

Investor Presentation

Business Plan and Growth Potential

Nippon Denkai, Ltd.

June, 2024



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01. Company Overview

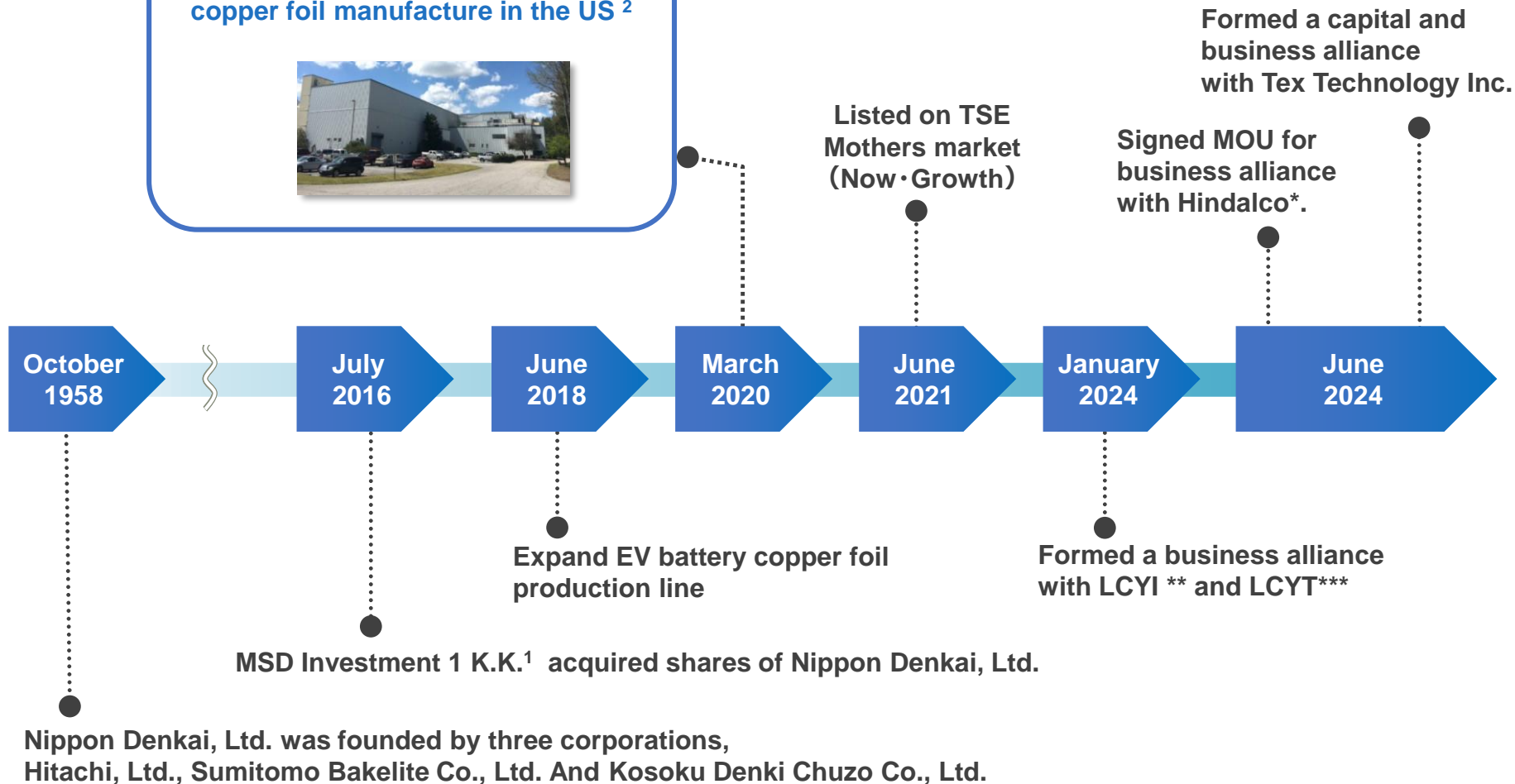
About us

Company Name	Nippon Denkai, Ltd.
Established	October, 1958
President/CEO	Hidemasa Nakajima
Headquarters	1226 Shimoezure, Chikusei city, Ibaraki Pref.
Listing Market	Tokyo Stock Exchange, Growth: 5759
Capital	1,858 Million yen (As of March 31, 2024)
Employees ¹	203 employees (Consolidated : 269)
Group Company	Denkai America Inc. (Hereinafter referred to as “DAI”)
Business	Development, Manufacturing and Sales of Electrodeposited copper foil for xEV batteries and printed circuit board.
Consolidated Net Sales	16,650 Million yen (FY2023)

¹ As of March 31, 2024 : The figures includes temporary workers, loaned-out employees are not counted.

Denkai's Short history

Acquired the only electrodeposited copper foil manufacture in the US ²



¹ MSD 1st investment Limited Partnership is managed by MSD Investments Ltd. a private equity firm, which was jointly established by Mitsui & Co., Principal Investments Ltd., Sumitomo Mitsui Banking Corporation and Development Bank of Japan Inc.

² Source: Copper Foil Industries Association

*Hindalco Industries Limited ** Lee Chang Yung Group International Pte. Ltd. *** LCY TECHNOLOGY CORPORATION

Management Philosophy and Mission

Philosophy

As an electrodeposited copper foil manufacture selected in the global market, we work for continuous growth and prosperity.

Mission



Copper foil for EV batteries

Sustain high share in Japan

Securing a Presence in the US market with copper foil for High-Performance batteries.



Copper foil for circuit boards

Provide world top class quality circuit board copper foil.

Concentrate on high added value field.



Contributing to the Realization of a Decarbonized Society

100% recycled copper material used.

Location of Plants as of June 2024

Headquarters and Plant : **Nippon Denkai, Ltd.**



Chikusei city, Ibaraki

US : **Denkai America Inc.**



Camden, South Carolina

**Production capacity
(Japan-US Total)**

13,200t /Year^{*2}



203 ^{*1}



750t/M^{*2}



66 ^{*1}



350t/M^{*2}

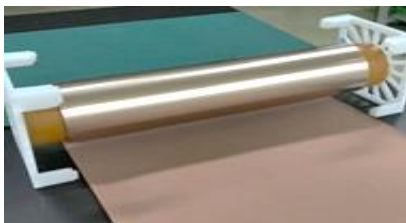
^{*1} As of March 31, 2024 (The figure includes temporary workers)

^{*2} As of March 31, 2024

Product overview and Sales by Product

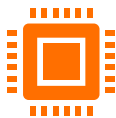
Circuit Board Copper Foil

Our Products



Uses

Flexible Printed Circuits
Board Package Substrate



Major End Products

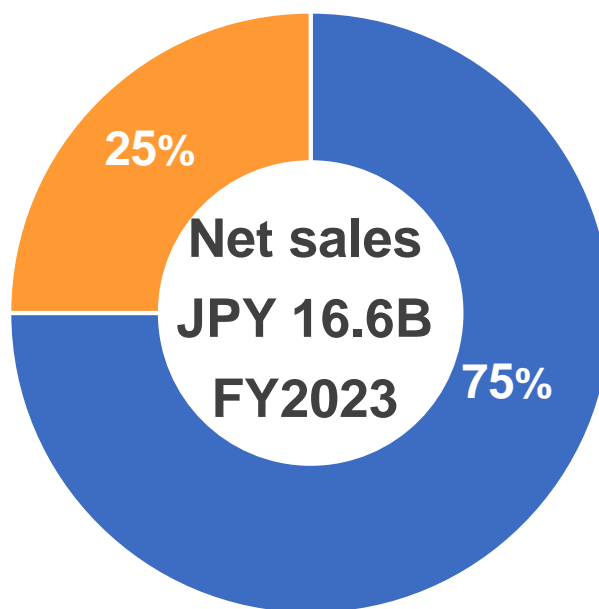


Smartphone



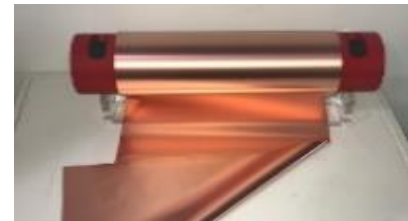
5G communication
base station etc.

