

IR Business Briefing

Automotive products business

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Forward-Looking Statements

Projections of future sales and earnings in these materials are “forward-looking statements.”

Management offers these projections in good faith and on the basis of information presently available.

Information in these statements reflects assumptions about such variables as economic trends and currency exchange rates.

Forward-looking statements incorporate known and unknown risks as well as other uncertainties that include, but are not limited to, the following items.

- Economic trends in the U.S., Europe, Japan and elsewhere in Asia, particularly with regard to consumer spending and corporate expenditures.
- Changes in exchange rates of the U.S. dollar, euro, and Asian currencies.
- The Furukawa Electric Group’s ability to respond to rapid advances in technology.
- Changes in assumptions involving financial and managerial matters and the operating environment.
- Current and future trade restrictions and related matters in foreign countries.
- Changes in the market value of securities held by the Furukawa Electric Group.

Due to the above factors, actual sales, earnings, and other operating results may differ significantly from Looking Statements in these materials. In addition, following the release of these materials, Furukawa Electric Group assumes no obligation to announce any revisions to forward-looking statement in these materials

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Furukawa Electric Co., Ltd

I . Main products and applications

II . Market trends

III . Growth strategy

(1) Business policy and targets

(2) Strengthen the introduction of products to growth domains

(3) Strengthen overseas sales

IV . Sales and operating income forecast

V . Focal products

VI . Technology development in new domains

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Main products

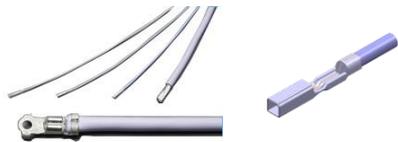
As of 2017, the new connector technology (a terminal) has been adopted by 3 companies (10 vehicle models)



Perimeter surveillance radar



Junction box



Aluminum electrical wire connector technology



Metal core substrate



In-vehicle Connectors

No. 1 share in the global market



SRC



MCPET[®]
(microcellular foamed reflector)



Battery state detection sensor



HV rectangular wire (HVW)

Product applications and customer segments **FURUKAWA ELECTRIC**

	Key products	Applications	Main customers	<ul style="list-style-type: none"> Overseas sales ratio Main markets
Wire harness	Wire harnesses (including aluminum) 	Promote "Green cars" by making vehicles lighter (aluminum)	Japanese automakers	<ul style="list-style-type: none"> 30% Japan
	Anti-corrosion terminals 	Water-resistant terminals for aluminum harnesses	Japanese automakers	
Vehicle components	SRC (Steering Roll Connector) 	Connectors for airbags	Global automakers, including Tier 1 companies	<ul style="list-style-type: none"> 75% Whole global market
	BSS (Battery state detection sensor) 	Vehicle power management	Japanese automakers	<ul style="list-style-type: none"> 75% Japan, China and North America
	Radar 	Advanced driver assistance system (ADAS)	Japanese automakers	<ul style="list-style-type: none"> Japan
Batteries	Lead storage batteries for idling stop systems EN standard lead storage batteries Auxiliary batteries for hybrid vehicles 		Automakers (new vehicles) Car dealers (commercial sales)	<ul style="list-style-type: none"> Japan, ASEAN

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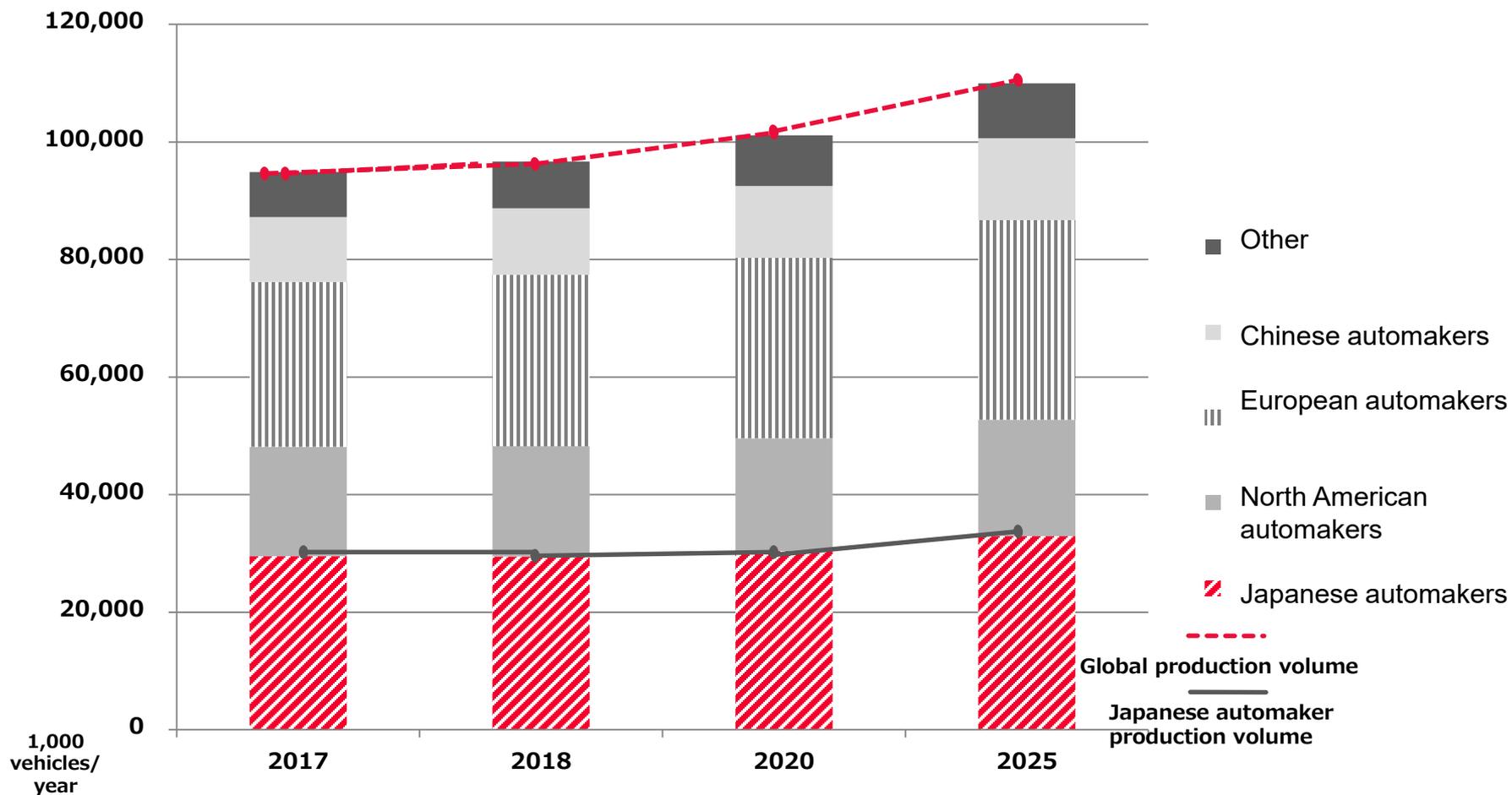
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Global production forecast (by manufacturer) **FURUKAWA ELECTRIC**

