

JFE Steel Carbon Neutrality Strategy

Dream for your **Future**,
Steel takes you **Further**.



JFE Steel Corporation



Company Overview

Official Name JFE Steel Corporation
President Masayuki Hirose
Head Office Chiyoda-ku, Tokyo

Crude Steel Production
 (Non-consolidated)

Approx. 22 million tons

(Consolidated) **Approx. 23 million tons**

Employees (Consolidated)

Approx. 43,000

Net Sales (Consolidated)

¥3,365.1 billion

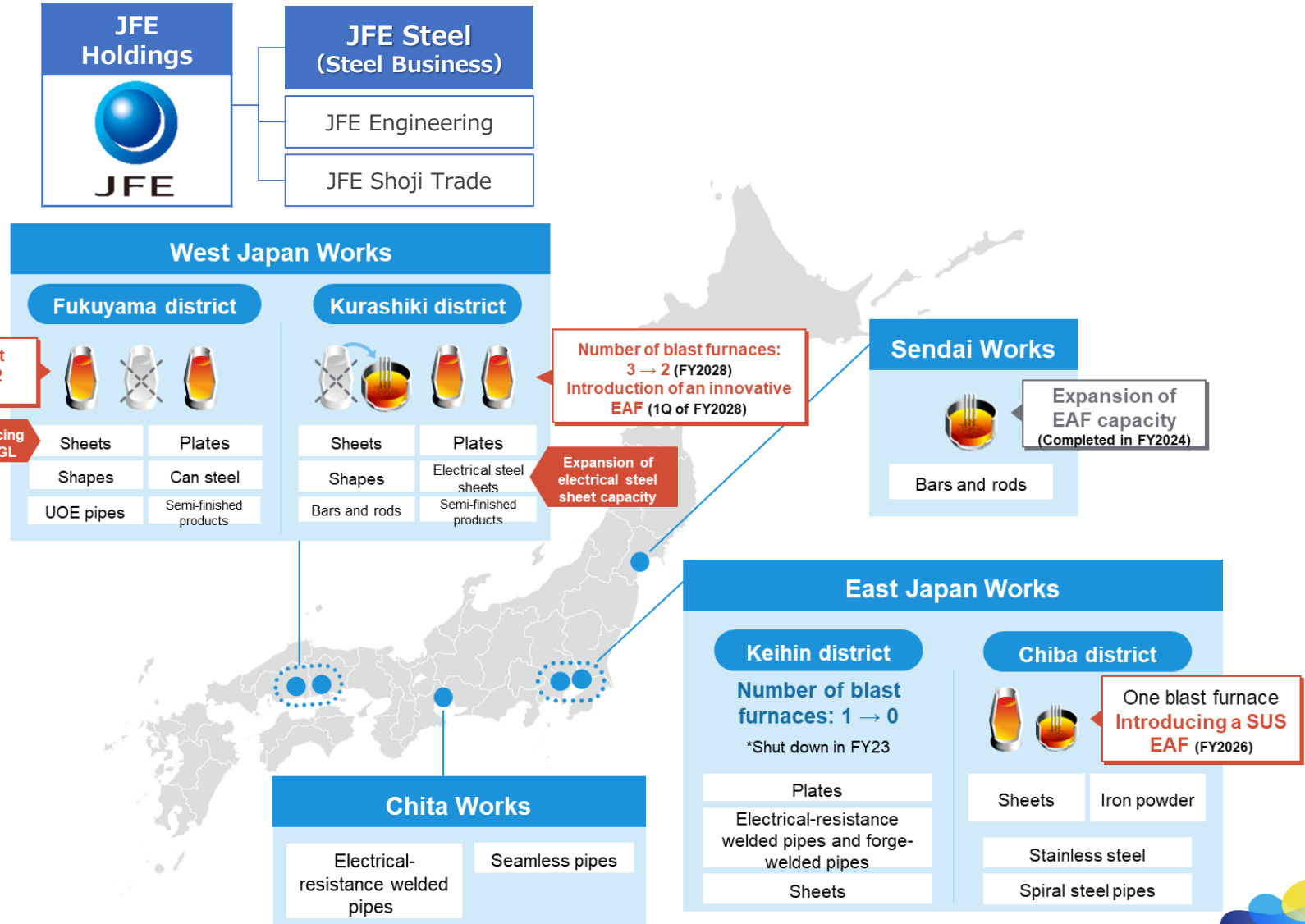
Corporate Vision

**Contributing to society
 with the world's most
 innovative technology**

Purpose (JFE Steel)

Dream for your Future, Steel takes you Further.

Copyright © 2026 JFE Steel Corporation. All Rights Reserved.