Sales Composition In FY2023



EV Battery copper Foil

Our Products



Uses

Lithium Ion Batteries (LIB)



Major End Products



EV



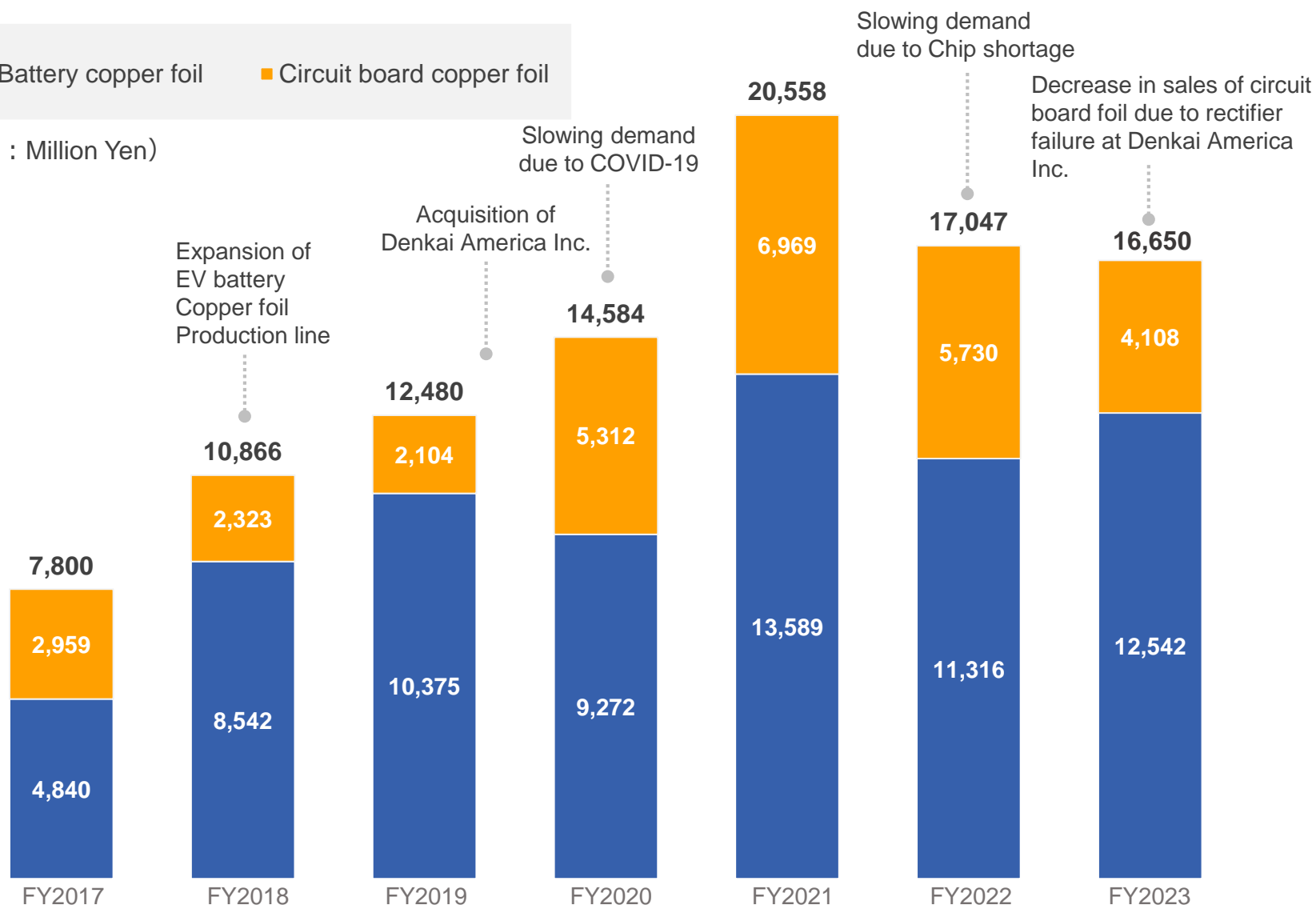
HV

02. Business Performance

Consolidated Net Sales

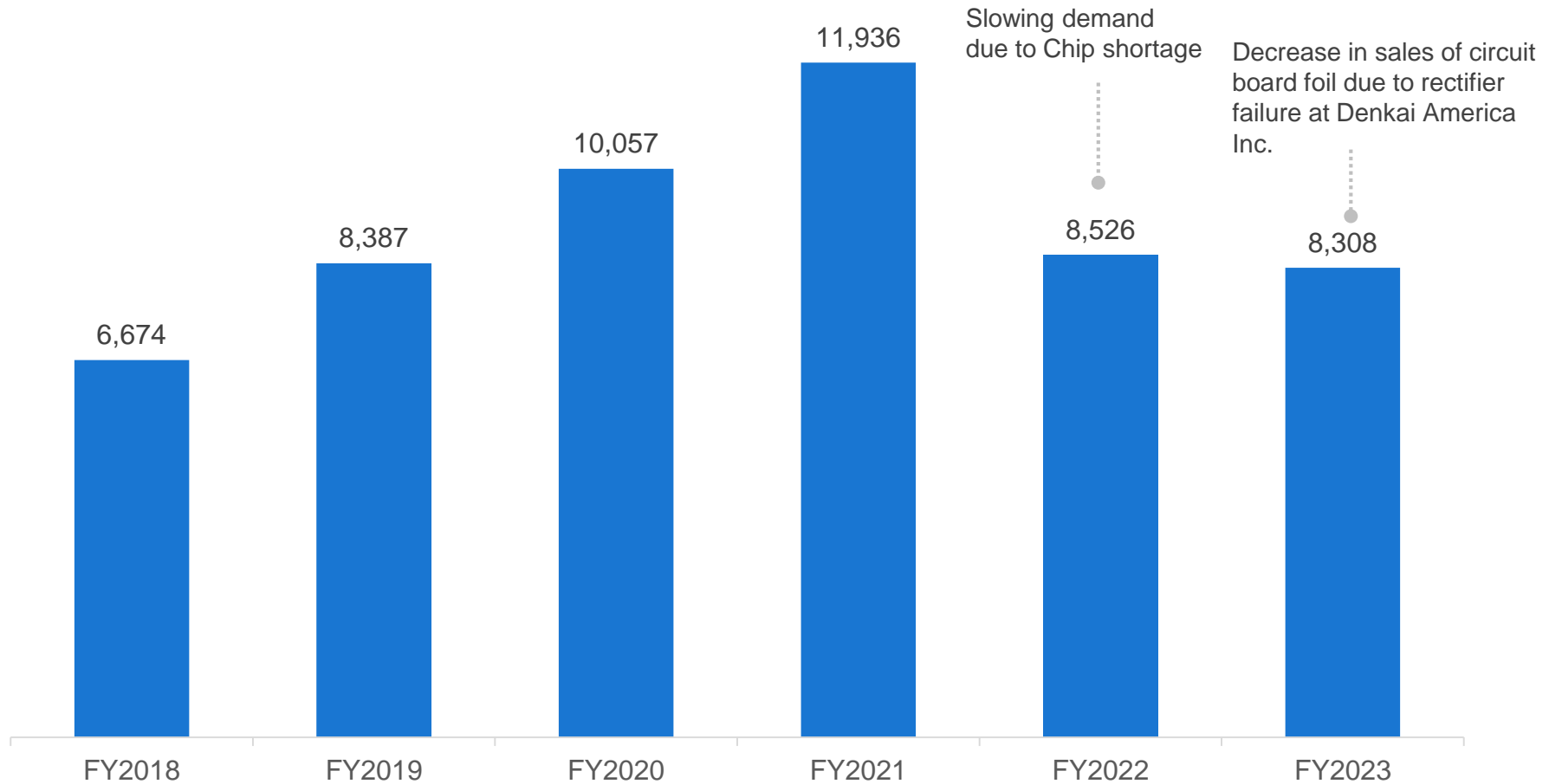
■ EV Battery copper foil ■ Circuit board copper foil

(Unit : Million Yen)



Production Quantity

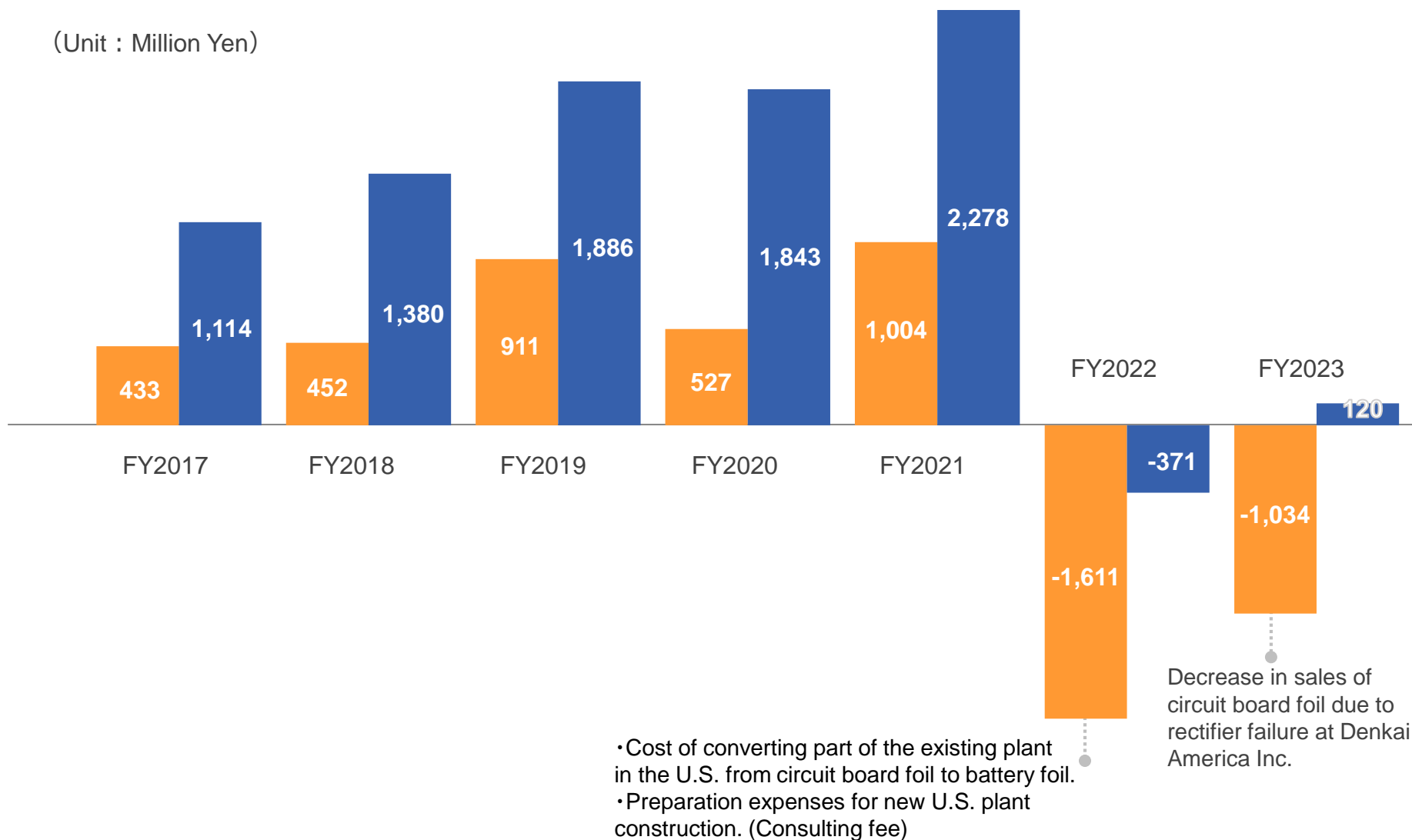
(Unit : MT)



