

# Business Briefing

Automotive Products Business

June 9, 2023

Furukawa Electric Co., Ltd.

Automotive Products Division

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**FURUKAWA ELECTRIC CO., LTD.**

1. Business strategy directed at 2030
  2. Response to the accelerating shift to EV  
(Opportunity to increase sales through lightweight, large current/high voltage and high speed communications technology)
  3. Initiatives in FY2023 for achieving the 2025 Mid-term Plan
  4. Initiatives for the SDGs and achieving Vision 2030
- Appendix – Product overview

# 1. Business strategy directed at 2030

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# (1) Vision 2030

Support carbon neutrality and a safe, secure mobility society, and achieve both contributions to the SDGs and sustainable growth through the provision of value

Changes in the business environment	Category	Vision for 2030
<p>► <b>Revenue opportunities</b></p> <ul style="list-style-type: none"> <li>• Acceleration of vehicle electrification directed at carbon neutrality</li> <li>• Rapid transformation of vehicles through advances in CASE</li> <li>• Expanding mobility market, including MaaS</li> <li>• Safe, secure next-generation urban planning (smart cities)</li> </ul> <p>► <b>Risks</b></p> <p>Major changes within society, such as pandemics, war or semiconductor shortages, are realized as a major menace or risk</p> <ul style="list-style-type: none"> <li>• National or local lockdowns</li> <li>• Extreme demand volatility</li> <li>• Confusion within the supply networks or logistics</li> <li>• Supply chain disruptions</li> </ul>	<p>Promote Carbon Neutral</p>	<ul style="list-style-type: none"> <li>• Expand the products with low environmental impact throughout the product lifecycle</li> <li>• Promote the use of renewable energy such as solar power and geothermal power</li> <li>• Enhance energy saving production through the use of data</li> </ul>
	<p>Realize a safe, secure mobility society</p>	<ul style="list-style-type: none"> <li>• Contribute to preventing accidents, and create products that support safe, secure mobility</li> <li>• Contribute to building social infrastructure that is connected to various mobility services</li> <li>• Create new products that combine information, energy and mobility</li> </ul>
	<p>Strengthen the ability to respond to change</p>	<ul style="list-style-type: none"> <li>• Strengthen the predictive management capability and BCM in the overall supply chain</li> <li>• Rebuild a more resilient supply chain that minimizes geopolitical risks</li> <li>• Develop products that enable automation and reduced manpower from the design stage</li> </ul>

## (2) Production and supply network

Through an optimum allocation that balances cost competitiveness and BCM,  
establish a production and supply network that can withstand change

### 【Europe market】

- ▶ Produce in Asia → Pass through supply
- Respond with pass through supply from the optimum region

### 【Japan and Americas market】

- ▶ Produce in Asia and Mexico → Pass through supply
- For aluminum wire harnesses that contribute to CN, optimally allocate production to Asia and Mexico
- Local consumption of local production for high voltage products related to IRA and USMCA

### 【China market】

- ▶ Local consumption of local production
- In addition to production and supply, shift to a full-service business that includes sales, design and procurement

### High voltage products



### Aluminum wire harnesses



### 【ASEAN + India market】

- ▶ Local consumption of local production (Hedge foreign currency exchange risk caused by local currency depreciation)

## Improve the entire value chain to better withstand change, and strengthen BCM

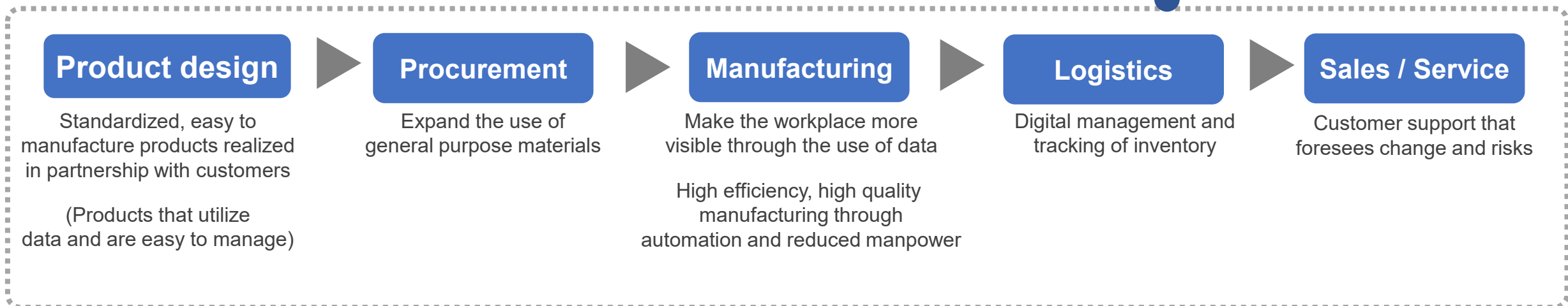
### Current

- Separate specifications for each model
- Time consuming processes that rely on skilled workers
- Delays in making the workplace more visible through the use of data



### Ideal

- Standardized, easy to manufacture product specifications
- Efficient processes that do not rely on skilled labor
- Workplace is readily visible through the use of data, Predictive management

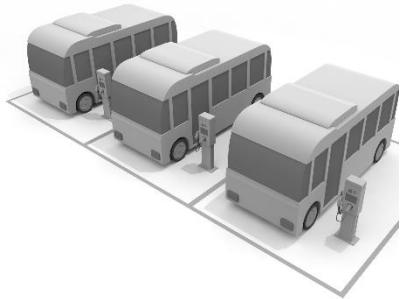


# (4) New markets

In addition to OEM, form partnerships with diverse stakeholders, and expand the business to include mobility and smart cities

