

# Business Briefing Energy Infrastructure business

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Furukawa Electric Co., Ltd.

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**FURUKAWA ELECTRIC CO., LTD.**

- Steadily reform the business under the theme of “change” in the 2020 Medium-term Management Plan
- Targeting Japan and Asia, restructure the business strategy  
⇒ Create a foundation for generating profit
- Shift to the growth phase through business development with an awareness of SDGs

## [Energy Infrastructure Overall]

1. Review of the 2020 Medium-term Management Plan
2. Review of the FY2020 results
3. FY2021 forecast and medium-term plan
4. FY2021 management policy

## [Power Cable]

5. Market overview (medium-term)
6. Market overview (long-term)
7. Sales activities
8. Increase cable manufacturing capacity
9. Increase underground cable installation capacity
10. Promote technology development
11. Renewable energy / Direct current business

## [Industrial Cable & Power Cable Accessories]

12. Market overview (medium-term)
13. Basic strategy (target markets)
14. Expand sales of Rakuraku aluminum cable<sup>®</sup>
15. Main strategic products
16. Contribute to making the transmission grid more resilient

## [SDGs]

- 17.SDGs and the business strategy
- 18.SDGs and the business domains

## Appendix

# 1. Review of the 2020 Medium-term Management Plan (Furukawa G Plan 2020)

## Theme of the 2020 Medium-term Management Plan for Energy Infrastructure: **Reform**

- ① Reform the extra-high voltage power cable business
- [Actions]
- Take over the business from VISCAS Corporation (October 2016)
  - Clarify the target markets and strengthen sales activities with a focus on profit
- Structural reforms to the subsidiary in China (Shenyang Furukawa)
- [Results]
- Improved the earnings structure for power cable at Furukawa Electric and Shenyang Furukawa
- ② Accelerate the acquisition of renewable energy demand
- [Actions]
- Promote actions aimed at receiving definite orders and technology development (development of dynamic cable, etc.)
- [Results]
- Leader in orders for submarine power cable within the fledgling renewable energy market
- ③ Reform the low voltage power cable business for the construction and wholesalers market
- [Actions]
- Reorganize the general-purpose power cable business for the construction and wholesalers market (Established a joint venture with SWCC Showa Holdings)
- [Results]
- Introduced Rakuraku aluminum cable® into the market
- ④ Expand sales of functional power cable and components (high value-added products)
- [Actions]
- Expand sales of functional power cable
  - Develop power transmission components for use in disaster prevention or mitigation
- [Results]
- Increased sales of power cable for distribution boards
  - Introduced lightweight power transmission components and polymer jumper insulators into the market

## 2. Review of the FY2020 results

	Net sales	Operating income
<b>FY2020 Results (announced on May 12, 2021)</b>	<b>JPY 100.9 bil.</b>	<b>JPY <math>\Delta</math> 1.9 bil.</b>
(Reference) 2020 Medium-term Management Plan (Announced in May 2018)	JPY 140.0 bil.	JPY 1.0 bil.

### FY2020: Affected by extraordinary factors

#### Impact on

**Net sales: JPY  $\Delta$  12.0 bil.**

**Operating income: JPY  $\Delta$  2.5 bil.**

#### COVID-19

- Lower demand in the construction and wholesalers market and the railroad market in Japan
- Delays to customer project schedules at the subsidiary in China

#### Expenses for the evaluation of new materials

- As part of risk management, response to the risk of disruptions to the procurement supply chain

## Evaluation of the FY2020 results compared to the 2020 Medium-term Management Plan

Excluding the extraordinary factors, operating income was generally as planned

Although demand declined in the Industrial Cable & Power Cable Accessories business, strengthened the profit structure through reforms to the business

### 3. FY2021 forecast & medium-term plan

#### ① FY2021 forecast

Net sales: JPY 105.0 bil. Operating income: JPY 1.0 bil.

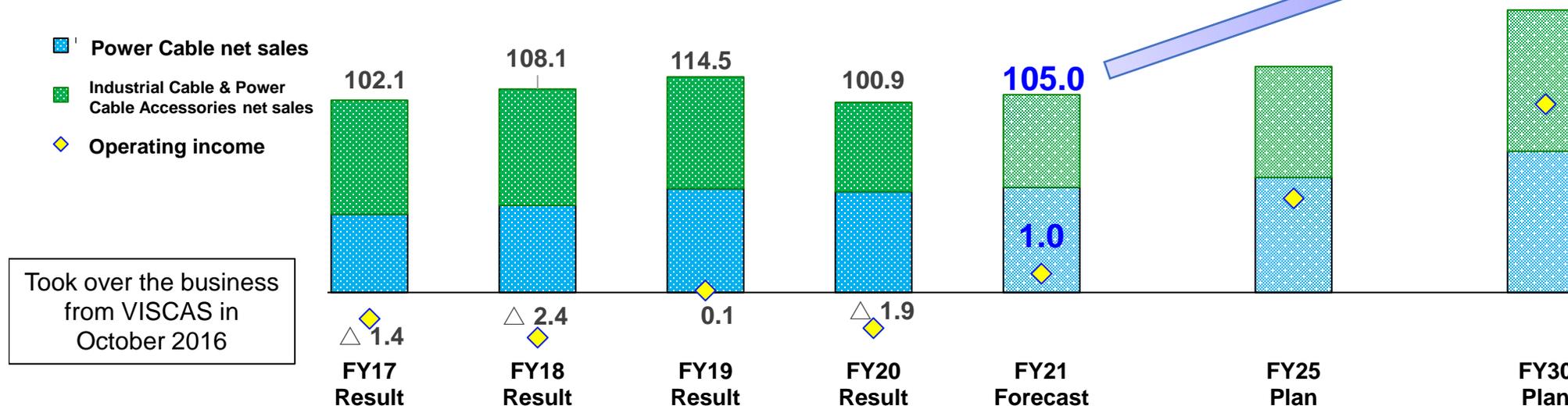
Establish a foundation for generating profits

#### ② Medium-term plan

〈Establish Energy Infrastructure as a pillar of the company〉

Shift to the growth phase through business development with an awareness of SDGs

Performance of the energy infrastructure business (Units: JPY billion)



## Energy Infrastructure business policy

Strengthen development of the business with an awareness of SDGs

~Focus on the renewable energy and submarine water pipe businesses~

### 【Power Cable】

Directed at the next medium-term management plan, promote the 5 main initiatives (4 main initiatives + new initiative)