Consolidated Operating Profit and EBITDA

■ Operating Profit ■ EBITDA

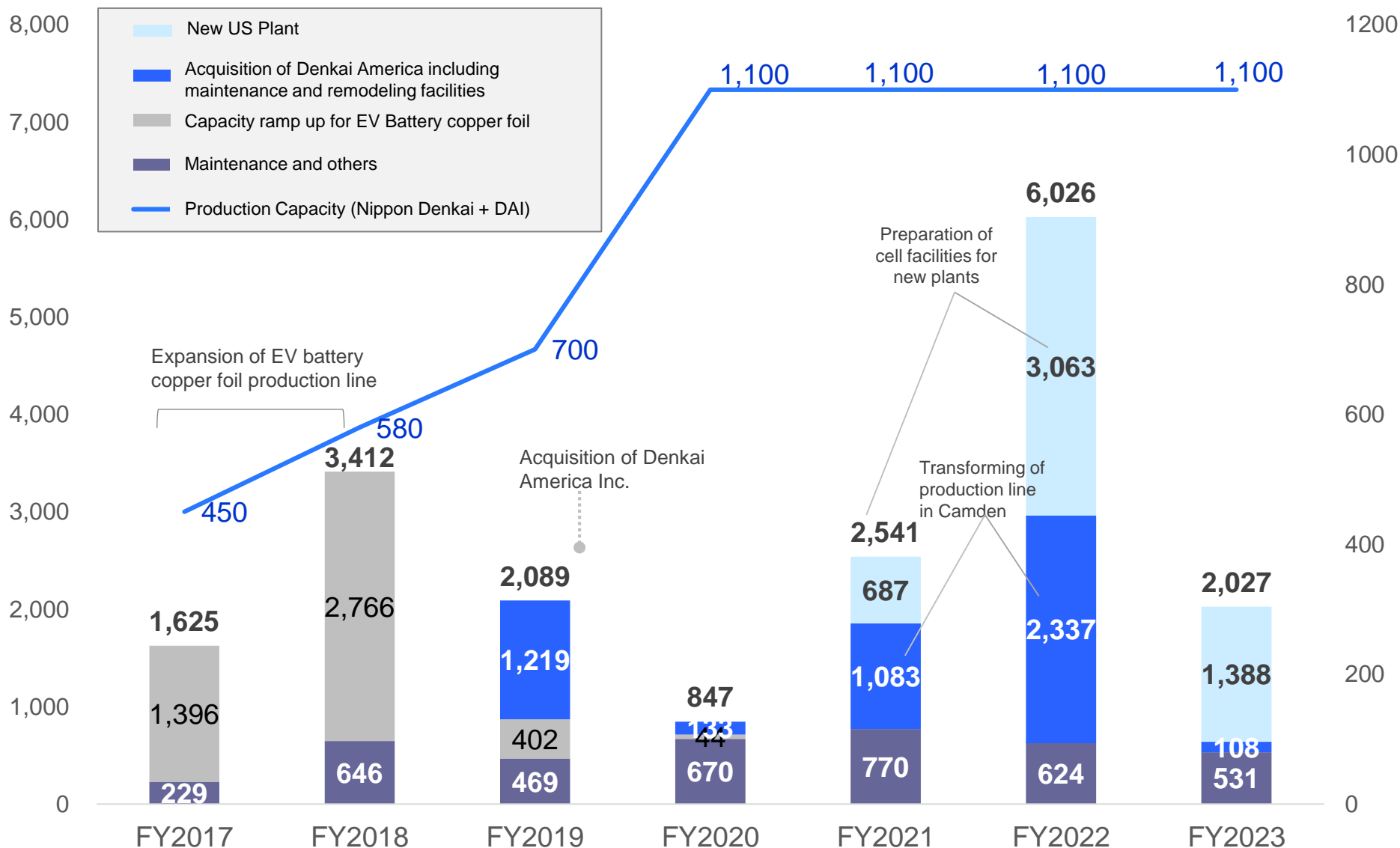
(Unit : Million Yen)



Capital Investment and Production Capacity

(Million Yen)

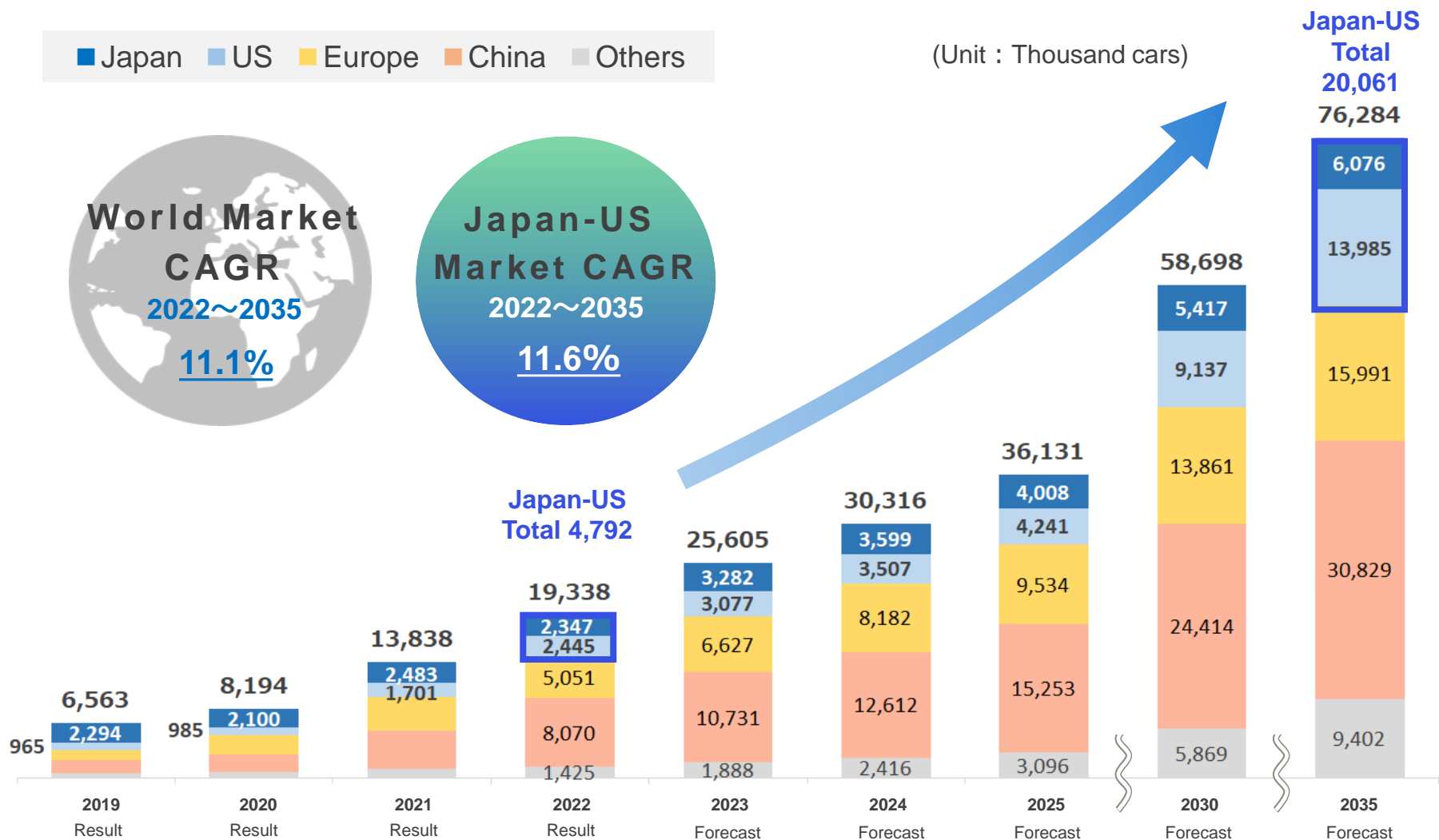
(MT/Month)



03. Business Environment

xEV Market Forecast

► Global xEV demand is currently slowing, but is still expected to expand at a CAGR of 11.1%.