## Growing EV market

- ✓ Based on the accumulated material technology, form partnerships with OEM and Tier 1 suppliers



EV mobility + Resource recycling

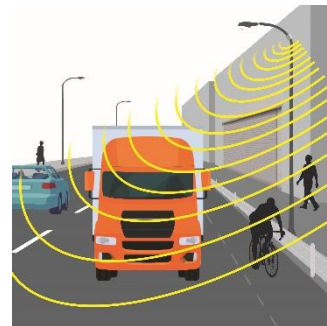


## Smart cities

- ✓ Contribute to building social infrastructure that is connected to various mobility services through the accumulated in-vehicle technology



V2X communications  
Sensing x networks



## Construction equipment and mobility market

- ✓ Utilizing the features of quasi-millimeter wave radar, improve the safety and security of mobility

Warehouses



Forklifts



Construction equipment and industrial vehicles



Mobility





# (5) Business strategy roadmap ①

Focus on creating value that solves customer issues such as high speed communications and high output, and increase product value

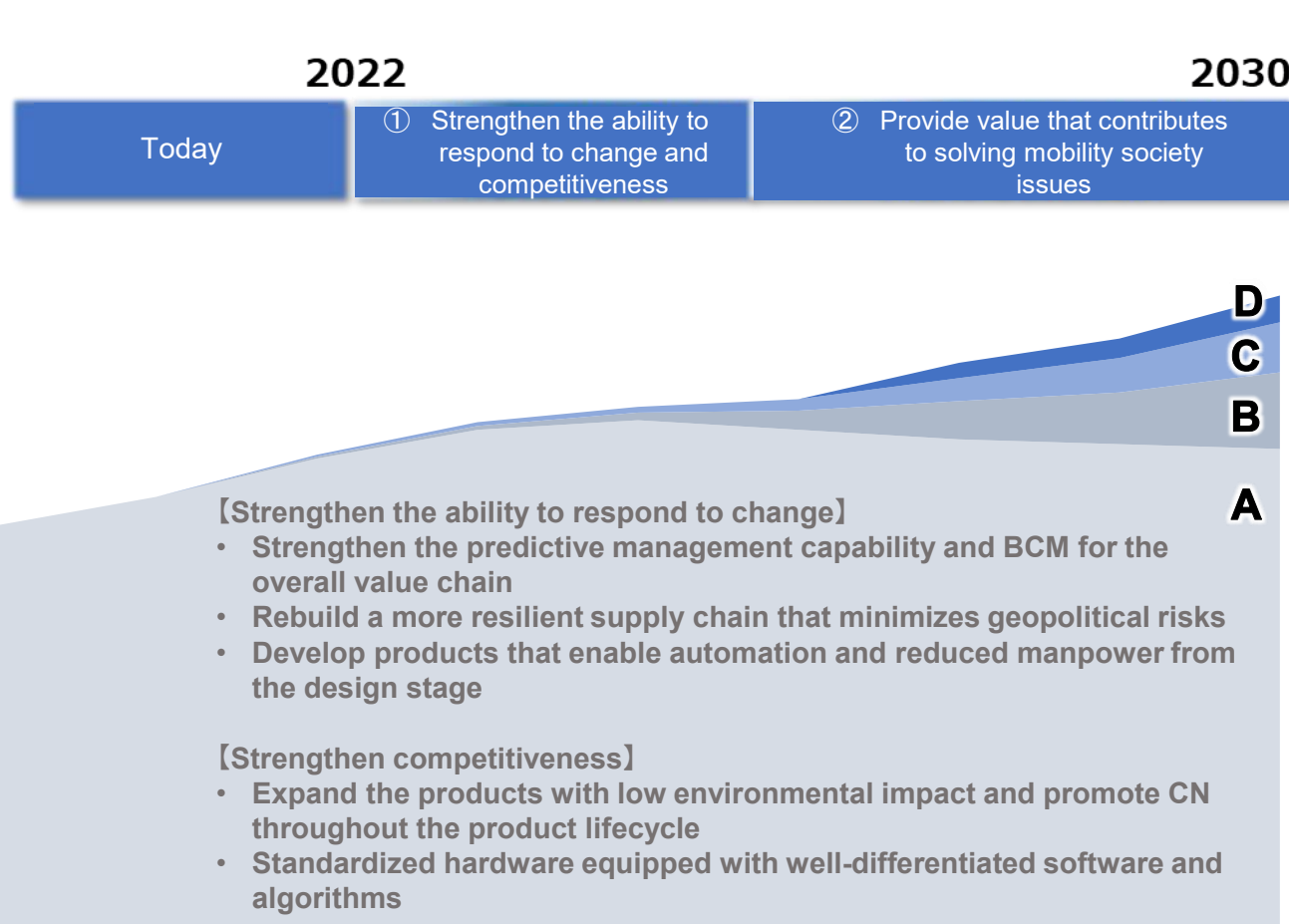
Products	Main points	2025	2030–
<b>Wiring systems</b> 	<b>High speed communications, lightweight, narrow/fewer wires</b>	2.5G~10G communications Increase product value and contribute to increased fuel efficiency and power consumption	In-vehicle optical communications exceeding 10G/s
<b>High voltage products</b> 	<b>High output (large current/high voltage), noise countermeasures</b>	Respond to market growth from the maturation of HEV and growth of BEV, and increase market share Promote the development of well-differentiated technology	
<b>SRC</b> (Steering roll connector) 	High speed communications, products that support next-generation cockpits	Support CAN communications	Support high speed communications and steer by wire Respond to new requirements, such as stowable steering columns
<b>BSS</b> (Lead battery state sensor) 	Functional safety, ASIL compliant, utilize data, new services	Increase product value and increase sales	Establish a <i>Kotozukuri</i> business
<b>Peripheral monitoring</b> 	NCAP compliant, improved algorithms and robustness	Promote new NCAP compliance Increase product value and increase sales	
<b>New products in the combined domains</b> 	<b>Connected to infrastructure</b> <b>V2X communications control system</b> <b>In-vehicle wireless communication/power supply</b>	Traffic monitoring radar	Next-generation urban planning safety systems V2X systems Products for in-vehicle wireless applications