①Continue the 4 main initiatives:

- 1) Secure orders, 2) Increase cable manufacturing capacity,
- 3) Increase installation capacity, 4) Promote technology development

②New initiative: Strengthen the renewable energy / direct current business

### 【Industrial Cable & Power Cable Accessories】

Further restructure the business to better match the market trends based on coexistence with COVID-19

①Expand sales of Rakuraku aluminum cable<sup>®</sup>

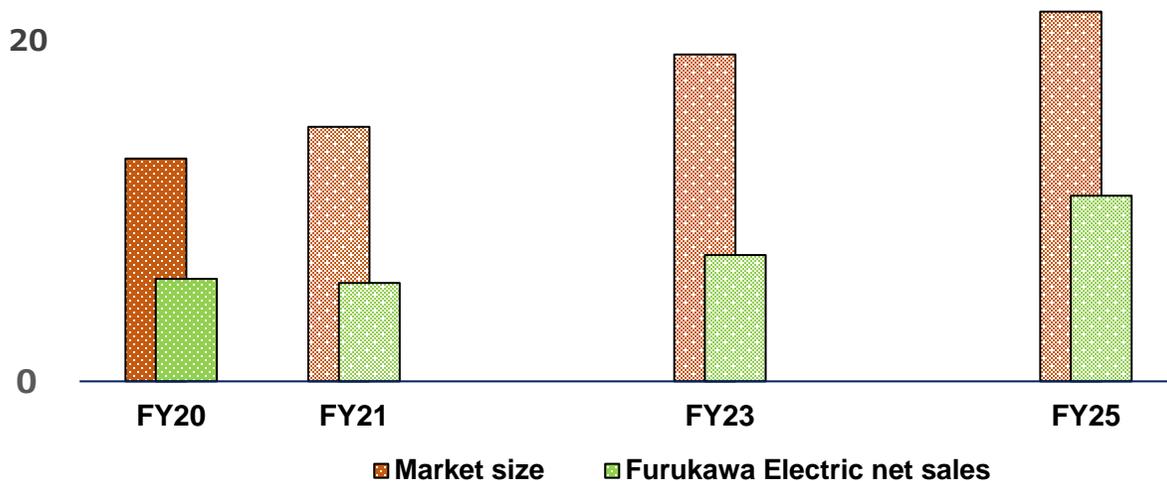
②Capture the demand for renewable energy, data centers and disaster prevention and mitigation applications

# Power Cable

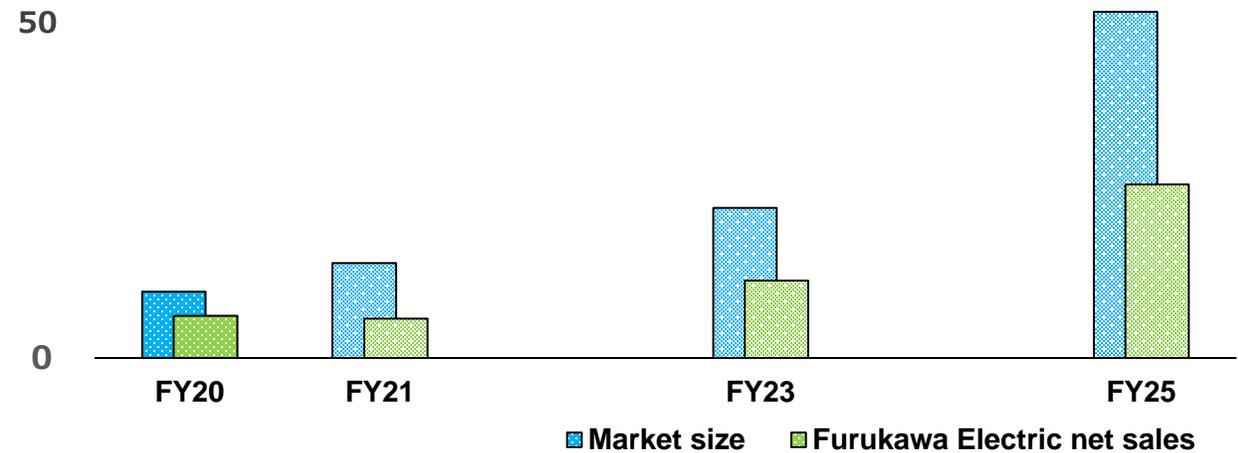
# 5. Power cable market overview (medium-term)

In addition to traditional demand from the electric power companies, market growth in Japan will accelerate following the launch of renewable energy projects

Extra-high voltage underground power cable market in Japan / Furukawa Electric net sales (JPY billion)



Renewable energy market (submarine + underground power cable) in Japan / Furukawa Electric net sales (JPY billion)



Will double based on renewal of the electric power mains (OF replacement)

- Respond to the tight installation capacity, and share the long-term plan with the electric power companies
- Increased demand for replacement and maintenance of the transmission grids of the electric power companies nationwide

Rapid market growth from the introduction of offshore wind power

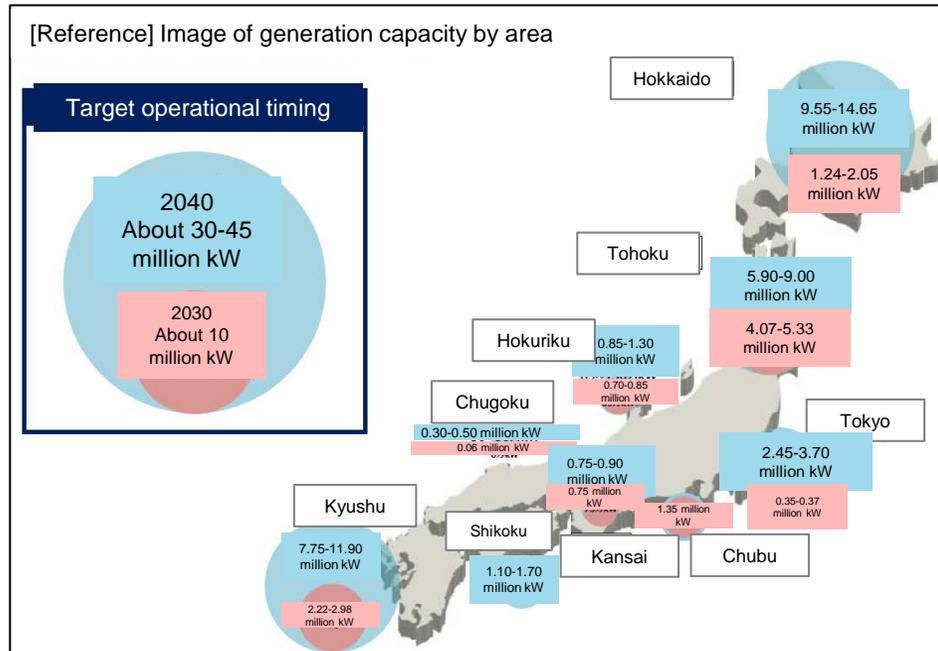
- Further designation of promotion zones under the offshore renewable energy act
  - ※3 locations (4 zones) were designated in July 2020, and from November, the public bidding process began for selecting the power producer
- Many requests and inquiries for design related cooperation have been received from power producers