(Note 1) Above graph shows the result and estimate classified by vehicle production regions, not the demand classified by production regions of EV batteries.

(Note 2) The results and forecast in above graph is calculated and estimated by Fuji Keizai Management Ltd. and information.

Source : Fuji Keizai (October 2023)

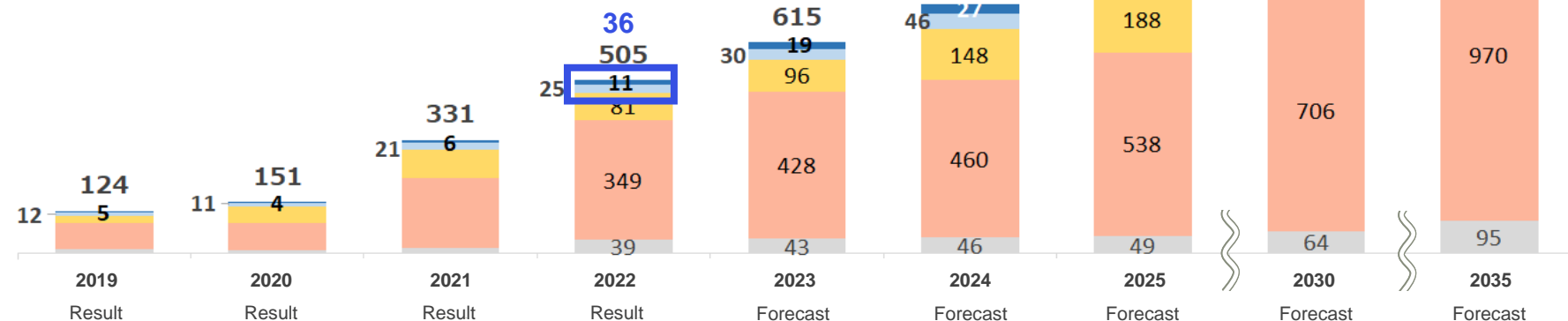
Negative current collector demand forecast by production region

- ▶ Copper foil demand for LIBs is in an adjustment phase, but is expected to continue to grow at a high rate over the medium to long term.
- ▶ Our company policy is to focus on the Japanese market and Japanese manufacturers based overseas.

■ JPN ■ North America ■ Europe ■ China ■ Others



North America
& JPN



(Unit : Kmetric ton/year)

North America
& JPN
591
2,142

202

390

486

316

706

970

64

95

(Note1) The above graph shows actual and projected demand by area classified by vehicle production area, which differs from demand by area in the cell production area.

(Note2) The actual and forecast figures in the above graphs are compiled and estimated by Fuji Keizai.

Source :Fuji Keizai (October 2023)

Major LIB Production Bases in the US

In the U.S., the slowdown in EV growth has led to a review of plans to establish EV LIB production facilities. However LIB copper foil production bases are not being established, and there are still few competitors.



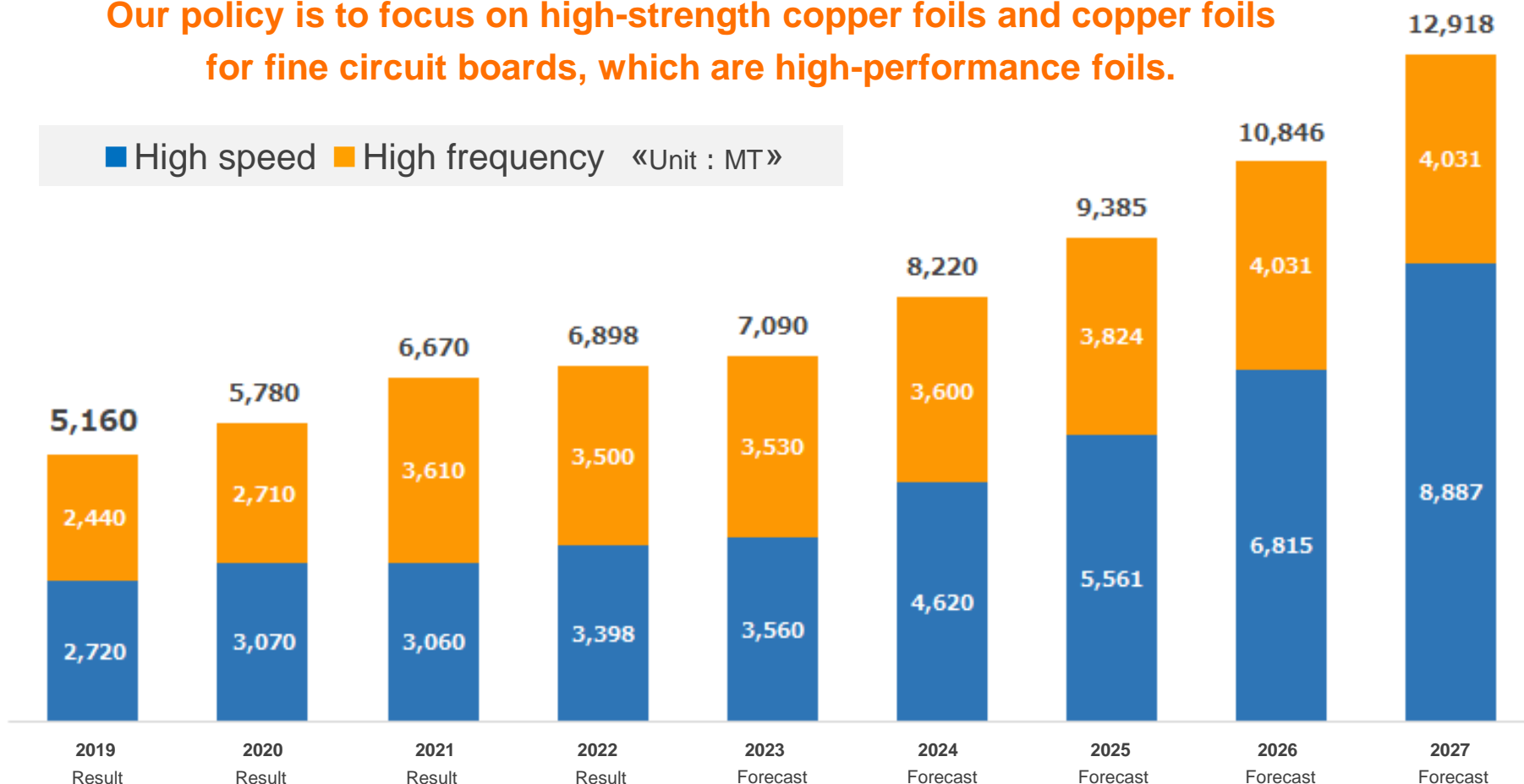
Based on articles from various companies, compiled by us

High-end and super high-end markets

The markets are growing at an average annual rate of 13.4% (2022-27)

In addition to telecommunications equipment such as smartphones and base stations, the AI server market is expected to expand. Demand for high-performance copper foil for these applications is also expected to grow significantly.

Our policy is to focus on high-strength copper foils and copper foils for fine circuit boards, which are high-performance foils.



Source: Fuji Chimera Research Institute, Inc. and our calculations (compiled in October 2023)

04. Growth Strategy

Image of Growth Strategy



“Accelerate development of high value-added products”

“Adaptation to next-generation batteries such as all-solid-state batteries”

Start production and sales of copper foil for new batteries

Collaboration with LCYT to strengthen competitiveness of copper foil for circuit boards

Expand sales of copper foil for circuit boards to high-end overseas markets (Shipment has been ongoing since FY2022)

Strengthen sales of products for the high-margin 5G and HDI markets (ongoing from FY2020)

FY2023

Introduced the first copper foil production facility for EV batteries in the U.S. at Denkai America

FY2024

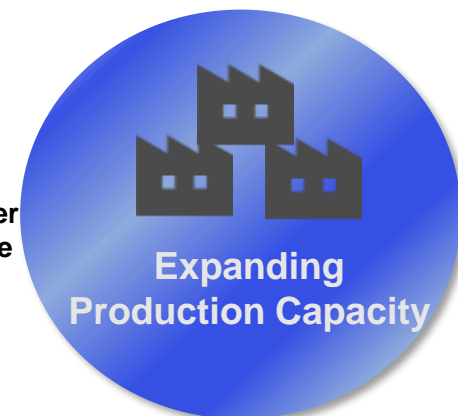
Started mass production of copper foil for high-capacity automotive batteries at Chikusei plant
Started mass production of copper foil for next-generation high-frequency circuit boards

FY2025

Boost supply capacity for circuit boards copper foil by improving manufacturing facilities of the Chikusei plant

FY2026

FY2030



【Consideration and execution of production capacity expansion】

- Strengthened capacity for EV batteries at Chikusei Plant
- Study of copper foil supply system in the U.S. market

Orange letters indicate changes from the previous version (May 2023)

Core Strategies for Business Growth

Focused on two markets, EV batteries and advanced circuit boards, to expand sales

- For EV batteries:
 - Strengthening supply system for high-performance batteries to respond to market expansion.
 - Establishing the brand of "copper foil for high-performance batteries = Nippon Denkai" .
 - Maintaining the top share in the Japanese market.
- For Circuit board:
 - Expand production capacity in Chikusei plant.
 - Globally promote sales to leading manufactures of circuit board, lead by developing products meeting new demand being ahead of the trends.