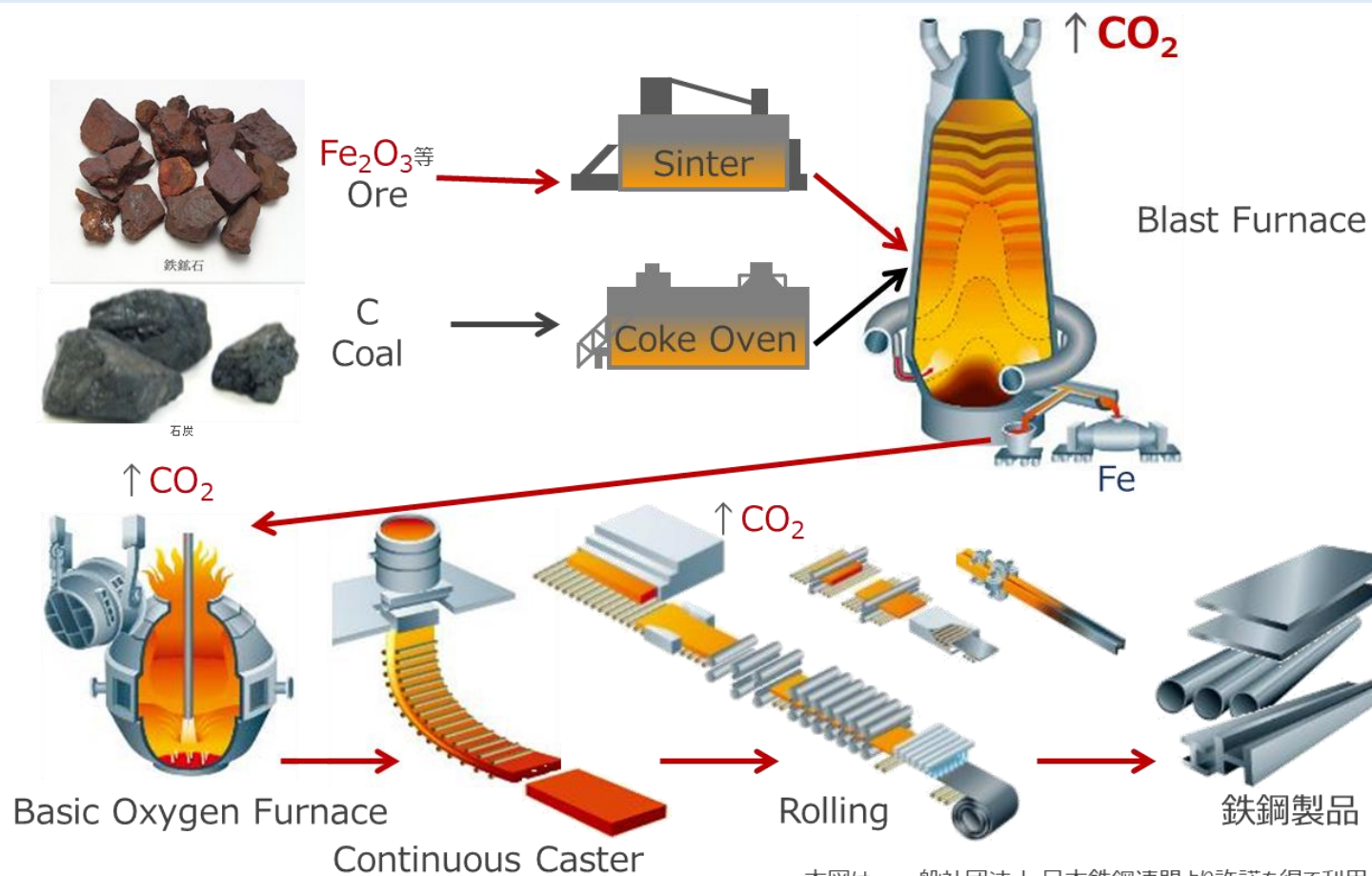




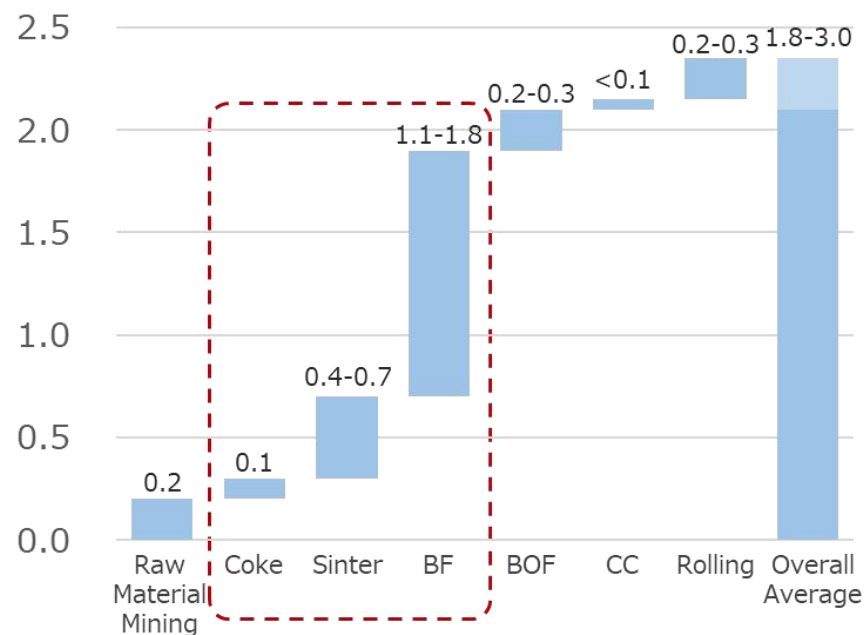
JFE

Key Characteristics of the Blast Furnace Route

- CO₂ emissions are inherently generated when iron ore (iron oxide) is reduced with carbon to produce iron.
- Around 80% of CO₂ emissions in the steelmaking process come from the blast furnace iron ore reduction process, making the decarbonization of ore reduction technologies the key challenge for achieving carbon neutrality in the steel industry.



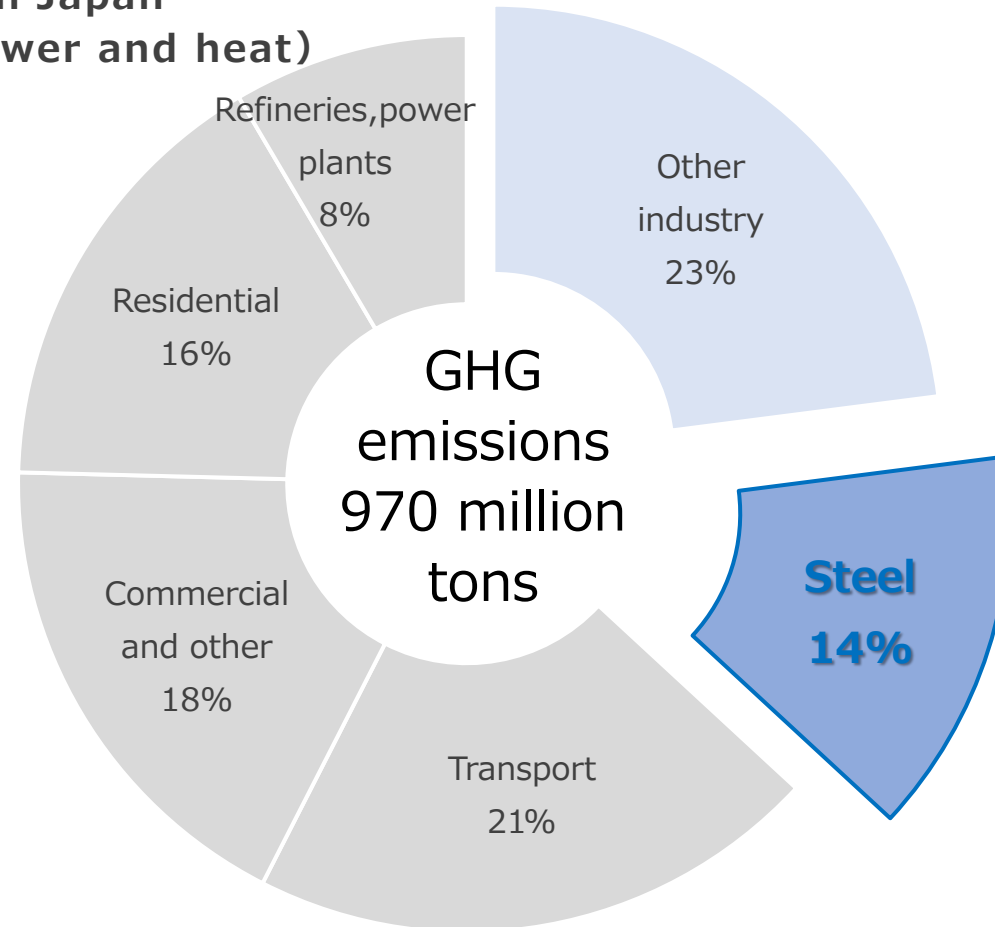
■ Share of CO₂ Emissions from the Steel Production Process (t-CO₂/t-steel)



The Steel Sector is the Largest GHG Emitter

- Steel industry: A key sector for Japan's carbon neutrality, responsible for approximately 14% of the nation's total GHG emissions.