# 6. Power cable market overview (long-term)

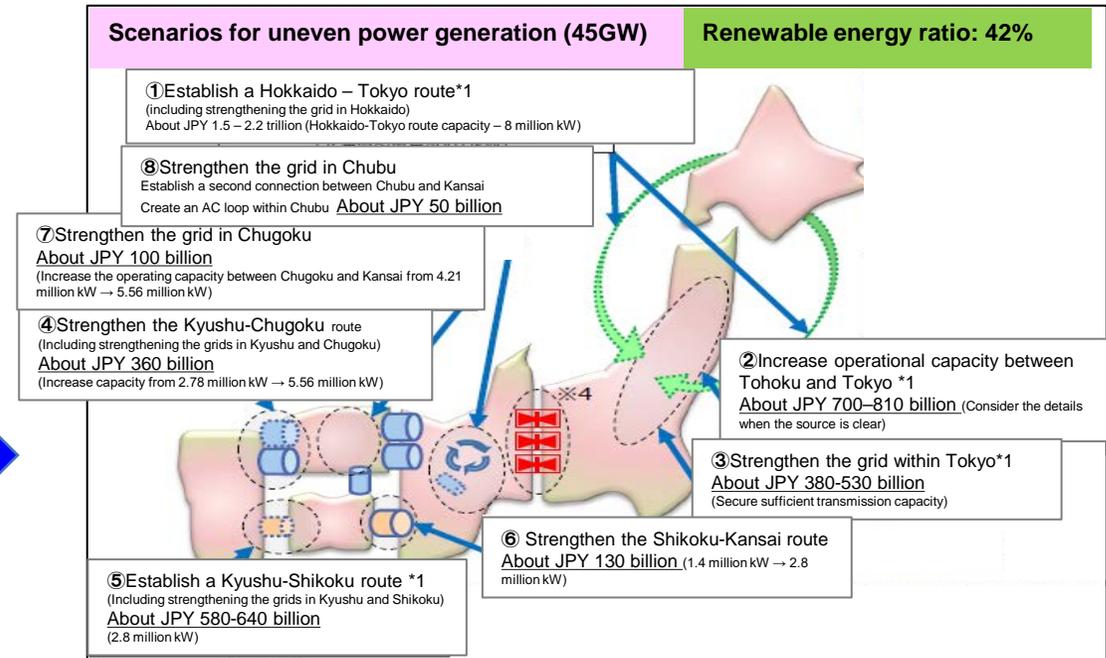
## Accelerating actions towards “becoming carbon neutral in 2050”

Envisioned large-scale introduction of offshore wind power

Envisioned wide-area power grid in Japan



Supplying the electric power to users



From the materials for the second “Meeting regarding public and private sector cooperation directed at strengthening the industry’s competitive position in offshore wind power” (December 15, 2020)

Materials for OCCTO’s 9th “Study session regarding the wide-area grid master plan and rules for using the grid” (April 28, 2021)

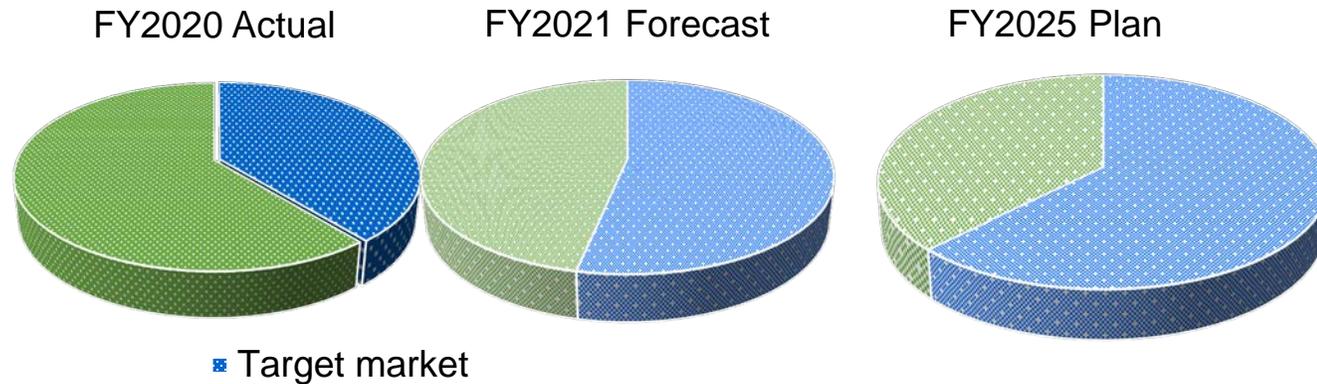
**Furukawa Electric is expected to contribute as one of the premier extra-high voltage and submarine power cable manufacturers in Japan**

# 7. Power Cable initiatives – Sales activities

Maintain the existing strategy

**Narrow down the segments, and focus on particular domains!**

- Japan extra-high voltage underground power cable      FY2025 share: At least 50%
- Japan renewable energy (submarine + underground power cable)      FY2025 share: At least 50%
- Overseas submarine power cable (Asia)      Provide high quality



**Ratio of sales in the target market (Japan)**  
FY2020: about 40%  
⇒ **FY2025: about 65%**

**Goal: Main player in Asia**

# 8. Power Cable initiatives

## – Increase cable manufacturing capacity

### Double cable manufacturing capacity by FY2025 (compared to FY2017)

- Respond to growing demand for extra-high voltage underground power cable and renewable energy (submarine + underground power cable) in Japan
- Manufacture long-length submarine power cable for the large overseas project

#### ① Improve productivity

- Promote the development of production technology such as long-length insulation extrusion (reduce the need for joints)
  - ✂ Will also contribute to higher quality and faster delivery times