: Discussed in detail later

■ CAN : Controller Area Network    ■ ASIL: Automotive Safety Integrity Level  
 ■ NCAP: New Car Assessment Program

# (5) Business strategy roadmap②

- ① Strengthen the ability to respond to change and competitiveness, and transform into a business that can stably generate profits
- ② Accumulate value that contributes to solving the mobility society issues, and both contribute to the SDGs and realize sustainable growth

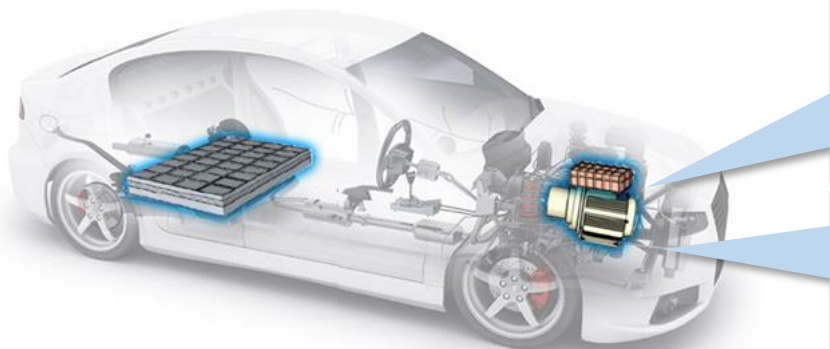


<p><b>C</b></p> <p>Increase sales to the mobility market of peripheral monitoring radar that contributes to <b>safety</b>, including industrial vehicles, construction equipment and traffic infrastructure</p>  <p>Peripheral monitoring radar</p>	<p><b>D</b></p> <p>Create new products that contribute to solving social issues, such as <b>CN</b> and <b>safe, secure mobility</b></p>  <p>Traffic monitoring</p>
<p>Environmentally friendly aluminum WH and functional products that support the transformation of automobiles</p>  <p>Aluminum WH</p>  <p>SRC</p>  <p>BSS</p> <p><b>A</b></p>	<p>Directed at <b>CN</b>, launch high voltage products that incorporate Gr technology in the growing EV market</p>  <p>High voltage WH</p>  <p>High voltage JB</p> <p><b>B</b></p>

2. Response to the accelerating shift to EV  
(Opportunity to increase sales through lightweight, large current/ high voltage and high speed communications technology)
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# (1) Lightweight

## Reduce the increased EV vehicle weight through aluminum harnesses (aluminum wires and α terminal)



### <Major changes in EV>

- Engine system ⇒ Electric motor
- Fuel system ⇒ Battery pack (BEV) Hydrogen tank (FCEV)
- Vehicle weight ⇒ +10-30% (※Survey by Furukawa Electric)



Low voltage WH



High voltage WH



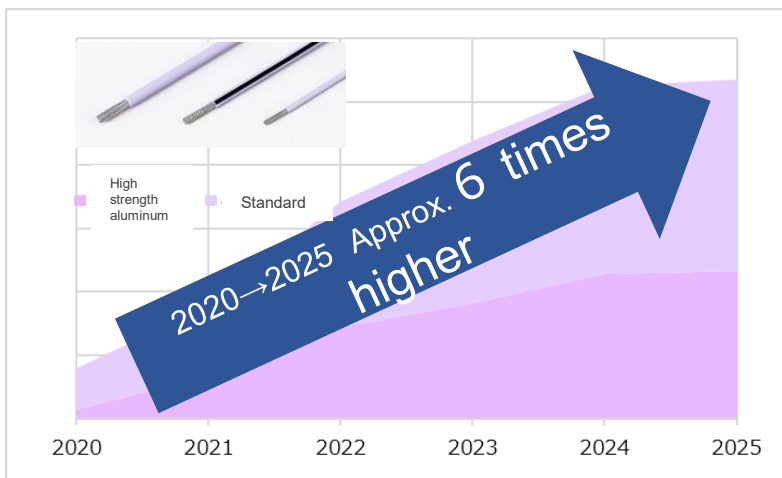
Aluminum components and technology



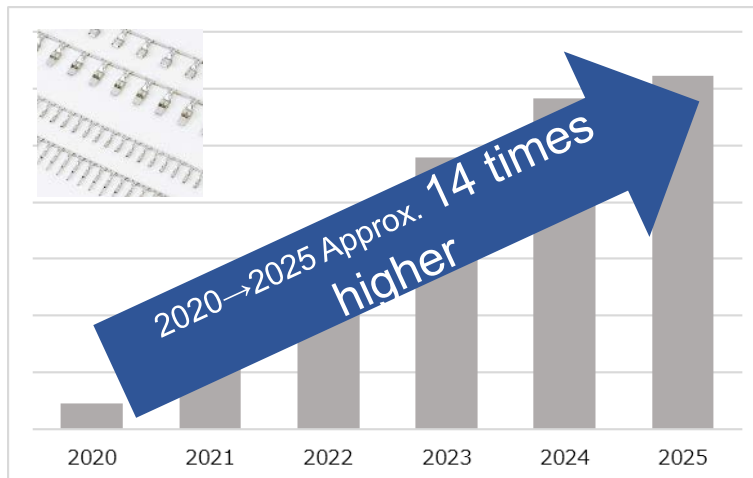
**EV generally weigh about 10–30% more than ICE vehicles** (※Survey by Furukawa Electric)

