

# IR Business Briefing

## Energy infrastructure business

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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.

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- 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.
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**Furukawa Electric Co., Ltd**

Business	Applications	Customers
<p><b>Power cable</b></p> <ul style="list-style-type: none"> <li>• Ultra 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>• Underground power lines between power plants ~ substations ~ large plants</li> </ul>	<ul style="list-style-type: none"> <li>• Electric power (distribution) companies, large plants, etc.</li> </ul>
<ul style="list-style-type: none"> <li>• Submarine transmission cables and installation</li> </ul>	<ul style="list-style-type: none"> <li>• Inter-region and island interconnections</li> <li>• Submarine power cable from offshore wind power stations <b>(new business domain)</b></li> </ul>	<ul style="list-style-type: none"> <li>• Electric power (distribution) companies</li> <li>• Special purpose companies (SPC), etc.</li> </ul>
<p><b>Industrial cable &amp; power cable accessories</b></p> <ul style="list-style-type: none"> <li>• Low to medium voltage power cables, electric power distribution accessories and overhead transmission line accessories</li> </ul>	<ul style="list-style-type: none"> <li>• Wiring in factories/buildings, for railroads, for power distribution lines</li> </ul>	<ul style="list-style-type: none"> <li>• Construction contractors, railroad companies, electric power companies, etc.</li> </ul>

## 1. Furukawa Electric's Power Cable Business and Response to the Demand for Submarine Power Cable for Renewable Energy

- : Delivery and installation experience
- : History of the submarine power cable business in Japan
- : Structural changes in the electric power system and demand for submarine power cable for renewable energy – Example of submarine power cable for renewable energy-
- : Experience with renewable energy projects in Japan
- : Main renewable energy submarine power cable projects in Japan

## 2. Initiatives of the Power Cable Business

- : Target markets and goal
- : Status of orders (Japan ultra high voltage underground power cable, submarine power cable)
- : (Initiative) Increase installation capacity
- : (Initiative) Capital investments
- : (Initiative) Technology development

## 3. Medium to Long-term Strategy for the Power Cable Business

- :Market analysis and company objectives

## 4. Medium to Long-term Strategy for the Industrial Cable and Power Cable Accessories Business

- :Increase profitability through structural reforms and introducing new products

## 5. Medium-term Plan for Energy Infrastructure

# 1 . Furukawa Electric's Power Cable Business and Response to the Demand for Submarine Power Cable for Renewable Energy

Ample experience in deliveries and installation of submarine and underground power cable, and strong global brand power based on high technological capability and quality



# History of the submarine power cable business in Japan

Furukawa Electric started manufacturing submarine cable in 1911, and it has always been at the forefront of submarine cable technology in Japan. Based on a foundation of this accumulated technology, Furukawa Electric will provide high quality submarine power cable suitable for offshore wind power.

Submarine power cable	Offshore wind power	Pipes
1911•Start deliveries of rubber insulated submarine cable	<b>Long history exceeding 100 years</b>	
1925•Start deliveries of paper insulated submarine cable (OF cable)		
1961 1962•Start deliveries of cross-linked polyethylene insulated submarine cable		•Started deliveries of submarine water pipes
1969•Start laying cable using a cable plow		
1978•Delivered Japan's first direct current OF submarine cable (Hokkaido-Honshu, DC±250 k V)		
1984 1988		•Started deliveries of submarine oil pipes •Started deliveries of deep-sea water suction pipes
1994•Delivered and installed a submarine cable for the Tokyo Bay Aqua Line 1999•Anan-Kihoku direct current trunk line (DC±500 k V , Distance: 49 k m)		
2000 2002•Nakijin-Izena line (Distance: 24 k m/ Water depth: 300m)		•Delivered and installed the world's longest (7.2km) and deepest (687m) deep-sea suction pipe
2003 2004•Matsushima-Narao line (66 k V , Distance: 52 k m)	•Installed submarine cable in Setana Port (Japan's first offshore wind power station)	
2011 2012•Off the coast of Fukushima (66 k V , 24 k m)	•Fukushima offshore wind power station Delivered and installed a 66 k V riser cable •Delivered and installed submarine power cable for the Hibikinada offshore wind power station	
2015•Kyushu Electric Power Karatsu 2016•Kyushu Electric Power Miyazaki, Chubu Electric Power Toshijima	•Repaired the Choshi offshore wind power station	•Taketomi Town water pipe (high density pipe)