#### ② Capital investments (Chiba Works)

**Invest a total of JPY 15.0 billion over 8 years (2018-2025)**

**Currently progressing as planned (50% of the investments will be finished in FY2021)**

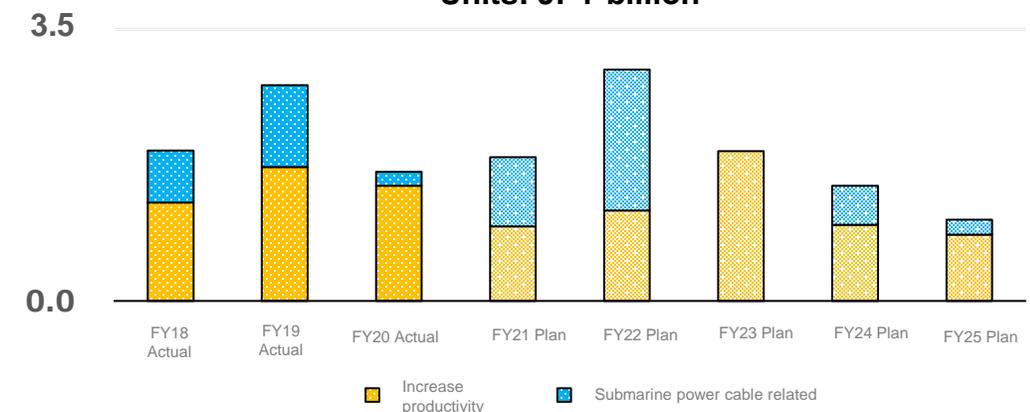
- **Submarine power cable (about JPY 5.0 billion)**
- Increase long-length submarine power cable manufacturing capacity 250% by reducing the number of joints
- **Increase productivity (about JPY 10.0 billion)**
  - Restart the Chiba No. 2 Works (already complete)
  - Continue to invest in facility renewal and systemization, and more than double productivity



Submarine power cable manufacturing facility (Chiba Works)

### Planned major capital investments at the Chiba Works

Units: JPY billion



# 9. Power Cable initiatives

## – Increase installation capacity

### Double installation capacity by FY2025 (compared to FY2017)

- Respond to demand from electric power companies for mains replacement
- Respond to growing installation demand for renewable energy projects

#### ① Reinforce the teams working directly for Furukawa Electric

- Increase personnel by expanding recruitment activities
- Improve engineer compensation
- Increase cable jointing skills

#### ② Expand the partnerships with partner companies

- Expand the number of partner companies
- Increase operational efficiency through technological support from Furukawa Electric

#### ③ Develop new technology

- Introduce joint components that are efficient to install

#### ④ Enhance the installation centers

- Improve customer service and operational efficiency by opening centers in areas with high installation demand



Installation training



Kyushu Installation Center  
(Opened in April 2021)

# 10. Power Cable initiatives

## – Promote technology development

Focus on renewable energy and direct current, which have a bright future

Main points of technology development

### ① Develop a submarine power transmission system for floating offshore wind power

- Gained experience from the Fukushima Floating Offshore Wind Farm Demonstration Project (Fukushima FORWARD)
- Currently developing extra-high voltage dynamic cable for floating offshore wind power
- Develop a submarine power transmission system for the tension leg platform (TLP) (Participate in the research and development of technology for reducing the cost of floating offshore wind power (NEDO))

### ② Develop direct current extruded insulation cable

- Complete the long-term demonstration project of a 525kv direct current extruded insulation cable system for submarine/land applications
- Establish a stable supply network of the materials used for direct current extruded insulation cable

### ③ Develop direct current deep sea cable

- Participate in the development of basic technology for a multi-purpose, multi-terminal direct current power transmission system (NEDO)
- Promote the development of lighter weight cable and cable-laying technology that can withstand high tensile forces

### ④ Acquire certification

- Conform to international standards for overseas submarine power cable and submarine power cable for offshore wind power in Japan



Installation of submarine power cable

# 11. Power Cable initiatives

## – Renewable energy / Direct current business

Make the renewable energy and direct current (wide-area power grid) businesses drivers of the growth phase

(Market needs) Increasing demand for services that support the entire power production project  
(planning – operation)

⇒ In Japan's fledgling offshore wind power industry,  
be the best partner for projects through a market-in approach

■ Tangible sales: Manufacturing & supply of high quality power cable

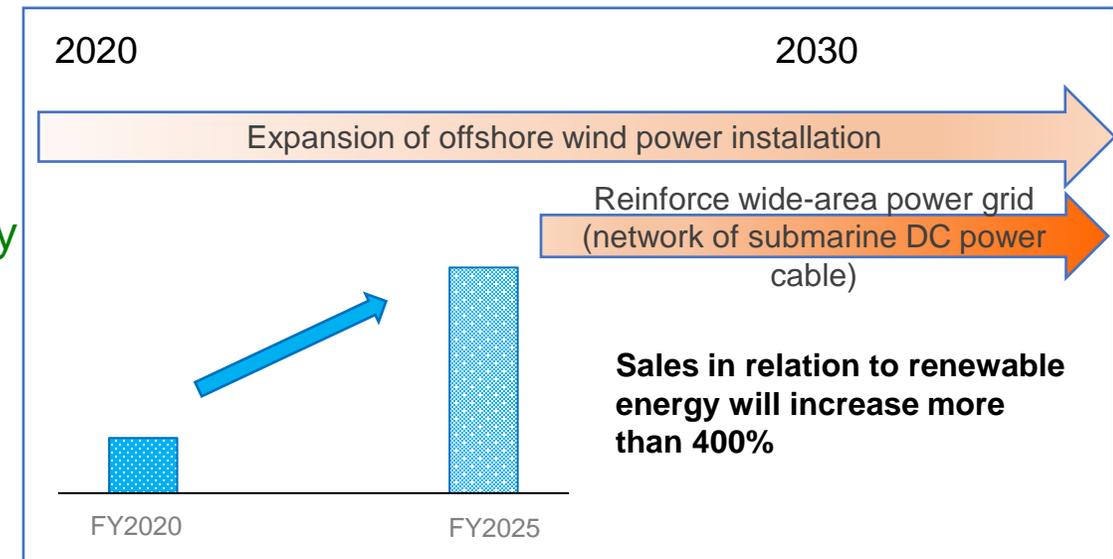
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■ Intangible sales: Strengthen the engineering services (new strategy)