■ Energy related GHG emissions in Japan (In 2024, after allocation of power and heat)



Source: Ministry of the Environment, "FY2024 Greenhouse Gas Emissions and Removals "; edited by JFE Steel.

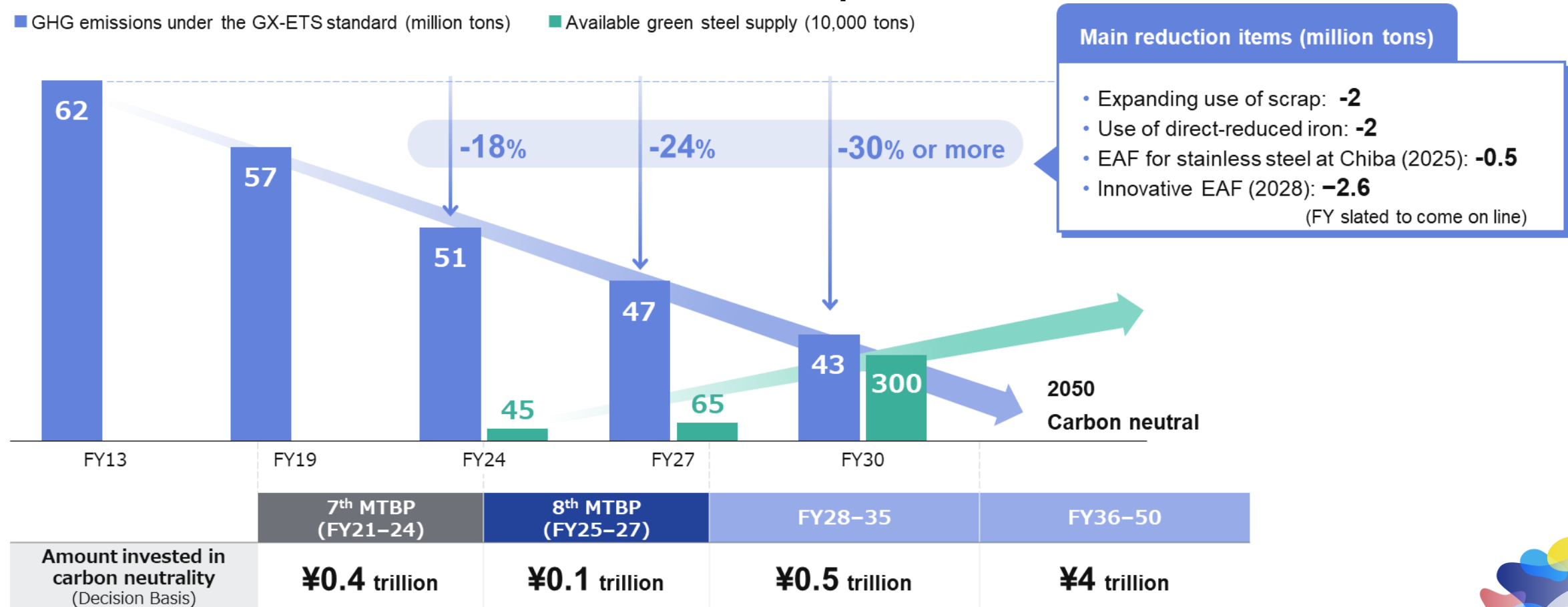
<https://www.env.go.jp/content/000392897.pdf>

GHG reduction initiatives in the Steel business

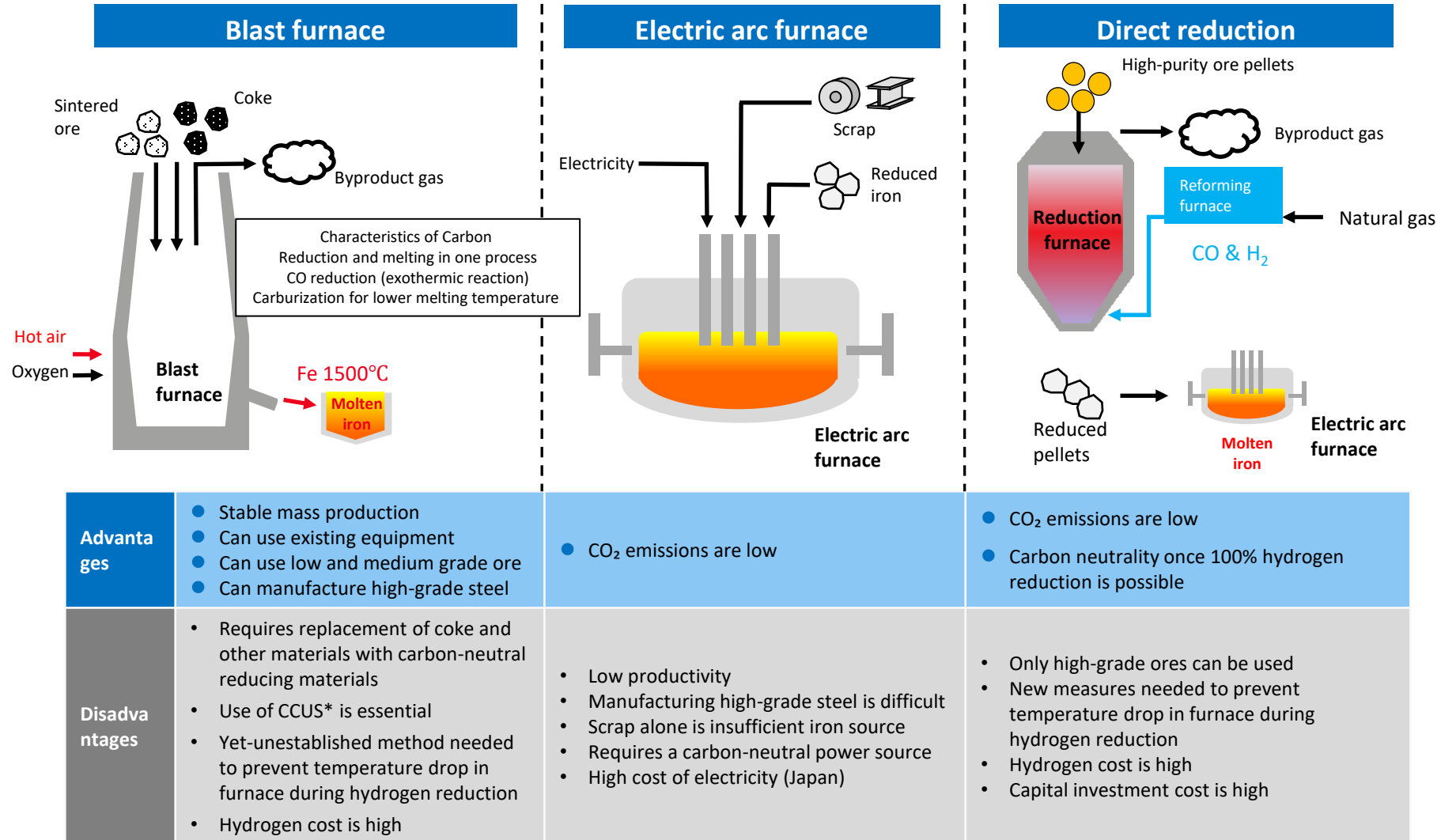
- In the steel business, GHG emissions will be reduced steadily. An innovative electric arc furnace will be installed at Kurashiki to build a system for the mass supply of green steel. Development of ultra-innovative technologies will be promoted to achieve carbon neutrality.