**Japan's first floating offshore wind power station**

## Japan submarine cable installation experience

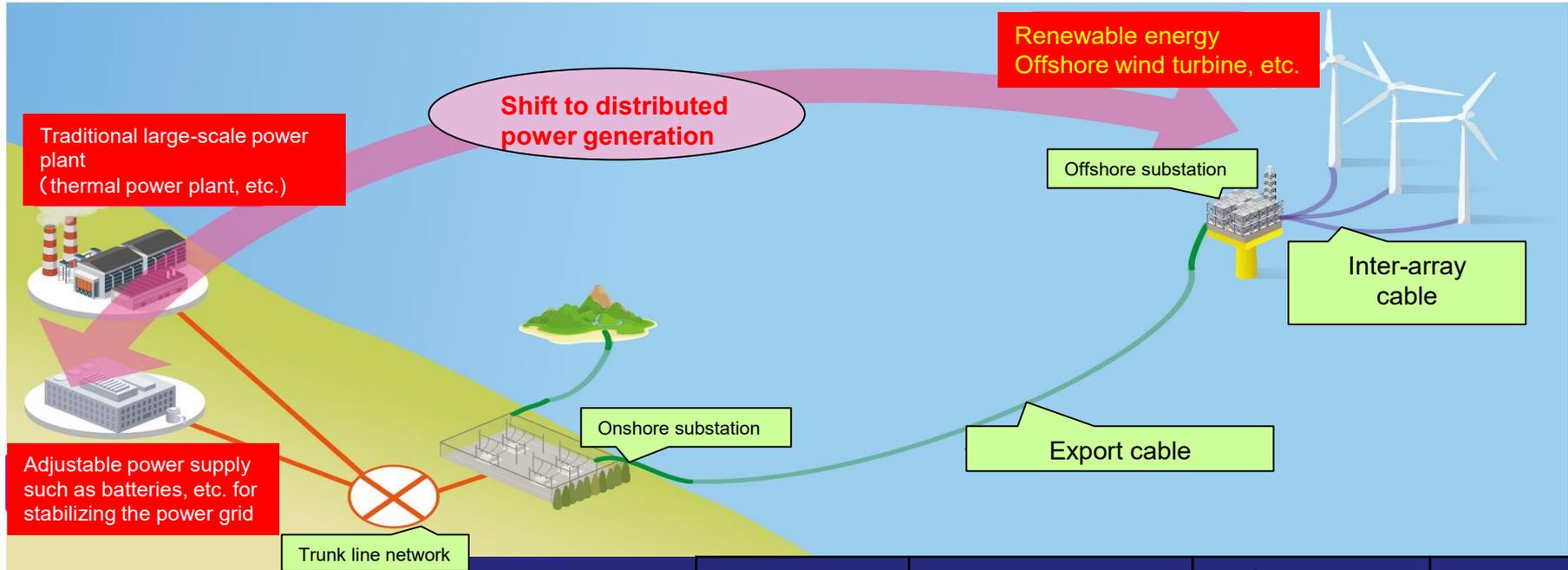
Expanding into renewable energy based on the ample installation experience and technological capability accumulated to date




Actual

# Structural changes in the electric power system and demand for submarine power cable for renewable energy

Structural changes to the electric power systems around the world following the trend toward carbon-free (renewable energy / distributed power generation)



Appearance of new business domains



Occurrence of demand for submarine cable (Orders targeted by the company)

	Applications	Voltage / type	Component technology	Customers
<b>Submarine cable for renewable energy (offshore wind power)</b>	Transmission from offshore wind power stations to the trunk line network	CV cable • Inter array cable (Low to medium voltage / High voltage) • Export cable (High voltage)	Respond to European standards/ Long length, high voltage, large capacity	Special purpose companies (SPC)
<b>Traditional submarine cable</b>	Transmission to island users	Low to medium voltage CV cable	Domestic specifications in Japan	Electric power (transmission) companies
	Inter-region connections	Ultra high voltage direct current OF/ High voltage CV cable		

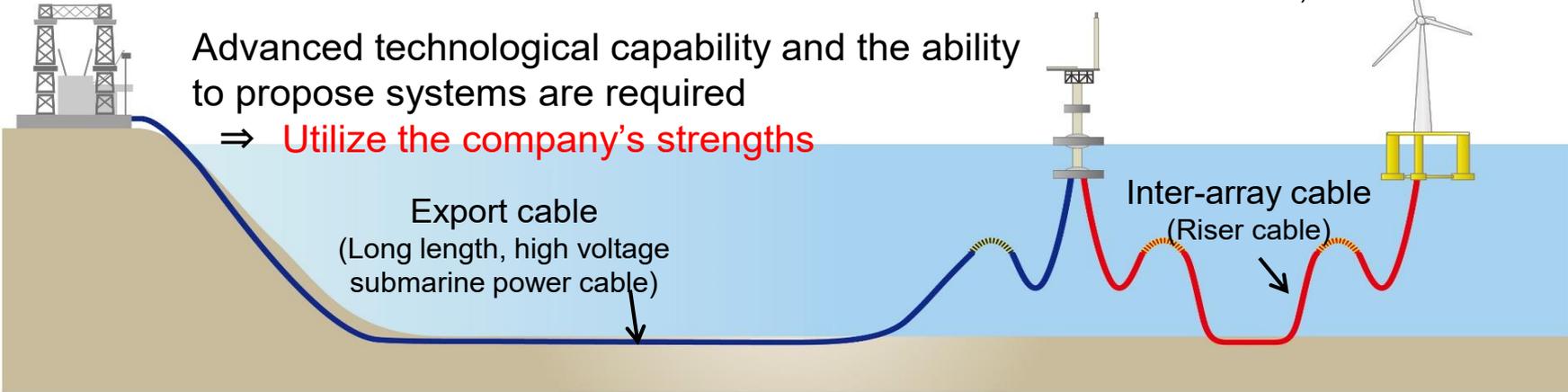
## Submarine cable for renewable energy

Transmission system from an offshore power source to the onshore power grid

Onshore switching station & onshore overhead copper power lines

Offshore substation (66/22kV substation & observation tower)

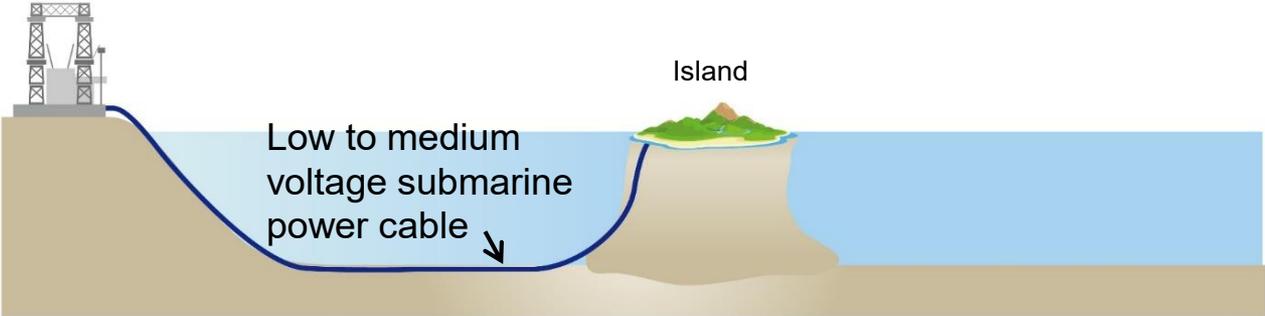
2MW wind turbine & semi-submersible structure