- Global production is expected to increase about 20% by 2025
- Japanese automakers' production is expected to increase about 10%

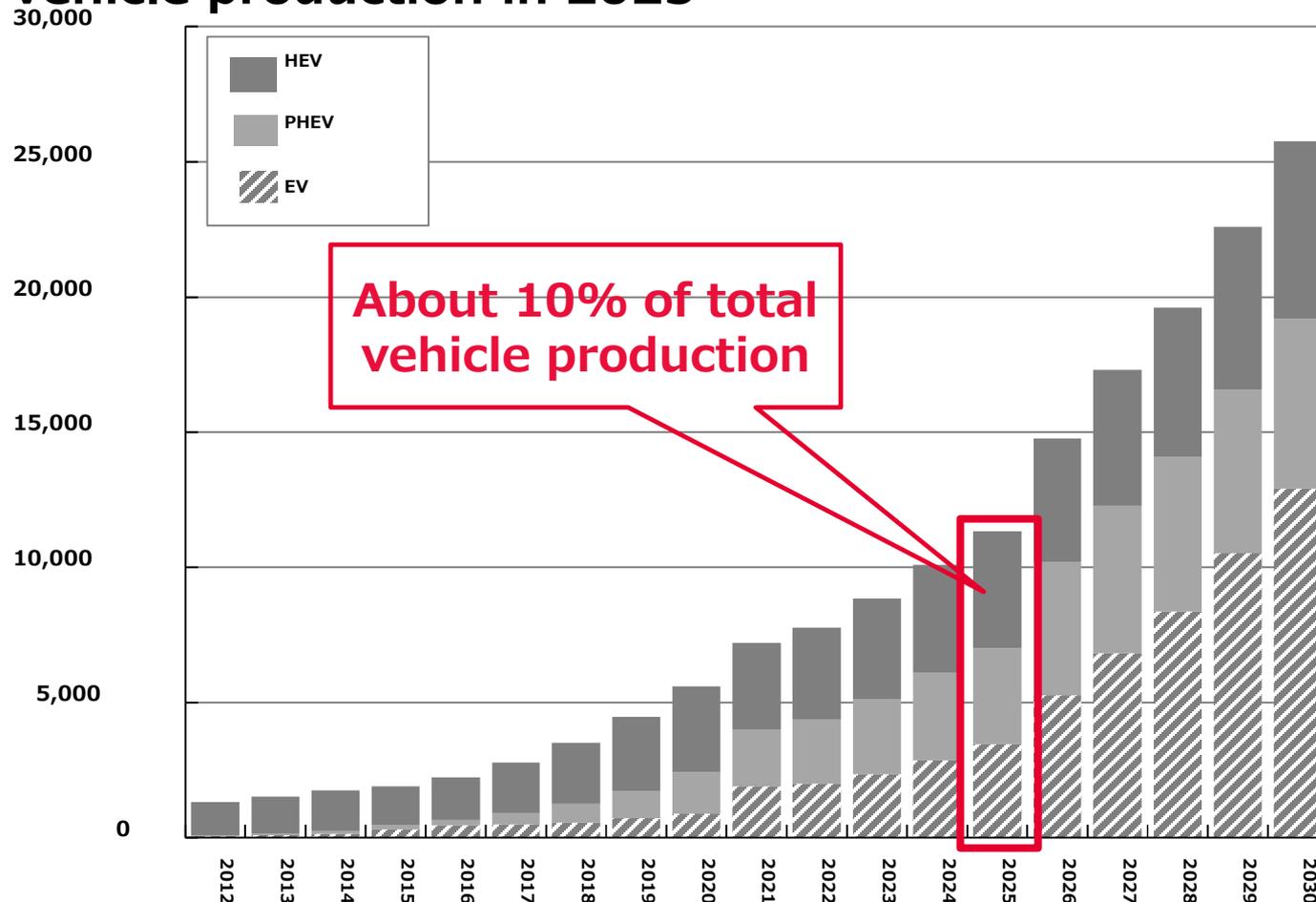


Source: Calculated by Furukawa Electric based on IHS market data

Vehicle electrification market forecast

(EV, HEV, PHEV)

- Going forward, the vehicle electrification market will rapidly grow, and electric vehicles are expected to account for about 10% of total vehicle production in 2025



Source: Mizuho Bank (created by the Mizuho Bank Industry Research Department based on materials from JATO JAPAN and various countries' automotive industry associations)

*Forecasts from 2017 were forecast by the Mizuho Bank Industry Research Department

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Overall business policy and targets

- Introduce products to the growth domains, and strengthen components in particular

Target: **Operating income composition ratio of components is 50%** in FY2025 (Stabilize profits)

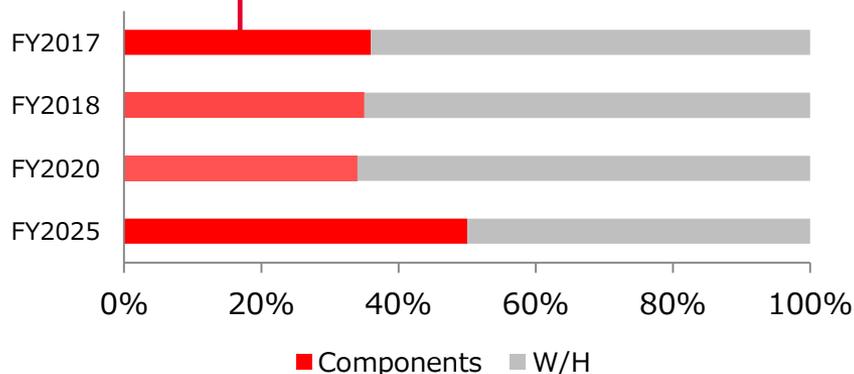
- Strengthen overseas sales

Target: **Operating income composition ratio is 50%** for Japan/overseas in FY2025

(Organization that can withstand currency fluctuations)

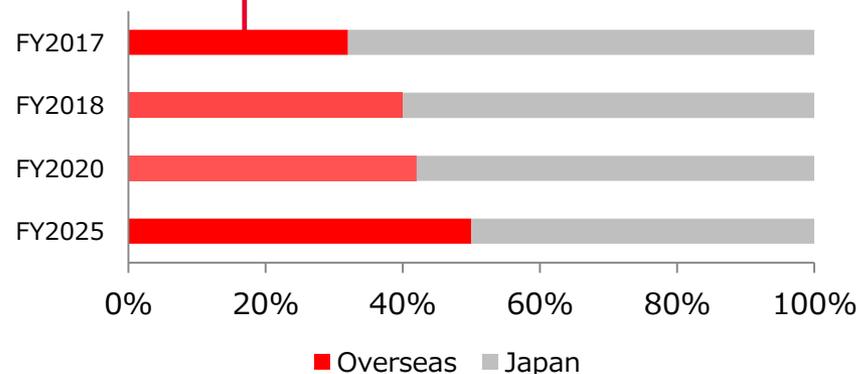
Target operating income composition ratio of wire harnesses and components