Optimization of production system in line with changes in the global market

- Japan: Strengthen product and process development as a development base and mother plant, and enhance production system to respond to market expansion in Japan and Asia.
- North America: Optimize Denkai America production system.
- Overseas: Collaboration with LCYT and Hindalco.

Restore business profitability

- Reform organization, improve processes, increase labor productivity, improve yield, and enhance quality through DX and IoT utilization to reduce costs and restore profitability.
- North America: Denkai America Strengthening profitability.

KPIs and measures

【KPI】

Production Volume : 22,000t /Y (FY2028)

Focused on two markets, EV batteries and advanced circuit boards, to expand sales.

Optimization of production system in line with changes in the global market.

- Expand sales of copper foil for EV batteries
 - Expansion of materials for high-capacity LIBs in response to new customer lines.
 - Supply of products to new customers.
 - Supply of new materials for high energy density.
- Expand sales of copper foil for circuit boards
 - Expand sales of highly profitable products to circuit board manufacturers in Japan and overseas.
- Improvement and enhancement of product supply system
 - Chikusei plant (Japan) :
 - Considering expansion of copper foil production facilities for EV batteries
 - Expansion of circuit board copper foil production facilities and increase in production capacity (FY2024~)
 - Denkai America :
 - Transition to mass production after completion of modification work.
 - Optimization of production system in response to changes in the U.S. market.

【KPI】

EBITDA Margin \geq 15% (after FY2028)

Restore business profitability.

By utilizing DX and IoT at the production site, cost reduction through organizational reform, process improvement, labor productivity improvement, yield improvement, and quality enhancement to restore profitability.

Product development anticipates the needs of the next generation

Battery foil for high capacity and high energy density

Additive control technology

↓
Tensile strength and high heat resistance

High performance, next-generation battery foil

Crystal Grain Control Technology

↓
Low elastic modulus (deformation)

Surface Treatment Technology

↓
High corrosion resistance

Among the three technology platforms (additive control, tissue control, and surface treatment), in the past year we have been using surface treatment technology to improve the life of current collectors.

Circuit foil for next-generation telecommunications infrastructure and equipment

Low-latency and Low energy loss

>28GHZ

12GHZ-28GHZ

6GHZ-12GHZ

BELOW 6GHZ

Ultra low profile copper foil conductor

Resin substrate with low permittivity

High Density Circuits /High Adhesion Copper foil surface treatment

Ultra low profile copper foil conductor

Resin substrate with low permittivity

Surface modification of resin substrate

Surface Roughened copper foil

Resin substrate with low permittivity

Copper foil surface roughening

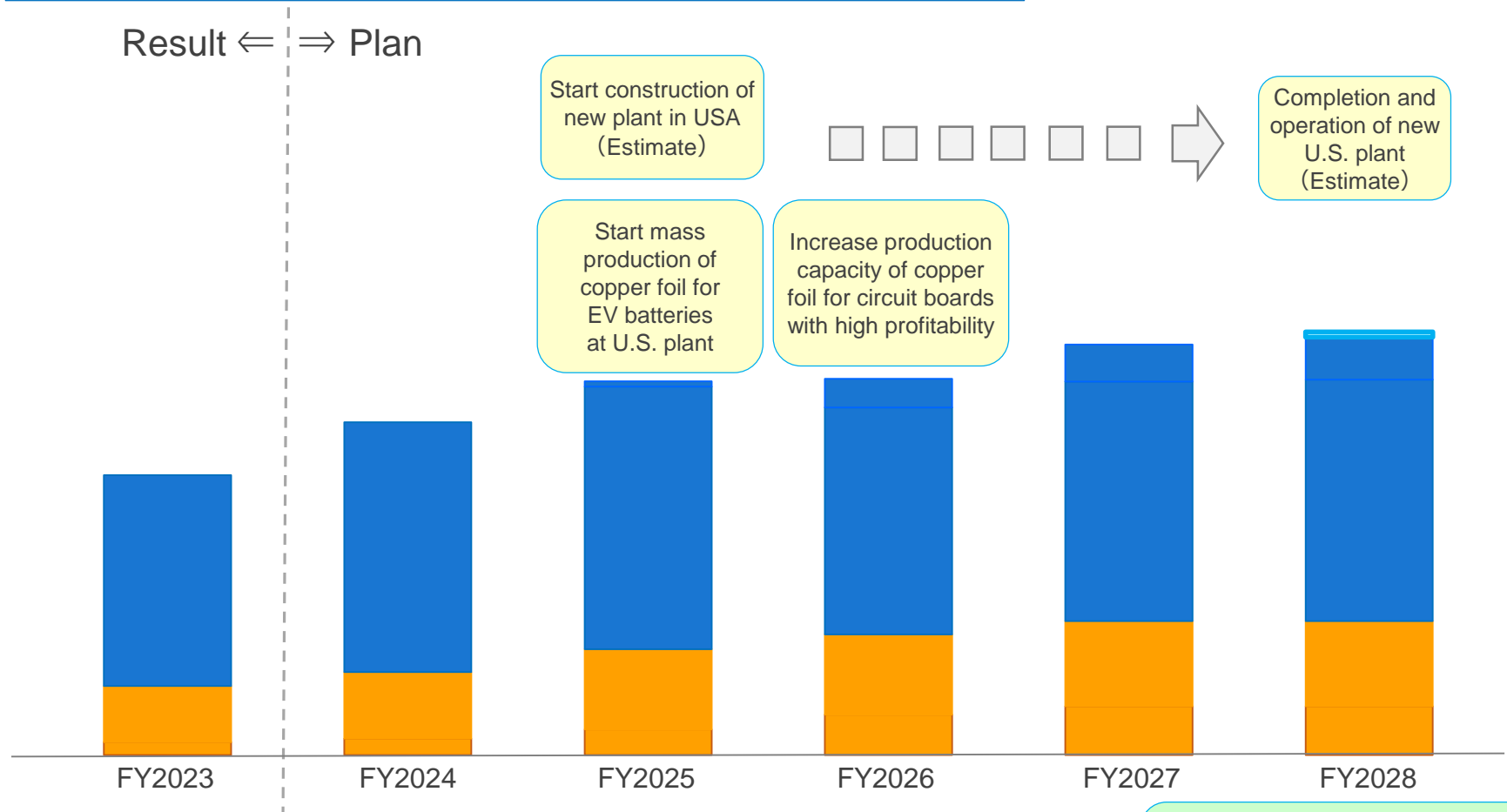
conventional technology

high cost performance

For the hot spot frequency market, which has high demand for low latency in 5G and 6G, **we have developed and applied** ultra-low roughness copper foil and high adhesion surface treatment technology.

Growth Image of Net Sales by Product

■ For EV Batteries/Japan + US Plant □ For EV Batteries/Japan + US new Plant
 ■ For circuit boards/Japan + US plant

