



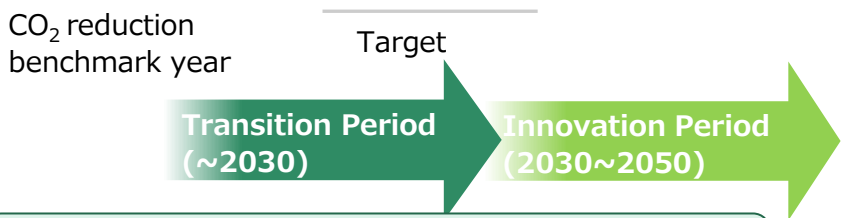
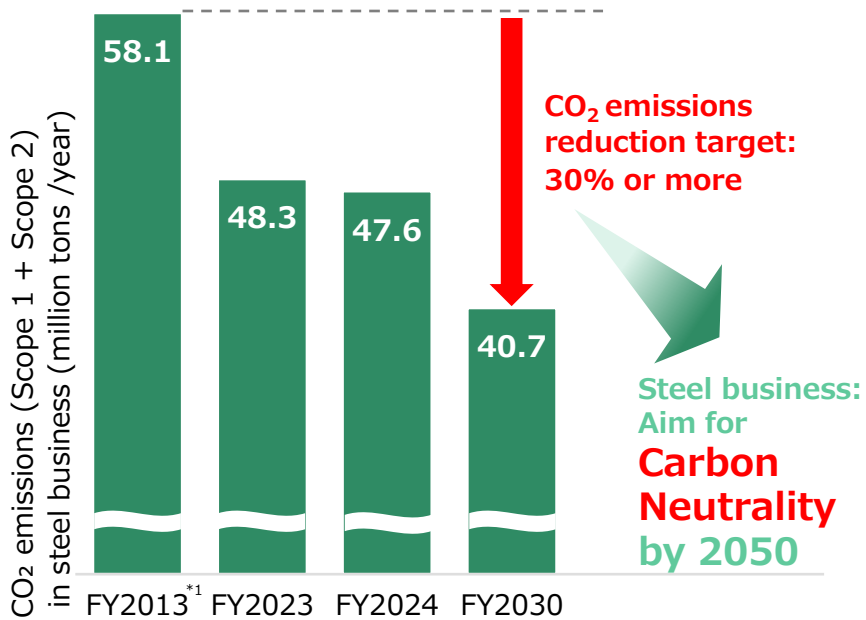
# Electrical Steel Business Strategy

24<sup>th</sup> October, 2024

JFE Holdings, Inc

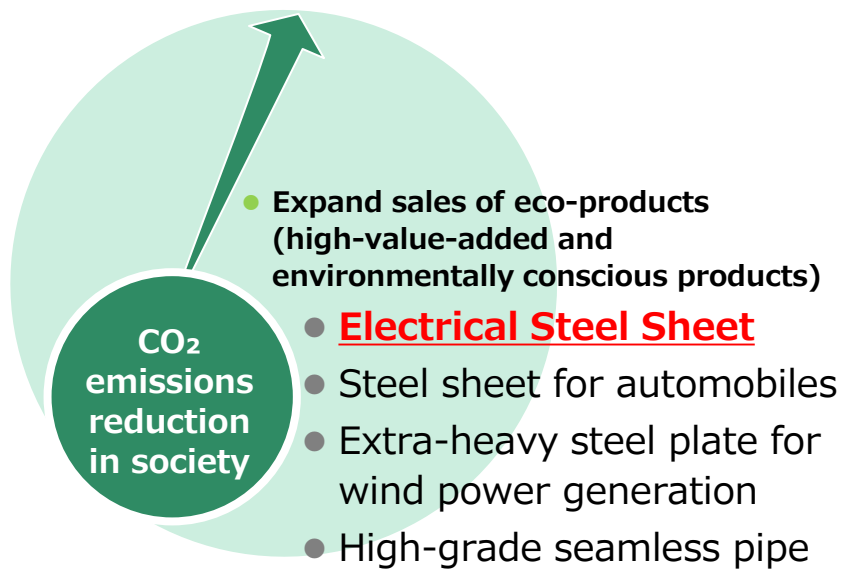
✓ In preparation for the arrival of a carbon-free society, pushing forward the GX strategy as a key growth strategy that determines our mid-to-long term profitability and competitiveness.