FY2017 actual: Components - 36%



Target operating income composition ratio of Japan and overseas

FY2017 actual: Overseas - 32%



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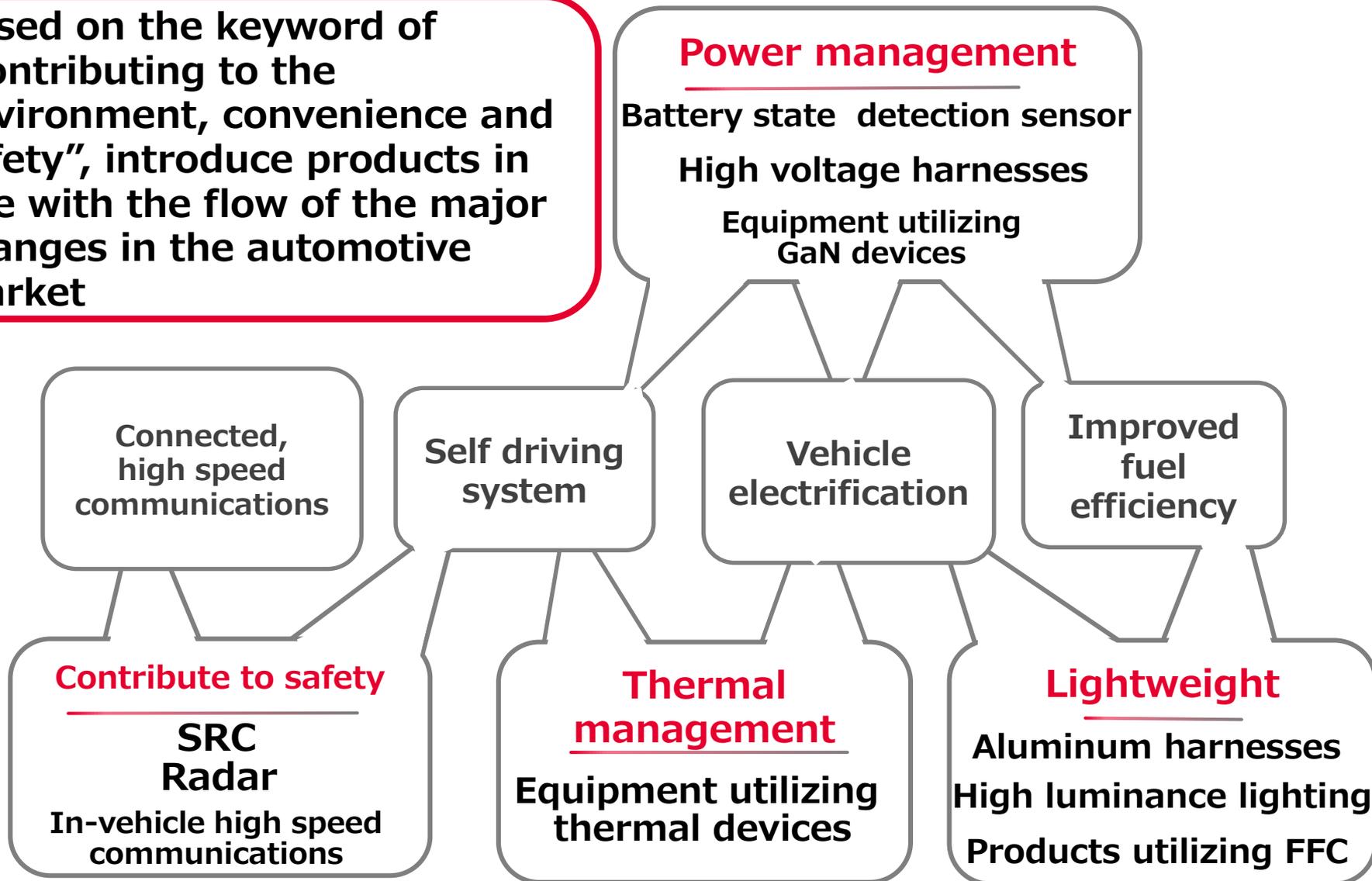
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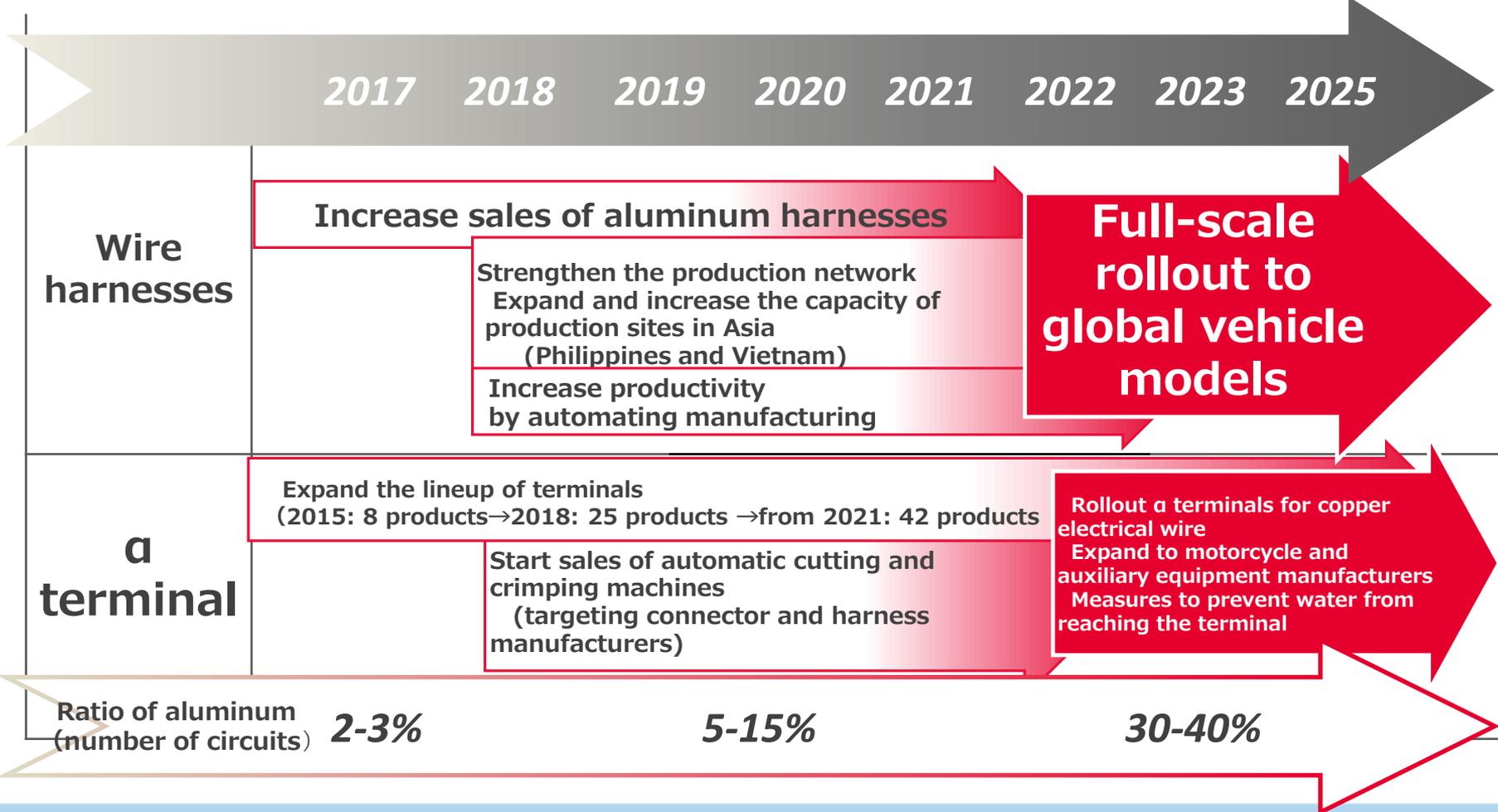
Strengthen the introduction of products to growth domains (1)