→ Contribute to improving power consumption by reducing vehicle weight through the use of aluminum

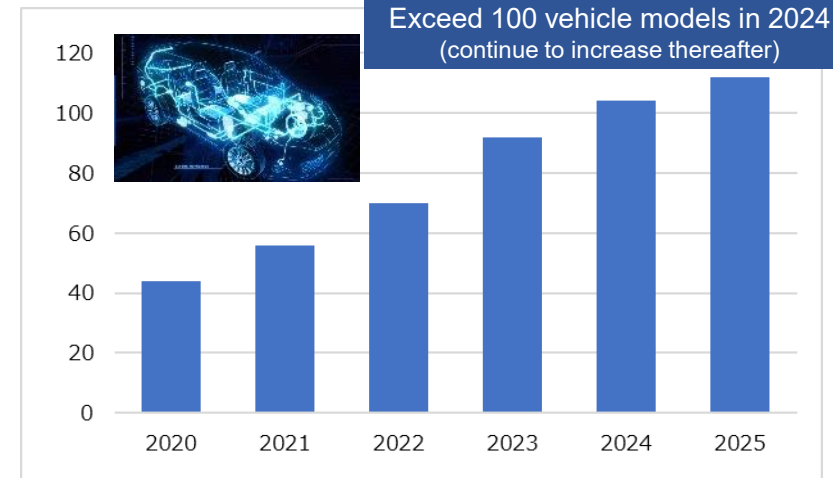
Aluminum electric wire production volume (length)



Cumulative α terminal production volume



Cumulative vehicle models that use aluminum WH



## (2) Large current and high voltage

Respond to the higher voltages following the system changes in EV using the company's technological strengths (processing technology and materials capabilities)



### <Major changes in EV>

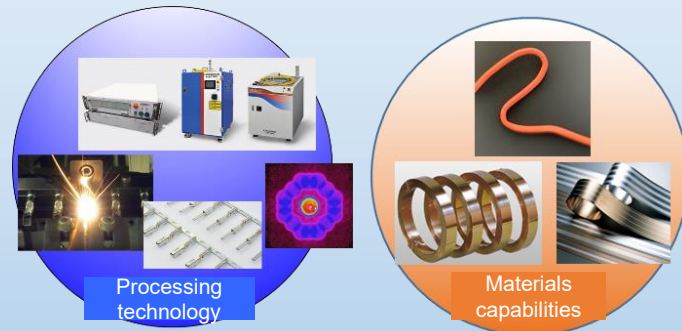
- Engine system ⇒ Electric motor
- Fuel system ⇒ Battery pack (BEV) Hydrogen tank (FCEV)
- Vehicle weight ⇒ +10-30% (※Survey by Furukawa Electric)

### <Respond to the growing EV market>

**High voltage system products are expected to increase following the changes to vehicle systems**

- Rapid charging / high motor output ⇒ High voltage WH using large current connectors and electrical wire
- WH and high voltage products in the battery pack
- WH and high voltage products in the FC system

Fiber laser welding / Metals & polymers technology



Large current, high voltage connectors



High voltage WH



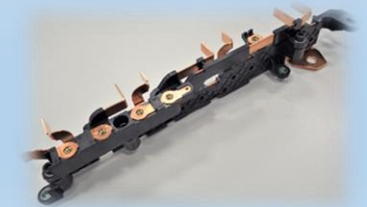
WH in the battery pack



High voltage terminal block in the battery pack



High voltage JB



High voltage busbar

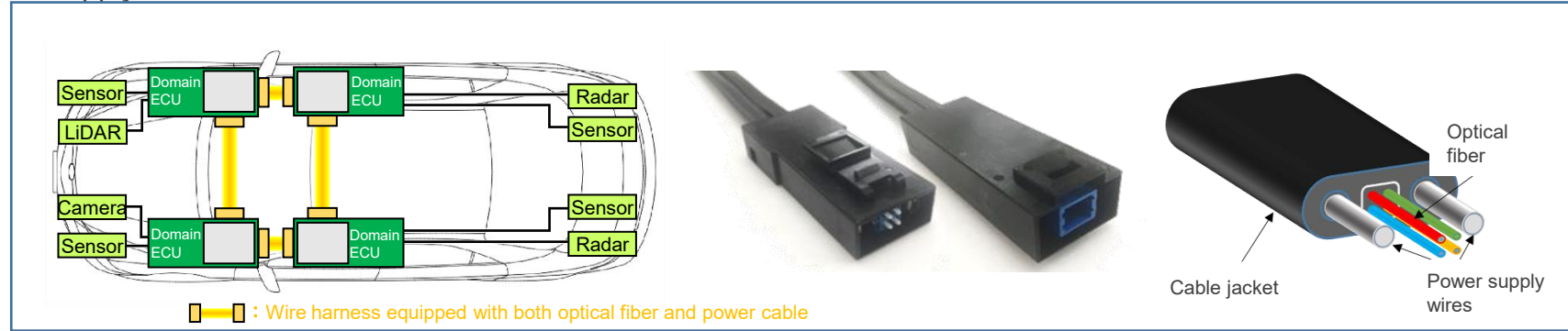
# (3) High speed communications technology

In line with the increased vehicle layout freedom enabled through the shift to EV, respond to next-generation mobility that will be realized through advances in autonomous driving and connected technology