1) Decarbonizing steel manufacturing processes



Supply of Green Steel (JGreeX™)

2) Contributing to society’s CO<sub>2</sub> emissions reduction efforts



Expansion of profit per ton by increasing sales of eco-products

⇒Explain our electrical steel business strategy

\*1 FY2013 includes JFE Bars and Shapes Corporation



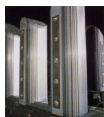
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# Our Strong Presence in Electrical Steel Sheet Market

✓ Capturing Expanding Demand with World-Class Technology and Global Supply Chain.

## Grain-oriented electrical steel sheet (GO)

### Product description



- Functional materials used as iron core materials for electrical equipment
- Enables equipment to be efficient, compact and lightweight

### Major applications

- Transformers for electricity and distribution



### Major customers

- Heavy machinery and equipment manufacturers

### Production sites

- Kurashiki District
- Establish JV with JSW in India for electrical steel sheet (2024/2)
- **Signed a share purchase agreement to acquire an India's electrical steel sheet subsidiary from tk\* (2024/10)**

\*thyssenkrupp AG in Europe

### JFE's competitive advantages

- World-class technologies in GO and NO production
- Global supply network (Japan, China, ASEAN, U.S. and Europe)

## Non-oriented electrical steel sheet (NO)



- Motors for EV and electrical equipment
- Power generators



- OEMs, auto part, home appliance and industrial machinery manufacturers

- Kurashiki & Keihin District
- Capacity Expansion of top-grade NO in Kurashiki District

**Phase I : 2024/9 Start of production**

Phase II : FY2026



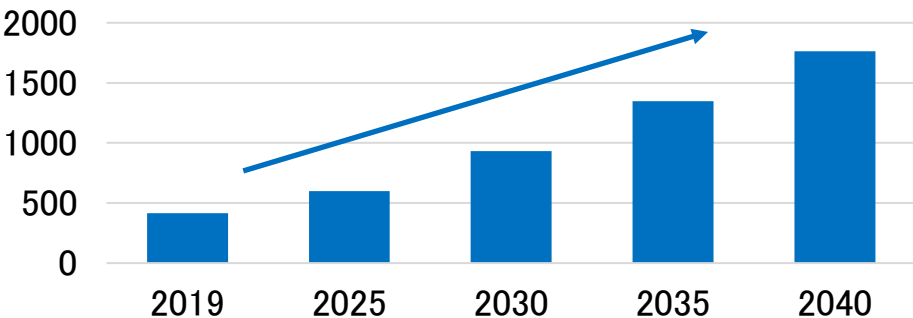
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# GO – Outlook of Indian Market and our Proprietary Technologies

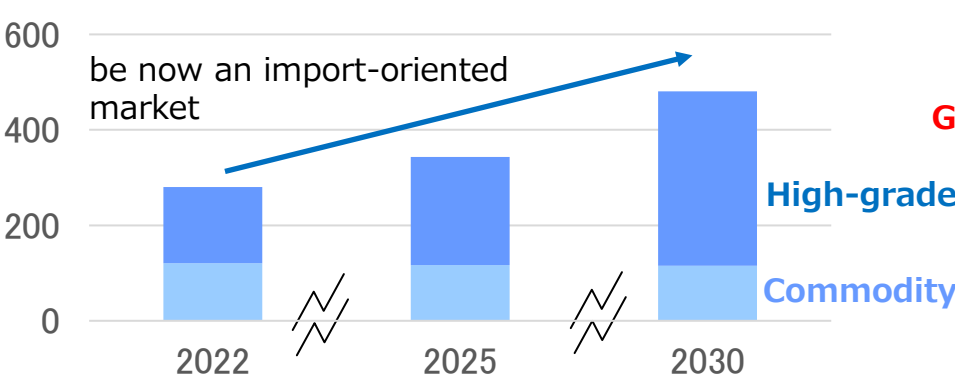
- ✓ India's power capacity is expected to grow at 7% per year. **Demand for GO** used in transformers is expected to **increase as well**.
- ✓ Due to the Indian government's regulation for higher efficiency, **the transformers used by the government PJ mainly use high-grade GO**.
- ✓ We respond to increasingly sophisticated needs in the Indian market with our unique technologies.