Create an asset light business model that utilizes the know-how obtained from participation  
in projects in Japan and overseas

- Expand intangible sales through a market-in strategy
- Link to improved earnings capability and higher capital efficiency

Formulate specific initiatives for the 2025 Medium-term  
Management Plan



## TOPIX (Sales activities): Submarine power cable project in Indonesia

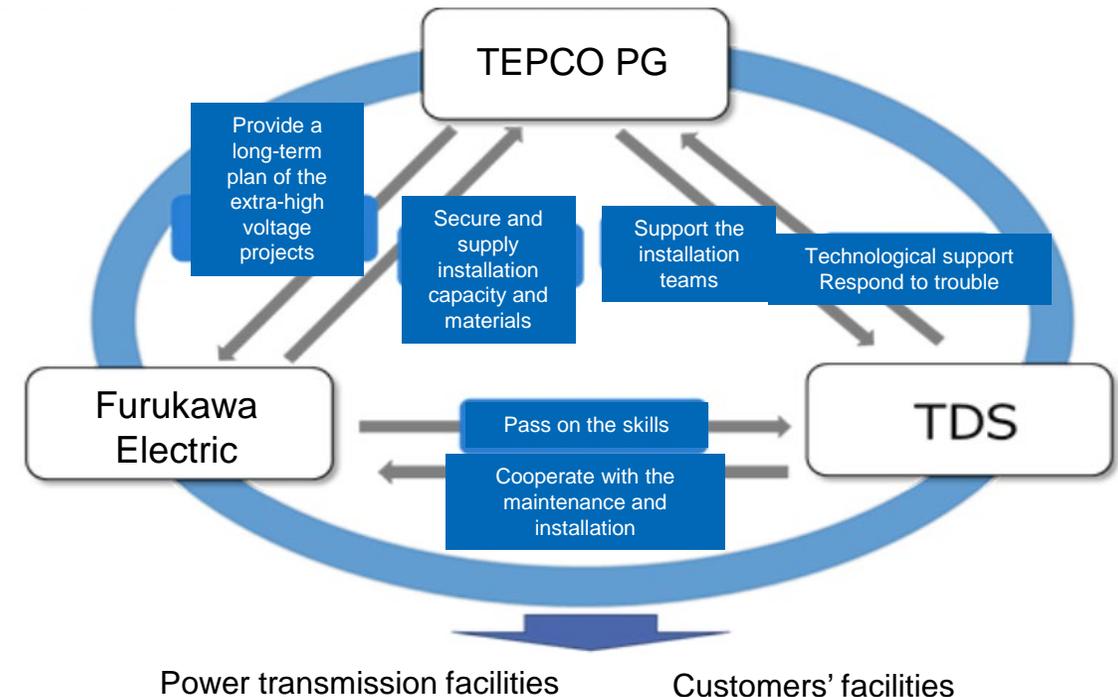
Jointly received an order together with a local engineering & construction company in Indonesia in relation to a large submarine cable project (108km of 150kV 3 core cross-linked polyethylene (XLPE) insulated optical fiber composite cable).  
At the Ichihara Works, manufacturing of the cable for the project is underway utilizing the increased manufacturing capacity, and shipments will begin in FY2021.



## TOPIX (Increase underground power cable installation capacity): Alliance between TEPCO Power Grid Inc., Tokyo Densetsu Service Co., Ltd. and Furukawa Electric for underground transmission facilities

Due in part to aging of the engineers, it is becoming difficult to maintain facilities such as the OF / POF cable. By creating a maintenance framework that is sustainable and can provide flexible transmission facility maintenance, contribute to the supply of high quality electric power.

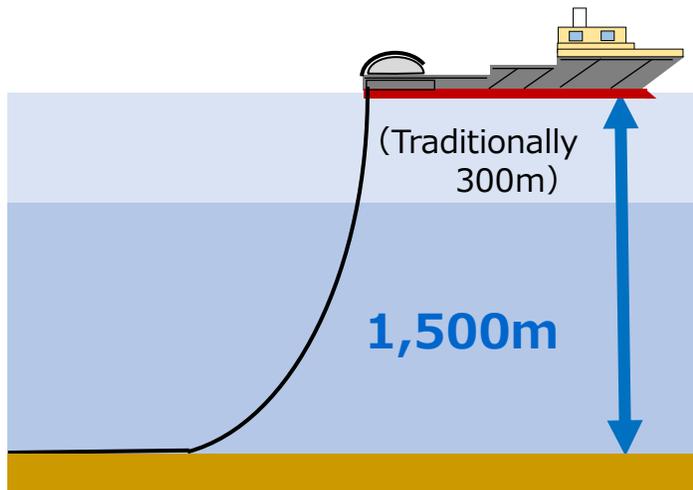
Details of the business alliance for the maintenance of power transmission facilities



## TOPIX (Technology development):

### Direct current deep sea power cable

By developing direct current deep sea power cable that can be installed at depths of 1500m, it will be possible to lay cable in areas that have traditionally (depths exceeding 300m) been avoided, thus contributing to shorter routes and lower costs.



Promote the development of lighter weight cable and cable-laying technology that can withstand high tensile forces

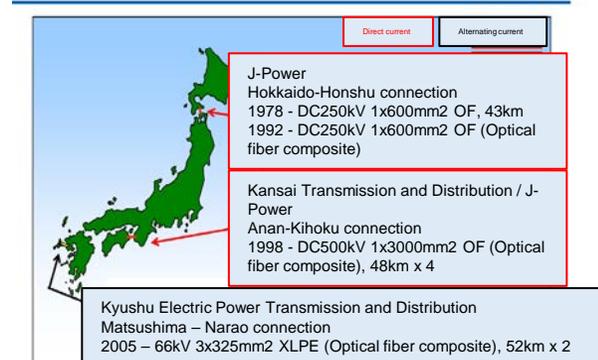
## TOPIX (Renewable energy & Direct current):

### Presentation of Furukawa Electric's initiatives at the "Study session for establishment of a long-distance submarine direct current transmission network" hosted by the Agency for Natural Resources and Energy

At the 3<sup>rd</sup> study session held on April 30, 2021, gave a presentation on the experience, project implementation and technology development regarding direct current submarine power cable systems.



