sub>2</sub>e/t crude steel

10,000 tons of CO<sub>2</sub>e



GHG emissions of Baosteel's four bases

# BeyondECO® STEEL PRODUCTION LINES PLAN

2025

- Shaft furnace+EAF
- 100%Scrap+EAF
- 30%Scrap+BF-BOF

2030

- Shaft furnace+EAF
- 30%Scrap+BF-BOF
- 100%Scrap+EAF
- HyCROF



# BeyondECO® STEEL SUPPLY SCHEDULE



2022, 100% Scrap +EAF with 100% renewable electricity Low-Carbon Products  
2023,30~50% Scrap +BF/BOF with 100% renewable electricity Low-Carbon Products  
2025, DRI-EAF with 100% renewable electricity Low-Carbon Products

## 2022

- 100% Scrap+EAF
- 100% Renewable electricity
- HSS/UHSS
- Trial supply



## 2023-2024

- 30%-50%Scrap+BF/BOF
- 100% Renewable electricity
- All grade
- Batch supply



## 2025

- DRI-EAF
- EAF
- 100% Renewable electricity
- Majority of grades

## 2030

- HyCROF
- DRI-EAF
- CCUS
- Renewable electricity
- All grade



# DEVELOP BeyondECO® STEEL VIA BF/BOF ROUTE

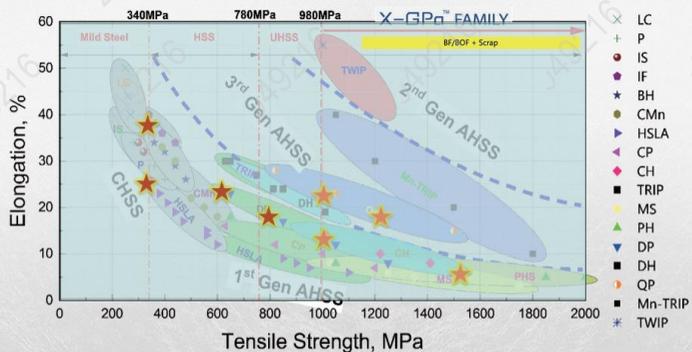
By employing the flexible multi-station scrap adding technology, a carbon reduction over 30% could be achieved with a scrap ratio of 30%-50%, according to the third-party certification.

The products up to 780MPa can be produced by the technical route of BF/BOF-Scrap.

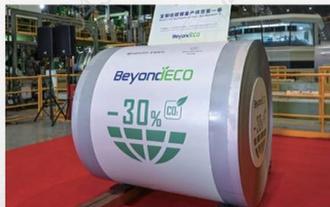
## Technical Route



## Progress of Products Development



### Carbon reduced by 30%



### Carbon reduced by 50%



# DEVELOP BeyondECO® STEEL VIA EAF ROUTE

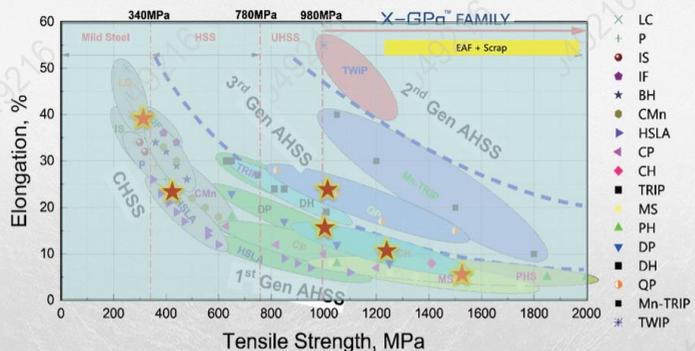
By employing the clean smelting technology of EAF, a carbon reduction over 60% could be achieved with 100% scrap, according to the third-party certification.

The products of HSS and X-GPa® can be produced by the technical route of EAF.

## Technical Route



## Progress of Products Development



## Carbon reduced by 60%



# BeyondECO® STEEL PRODUCTS AVAILABLE



Technical Route	Carbon reduction	Verified steel category, typical steel grades	Steel products available
High scrap ratio via BF/BOF	$\geq 30\%$	<p>Hot rolled pickled sheet: HSS</p> <p>Cold rolled automotive sheet: Outer plate, HSS,UHSS,Hot formed steel</p> <p>Silicon steel: Oriented and High grade non oriented silicon steel</p> <p>Tinplate: SR &amp; DR tinplate products for easy open ends</p>	All flat-rolled products including hot rolled, heavy plate, cold rolled, HGD, EG, silicon steel, tinplate.
100% scrap ratio via EAF	$\geq 60\%$	<p>Cold rolled automotive sheet: HSLA, 980DP, 980QP</p> <p>Seamless steel tubes: 34CrMo4 for Gas Cylinder</p> <p>Wire rod: Tire Cord Steel B72LX/B82LX</p>	<p>Cold rolled automotive sheet: HSS &amp; UHSS</p> <p>Seamless steel tubes: Gas Cylinder</p> <p>Wire rod: Tire Cord Steel, Cold Heading Steel, Spring Steel</p>

# BeyondECO® STEEL CUSTOMERS





# CARBON FOOTPRINT AND EPD REPORT

Carry out carbon footprint accounting for major product categories, certified by third party (intertek/ TÜV SÜD)  
Hot rolled pickled steel plates and strips, color coated steel strip, Hot rolled steel plates and strips, wire rod EPD reports are released on China Steel Association EPD Platform <https://www.cisa-epd.com/>



According to

- ISO 14040, ISO 14044, ISO 14025, 14067, ISO 20915
- China steel Association PCR
- GB/T 30052 Technical Specification for Life Cycle Assessment of Steel Products

# ENHANCEMENT OF CLIMATE-RELATED DISCLOSURES

Carry out GHG emission inventory and verification according to ISO 14064, the first climate action report in China steel industry, reached A- leadership level in the CDP climate change 2023 questionnaire

## Ghg Verification Statement



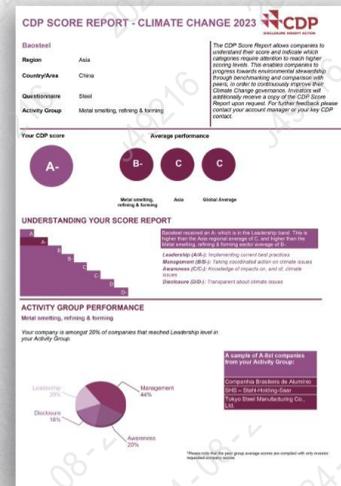
## Climate Action Report



## Sustainability Report



## CDP Score Report





# For more information



Refer to our 《Baosteel Sustainability Report》

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