## Power capacity and GO market size forecast for India

Power Capacity Forecast for India (GW) ※1

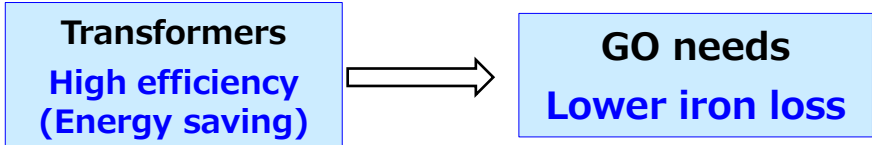


GO Market Size for Transformers in India (kt) ※2

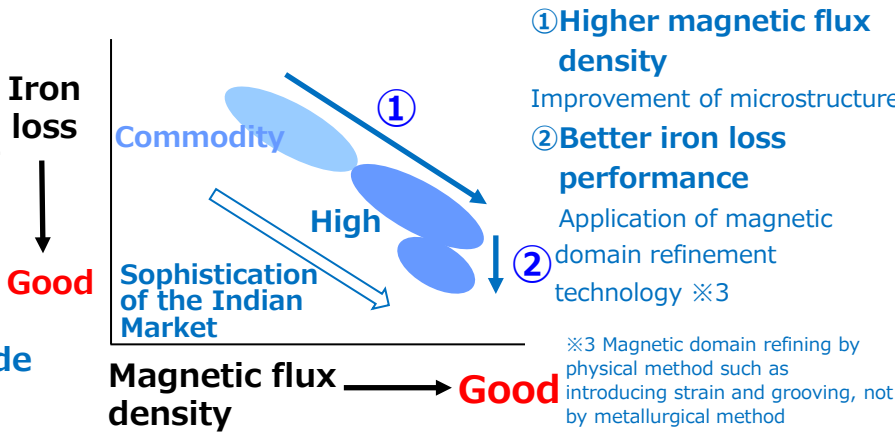


※1 IEA India Energy Outlook 2021  
※2 Estimated base on World Energy Outlook

## Performance requirements for GO



## Lower iron loss in GO



✓ We will satisfy the increasingly sophisticated needs of the Indian market with our proprietary technologies cultivated in Japan



# Expansion Strategy of GO Electrical Steel Business in India

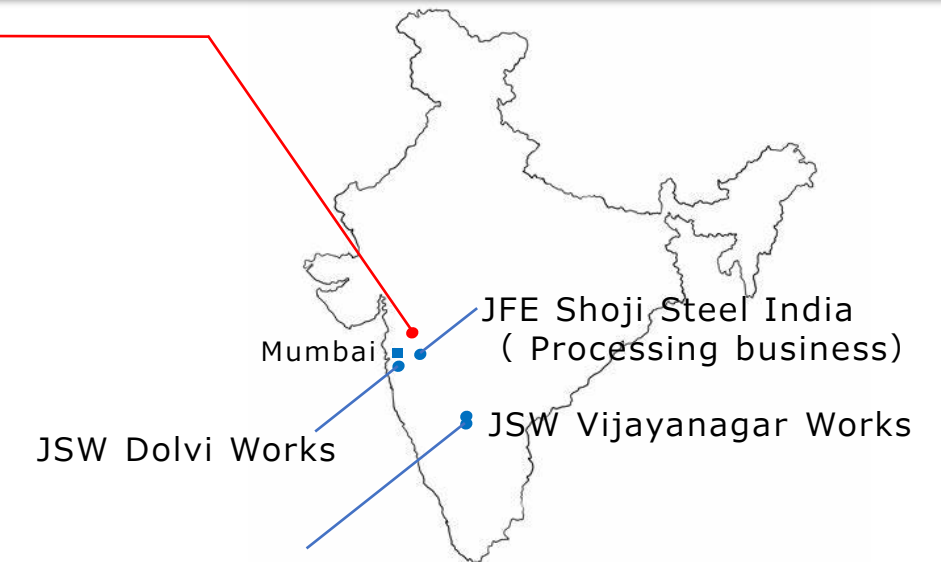
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- ✓ **Established a Joint Venture** with JSW Steel Limited for **the manufacture and sales of GO electrical steel sheets in India** in February 2024.  
(Company Name : JSW JFE Electrical Steel Private Limited (J2ES))
- ✓ **In addition, concluded a share purchase agreement to acquire thyssenkrupp Electrical Steel India Private Limited (tkES India) from thyssenkrupp AG through J2ES.**