Domestic steel business: GHG emissions reduction plan

■ GHG emissions under the GX-ETS standard (million tons) ■ Available green steel supply (10,000 tons)



Advantages and Problems of Current Steelmaking Process

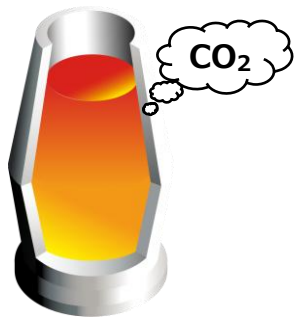




Direction of Breakthrough Process Transformation

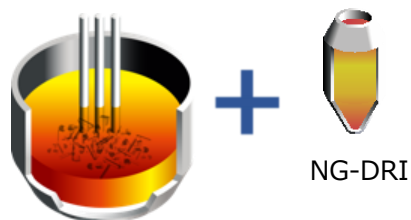
- While the development of breakthrough steelmaking technologies and the required green hydrogen and power infrastructure will take time and substantial investment, the steel industry, as the largest industrial emitter, must continue to make every effort to reduce emissions.
- During the transition period, EAF technology is the only viable decarbonization pathway. We will therefore lead the industry in deploying innovative, high-efficiency, large-scale EAFs as an alternative to conventional blast furnaces.

Current State: Blast Furnace Route



Ore/Coal

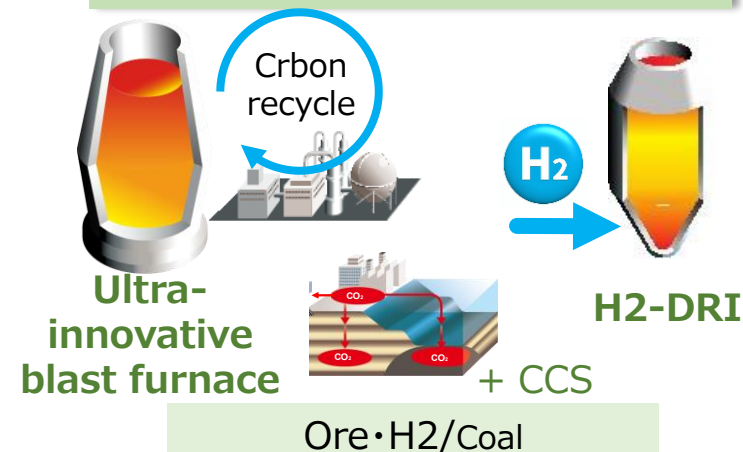
Transition to an Innovative EAF Route



Scrap/DRI(HBI)

Production of high-quality, high-performance steel products using highly efficient, large-scale EAFs

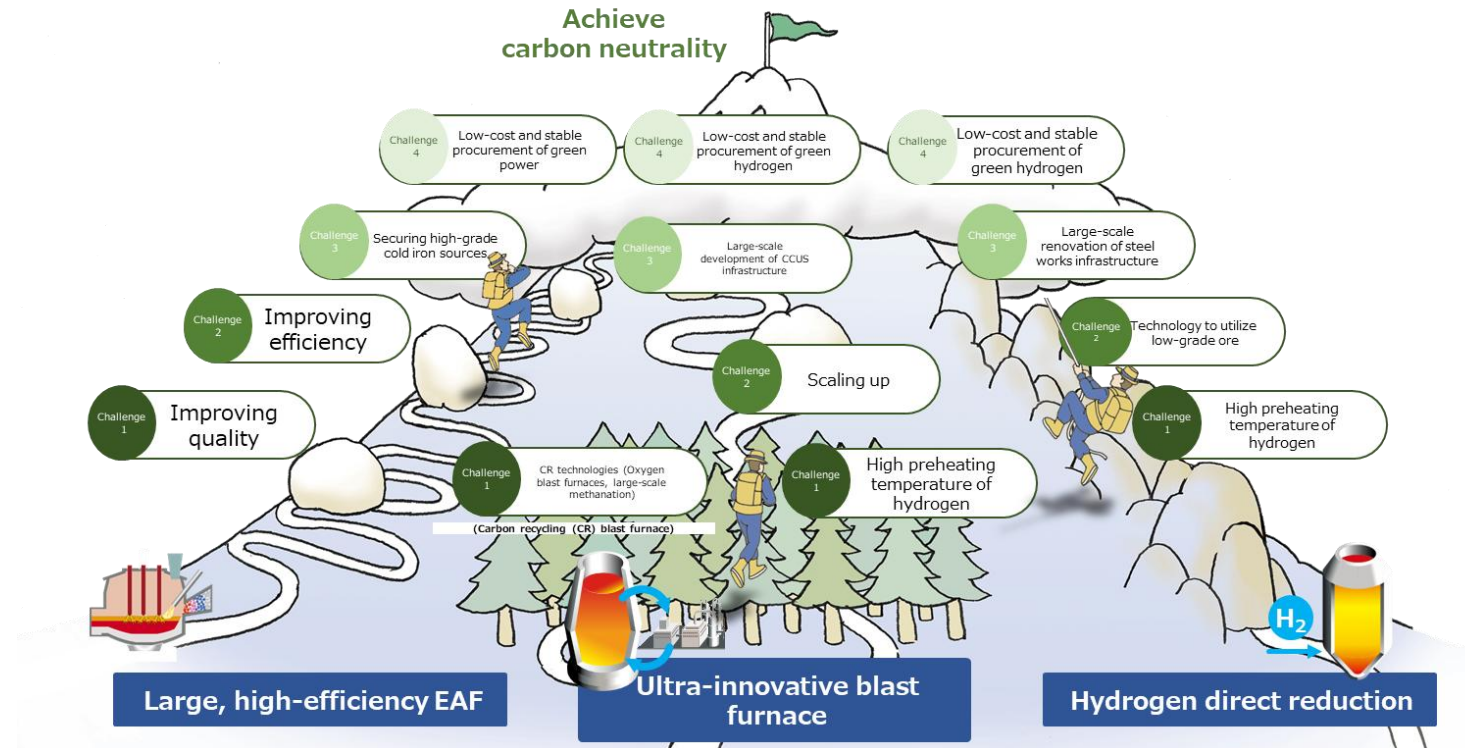
Hydrogen Reduction Technology (Under Development)