Long-distance submarine cable laying experience in Japan (about 50km)



# Industrial Cable & Power Cable Accessories

# 12. Industrial Cable & Power Cable Accessories

## - Market overview (medium-term)

### ① Construction and wholesalers market

- Although the market is recovering from the impact of COVID-19, construction demand is expected to decline in the medium to long-term
- As the population ages, the working-age population will shrink, resulting in a labor shortage

Increased needs for more efficient installation

### ② Renewable energy, data center, disaster prevention and railroad markets

- Based on a policy of becoming carbon neutral, renewable energy will increasingly become a main source of power
- As the volume of data communications increases, data centers and other infrastructure need to be installed and enhanced
- Following the increased occurrence and severity of natural disasters, the need to strengthen the resilience of the power grid is increasing
- Depending on railroad transportation demand trends, capital investments may become selective

Establishment of markets in relation to  
renewable energy and data centers

Increased need for measures to prevent  
and mitigate disasters

# 13. Industrial Cable & Power Cable Accessories

## - Basic strategy (target markets)

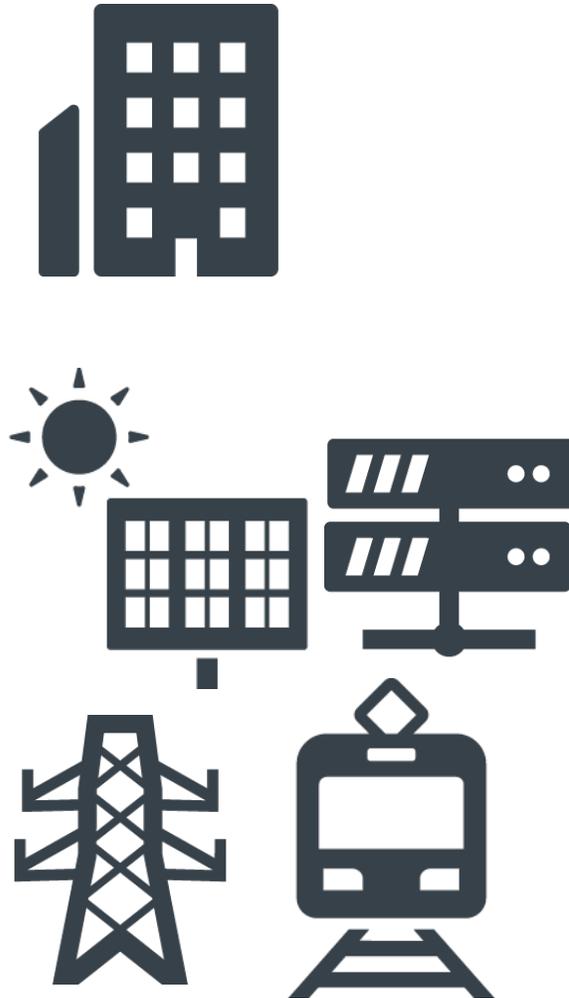
Narrow down the targets and execute the strategy

### ① Construction and wholesalers market

- Supply products that contribute to improved installation efficiency  
⇒ Expand sales of Rakuraku aluminum cable®

### ② Renewable energy, data center, disaster prevention and railroad markets

- Develop and launch high value-added products in niche domains
- Roll out products that include proposed solutions for customer needs
- Expand sales of power cable for solar power and start selling power cable for use inside wind generator towers
- Expand sales of strategic data center products
- Supply products that contribute to creating a resilient power transmission grid, including responding to increasingly severe natural disasters and strengthening the regional interconnections



# 14. Industrial Cable & Power Cable Accessories Initiatives

## Expand sales of Rakuraku aluminum cable®

### ① Work to ensure the aluminum cable aligns with the required specifications

- Quickly obtain project information from customers such as the project owner and general contractor. Also, improve information sharing with Showa Furukawa Cable Co., Ltd.
- Provide design support to the subcontractor's sales and design divisions, and propose overall cost reductions.

### ② Open a training center

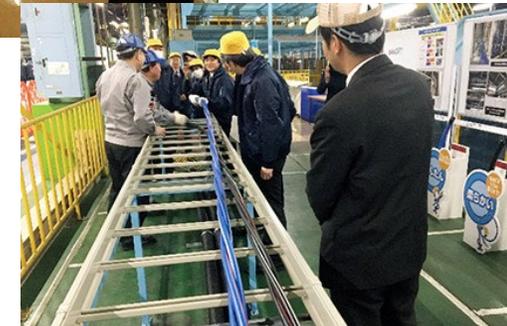
(Inside the Hiratsuka Works of Furukawa Electric Industrial Cable Co., Ltd.)

- Can compare first hand the lightweight and flexible features of Rakuraku aluminum cable® compared to copper cable
- Detailed explanation and hands-on training for installing aluminum cable terminals
- Can experience the wiring operations using a distribution board

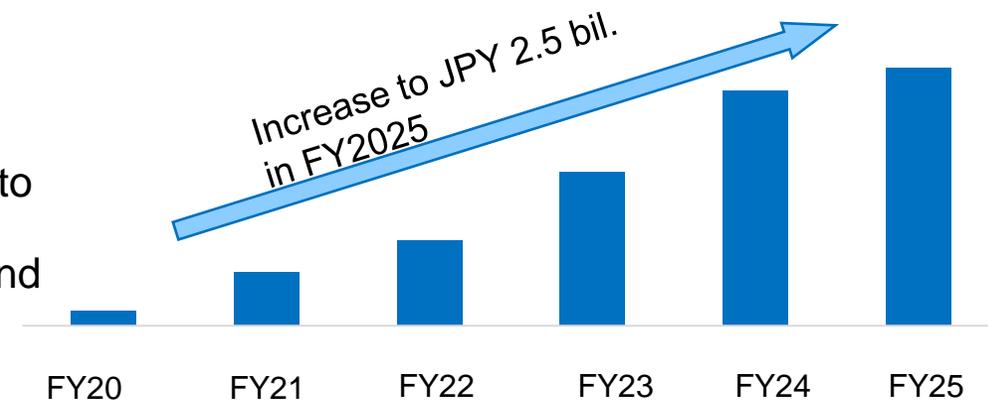
### ③ Start holding terminal handling and installation classes

- Through classroom learning and hands-on training, teach customers how to correctly handle and install the terminals
- At the end of the class, give a test to confirm the level of understanding, and issue graduation certificates to those who pass

The price of aluminum is relatively steady, so it is also useful for preventing theft when copper prices rise