★ Released on 18<sup>th</sup> October 2024

Acquired company name	thyssenkrupp Electrical Steel India Private Limited (tkES India)
Location	Nashik, Maharashtra, India
Establishment	2000
Acquisition Price (Estimation)	INR40.5bn. (Approx. ¥69.0bn.(*))
Shareholding Ratio	JFE50%、JSW50%
Closing (Estimation)	To be completed following necessary procedures. (In approx. 6months)
(Reference) Turnover	FY2023-24 : INR 12.7bn. FY2022-23 : INR 12.8bn. FY2021-22 : INR 7.8bn.

(\*)Translated at the exchange rate as of the end of September (¥1.71/INR)



■ Released on 13<sup>th</sup> February 2024

Company Name	JSW JFE Electrical Steel Private Limited (J2ES)
CAPEX	Approx. US\$ 670M
Shareholding Ratio	JFE50%、JSW50%
Start Operation	Full production in FY2027(planned)



# Significance for the acquisition of tkES India and our GO Business in India

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- ✓ In the Indian market, which is expected to continue expanding, we have acquired an additional manufacturing base to fully capture domestic demand.
- ✓ **We aim to be NO.1 GO supplier in India** with our 2 manufacturing bases, processing business (JFE Shoji Steel India, etc.) and JSW's marketing capabilities, etc.

<Our strength in the Indian GO market>

- **Entering the Indian GO market earlier**

(Before Acquisition : Full production in 2027 by J2ES

After Acquisition : tkES India contributes revenue from 2025)

- **India's only integrated GO manufacturer** in cooperation with JSW Steel's Steel Works
- **Supplying full lineup** from volume zone to top grade



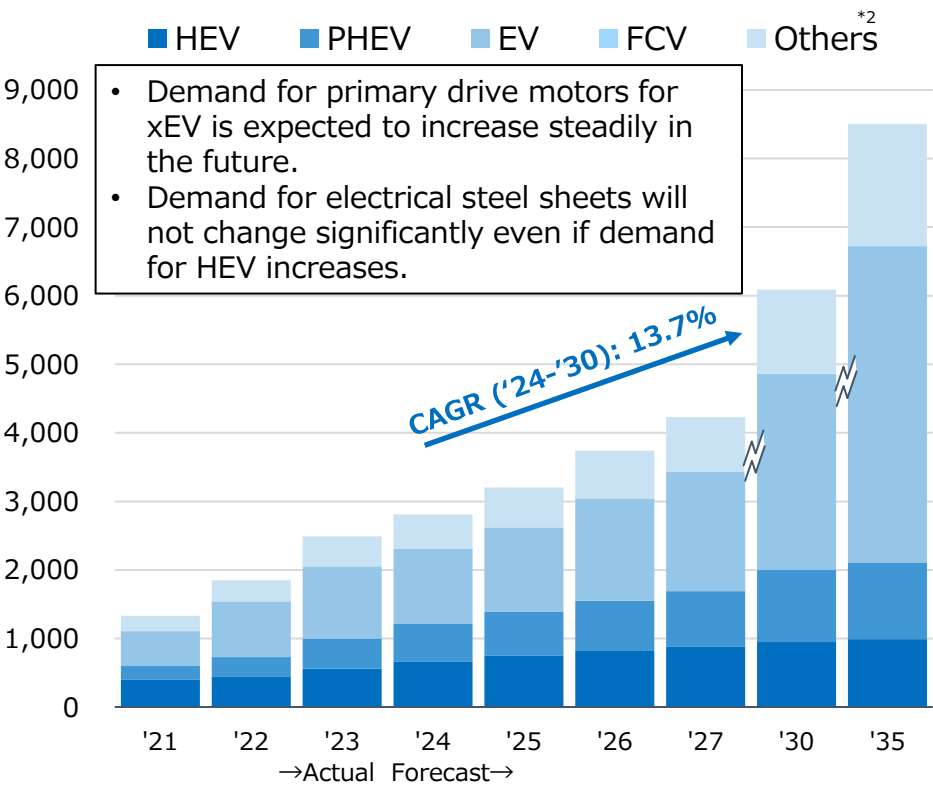
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# NO – Expanding Demand and Our Technical Advantages