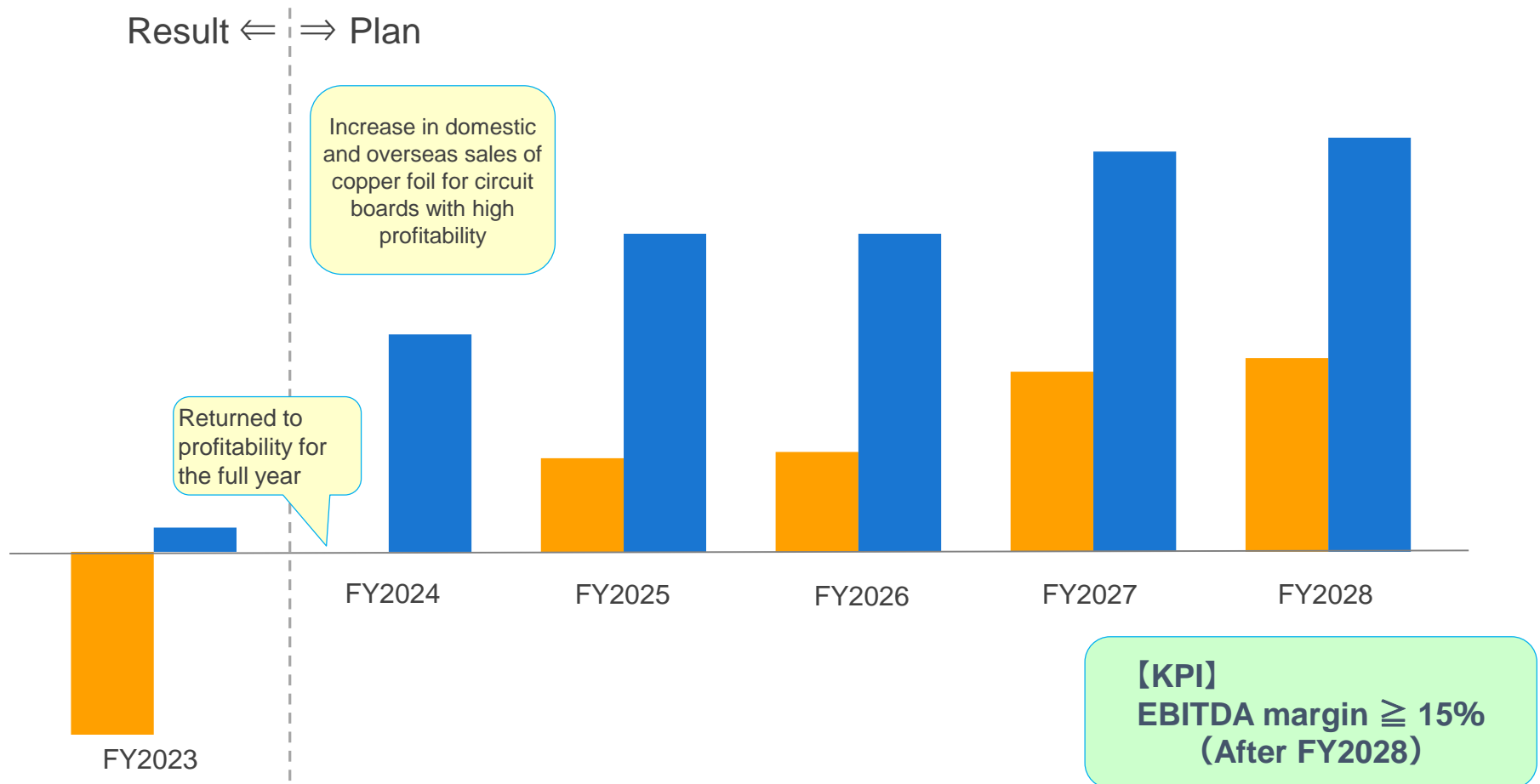


※FY2025 and beyond are tentative images. Will be updated as soon as synergies with business partners are factored in.

【KPI】
Productive capacity
 : 22,000t /年 (FY2028)

Operating Profit and EBITDA

■ Operating profit ■ EBITDA



FY2025 and beyond are tentative images. Will be updated as soon as synergies with business partners are factored in.

Camden Plant, U.S. Remodeling of existing facilities



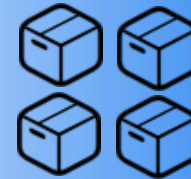
May, 2023

Completion of transforming



2023

Prototype sample suspended due to rectifier problems.



2025

Start of product supply



Photo: Trial run

◆ Location

In Camden Plant, South Carolina, U.S.A.

◆ Capex

US\$26 million

◆ Product / Capacity

Copper foil for EV batteries

/ 1,200 metric ton per year

◆ Customers

Major LIB manufactures in the US

New Plant Construction Plan in the U.S.

Capital investment and product supply timing are currently under scrutiny.

No change in production varieties, production capacity, and product suppliers.

※ In this document, construction of a new plant in the U.S. is assumed as

Construction to begin within FY2025, sample shipments to begin in summer 2028.

Location / Site area

Augusta, GA, U.S. / 465K m²

Product / Capacity

Copper foil for automotive batteries
/ 9,500 metric tons per year

Target customer

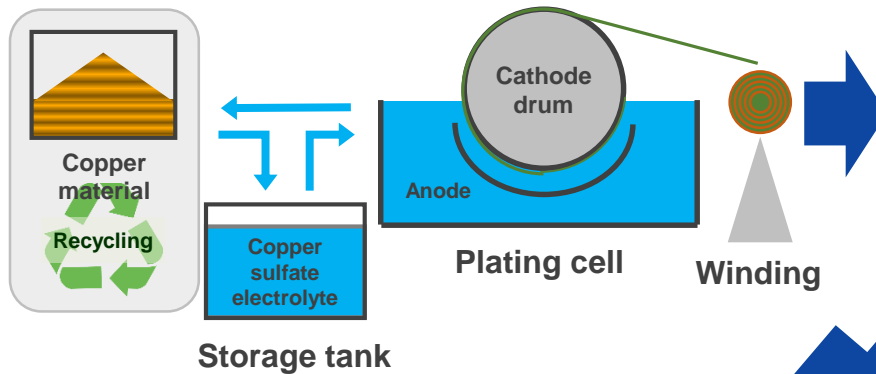
Major battery manufactures in the U.S.

05. Appendix

Manufacturing process of electrodeposited copper foil

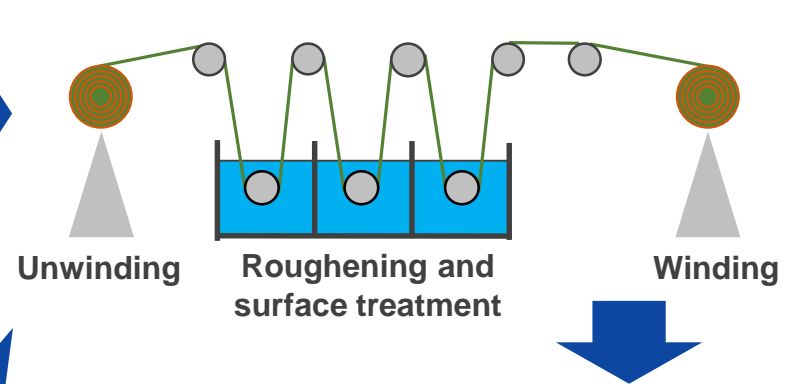
① Base foil plating process

Surface morphology and mechanical properties are controlled with plating conditions, and continuous plating is performed on a rotating cathode drum.

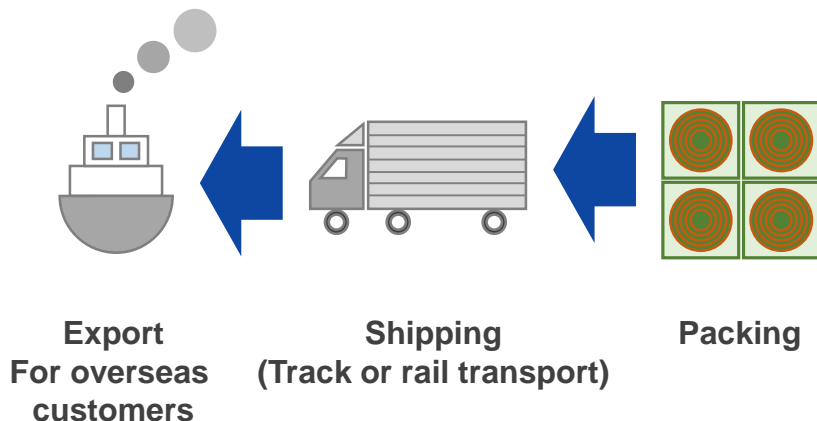


② Surface treatment process

Roughening and surface treatment such as anti-rust and organic treatment is performed according to the application.

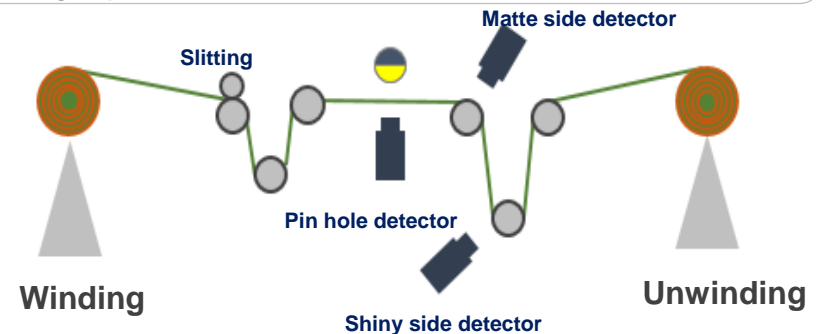


④ Shipping



③ Slitting·Inspection (Appearance)