Based on the keyword of “contributing to the environment, convenience and safety”, introduce products in line with the flow of the major changes in the automotive market

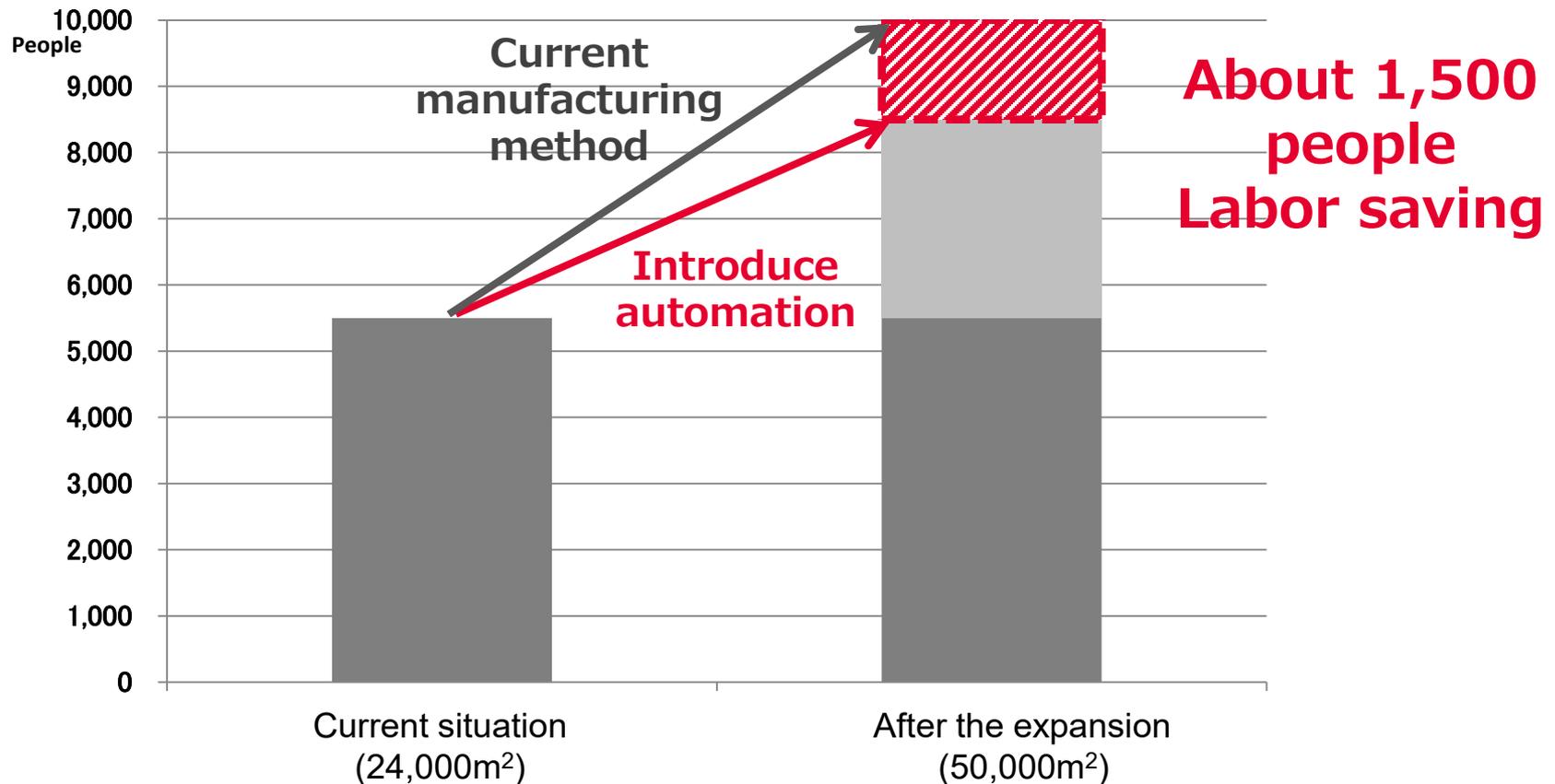


Strengthen the introduction of products to growth domains (2) [Aluminum harnesses]

Increase sales of aluminum harnesses that respond to requests for lightweight products, and aim to improve profitability by promoting automation in manufacturing

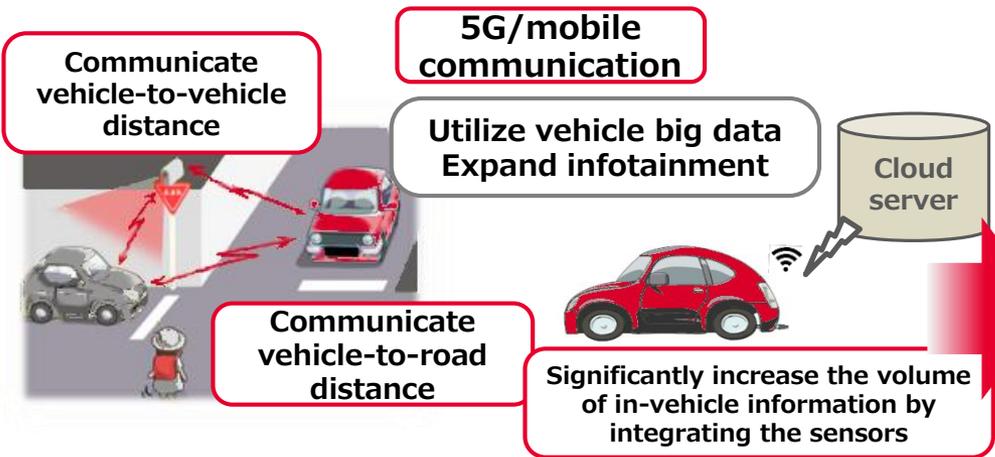


Example of labor saving through the promotion of automation in manufacturing (Expansion of the wire harness factory in the Philippines)