- ✓ Demand for high-grade NO is expected to grow rapidly along with xEV market growth.
- ✓ Our proprietary technology meets performance requirements for high-grade NO.

## xEV motor production volume forecast <sup>\*1</sup>

Global forecast (unit: 10,000)



Source: FUJII KEIZAI CO., LTD.

\*1 FUJII KEIZAI CO., LTD. "HEV and EV-related Markets: Comprehensive Survey, 2024," HEV: Hybrid Electric Vehicles, PHEV: Plug-in Hybrid Electric Vehicles, EV: Electric Vehicles, FCV: Fuel Cell Vehicles

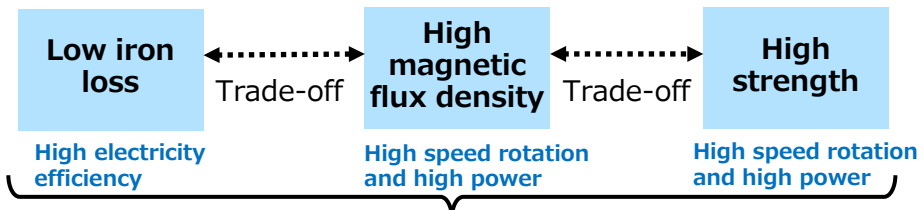
\*2 Motors for AWD assist and generator

## Requirements for xEV primary drive motors

High electricity efficiency  
⇒ More cruising distance and efficient battery usage

High speed rotation and high power  
⇒ Downsizing, weight reduction

## Performance requirements for high-grade NO



- ✓ By applying our proprietary technologies, we achieve a high-level balance of all performance requirements, realizing world-class characteristics. (Top-grade NO)



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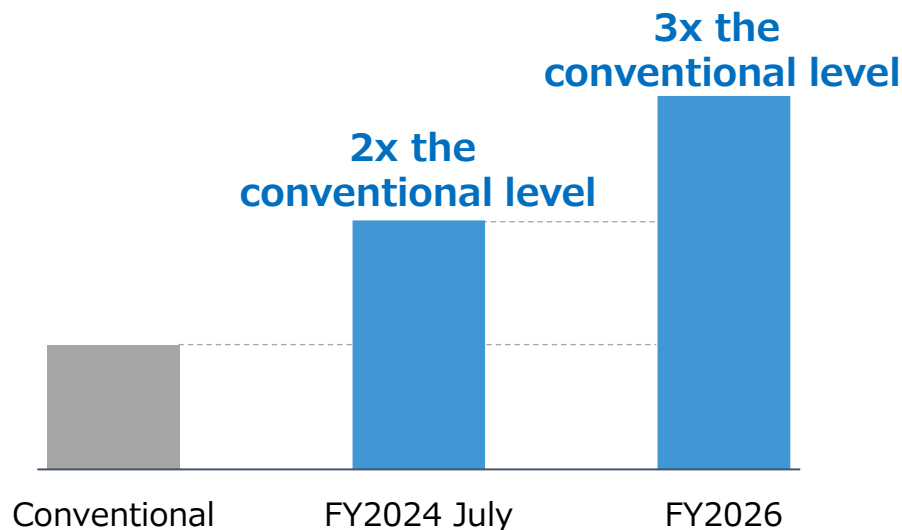
# Expanding Production Capacity for Top-grade NO Electrical Steel Sheets

- ✓ To capture future demand growth, we plan to increase our production capacity of high-grade NO for xEV primary drive motors in the Kurashiki District to 3 times the conventional level.
- ✓ Phase I production capacity expansion was completed as planned in July 2024, and production commenced in September.