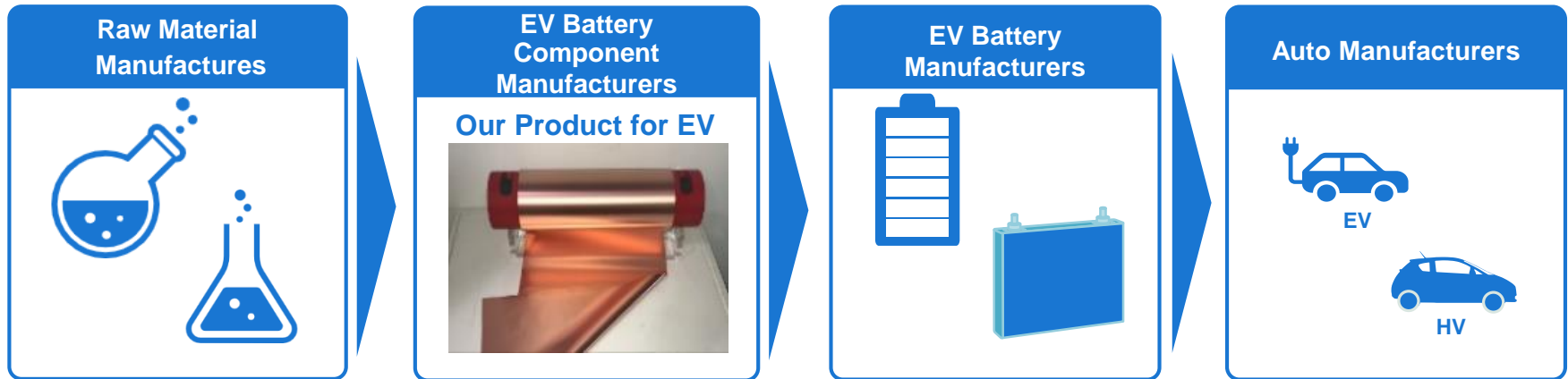
After automatic inspection of all length and width of copper foil, slitting is performed.



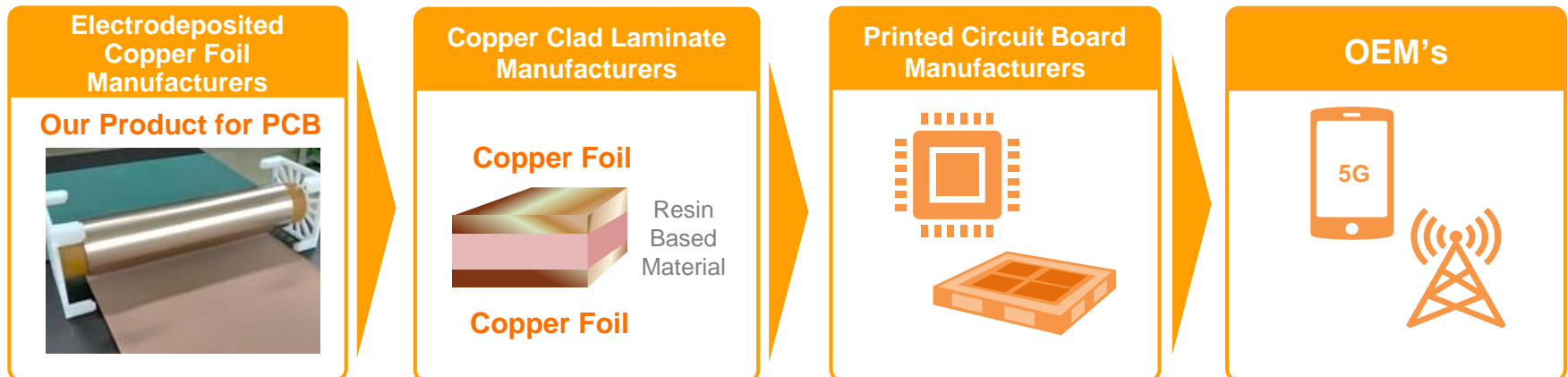
Our Product's Supply Chain

EV Battery's Supply Chain

We have channels to major Japanese and US xEV manufactures through major Japanese EV battery manufacturers



5G Products' Supply Chain



Automotive LIBs using our copper foil

Requirements

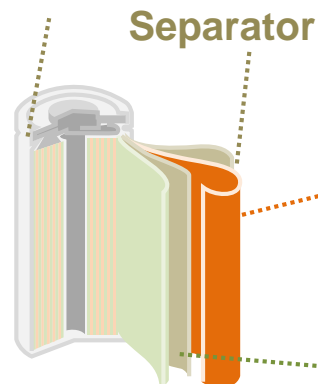
Long-term reliability,
capable of withstanding
internal **expansion and
contraction** of the battery
during charging and
discharging

Required Characteristics

- High elasticity: **tear-resistant**
- Even thinness: **Prevention of heat generation**
in thin areas
- Smoothness: **Same roughness** on both sides
- High purity: **Prevention of heat generation**
by low resistance etc.

Type of LIB

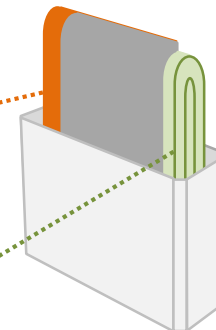
Cylindrical LIB



Negative
Current
Collector
(Copper Foil)

Positive
Current
Collector

Prismatic LIB



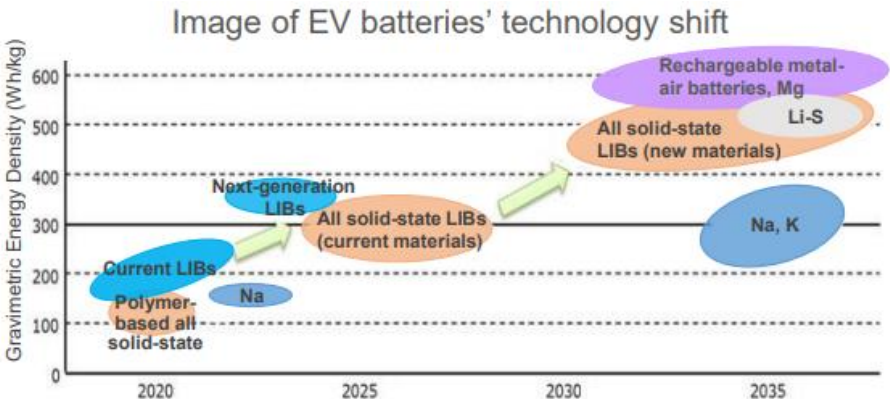
Our Technology to contribute Medium-to-Long Term Growth

We pursuit mid- to Long-term growth through joint research and development of next-generation EV batteries with EV-related companies in Japan and overseas.

Next Generation EV Battery

- ① Advanced LIB for high capacity
- ② All solid-state LIBs with high energy density
- ③ Innovative secondary battery with greatly improved performance through technology based on new principles

The development of copper foil that maximizes the characteristics above is required.



Source: New Energy and Industrial Technology Development Organization (NEDO) website

Next-generation LIB	Joint Development Partners	Our R&D achievement	Status
Advanced LIB (Liquid Type)	<ul style="list-style-type: none">Japanese battery manufacturersAnode material manufacturer	Developed copper foil with surface treatment offering high tensile strength and high adhesion, which contributes to the improvement of cruising distance and acceleration performance	Under evaluation by the manufactures
All Solid-state LIB	<ul style="list-style-type: none">Automobile manufacturers In Japan and overseas	Developed surface treatment offering the ability to prevent copper sulfide from producing, contributing to the exponential increase of safety and reliability and the ensuring of high energy density	Under evaluation by the manufactures
Innovative secondary batteries (Post-LIB)	-	Commenced the development of copper foil necessary for innovative secondary batteries, such as fluoride-ion batteries and zinc negative electrode batteries	-