## Traditional submarine cable

Supply electricity from an onshore power source to an island

Onshore switching station & onshore overhead copper power lines



# Experience with renewable energy projects in Japan **FURUKAWA ELECTRIC**



Setana Offshore Wind Farm  
(first in Japan)



Already selected in the bidding  
for the Ishikari Bay Wind Farm



5MW wind turbine



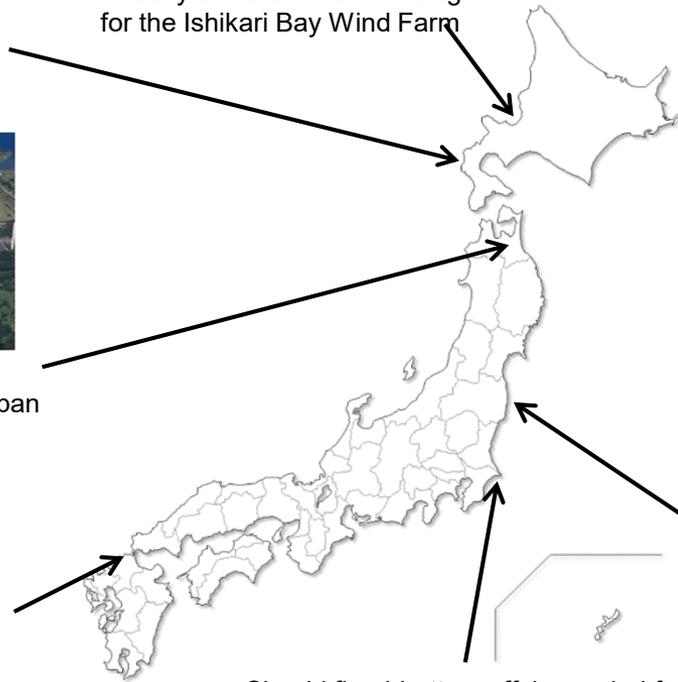
7MW wind turbine



Rokkasho solar park  
First renewable energy project in Japan  
to use 154kV



Kitakyushu fixed-bottom offshore  
wind power demonstration project



Offshore substation



2MW wind turbine

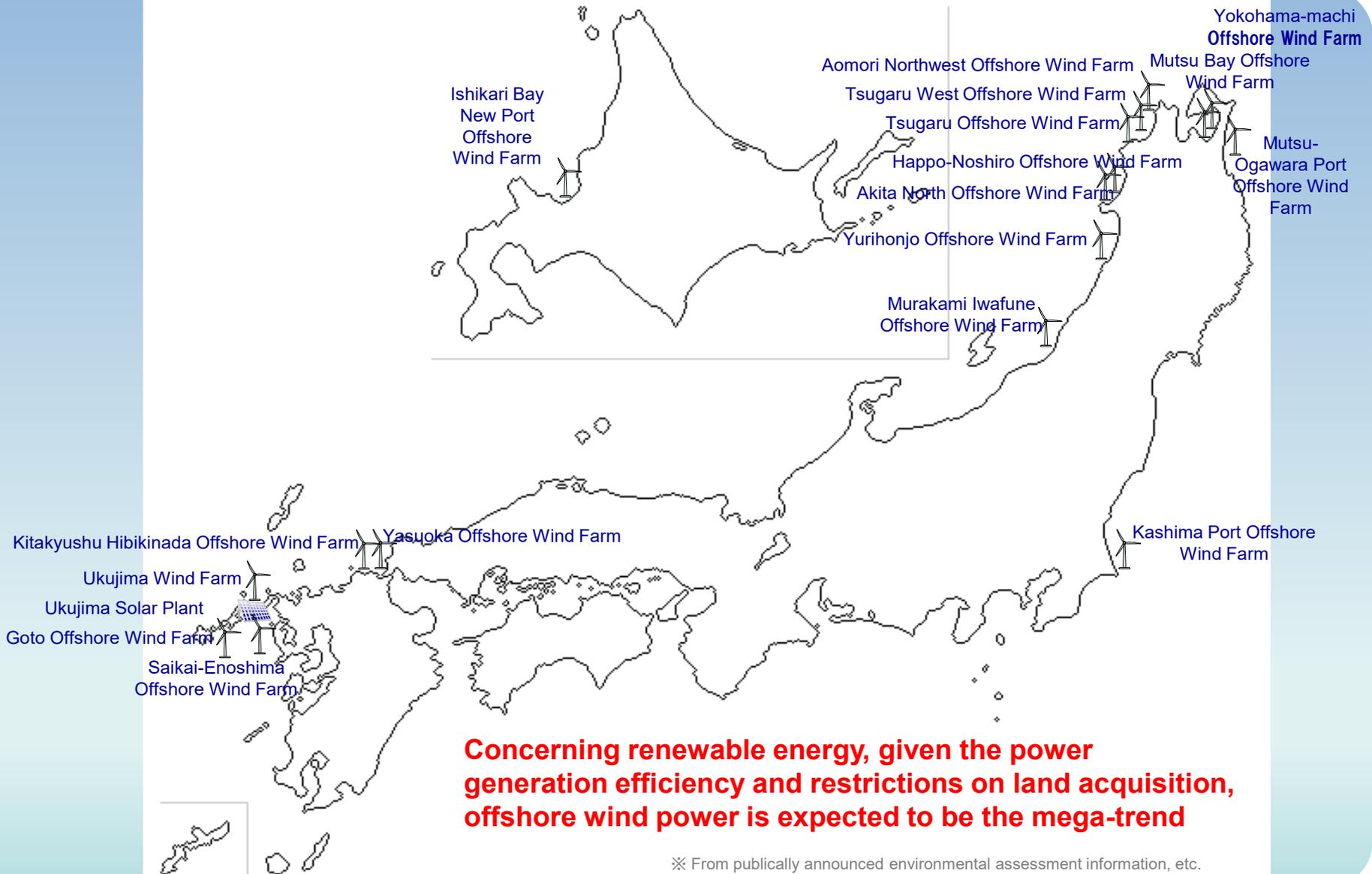
Fukushima floating offshore wind farm  
demonstration research