Hydrogen utilization technologies for blast furnace and DRI processes
(e.g., high-temperature hydrogen injection and carbon recycling)

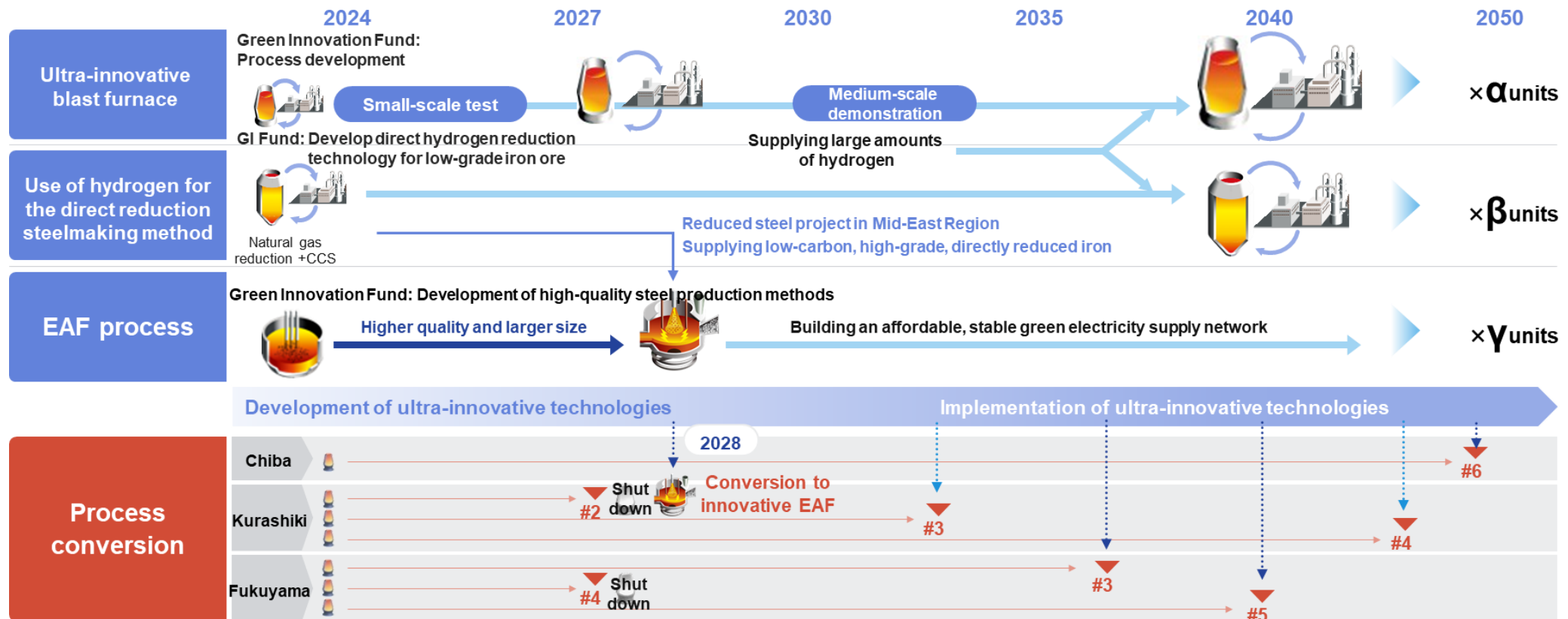
Technological Multi-track Approach for Carbon Neutrality

- Along the way to reaching carbon neutrality (something like climbing to the summit) by 2050, there are variety technical paths and numerous challenges.
- The fastest way to the summit is unpredictable, a multitrack approach is essential in driving technological development.
- Although it is difficult to achieve the goal by only company itself, we will progress steady with government subsidy (GI Fund: Green innovation fund) support.



Direction of Process Transformation

- **Ultra-innovative technologies:** Completing technology development using the Green Innovation Fund, etc. to make the conversion technologically viable (around 2035)
- **Transition Policy:** Making comprehensive judgements regarding the method and timing of process conversion by also considering the affordable and stable network for the mass supply of hydrogen and electricity, the entrenchment of green steel, and other factors.