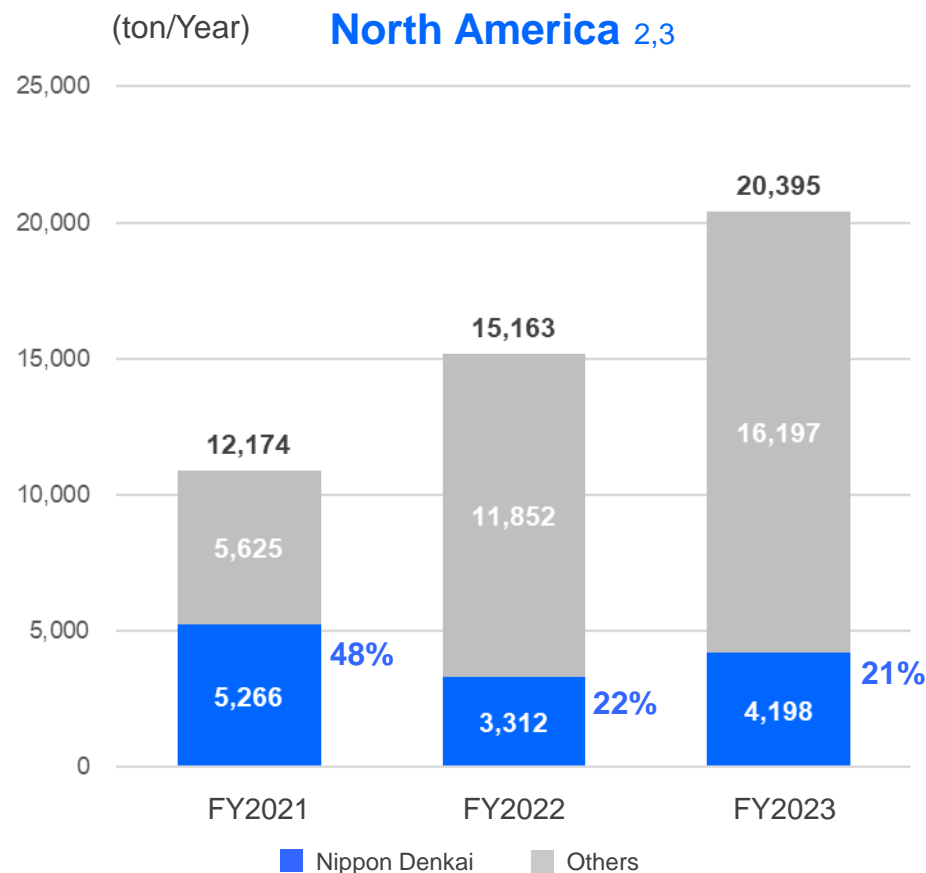
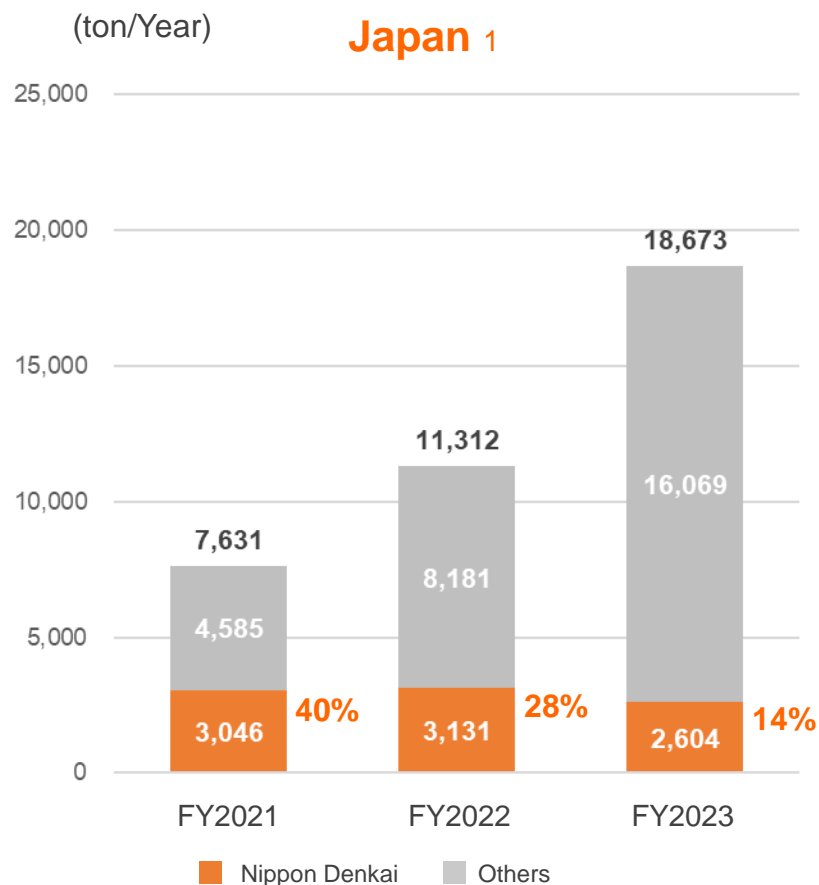
Major Customers (FY2023 Result)

We have stable connections and revenue bases with major Japanese EV battery manufacturers and major Japanese and US electrical parts manufacturers, through actual sales performance.

Customer	Products	Sales (JPY million)	Ratio
Panasonic Corporation	For EV batteries / PCB	9,672	58.1%
Primearth EV Energy Co., Ltd.	For EV batteries	2,826	17.0%
Others	For EV batteries / PCB	4,152	24.9%
Total Sales		16,650	

Our Market Share in the EV Battery Copper Foil Market

Our products have been highly evaluated by the market for the long-term reliability and good handling performance, and have high market share in the Japanese market.



¹ The above graph compares our sales volume in the Japanese market with the demand for anode current collectors by region (Source: Fuji Keizai Co., Ltd.). (April 2024 data)

² Import statistics are used for the size of the North American market for copper foil for automotive batteries. ³North American market share does not include DAI products.

Management Indicators Focused on by the Group

Business Indicators / Reasons to focus on

Production (by metric tons)

We place importance on production volume (by metric tons) as an indicator to grasp the progress of our production and sales activities, **excluding the impact of the rise and fall of copper price.**

Operating Income

We place importance on Operating Income as a basic indicator for measuring the status of our profit.

EBITDA

As we own a large number of fixed assets properties, we place importance on EBITDA, which is adjusted to the impact of Depreciation and Interest Expenses.

Financial Highlights

(Unit : million yen)	FY2019	FY2020	FY2021	FY2022	FY2023
Net sales	12,480	14,584	20,558	17,047	16,650
EV battery copper foil	10,375	9,272	13,589	11,316	12,542
Circuit Board copper foil	2,104	5,312	6,969	5,730	4,108
Operating profit	911	527	1,004	-1,611	-1,034
(Operating profit margin)	7.3%	3.6%	4.9%	-9.5%	-6.2%
Net income	1,988	193	848	-1,933	-874
(Net income margin)	15.9%	1.3%	4.1%	-11.3%	-5.3%
Depreciation and Amortization, etc.	974	1,316	1,274	1,240	1,169
EBITDA	1,886	1,843	2,278	-371	134
EBITDA margin (%)	15.1%	12.6%	11.1%	-2.2%	0.8%
Interest bearing debt	6,459	6,010	8,866	12,377	13,880
Net interest bearing debt	5,205	4,348	6,366	8,797	10,503
Total assets	13,747	13,643	18,034	22,678	23,908
Net assets	4,434	4,946	5,755	7,447	6,724
Net interest bearing debt/EBITDA	2.8x	2.4x	2.8x	—*	77.9x
Equity ratio (%)	32.3%	36.3%	31.9%	32.8%	28.1%
ROE (%)	57.7%	4.1%	15.9%	-29.3%	-12.3%
Financial leverage	3.1x	2.8x	3.1x	3.0x	3.6x
Total assets turnover rate	1.0	1.1	1.3	0.8	0.7

* Indicator values are omitted since this is a comparison between a deficit and a surplus.

Methods of earning Revenue and Cash Flow

Our company operates the development, manufacturing and sales of electrodeposited copper foil. We generate Revenue and Cash Flow by the sales of our products to the customers.



Risk factor Analysis

Risk factor / Possibility of occurrence	Impact level	How to cope with the factor
<p>Energy and resource price hikes / High</p> <p>In our group's manufacturing activities, soaring energy and resource prices will result in higher manufacturing costs.</p>	High	<p>We will improve production efficiency at manufacturing sites. In addition, we are negotiating with customers to reflect energy and resource price increases in selling prices.</p>
<p>Copper Price Fluctuations / High</p> <p>Our products are made mainly from High-purity copper materials, so market fluctuations in Copper prices have an impact on manufacturing costs.</p>	High	<p>In order to minimize the impact, we are working “Copper price Indexing System” with customers, in which product prices are decided based on Copper prices in the Market.</p>
<p>Exchange Rate Fluctuations / Medium</p> <p>Translation of foreign currency-denominated assets, liabilities, revenues, an expenses into Japanese Yen will increase or decrease depending on Exchange rate fluctuations.</p>	Medium	<p>In the cases of Account Receivables and Payables in foreign currencies are incurred or when investments are made in overseas subsidiaries, they are hedged by executing Forward exchange contracts.</p>
<p>Limited Number of Customers / High</p> <p>A significant portion of our Consolidated Net Sales is derived from sales to a limited number of clients. The performance and purchasing policies of the customers have a significant impact on our top line.</p>	High	<p>We will increase the number of clients by working to expand sales channels to the High-value-added fields where future growth is expected and to overseas customers.</p>

Our group has other business risk factors in addition to those mentioned above. For details, please refer to “Business and Other Risk Factors” in the Annual Securities Report.

Our Commitment to Sustainability

Environment

Carbon-Free world with xEV

We aim for creating a **carbon-free world and a sustainable society** by providing high-quality copper foils for LIBs and xEV.

Our SDGs targets



Our products are made from 100% recycled materials

We recycle copper foils scraps generated in the manufacturing process.
ISO 14021:2016 compliance has been verified by a third-party certification body.

Our SDGs targets



Social

Human Capital Management “Corporate development through employee growth”

We will enhance corporate value through employee growth through expanded training programs.

Our SDGs targets



Governance

Enhancing corporate governance by accelerating its environmental initiatives

As an example, the Environmental Management Committee was enhanced and a Carbon Footprint Subcommittee was established to improve the global environment.

Our SDGs targets



Scheduled Date of Next update

The next update of this document is scheduled for September 2024 to reflect the results of discussions with each business partner.

We plan to update this document as necessary in the event of material changes to the information contained herein.

Contact : Nippon Den kai, Ltd. / Investor Relations
ir_team@nippon-den kai.co.jp

Disclaimer

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日本電解株式会社

Nippon Denkai, LTD.