Choshi fixed-bottom offshore wind farm submarine  
power cable demonstration research

Other: NEDO offshore direct  
current research

**Leading position in the renewable energy field in Japan, particularly in regards to technological development and experience with submarine power cable for offshore wind power**

# Main renewable energy submarine power cable projects in Japan



## 2 . Initiatives of the Power Cable Business

- **Japan ultra high voltage underground power cable** (demand for OF cable replacement, etc.)  
Business strategy: **Secure a stable business foundation**
- **Japan submarine power cable** (Renewable energy projects such as offshore wind power)  
Business strategy: **Capture the robust renewable energy demand**
- **Overseas submarine power cable** (Submarine power cable market in Asia)  
Business strategy: **Secure future growth opportunities**

## 【2025 targets】

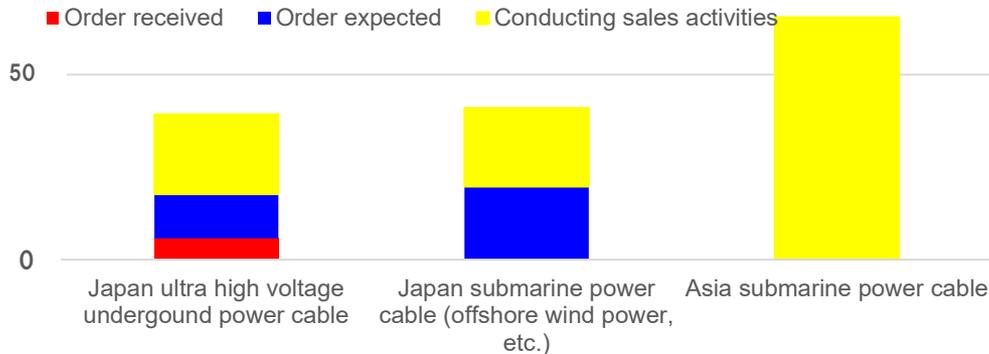
Share of the Japan ultra high voltage underground power cable market	At least 50%
Share of the Japan submarine power cable market	At least 50%
Share of the Asia submarine power cable market	At least 30%

Goal: **Main player in Asia**

# Status of orders (Japan ultra high voltage underground power cable, submarine power cable)

Cumulative scale of the projects targeted for sales activities within the target market (-2022)

(Units: JPY billion)



Currently conducting sales activities for projects totaling about JPY 150 billion in the target markets

Japan ultra high voltage underground cable

Current market scale: About JPY 10 billion/year

Japan submarine cable

Current market scale: About JPY 10 billion/year

Asia submarine cable

Current market scale: About JPY 15 billion/year

※Scale of each market was estimated by Furukawa Electric

Work to definitely capture the demand growth that is expected occur going forward in each market, and aim to expand the business

## Initiatives to expand the orders received

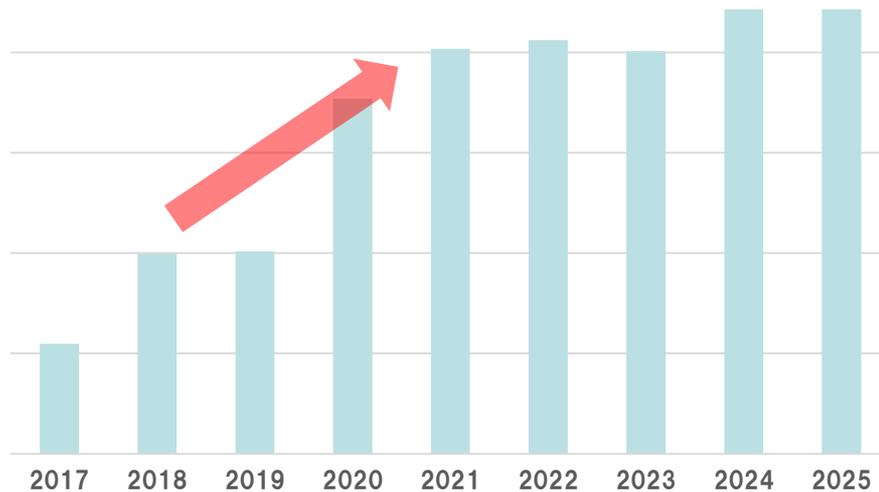
- Japan ultra high voltage underground power cable...Increase installation capability
- Japan and overseas submarine power cable...

Strengthen the ability to respond to submarine power cable requirements (longer length)

Technological development of high voltage, large capacity submarine cable

Forecast of ultra high voltage demand for  
Japanese electric power companies  
(Furukawa Electric estimate)

Demand for ultra high voltage (200kV and higher) will double !



## 【Furukawa Electric's strengths】

- Top **installation capability and installation quality** for underground power cable in Japan, and **most trusted by customers (electric power companies)** in Japan



## 【Expand the Japan ultra high voltage underground power cable business】

- **Double the installation capacity**, and definitely capture the ultra high voltage underground power cable market (cable, components, installation).