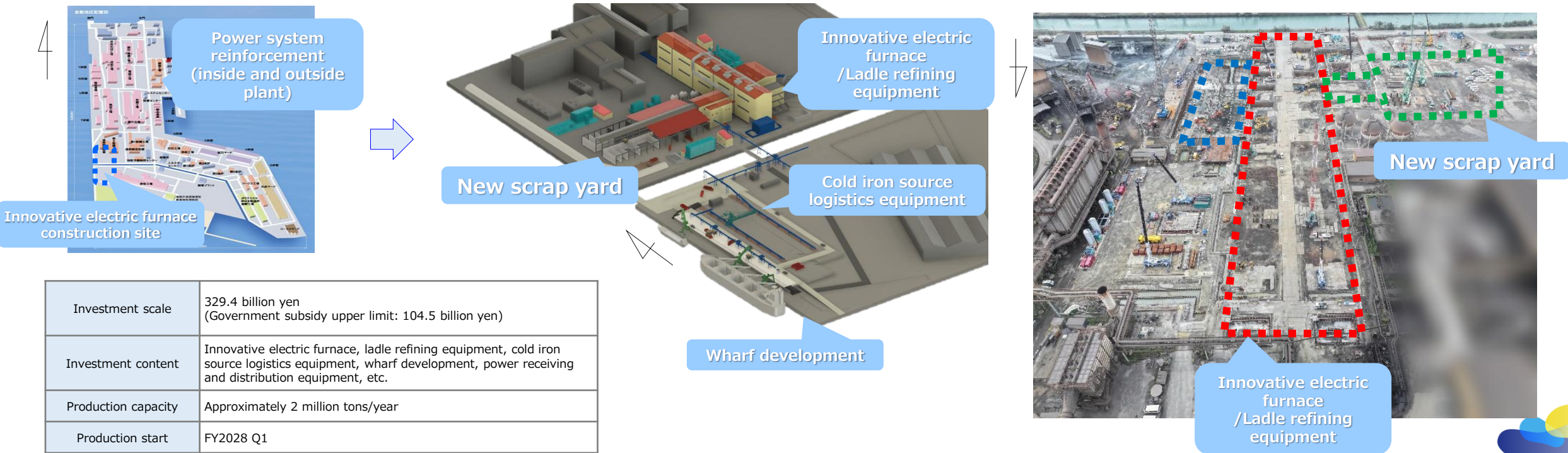




JFE

Kurashiki Innovative EAF Construction Plan

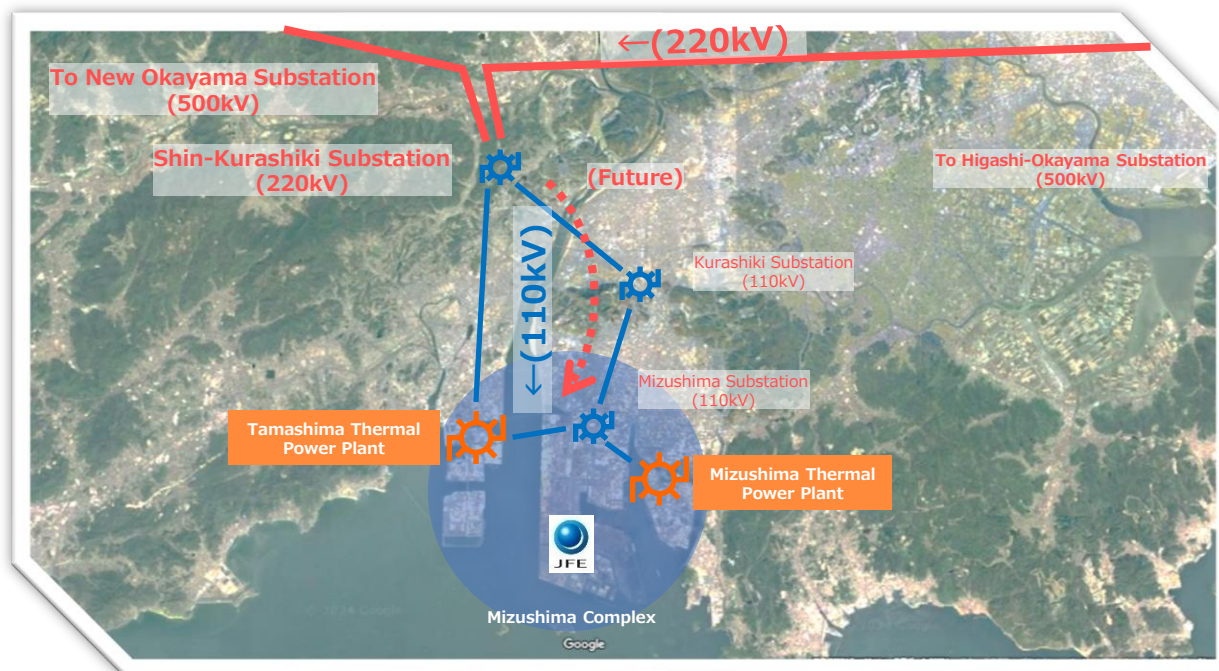
- Following project approval and the official grant award on April 9, 2025, we proceeded with the removal of existing facilities and are scheduled to commence foundation pile construction in late October 2025.
- In addition to the Green Innovation Fund project, our proprietary electric furnace facilities and laboratory testing have enabled us to establish a clear pathway toward the development of high-quality and highly efficient production technologies.
- By deploying one of the world's largest electric arc furnaces, we will become the first company to achieve large-scale production of high-quality, high-performance steel products beyond the capabilities of conventional EAFs, positioning ourselves to secure a leading share in Japan's growing GX steel market.



Investment scale	329.4 billion yen (Government subsidy upper limit: 104.5 billion yen)
Investment content	Innovative electric furnace, ladle refining equipment, cold iron source logistics equipment, wharf development, power receiving and distribution equipment, etc.
Production capacity	Approximately 2 million tons/year
Production start	FY2028 Q1
CO ₂ reduction effect	Approximately 2.6 million tons/year

Necessity of Power Infrastructure Development

- The Mizushima Complex power grid was constructed in the 1960s with the premise of local production and consumption of electricity generated by oil-fired thermal power plants and private power generation facilities within the complex, with surplus power transmitted outside the complex. Large-volume power supply from outside the complex has not been anticipated, and the transmission network is vulnerable to increased power demand for carbon neutrality and utilization of decarbonized electricity from outside the complex.
- Therefore, although large-scale infrastructure reinforcement is essential to meet carbon neutrality goals—such as the decarbonization of steelmaking processes—challenges remain due to increasing uncertainty in regional power demand and the complexity of cost burden allocation. These factors make it difficult for both the supply and demand sides to commit to large-scale equipment investments at this stage.



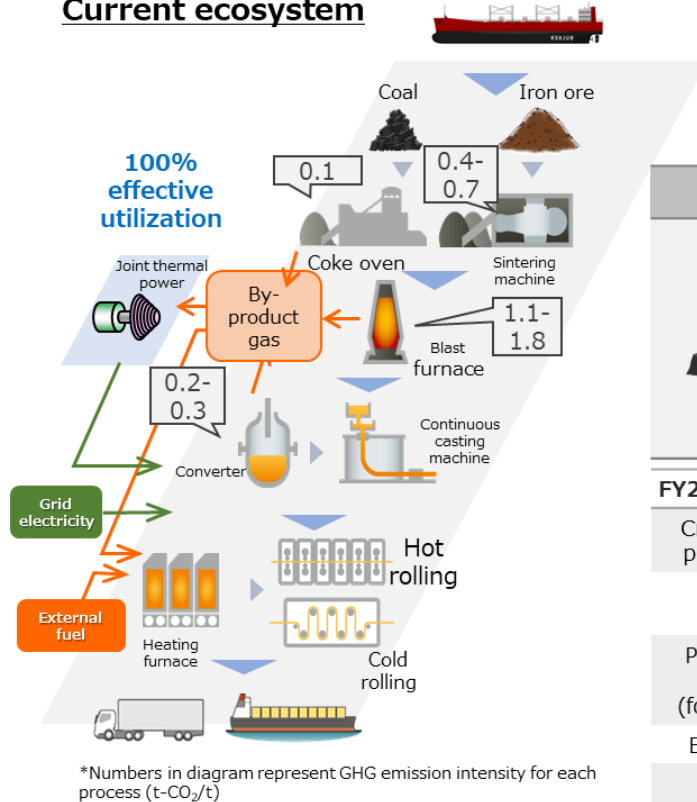
Until innovative electric furnace introduction in 2028, respond with existing 110kV system reinforcement

Looking ahead to power demand increases from 2030 onward, new 220kV system installation is necessary

Challenge for Carbon Neutrality

- In steel manufacturing processes, by-product gases generated during production processes are used as fuel for steel heating and in-house power generation, as well as energy supplied to society, achieving 100% effective utilization and building a complete ecosystem.
- The transition to innovative processes that accompanies decarbonization in the steel industry is a challenging initiative that requires the procurement of vast amounts of external energy.