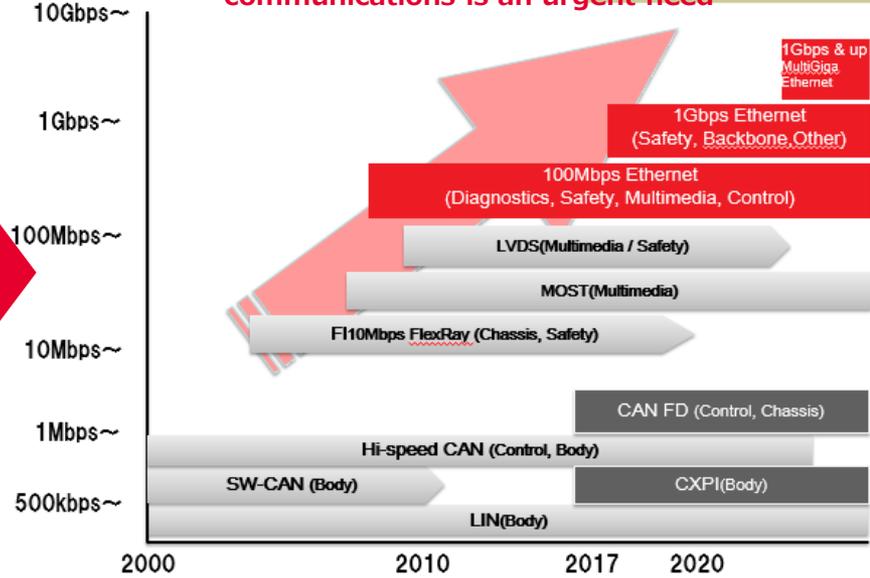


Strengthen the introduction of products to growth domains (3) [High speed in-vehicle communications]

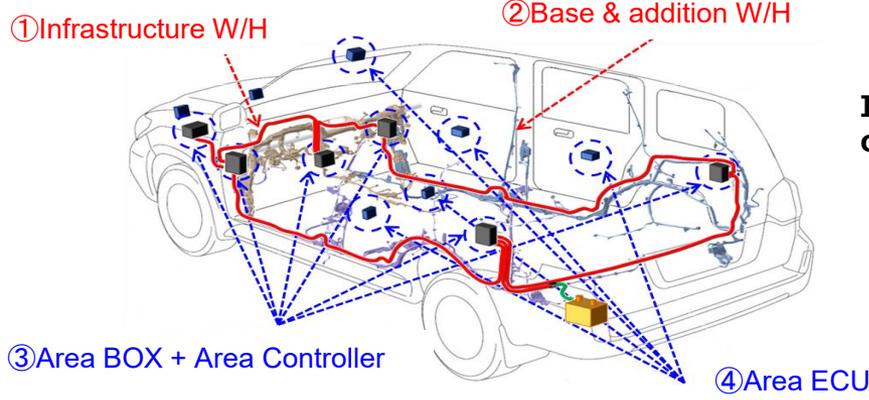
Initiatives for next generation communications that support connected cars and self driving systems



Increasing the speed and volume of in-vehicle communications is an urgent need



Future wiring system



Introduce high speed communication using metal electrical wire

Development aimed at optical fiber communications in the future



2018

2020

2021

2025

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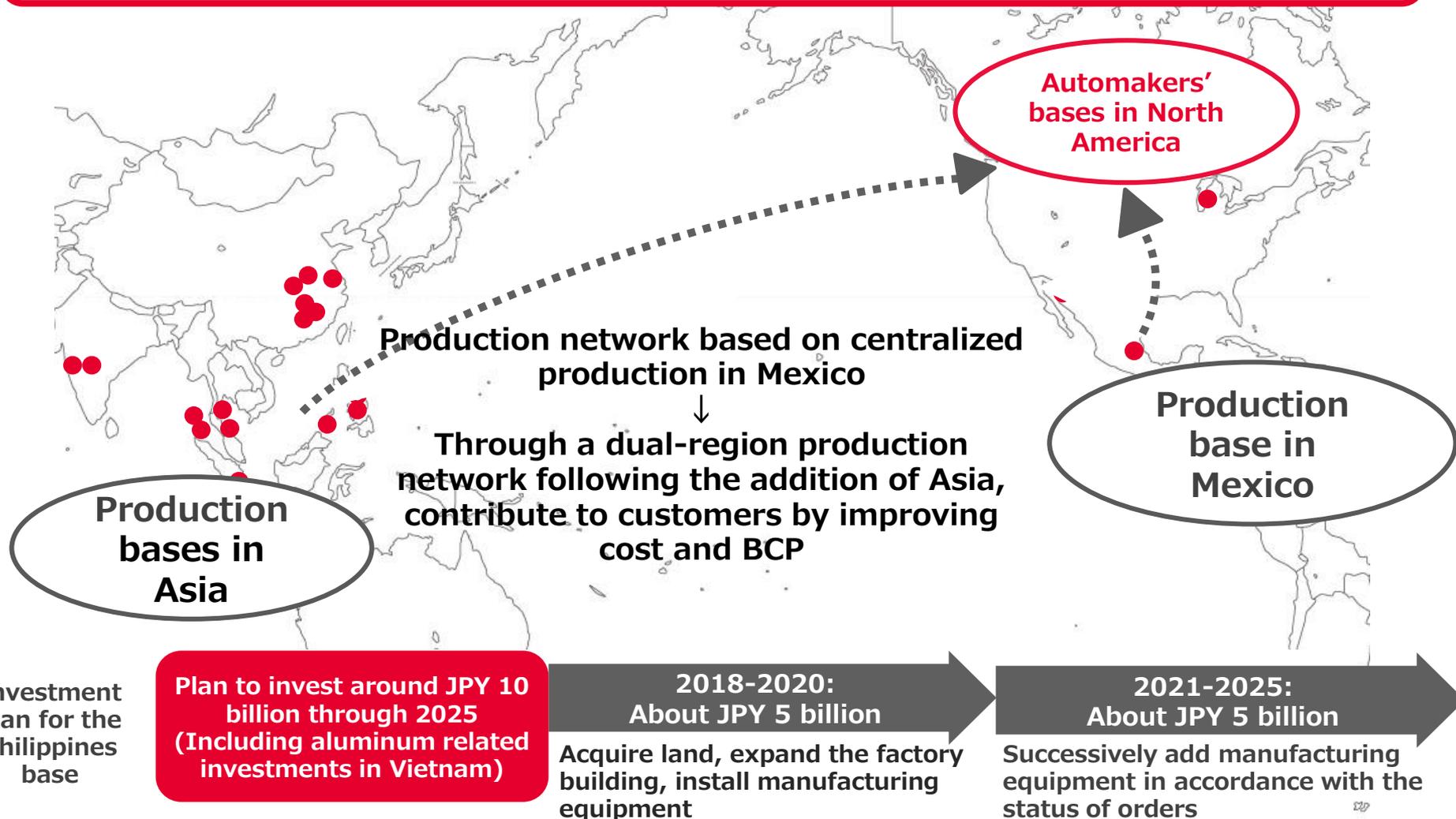
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Strengthen overseas sales (1)

[Optimize production of harnesses for North America]