## Plans for expanding production capacity of top-grade NO for xEV

Site	West Japan Works (Kurashiki District)
Total investment	Approx. 95 bn. yen Phase I: Approx. 49 bn. yen Phase II: Approx. 46 bn. yen
Operation timing and production capacity	Phase I: 1H of FY2024 ➤ Double the conventional production capacity Phase II: FY2026 ➤ Triple the conventional production capacity

(Production capacity)



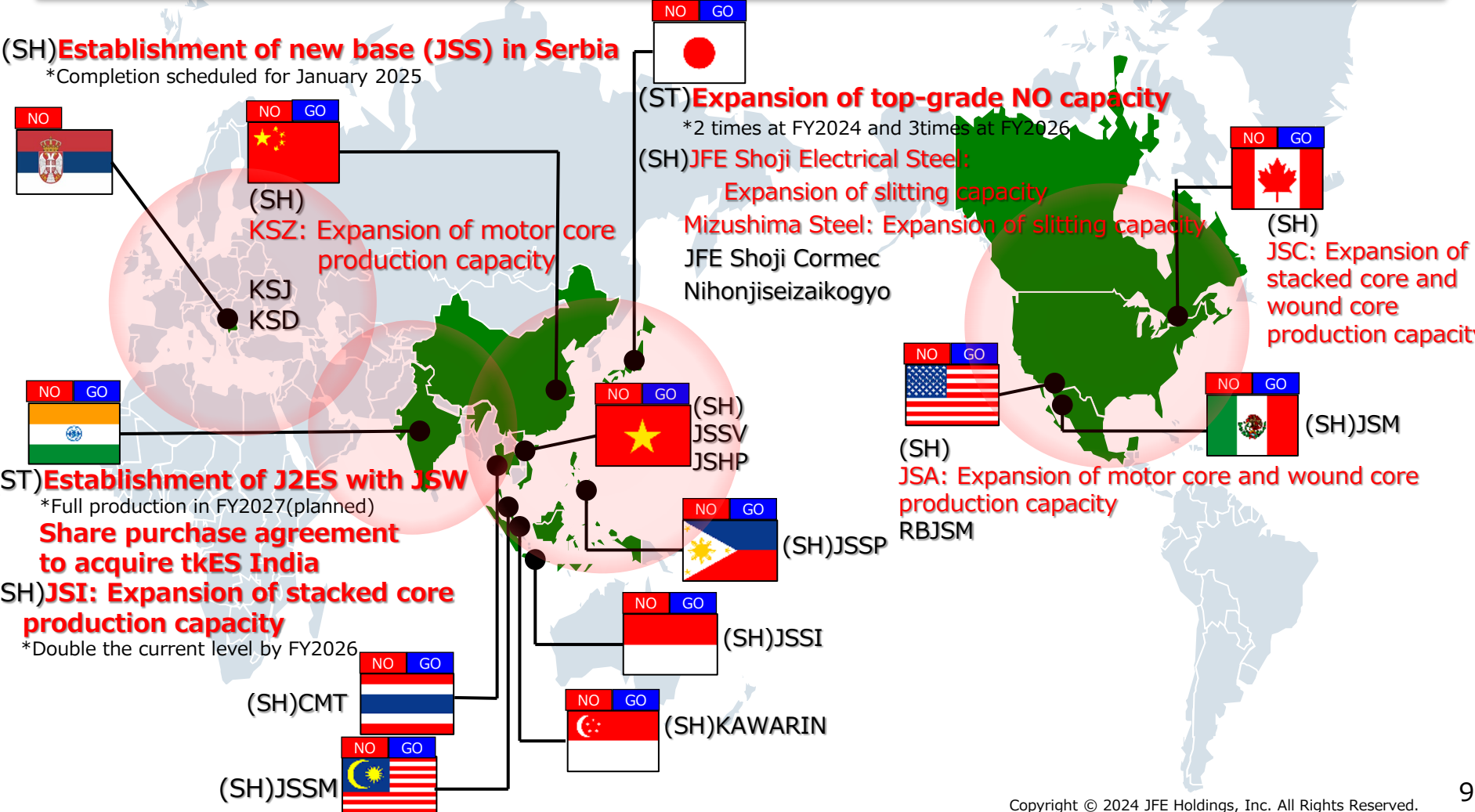




# Global Supply Chain for Electrical Steel Sheets

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- ✓ Building a global supply chain through synergies between JFE Steel and JFE Shoji.
- ✓ Accelerate investment in countries and regions where demand for electrical steel sheets is expected to grow.



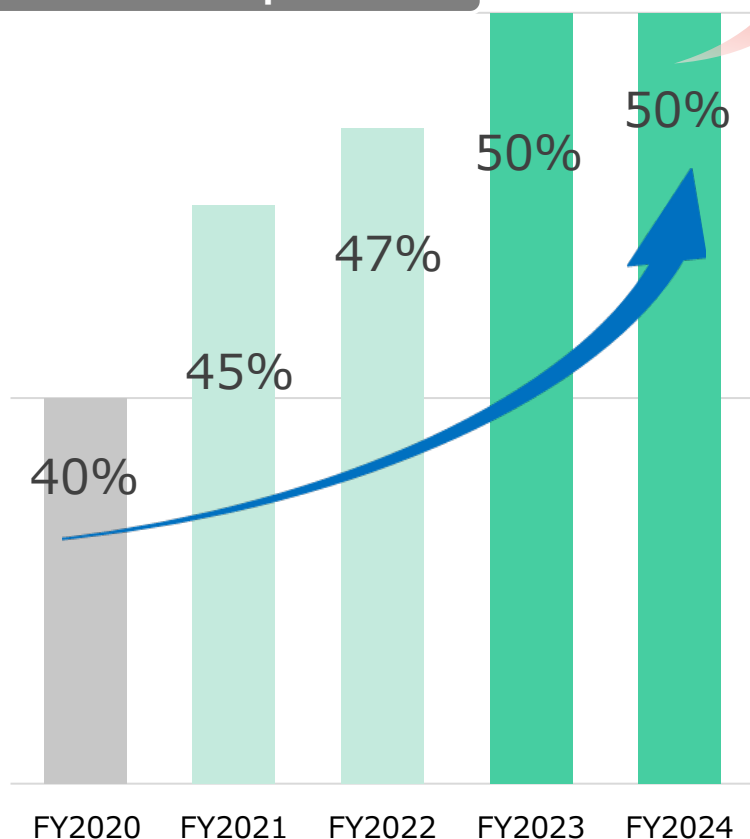


# Strategy for High-value-added Products

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- ✓ The ratio of high-value-added products is expected to reach 50% in FY2024 (achieving the 7th mid-term target).
- ✓ Continuing to shift to high-value-added products after the 7th mid-term, we aim to achieve both eco-friendliness and high profitability.

Percentage of high-value-added products



Further expansion after the 7th mid-term

## ■ Increase ratio of high-value-added products through investment in capacity expansion (as of October 2024)

- Expansion of NO production capacity (full contribution of phase 1 and 2 expansions)
- Contribution of extra-heavy steel plate for offshore wind power foundation (full operation of Kasaoka monopile factory of JFE Engineering)

## ■ Further growth of high-value-added products utilizing existing plants (development, stable production, and sales expansion)

- High strength steel mainly for automobiles
- High-grade seamless pipe
- Eco-products contributing carbon neutrality, etc.

## ■ Expanding high-value-added products in overseas business

- Automotive steel sheets (China, Thailand, Indonesia, Mexico)
- GO (J2ES in India; planned full production in FY2027)



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