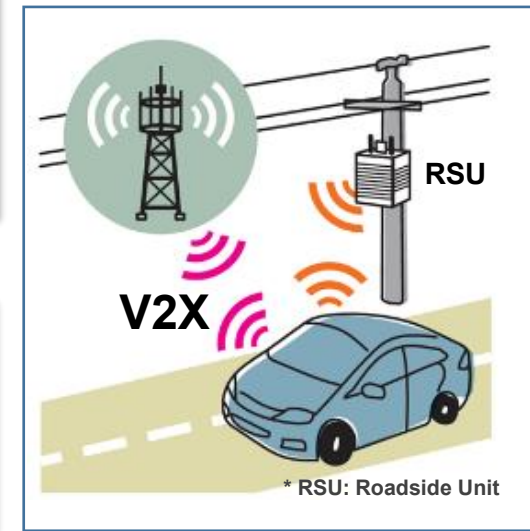
High speed communications technology that supports next-generation mobility

## In-vehicle optical communications V2X

■ Schematic diagram of in-vehicle optical communications: Wire harness equipped with both optical fiber and power supply wires



■ Vehicle-infrastructure communications (Image)



### Strategy

### Initiatives

- Respond to high speed, large volume communications required for EV electromagnetic noise, connected and autonomous driving through in-vehicle optical harnesses with speeds exceeding 10Gb/s. Start shipping samples for evaluation in FY2026, and aim to start mass production around 2030
- Contribute to realizing next-generation mobility through wireless communications technology that links vehicles with everything (V2X)

### Strategy

### Initiatives

- Reduce harness weight and space requirements and make them easier to assemble through cable/connectors with a unique structure that combines optical fiber and electrical wires
- Leverage the router and wireless communications technology to build a system for low latency, high quality communications between vehicles and infrastructure

### 3. Initiatives in FY2023 for achieving the 2025 Mid-term Plan

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### 3. Initiatives in FY23 for achieving the 2025 Mid-term Plan

- In FY2023, although the downturn in the global economy and semiconductor market will continue to pressure the business, automobile production is expected to progressively recover. Through FY2025, the global economy, semiconductor market and automobile market are all expected to turn positive.
- While monitoring the future trends, capture the demand rebound and growth.
- Grasp the revenue opportunities arising from the accelerating shift to EV.

#### Envisioned business environment

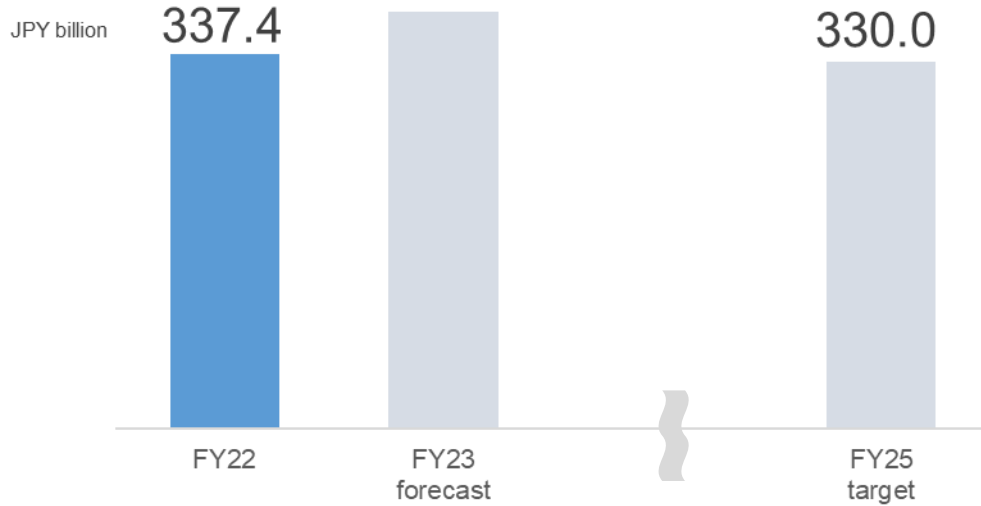
- Semiconductor shortage will gradually improve from the second half of FY2023
- High raw material and fuel prices
- Increased requirements from customers for BCM
- Promote automation and reduced manpower
- Increased geopolitical risks
- Accelerating shift to EV

#### Initiatives for FY2025

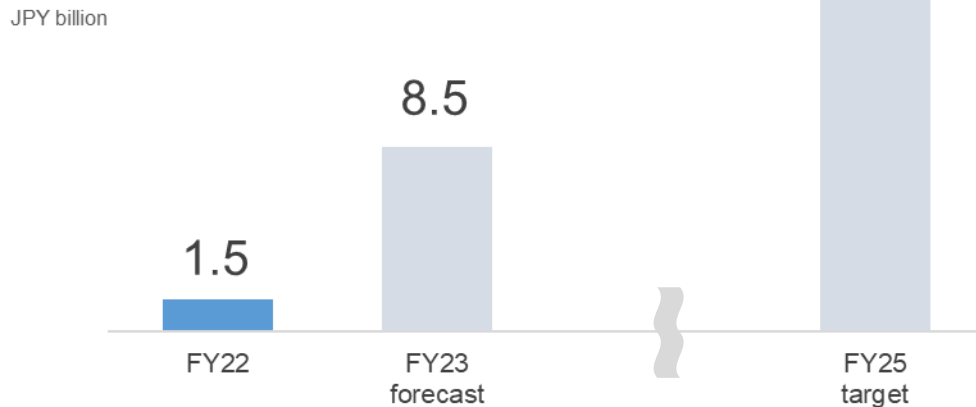
- In FY2023, strengthen the ability to respond to change through normalization of production (including use of strategic inventory), and from FY2024, improve the cost rate and reduce logistics expenses following stabilization of the customers' production plans
- Adjust sales prices to appropriate levels by increasing the ratio at which higher costs are incorporated in the sales price
- Promote production at multiple sites
- Rebuild the supply chain (response to the occurrence of an emergency situation in Taiwan)
- Automate WH production facilities through new simple structural designs (discussing with customers)
- Grasp the shift to EV as a revenue opportunity through lightweight, large current/high voltage and high speed communications technology (accelerate the development of new technology and products)