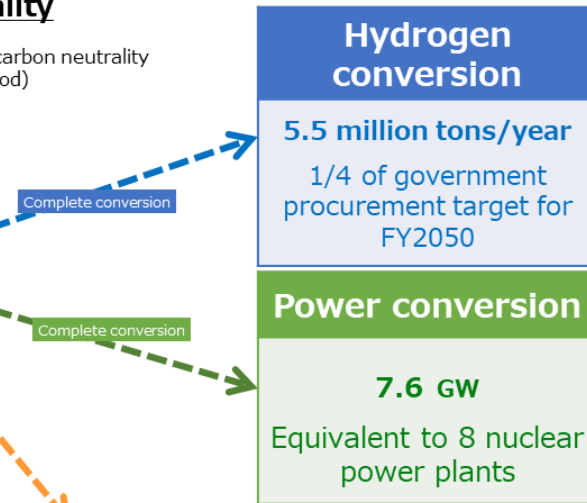
Current ecosystem



Non-fossil energy equivalent to fossil fuels required for carbon neutrality

(When achieving carbon neutrality through one method)

Fossil fuels	
	
FY2023 input resources	
Crude steel production	23.45 million tons
Coal	17.5 million tons
Purchased energy (fossil fuels)	20.0 PJ
Electricity	99 PJ
GHG emissions	50.4 million tons



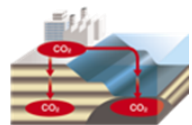
When continuing use of fossil fuels and achieving reduction through CCS utilization



Fixation (CCS)

Electricity: 1.6 GW
Hydrogen: 2 million tons/year

(Energy required for separation, recovery, and liquefaction)



- We have concluded a consignment contract with JOGMEC regarding “Engineering Design Work for Advanced CCS Projects” and are also independently promoting studies on the installation of CO₂ separation, capture, liquefaction, temporary storage, and shipping facilities.
- This fiscal year, front end engineering design (FEED) work will start. We are proceeding with studies toward the realization of EPC and beyond, assuming government support, aiming to start CCS by the end of the 2020s.

Advanced CCS	Kurashiki: Offshore Sarawak CCS (Malaysia CCS Project)		
Transportation/Storage Destination	Malaysia	JFE's Capture Volume	1.3 million tons-CO ₂ /year
			

Independent FS	Fukuyama: Setouchi / Shikoku CO ₂ Hub Concept		
Transportation/Storage Destination	Australia	JFE's Capture Volume	0.7 million tons-CO ₂ /year
			

Advanced CCS	Chiba: Northern Offshore of Peninsular Malaysia CCS		
Transportation/Storage Destination	Malaysia	JFE's Capture Volume	0.7 million tons-CO ₂ /year
			



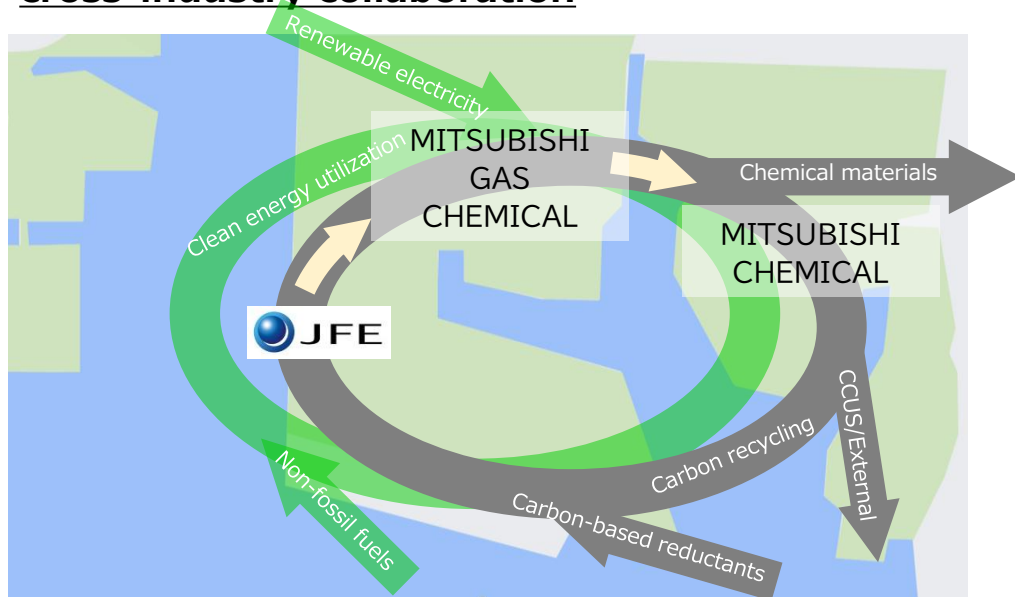
JFE's assumed roadmap						(Fiscal year)		
	2024	2025	2026	2027	2028	2029	2030	2031 onwards
Kurashiki	Pre-Feed	FEED		★	EPC		CCS start	
Chiba	FS	Pre-Feed/FEED			★	EPC		CCS start
Fukuyama	FS		Pre-Feed/FEED			★		

※ For final investment decisions, the concrete government support is necessary (★)