## 【Initiatives directed towards doubling installation capacity】

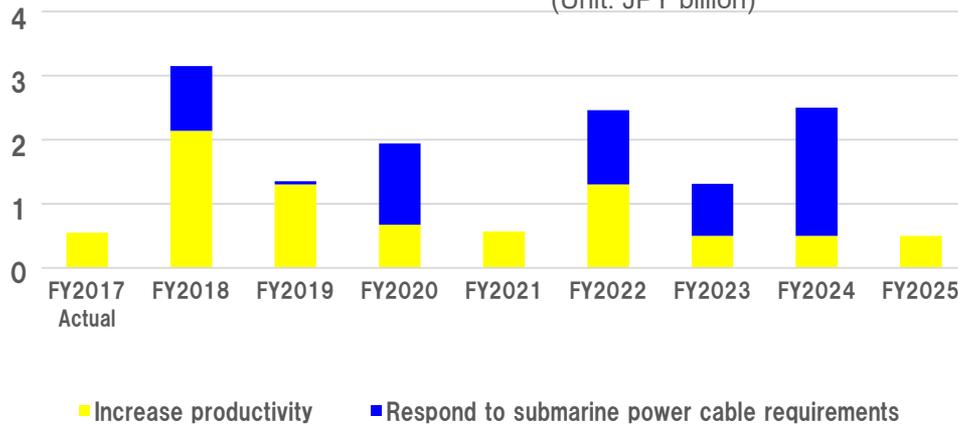
- ① Increase and continue hiring (new/mid-career)
- ② Expand the partnerships with installation affiliates
- ③ Strengthen the comprehensive capabilities of the Furukawa Group
- ④ Develop and launch onto the market cable accessories with excellent installation properties



**Double the installation capacity for ultra high voltage by the end of FY2020**

## Ichihara Plant: Capital investments on the scale of JPY 15 billion (8-year cumulative total) through FY2025

Planned major capital investments at the Ichihara Plant by year (Unit: JPY billion)



For each investment, identify the market situation, business feasibility and profitability

### ★ Respond to submarine power cable requirements (about JPY 6 billion)

Manufacturing of long length submarine cable, etc.

⇒ Increase quality reliability and cost competitiveness by reducing the joints

### ★ Increase productivity (about JPY 9 billion)

Install new manufacturing equipment for conductors, create dedicated ultra high voltage and high voltage underground power cable manufacturing lines, renewal and systemization of facilities, etc.

## Longer lengths, increased productivity

Investments in order to fully utilize current assets ⇒

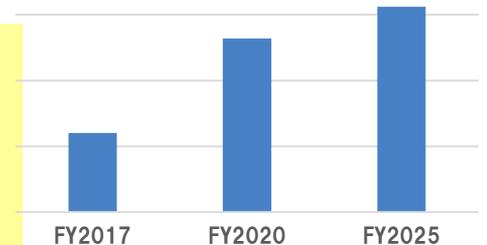
Review the product mix and increase the profit margin

Increased productivity **Over 2 times**

Maximum shippable strip length of submarine power cable **Over 3 times**

Submarine power cable manufacturing capacity **Over 2.5 times**

Manufacturing capacity



More than double cable manufacturing capacity by improving productivity

## Develop next generation cable

Develop direct current/ high voltage/ large capacity cable technology

- Develop component technology for direct current and submarine power cable  
Utilize the company's strengths in metal/ polymer component technology
- Accelerate the acquisition of international standards certification

**Development completion target: FY2020 ⇒ Launch in overseas markets**

## Develop cable manufacturing technology (Single process manufacturing, etc.)

Improve competitive strength and profitability through increased productivity and production capacity

**Development completion target: FY2025**

## Develop joints with excellent installation properties

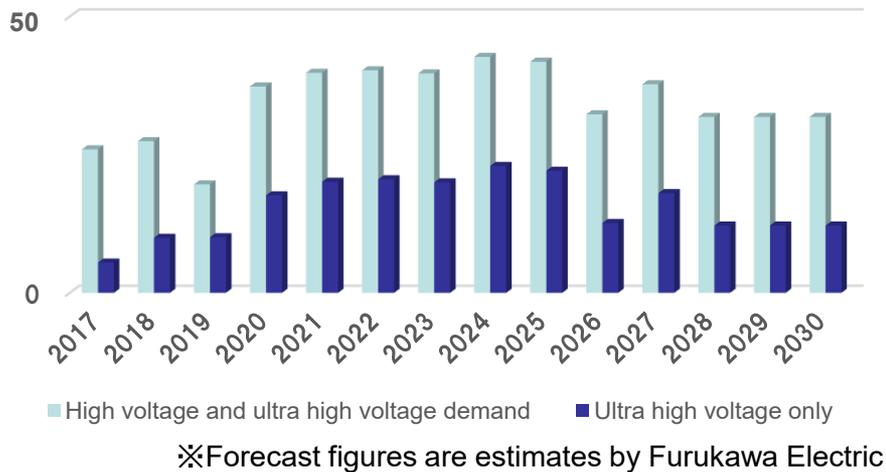
Secure superiority through the development of new joints for ultra high voltage power cable

**Development completion target: FY2025 ⇒ Introduce into the domestic market first**

## 3 . Medium to Long-term Strategy for the Power Cable Business

## Japan underground power cable market

Japan underground power cable demand forecast (Units: JPY billion)



### 【Market analysis】

- Even in the ultra high voltage segment, demand will remain firm, including the demand for OF cable replacement
- Demand for enhancing the power grid backed by a shift towards distributed generation such as renewable energy (installation of new power lines and increasing the capacity of current power lines)

### 【Current position of the company】

- Good reputation based on many years of installation results, performance and quality over a number of years
- Only one major competitor in Japan in the ultra high voltage (220kV and higher) underground power cable segment

### 【Initiatives aimed at achieving the targets】

- Increase installation capacity in response to the demand
- Improve the profitability of high voltage underground power cable