Rakuraku aluminum cable® sales plan



# 15. Industrial Cable & Power Cable Accessories - Main strategic products

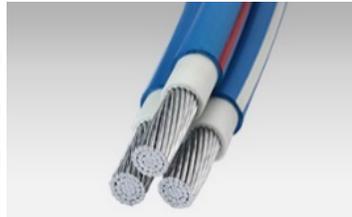
## ① Products for solar power systems

Cable for solar power systems and cable for wiring the distribution board and in tight spaces

*Propose one-stop solutions*



Eco cable for high voltage solar power systems



Rakuraku aluminum cable®

- Wiring between solar power battery module and connection box
- Wiring between the connection box and power conditioner



EM-LMFC

- Wiring the distribution board inside the power conditioner
- Wiring in tight spaces between the power conditioner and transformer



EM-FCC

## ② Cable with connectors for data centers

Bendable cable + Easy to attach plugin connectors]

*Contribute to alleviating the impact of the labor shortage through decreased workload and work time*



EM-FCC



Plugin connectors with a feature to prevent incorrect insertion

- Optimum for wiring in tight spaces with limits on bending radius, such as inside server racks.
- Requires less force to install and remove compared to existing connectors.
- Cables and connectors can be supplied as a unit from the factory, making it possible to reduce the manpower for connection and realize skill-free installation. Also, it contributes to less on-site waste.

## Contribute to making the transmission grid more resilient

Development and launch of polymer insulators

① Lighter than ceramic insulators

⇒ Easy to install

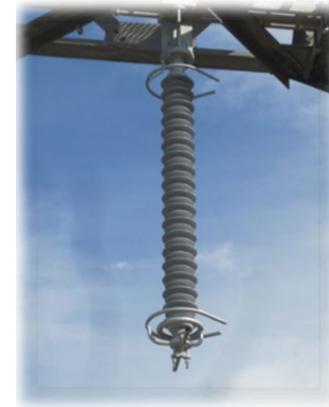
⇒ Good earthquake resistance

② Excellent anti-contamination properties

⇒ Effective for reducing tracking damage caused by salt

Can be used to replace existing ceramic insulators and for new power lines

*Reduces weight by about 86%\**

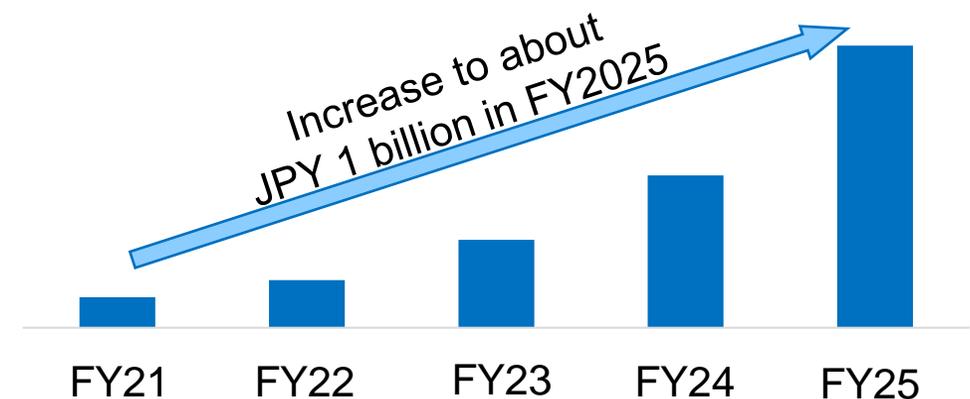


I-String



V-String

### Sales of polymer insulators



\*Comparison of polymer insulators corresponding to an I-string configuration of 7 120kN ceramic suspension insulators in a 66kv system

# SDGs

# 17. SDGs and the business strategy

## Furukawa Electric Group Vision 2030 and the Energy Infrastructure business strategy

- ① **Safe:** Increase the resilience of the electric power infrastructure
  - ⇒ Actively participate in mains renewal (OF replacement) and expansion
  - ⇒ Contribute to the expansion of renewable energy
- ② **Peaceful:** Contribute to developing frameworks for preventing and mitigating disasters
  - ⇒ Respond to distributed power generation
  - ⇒ Supply highly reliable cable and systems (design, manufacturing, installation)
- ③ **Rewarding:** Track infrastructure evolution through new technology
  - ⇒ Develop products that support infrastructure advancements
  - ⇒ From development & design to maintenance & service



**Furukawa Electric Group Vision 2030**  
In order to build a sustainable world and make people's life safe, peaceful and rewarding, create solutions for the new generation of global infrastructure combining information, energy and mobility

# 18. SDGs and the business domains

					
<p>Subject products and services</p>	<p>Submarine power cable (Power Cable) For offshore wind power</p>				
		<p>Engineering services Building, maintaining and restoring electric power mains</p>			
<p>Rakuraku aluminum cable® (Industrial Cable &amp; Power Cable Accessories) For solar power / more efficient wiring work</p>		<p>Submarine water pipes Supply water to islands</p>			

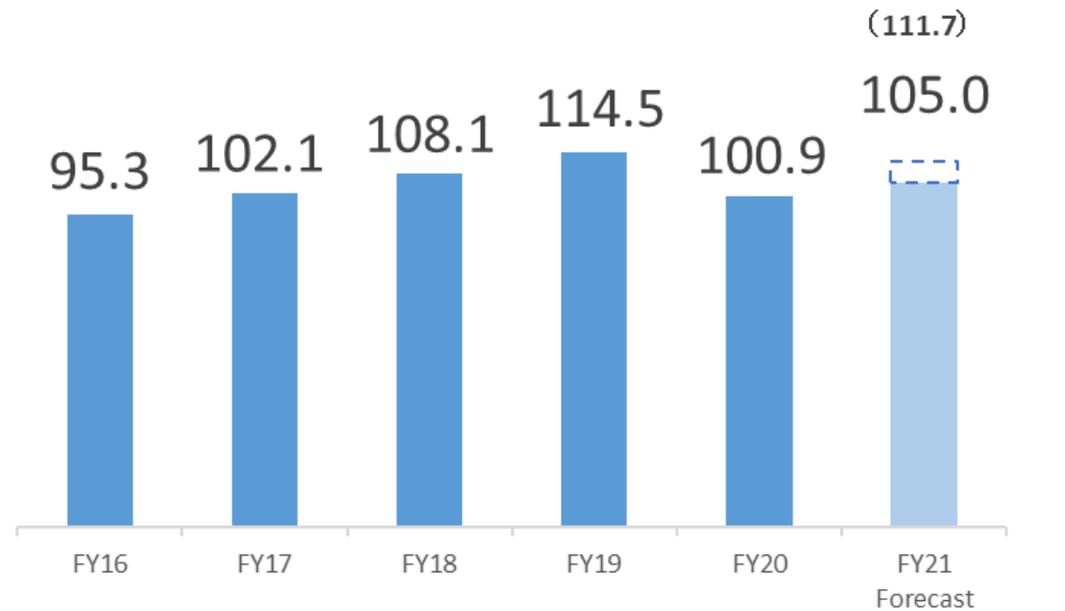
Thank you very much  
for your attention.