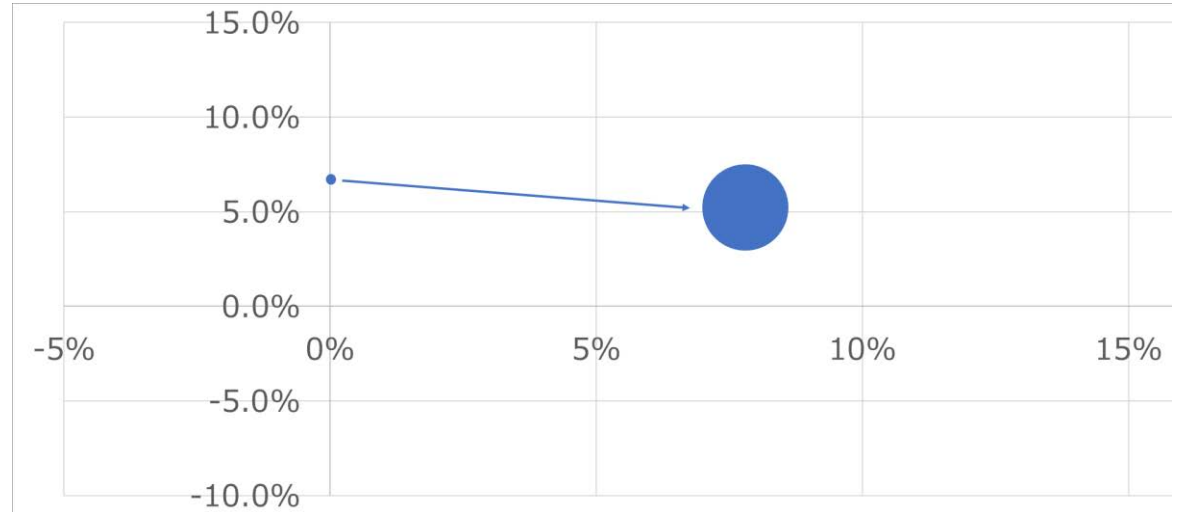
## Net sales



## Operating income



## ROIC (FY22 actual → FY25 target)



Vertical axis : Net sales CAGR (FY18-22→FY22-25)  
 Horizontal axis: ROIC (FY22→25)  
 Bubble : NOPAT (FY22→25)

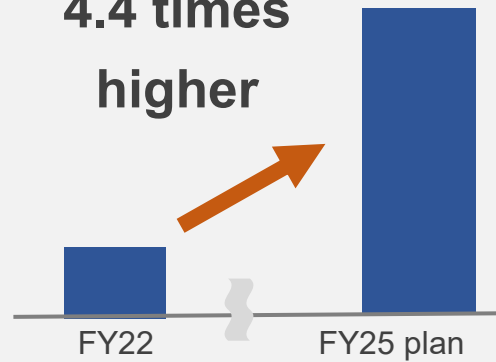
- ※ Net sales and invested capital in FY24 and FY25 have been adjusted based on the FY23 forecast average market price of copper and average exchange rate
- ※ CAGR: Compound annual growth rate, ROIC: Return on invested capital (after taxes), NOPAT: Calculated as net income + interest expenses after tax in accordance with IFRS

	FY22	FY23 forecast	FY25 target
Average copper price	1,209	1,180	1,085
Average exchange rate	135	130	110

# Net sales plan by product

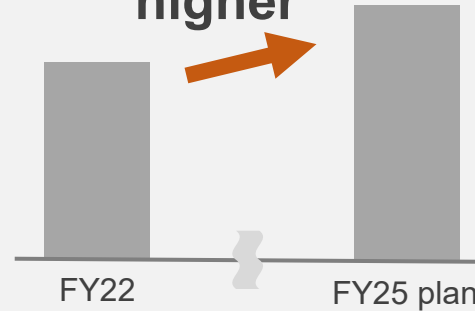
【 Peripheral monitoring radar net sales 】