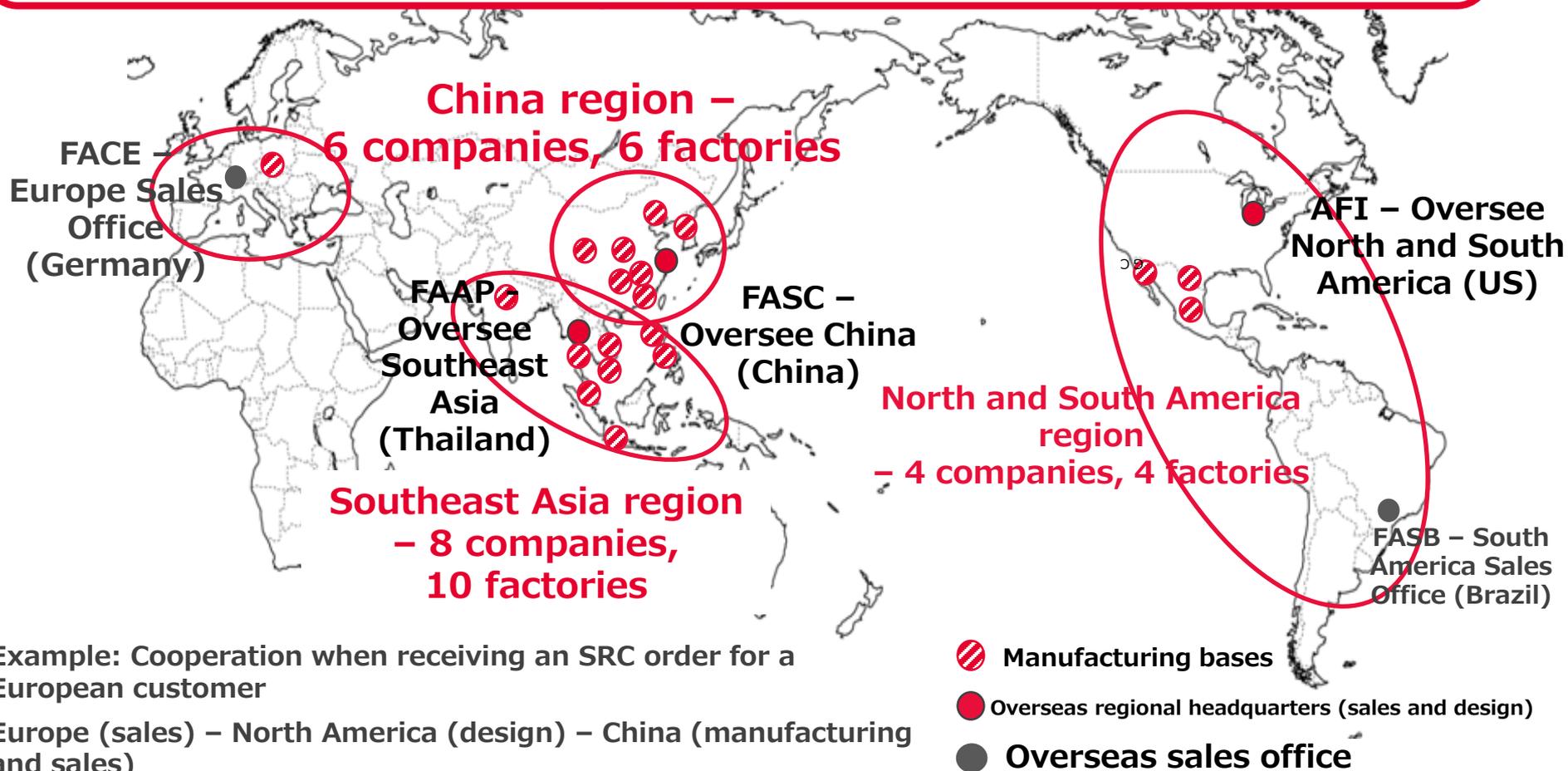
Respond to increased orders for global vehicle models, and expand the production bases of wire harnesses for North American vehicles



Strengthen overseas sales (2)

[Strengthen global cooperation: Sales, design and development]

Expand the business for European and American customers by strengthening global cooperation between the overseas regional headquarters (China, US, Thailand)



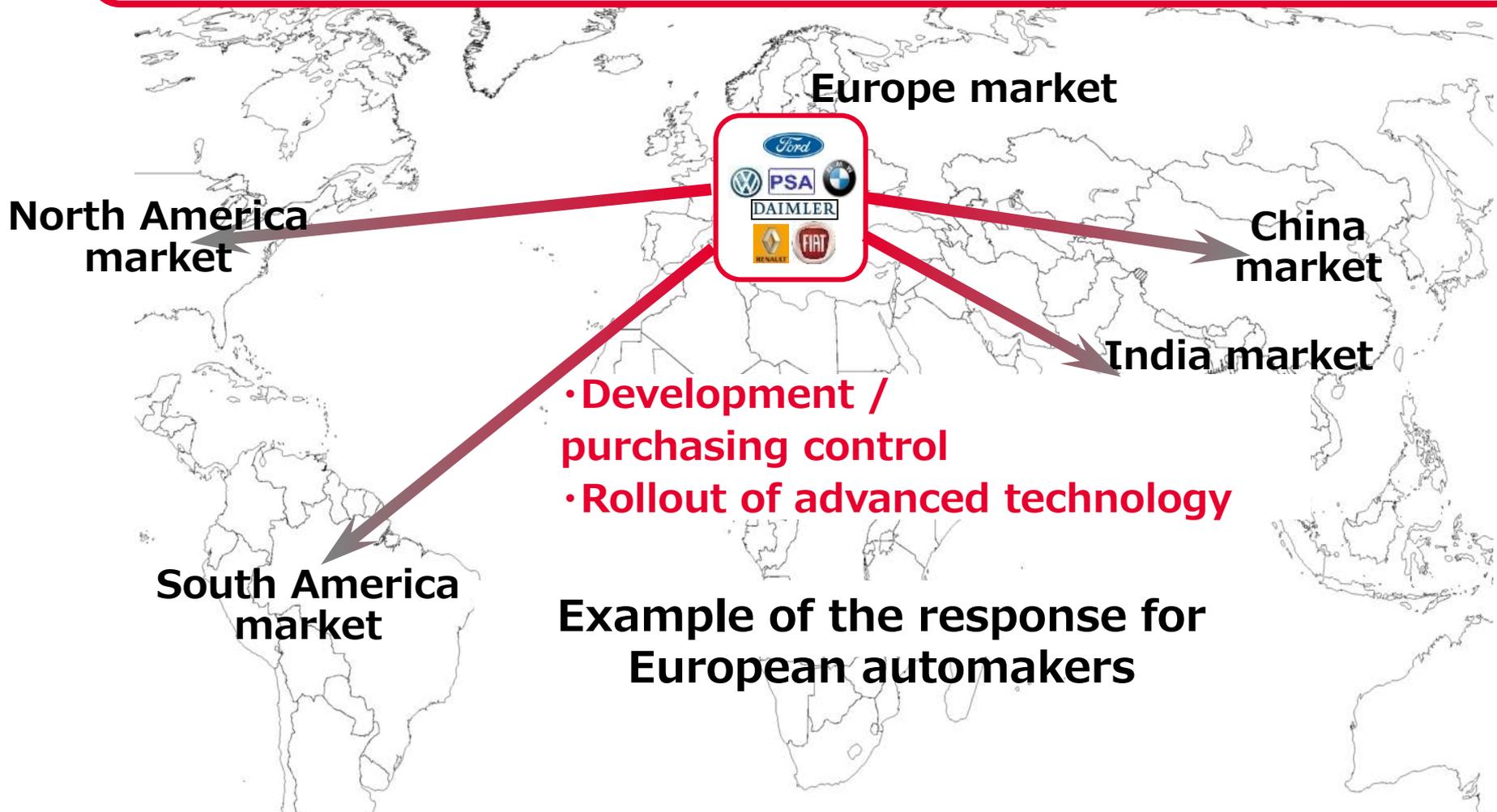
Example: Cooperation when receiving an SRC order for a European customer