## Strategic targets

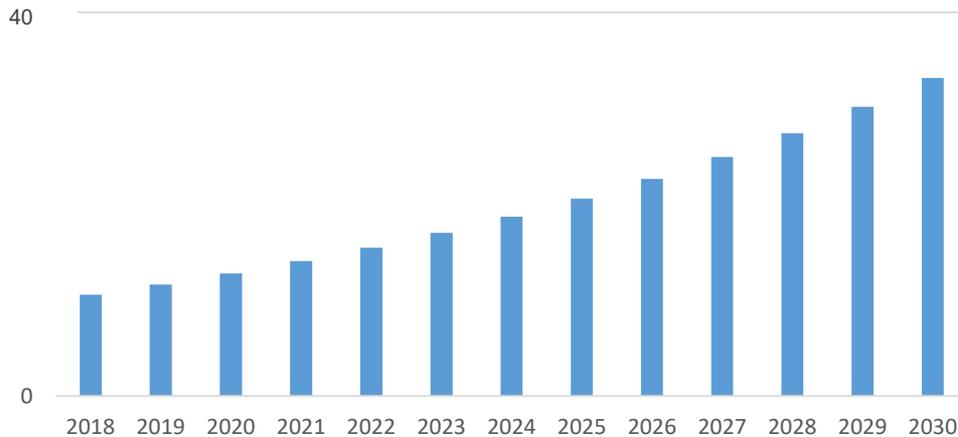
### 2025 market forecast and targets

Scale of the Japan ultra high voltage underground power cable market Over JPY 20 billion

Share of the Japan ultra high voltage underground power cable market At least 50%

## Japan submarine power cable (offshore wind power, etc.) market

Demand forecast for submarine power cable for renewable energy in Japan (Units: JPY billion)



※Submarine cable for renewable energy projects, which will form the basis of the business, will begin in full-scale from 2018

※Forecast figures are estimates by Furukawa Electric

### 【Market analysis】

- Annual growth approaching 10% centered on offshore wind power projects backed by a shift to renewable energy
  - ※Demand from 2025 is expected to be almost totally for offshore wind power projects

### 【Current position of the company】

- Only 2 companies in Japan are capable of manufacturing and installing submarine cable
- High technical capability has been proven through participation in various demonstration PJ, etc.

### 【Initiatives aimed at achieving the targets】

- Achieve definite results in renewable energy projects

## Strategic targets

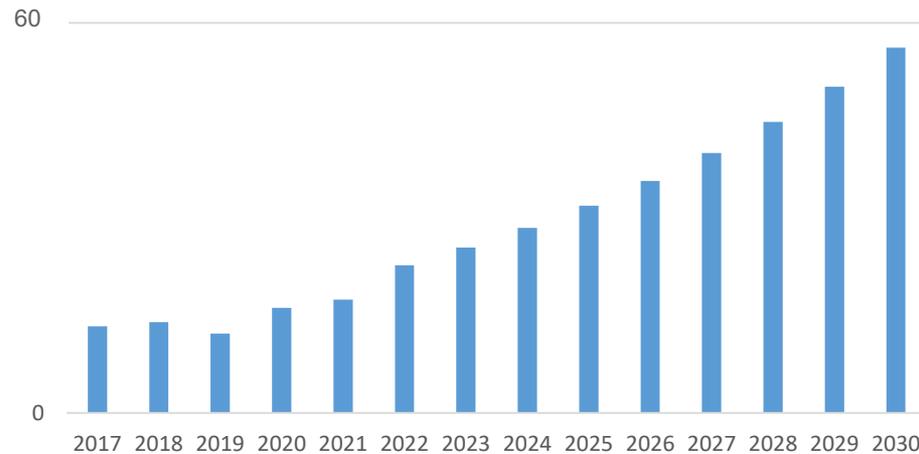
### 2025 market forecast and targets

Scale of the Japan submarine power cable market Over JPY 20 billion

Share of the Japan submarine power cable market At least 50%

## Asia submarine power cable

Asia submarine power cable demand forecast  
(Units: JPY billion)



※Forecast figures are estimates by Furukawa Electric

### 【Market analysis】

- Demand will significantly grow as a result of wide area interconnections, offshore wind power projects, etc.

### 【Current position】

- Brand strength in the Asia region  
Ample experience and quality reliability has been cultivated in Japan and overseas

### 【Initiatives aimed at achieving the targets】

- Development of direct current, high voltage, large capacity cable that can compete with global competitors
- Costs that can compete with other cable manufacturers in Asia
- Increase the manufacturing capacity and provide long length submarine cable in response to the rapid increase in demand

## Strategic targets

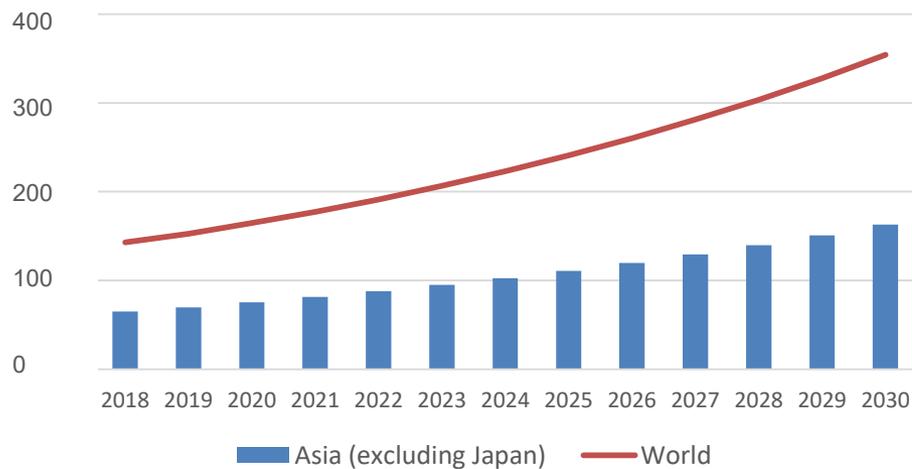
### 2025 market forecast and targets

Scale of the Asia submarine power cable market Over JPY 30 billion

Share of the Asia submarine power cable market At least 30%

## Asia ultra high voltage underground power cable market

Ultra high voltage underground power cable demand forecast (Units: JPY billion)