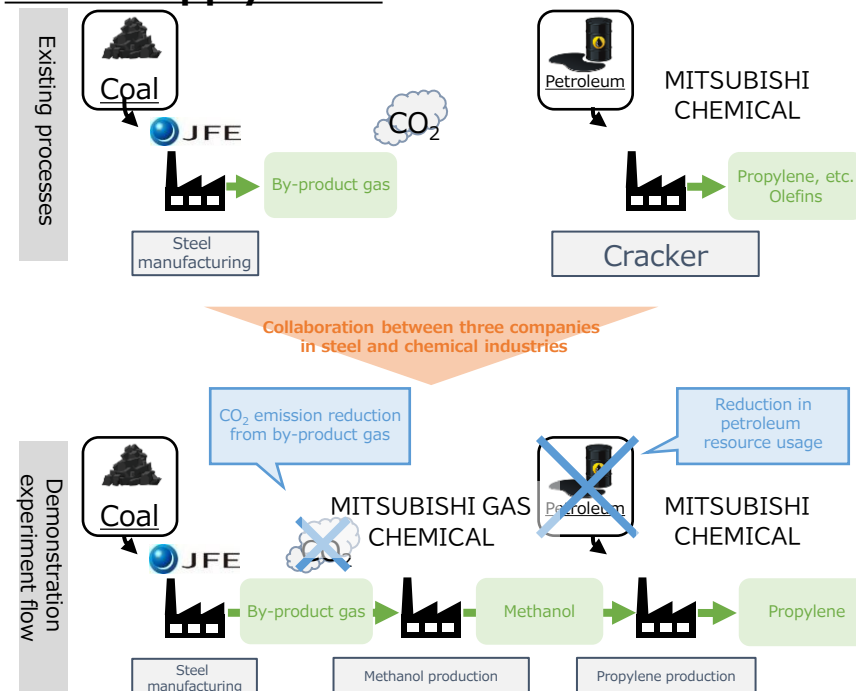
Initiatives for CCU Demonstration

- At the West Japan Works (Kurashiki), leveraging the location of the Mizushima Complex (Kurashiki City, Okayama Prefecture) where steel and chemical facilities are adjacent, we have started demonstration experiments to effectively utilize CO₂ generated from steel processes and manufacture chemicals through inter-company collaboration with Mitsubishi Gas Chemical Co Inc and Mitsubishi Chemical Group Corporation.
- This is a new initiative where Hard to Abate industries (industries where CO₂ emission reduction is difficult) collaborate, and by developing it into a carbon circulation concept through collaboration between the steel and chemical industries, we aim to significantly reduce GHG emissions compared to conventional chemical manufacturing methods using chemical resources.

Carbon circulation concept through cross-industry collaboration



Emission reduction effects across the entire supply chain



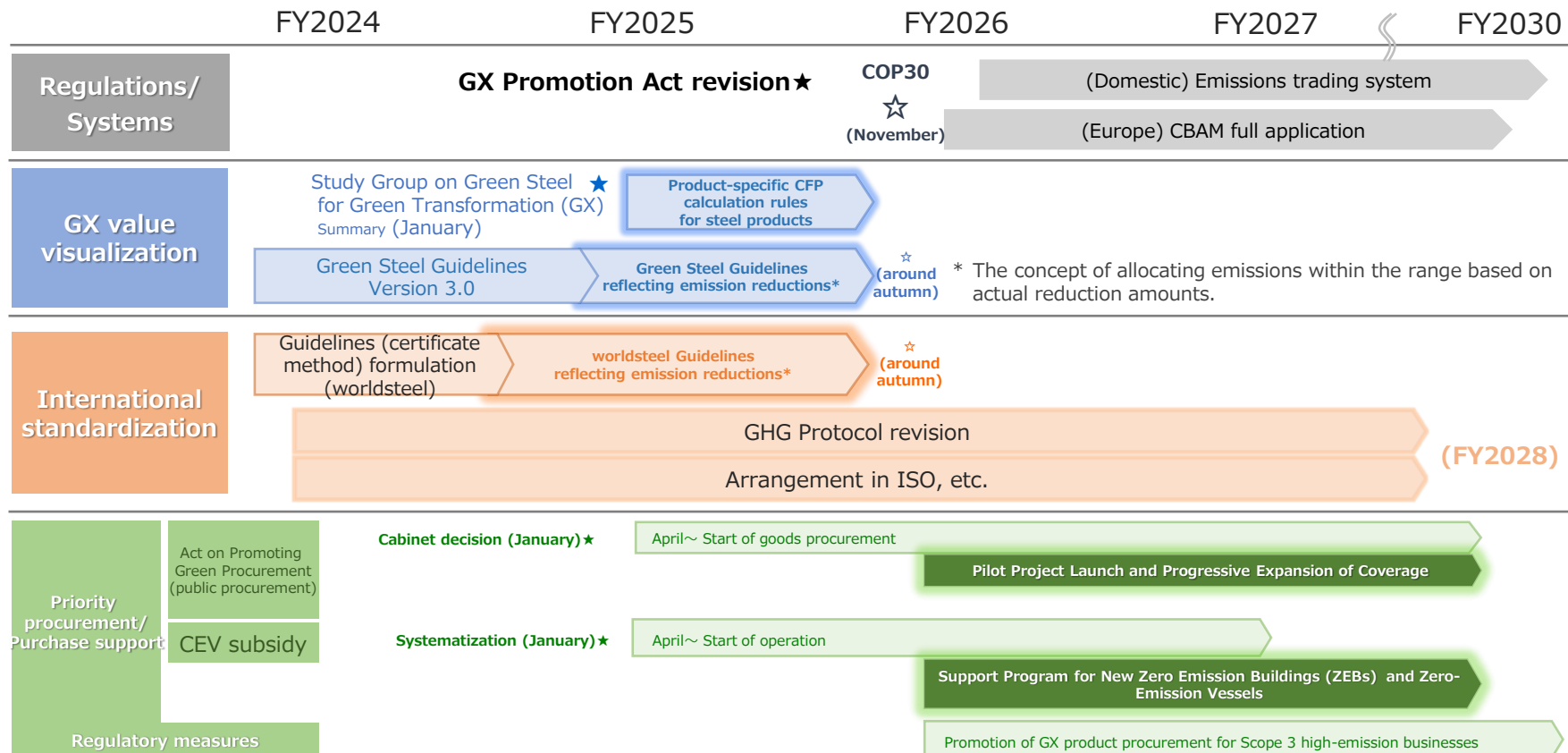
Green Steel "JGreeX™" Adoption Result

- Started supply of green steel "JGreeX™" that significantly reduces GHG emissions in manufacturing processes compared to conventional steel products from the first half of FY2023. In FY2024, adoption of "JGreeX™" expanded across all fields due to green steel demand stimulation.
- Toward –30% or more reduction in FY2030, we will steadily implement GHG reductions and expand green steel supply capacity to 3 million tons/year.



Initiatives for Creating GX Product Markets

- Government-led demand creation for GX Steel is taking shape through pilot public procurement projects starting in FY2026, with broader adoption expected ahead of full-scale deployment from FY2030 onward.
- Demand incentives for green steel are expanding beyond the automotive sector through support programs for Zero Emission Buildings (ZEBs) and zero-emission vessels, driving adoption in both the construction and shipbuilding industries.





Thank you

Dream for your **Future**, **Steel** takes you **Further**.



JFE Steel Corporation