Europe (sales) – North America (design) – China (manufacturing and sales)

Strengthen overseas sales (3)

[Strengthen global cooperation: Sales, design and development]

Contribute to expanding the commercial areas in growing markets outside of Europe by strengthening the sales and design development capabilities in Europe



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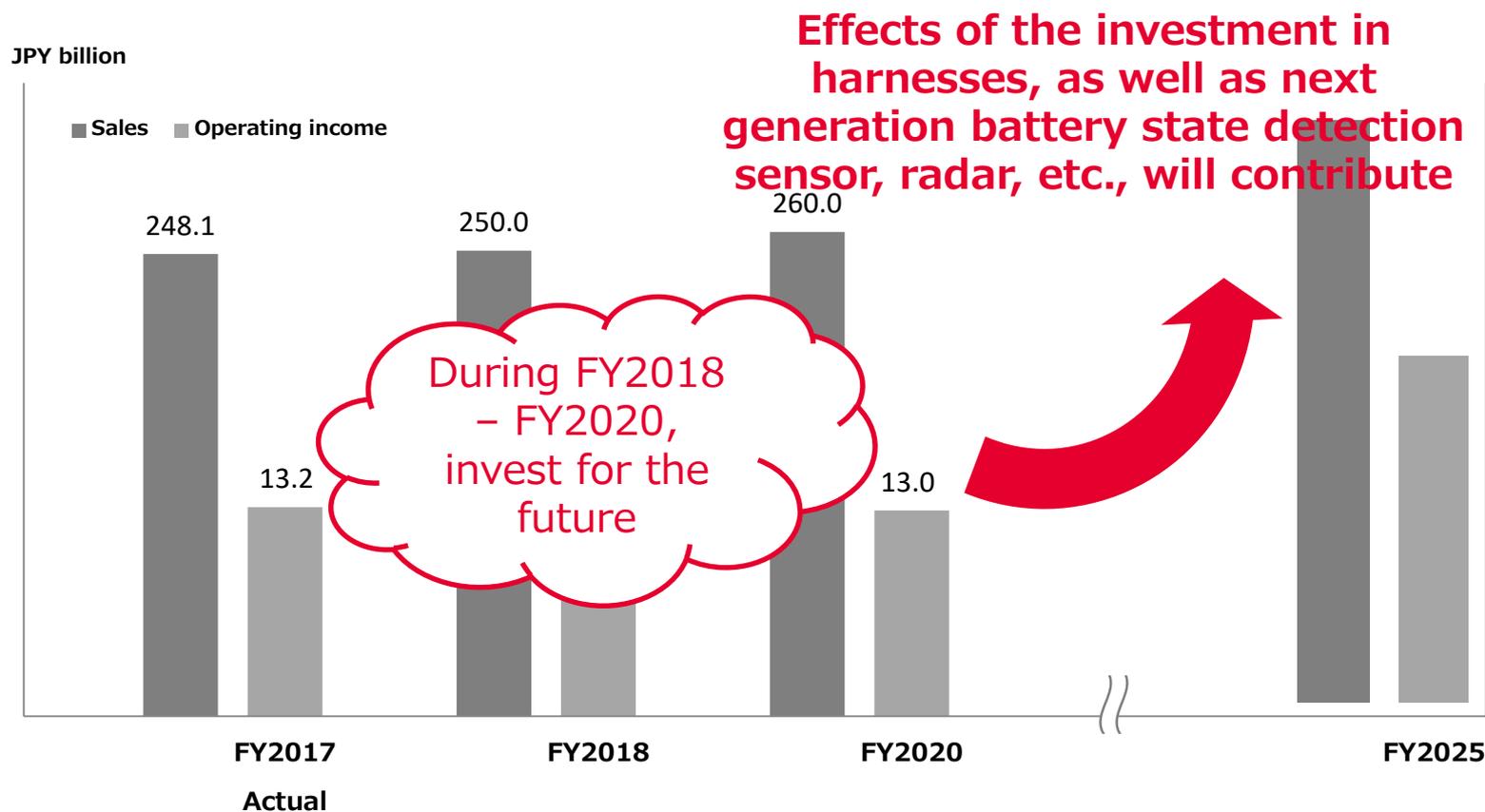
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Sales and operating income forecast

【Automotive Products & Batteries segment】

Expect sales and operating income to increase from FY2021 through the receipt of more orders overseas and strengthening the introduction of products to growth domains



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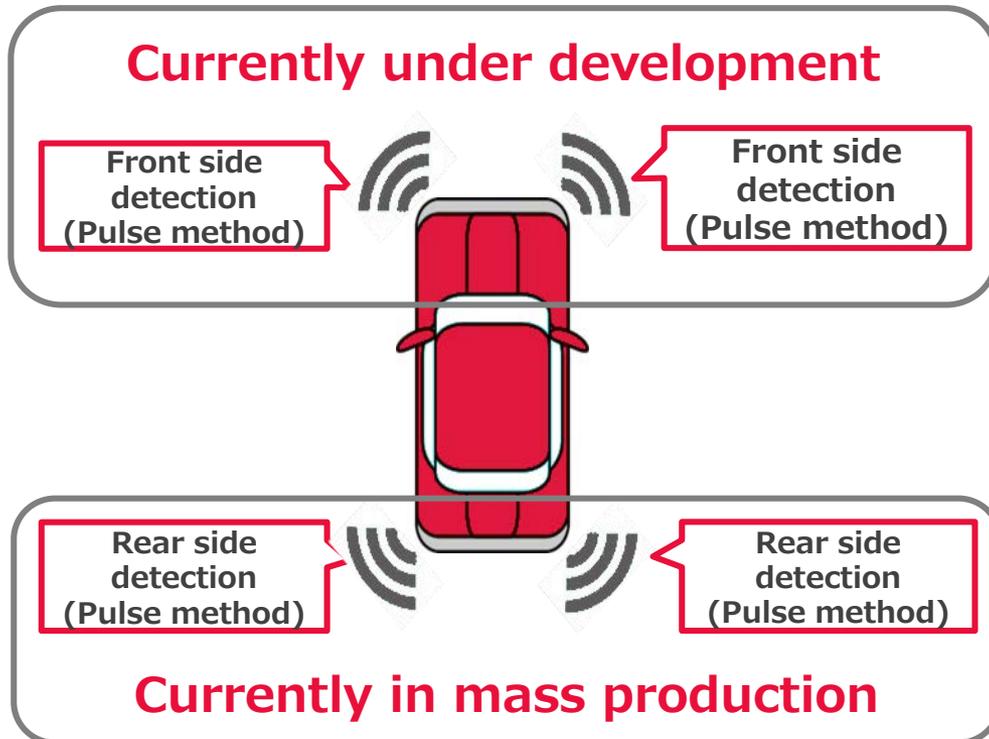
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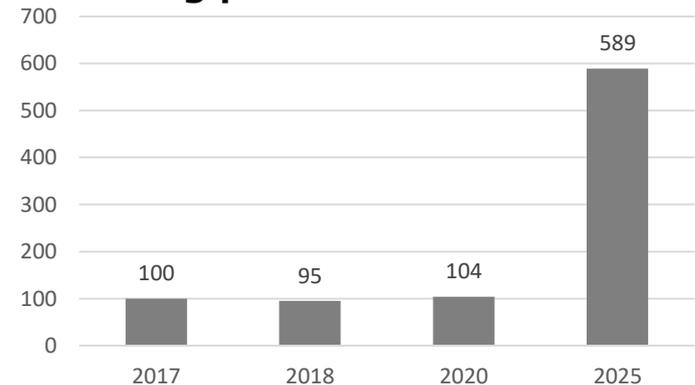
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Focal products (1) Radar