※Forecast figures are estimates by Furukawa Electric

### 【Market analysis】

- Demand will grow 8% annually in the Asia region
- Bay area in the Middle East and China are large markets

### 【Current position】

- Ample experience in ultra high voltage underground power cable in the Middle East
- Chinese subsidiary Shenyang Furukawa Cable Co., Ltd. (Shenyang Furukawa) possesses ultra high voltage underground power cable technology

### 【Initiatives of the company】

#### Shenyang Furukawa

- Increase cost competitiveness through thorough cost cutting activities
- Full-scale rollout of 500kV in the China market
- Expand the sales channels in the Chinese market (Asia market)

## Group strategy (Optimize the bases)

Ichihara: Japan ultra high voltage underground power cable, submarine power cable, etc.

Shenyang Furukawa: Overseas underground power cable

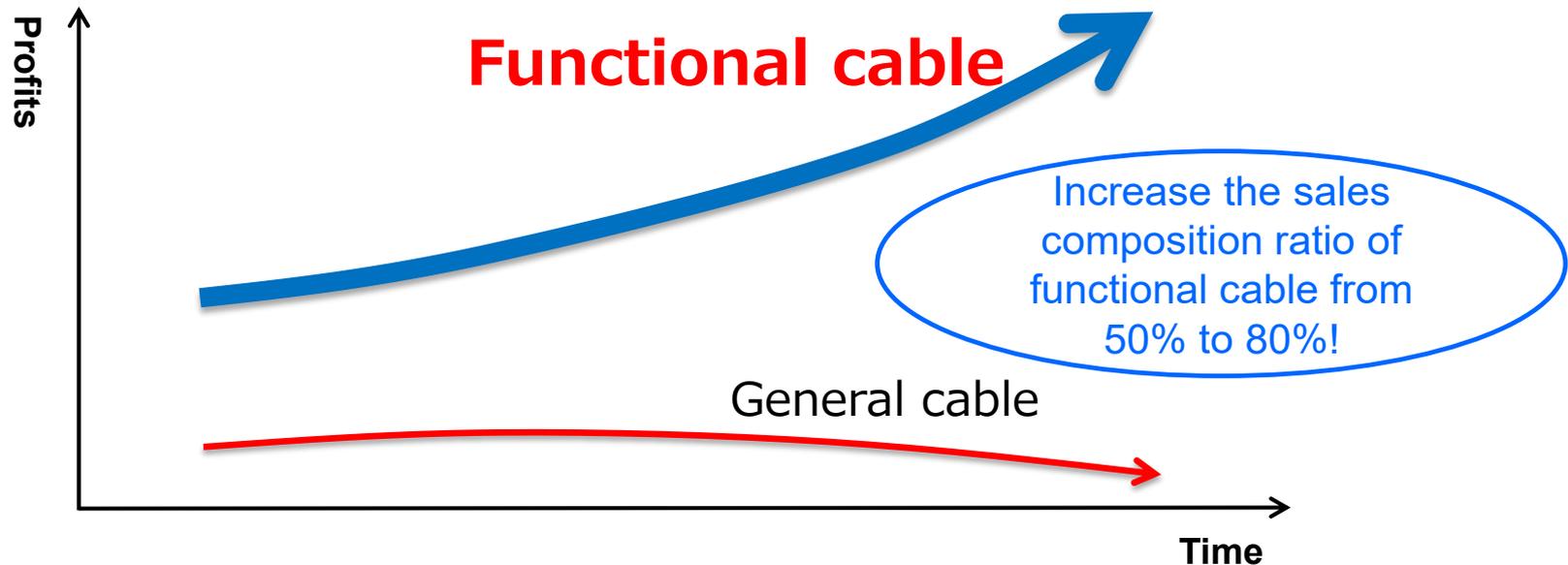
## Increase the presence in the Asia market



Cut costs by 10% compared to 2016 within 5 years

## 4 . Medium to Long-term Strategy for the Industrial Cable and Power Cable Accessories Business

# Medium to Long-term Strategy for the Industrial Cable and Power Cable Accessories Business



## 《Power cable》

- ① Basic strategy: Shift from general cable to functional cable
- ② The market for general use cable is currently stagnant, and measures for improving low margin products are being considered
- ③ Expand high value added functional cable, and aim to increase profits
  - ⇒ Propose \*"Rakuraku cable" to the construction industry, which is currently faced with a shortage of workers
  - ⇒ Make various useful proposals for simplifying the wiring work to the electronics industry

\*Low-voltage power cables that contribute to labor saving of electric equipment-related work

## 《Components》

Enhance the products used as a countermeasure for natural disasters such as heavy rain, snow and earthquakes