**4.4 times higher**



【 High voltage product net sales 】

**1.3 times higher**

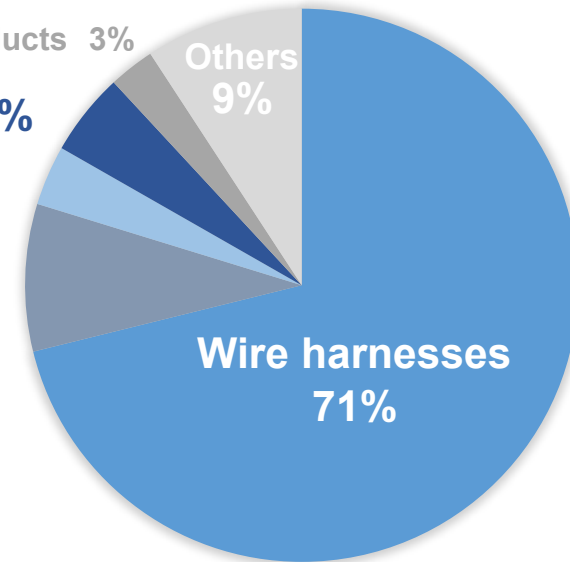


High voltage products 3%

**Radar 5%**

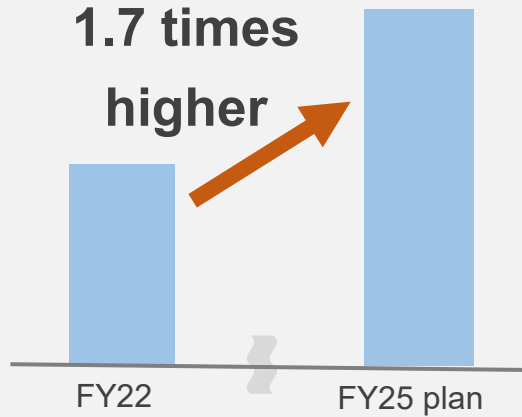
**BSS 3%**

**SRC 9%**



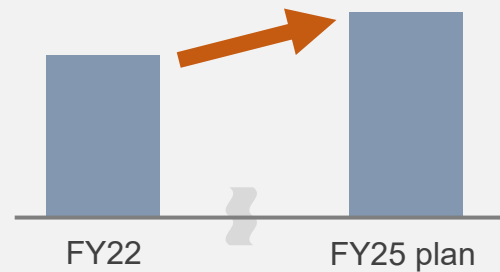
【 BSS net sales 】

**1.7 times higher**



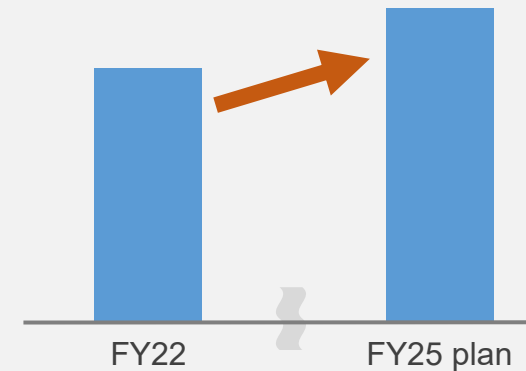
【 SRC net sales 】

**1.3 times higher**



【 Wire harness net sales 】

**1.2 times higher**



Vehicle models using aluminum WH

Will exceed **100** models in FY2024

Aluminum WH ratio

Over **60%** in FY2025

## 4. Initiatives for the SDGs and achieving Vision 2030

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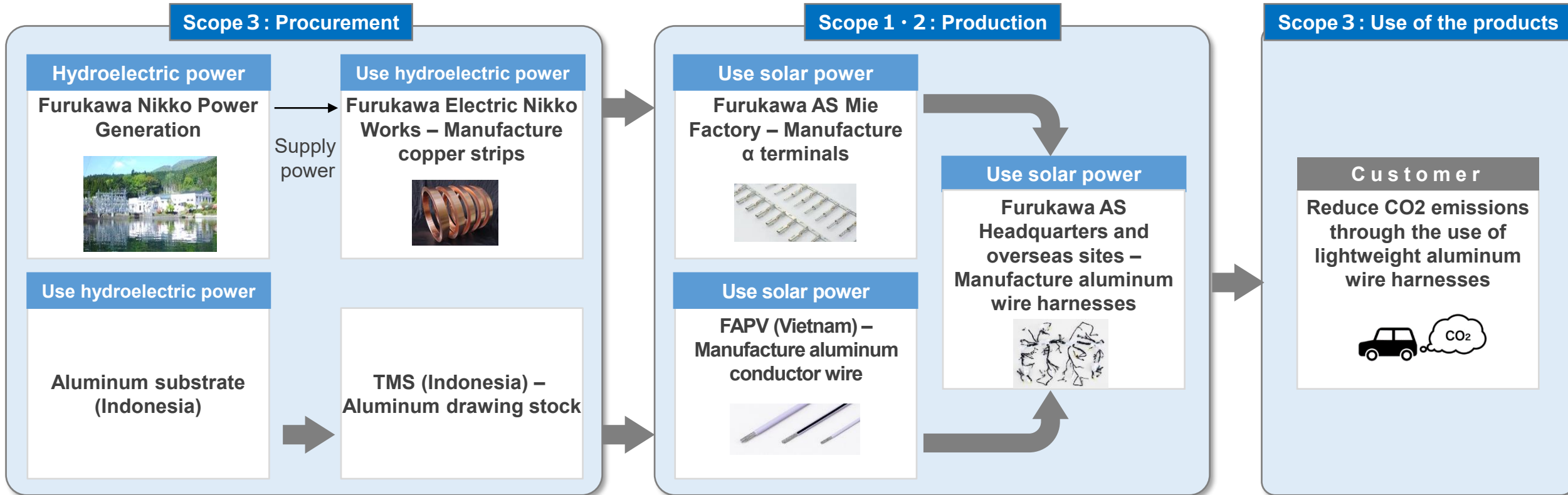
# Promoting carbon neutral<sup>①</sup>

Promote CN throughout the product lifecycle of “making”, “carrying” and “using”, and expand the products with low environmental impact

- Expand the lightweight, energy management and high voltage components
- Create new materials and products with low environmental impact (3R: Reduce, Reuse, Recycle design, materials and reduced number of components)

● Example of a product with low environmental impact: Aluminum wire harness

■ Use renewable energy    ➔ Supply chain



# Promoting carbon neutral ②

## Promote the use of solar power, geothermal power and other renewable energy sources

● Successively expanding the sites that use renewable energy (as of 2023)

Solar power



Furukawa AS Headquarters



Furukawa AS Mie Factory



FEAP (Philippines)



FME (India)



FURMEX (Mexico)



23/9-  
FAST (Thailand)



FAPD (China)



23/12-  
FAPV (Vietnam)



FAVV (Vietnam)

Geothermal power



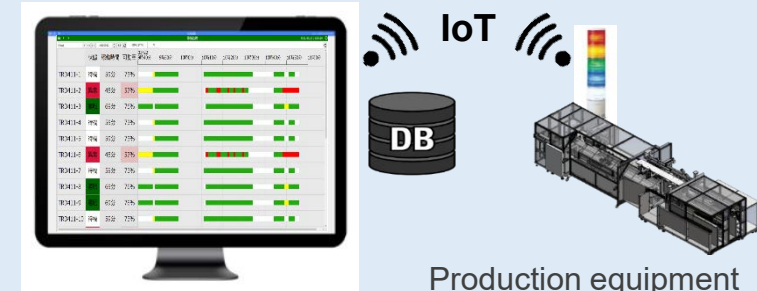
FALP (Philippines)