- Realize high resolution in the short to mid-range, wide-angle region
- Use the pulse method to detect extremely nearby objects, which have been difficult to detect using the traditional method
- Improve the ability to mount on the vehicle regardless of the bumper shape



Production targets
(Assuming production in 2017 is 100)

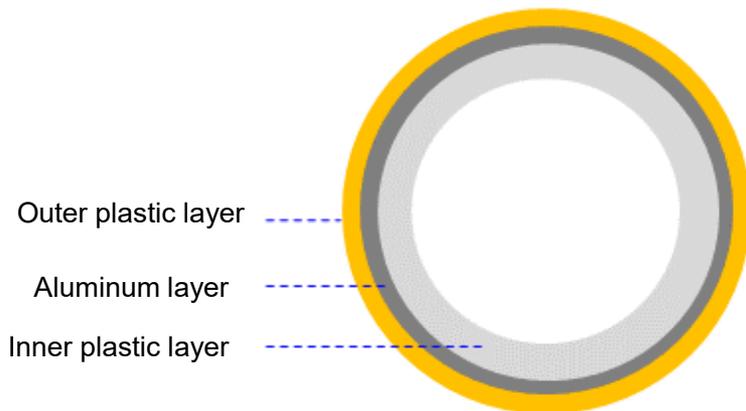


Focal products (2) High voltage harnesses **FURUKAWA ELECTRIC**

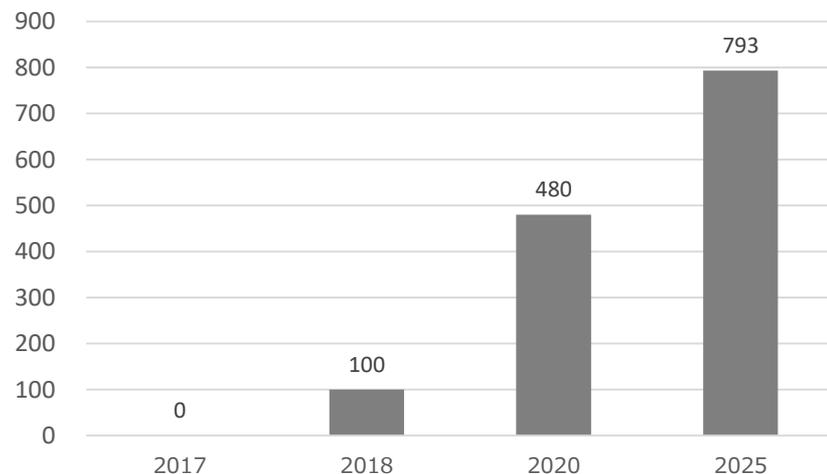
- Use SP tubes, a unique technology with excellent scratch resistance, anti-corrosion and shield performance
- Expand the lineup of SP tube diameters
- Using new materials that include aluminum, expand the new electrical wire and components that realize lighter weight, flexibility and smaller size



■ SP tube: Three layer construction of “plastic – aluminum – plastic”



Production targets
(Assuming production in 2018 is 100)



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Based on products that utilize the core technologies of the Furukawa Electric Group, cultivate markets through the **OneF® activities**

Power management systems

Collaboration with the **Research and Development Division**

- Fuse-less JB equipped with a high current semiconductor switch
- Power components with consideration for a shift to 48V systems (Plan to launch onto the market in 2020)



Utilize the core technologies of the Furukawa Electric Group

Products utilizing FFC (Flexible Flat Cable)

Collaboration with **FASC**

- Expand sales of SDH (Slide Door Harness) in overseas markets
- New products utilizing FFC

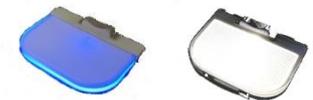
(SDH: Plan to launch in the China market in 2019, New products utilizing FFC: Targeting market launch in 2022)



Vehicle lighting

Collaboration with the **Functional Plastic Products Department and FETI**

- Along with high performance lighting using the good reflective characteristics of MCPET®, proposal as a new HMI with added speaker function (targeting market launch in 2020)



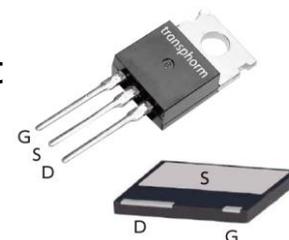
*HMI; Human Machine Interface

Based on products that utilize the core technologies of the Furukawa Electric Group, cultivate markets through the **OneF® activities**

Power electronics utilizing GaN

Collaboration with the **Research and Development Division and Transphorm**

- In collaboration with GaN module manufacturer Transphorm, targeting market launch of small, high efficiency power electronics products that secure in-vehicle quality (Targeting market launch in 2022)



Utilize the core technologies of the Furukawa Electric Group

Wireless recharging

Collaboration with the **Research and Development Division, Totoku, KANZACC and FMGW**

- Electric field method: Original method that is being considered for AGV
- Inductive method (industry standard): Currently creating and evaluating in-vehicle coil prototypes



Based on products that utilize the core technologies of the Furukawa Electric Group, cultivate markets through the **OneF® activities**

Thermal management

Utilize the core technologies of the Furukawa Electric Group

Solve the thermal issues concerning electric vehicles

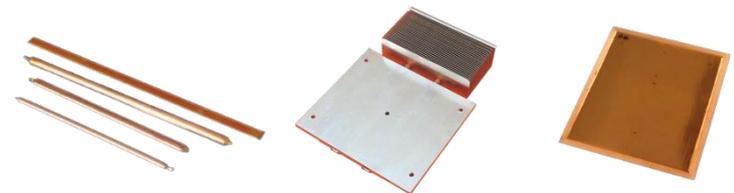
Components for cooling and controlling the temperature of lithium ion battery cells
 Components for cooling SiC inverters

Components for storing and reusing waste heat from the engine and motor



Solve the thermal issues involved in autonomous driving

Components for cooling the ECU used for autonomous driving



Heat pipe Heat sink Vapor chamber

Products utilizing thermal devices

Thank you!

Bound to  ***Innovate***