***Bound to***  ***Innovate***

# Appendix Change in net sales and operating income during the 2020 Medium-term Management Plan and FY2021 forecast

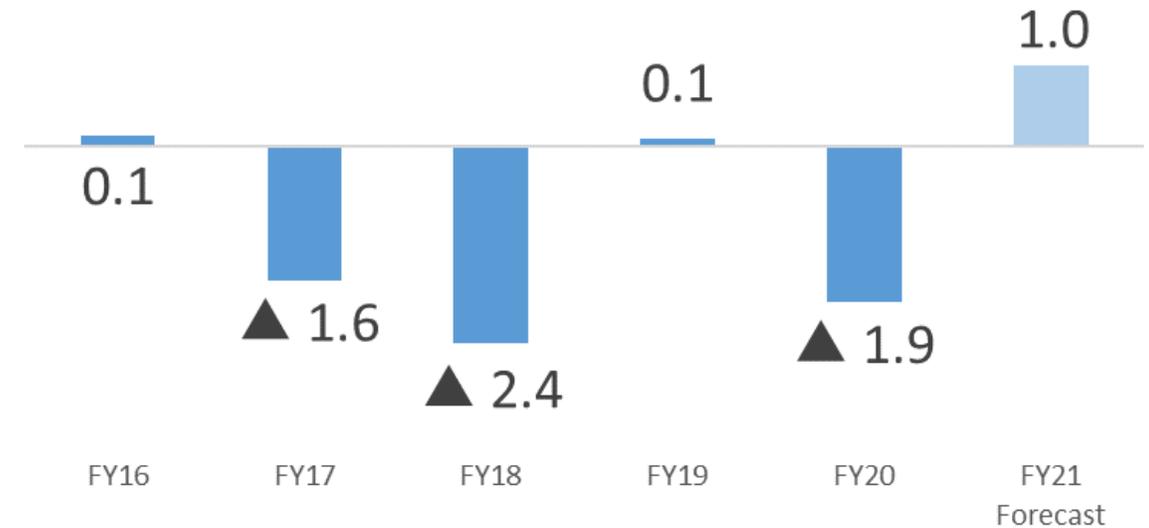
## Net sales

(JPY billion)



## Operating income

(JPY billion)





## 【FY2021 (Year zero of the 2025 Medium-term Management Plan) basic policy (directed toward achieving Vision 2030)】

Vision for 2030: As one of the core businesses of the Furukawa Electric Group, earn profits for continuous growth and realize a business that contributes to society

FY2021 basic policy: Strengthen business development with an awareness of SDGs (Focus on the businesses related to renewable energy)

### 【Strengths as a division】

- Ample experience in extra-high voltage and submarine power cable in Japan and overseas
- Technology development primarily in submarine power cable
- High value-added power cable utilizing polymer development technology
- High value-added components based on polymer & metal materials technology

### 【External environment – Main revenue opportunities】

- Rapidly growing demand mainly from renewable energy projects
- Increasing demand for easy to install products due to the labor shortage

### 【Issues and initiatives】

Short-term

- Steadily acquire orders for renewable energy (offshore wind power) projects
- Improve earnings in the low and medium voltage power cable business

Medium to long-term

- Strengthen intangible sales directed at developing the direct current (wide-area grid) business

### 【External environment – Main risks】

- Late to secure the personnel needed to expand the business
- Changes by the customer to the timing of large projects
- Supply disruptions of important materials

### 【Future outlook】

- Actively participate in creating a solid energy infrastructure foundation (reinforce the electric power mains, etc.)
- Contribute to preserving the environment (Carbon free: Expand the use of renewable energy)
- Develop the intangible sales business



# Appendix – Products overview

Energy Infrastructure						
Products	<ul style="list-style-type: none"> <li>• Extra-high voltage (220kV and higher) and high voltage (66kV and higher) underground transmission cables, accessories and installation</li> </ul>	<ul style="list-style-type: none"> <li>• Submarine transmission cables and installation</li> </ul>	<ul style="list-style-type: none"> <li>• Low to medium voltage power cables</li> </ul>	<ul style="list-style-type: none"> <li>• Overhead transmission line accessories</li> <li>• Electrical power distribution accessories</li> <li>• Other functional products</li> </ul>		
Applications	<ul style="list-style-type: none"> <li>• Underground power lines between power plants - substations - large factories</li> <li>• New energy power station related (interconnections)</li> </ul>	<ul style="list-style-type: none"> <li>• Submarine power cable from new energy power stations such as offshore wind power stations (new business domain)</li> <li>• Interconnections between regions and to islands</li> </ul>	<ul style="list-style-type: none"> <li>• Indoor wiring in factories, buildings, etc.</li> <li>• Wiring of the distribution board/ control panel for factory facilities/equipment</li> <li>• Wiring of mobile equipment</li> <li>• Solar power systems</li> <li>• Wiring of ship's onboard electrical equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical materials for distribution lines</li> <li>• Direct and branch cable connections</li> <li>• Insulation and protection for connectors</li> <li>• Thermal management for industrial and telecommunication equipment</li> <li>• Welding of automobile bodies and railroad tracks</li> </ul>		
Customers	<ul style="list-style-type: none"> <li>• Electric power (distribution) companies, large factories, etc.</li> <li>• New energy source electric power companies (SPC)</li> </ul>	<ul style="list-style-type: none"> <li>• New energy source electric power companies (SPC)</li> <li>• Electric power (distribution) companies</li> </ul>	<ul style="list-style-type: none"> <li>• Construction contractors</li> <li>• Electronic appliance manufacturers</li> <li>• Railroad companies</li> <li>• Shipbuilding companies</li> </ul>	<ul style="list-style-type: none"> <li>• Electric power companies</li> <li>• Construction contractors</li> <li>• Railroad companies</li> </ul>		