## Enhance efficient, energy saving production through the use of data

- ✓ Optimum coordination by making energy supply and demand visible
- ✓ Improve energy use per unit of production by increasing productivity
- ✓ Install energy saving equipment



Make energy consumption and solar power generation visible



Make the operational status visible

Production equipment

## Safe and secure

### People-oriented cities



- Radar detects danger that is difficult to see from the camera (forward monitoring for construction equipment and snow plows)
- Rear monitoring for large trucks, and support for highway merging



### Build tougher infrastructure

- Use radar to monitor and prevent driving in the wrong direction on highways
- BSS® protects the battery while the truck driver takes a break



## Convenient

### Make mobility universal to all people

- BSS® prevents dead batteries and safe system startup for BEV/HEV



### Peripheral monitoring radar



**BSS®** (Lead battery state sensor)



**Thank you very much for your attention**

***Bound to Innovate***

The slogan "Bound to Innovate" in a bold, italicized sans-serif font, with a red swoosh underline that starts under "Bound" and extends under "Innovate", ending in a sharp arrowhead pointing to the right.



**【2025 Mid-term Plan (Road To Vision2030 -Transform and Challenge-) Basic policy】**  
 As decarbonization accelerates toward realizing carbon neutrality, evolve the existing products and create new businesses in response to the requests for low environmental impact and safety, and contribute to energy management, lightweight, response to safety and electrification.

## 【Business environment, strengths and issues】

Business environment – Main revenue opportunities	Strengths as a division
<ul style="list-style-type: none"> <li>New opportunities from diversification of vehicle functions resulting from advances in CASE, including xEV and MaaS, and responding to requirements for modularization</li> <li>Increase the products for the acceleration toward EV directed at achieving carbon neutrality, products with low environmental impact and future wiring systems that respond to vehicle safety</li> </ul>	<ul style="list-style-type: none"> <li>Technological capability to create products that combine the group’s accumulated core technology and automobile technology</li> <li>Directed at advances in electrification directed at CN, products with low environmental impact, such as products that contribute to lightweight and energy management through aluminum wire harnesses (α terminals) manufactured using green energy</li> </ul>
Business environment – Main menaces and risks	Issues as a division
<ul style="list-style-type: none"> <li>Increased geopolitical risk</li> <li>Promotion of automation and reduced manpower</li> <li>Extreme volatility in customer production volumes due to the semiconductor shortage</li> <li>Soaring raw material prices, logistics disruptions and soaring container shipping costs</li> </ul>	<ul style="list-style-type: none"> <li>Creation of next-generation products that combine information, energy and mobility through co-creation with partners</li> <li>Strengthen the response to BCM, and promote automation for achieving the stable supply of high quality products</li> </ul>

## 【Main strategy for achieving the 2025 Mid-term Plan】

(WH) Expand the application of aluminum wire harnesses leveraging the superiority and high reliability of the α terminal, and promote lightweight

(SRC) Development that responds to high speed communications and the evolution of automobiles

(BSS) Improve fuel efficiency and power consumption, and secure power supply reliability

(Radar) Increase adoption of high performance next-generation products for vehicles (including response to cybersecurity)/ Enter the construction equipment, industrial vehicle and traffic infrastructure markets

(High voltage products)  
 Utilize the company’s technological strengths (processing and materials capabilities) to respond to the increased use of high voltage components following the changes to vehicle systems resulting from the shift to large current/ high voltage and EV







### Social issues

Reduce traffic accidents, Realize a carbon-free society and Realize more resilient traffic infrastructure





# Appendix – Products overview

	Automotive products					
	Wiring systems			Functional products		
						
Safety			●	●	●	●
Lightweight	●	●	●		●	
Electrification	●	●			●	
Carbon neutral	●	●	●	●	●	●
Main products	<ul style="list-style-type: none"> <li>● Aluminum wire harness</li> <li>● Corrosion-proof terminal (α terminal)</li> </ul>	<ul style="list-style-type: none"> <li>● High voltage products</li> <li>● Aluminum wire harness</li> </ul>	<ul style="list-style-type: none"> <li>● Products using flat cable</li> </ul>	<ul style="list-style-type: none"> <li>● SRC (Steering roll connector)</li> </ul>	<ul style="list-style-type: none"> <li>● BSS® (Lead battery state sensor)</li> </ul>	<ul style="list-style-type: none"> <li>● Peripheral monitoring radar</li> </ul>
Main applications	<ul style="list-style-type: none"> <li>● Wiring inside vehicles</li> </ul>	<ul style="list-style-type: none"> <li>● Wiring for electric vehicles</li> </ul>	<ul style="list-style-type: none"> <li>● Electrical supply and signal transmission for sliding doors and long slide seats</li> </ul>	<ul style="list-style-type: none"> <li>● Connectors for airbags</li> </ul>	<ul style="list-style-type: none"> <li>● Vehicle power management</li> </ul>	<ul style="list-style-type: none"> <li>● Advanced driver assistance systems (ADAS)</li> </ul>
Main customers	<ul style="list-style-type: none"> <li>● Japanese automobile manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>● Japanese automobile manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>● Automobile manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>● Tier 1</li> </ul>	<ul style="list-style-type: none"> <li>● Japanese automobile manufacturers</li> </ul>	<ul style="list-style-type: none"> <li>● Japanese automobile manufacturers</li> </ul>