# Introduce new products (Rakuraku cable)

## ■ Rakuraku CV cable

- Product with high customer satisfaction that is both lightweight and flexible



Light

Simple

Flexible

FY2020 sales target:  
JPY 2.1 billion

## ■ Rakuraku cable system

Rakuraku cable + aluminum terminal



Terminal block



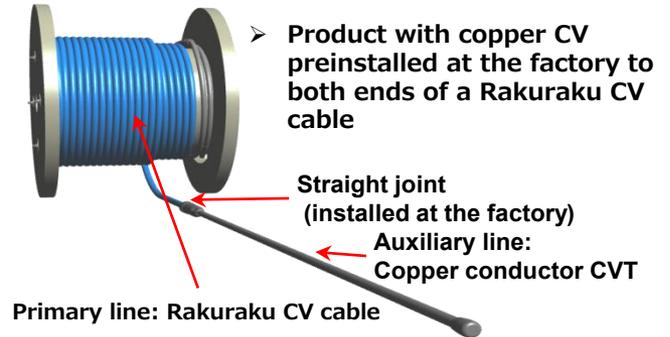
Electro-hydraulic tool + dice



Stripper and brushing tool

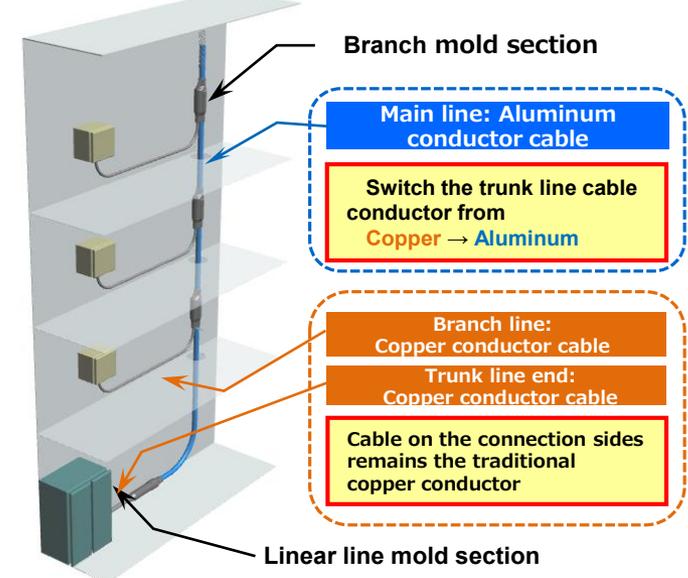


## ■ Hybrid CV power cable



## ■ Hybrid BH cable (Harness for buildings)

- Branched harness cable for buildings that uses Rakuraku CV cable for the trunk line and has factory installed copper CV for the branch lines and at the end of the trunk line



## 5 . Medium-term Plan for Energy Infrastructure

# Medium-term plan for Energy Infrastructure **FURUKAWA ELECTRIC**

## Position Energy Infrastructure as a pillar of the company

- Increase the scale of the business at least 1.5 times
- Realize an operating income margin of 5% and return on operating assets of 10% by FY2030
- Thoroughly implement selection and concentration within the **Industrial Cable & Power Cable Accessories business**, and improve profitability

Concentrate assets on and specialize in high performance products such as aluminum CV

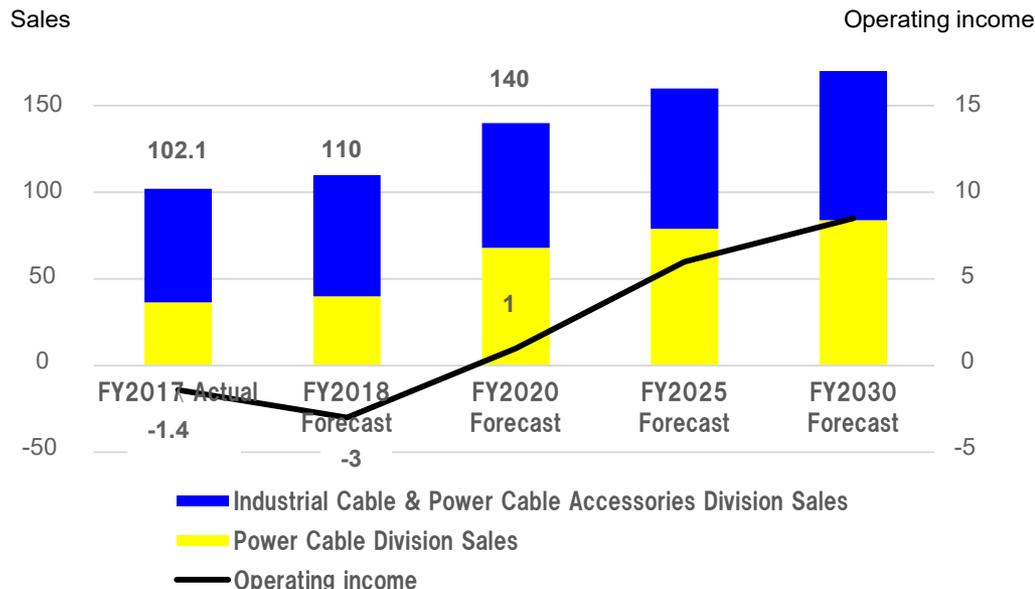
- Expand the foundation of the **power cable business**

Ratio of power cable sales within Energy Infrastructure

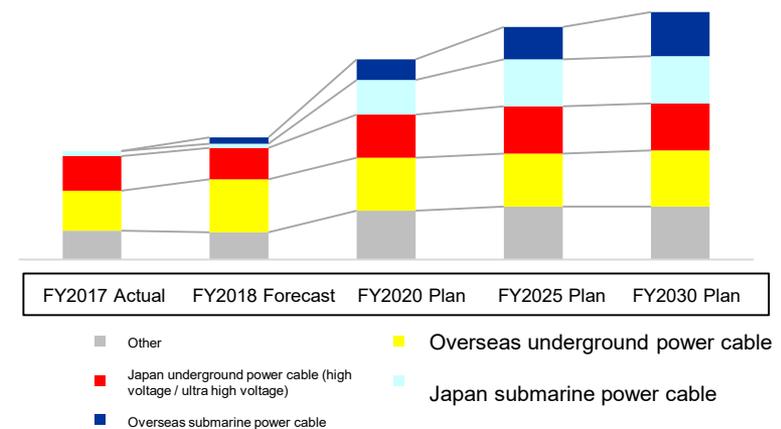
About 35% (FY2017) ⇒ 50%

Expand the business with a focus on submarine power cable, and aim to become a major player in Asia

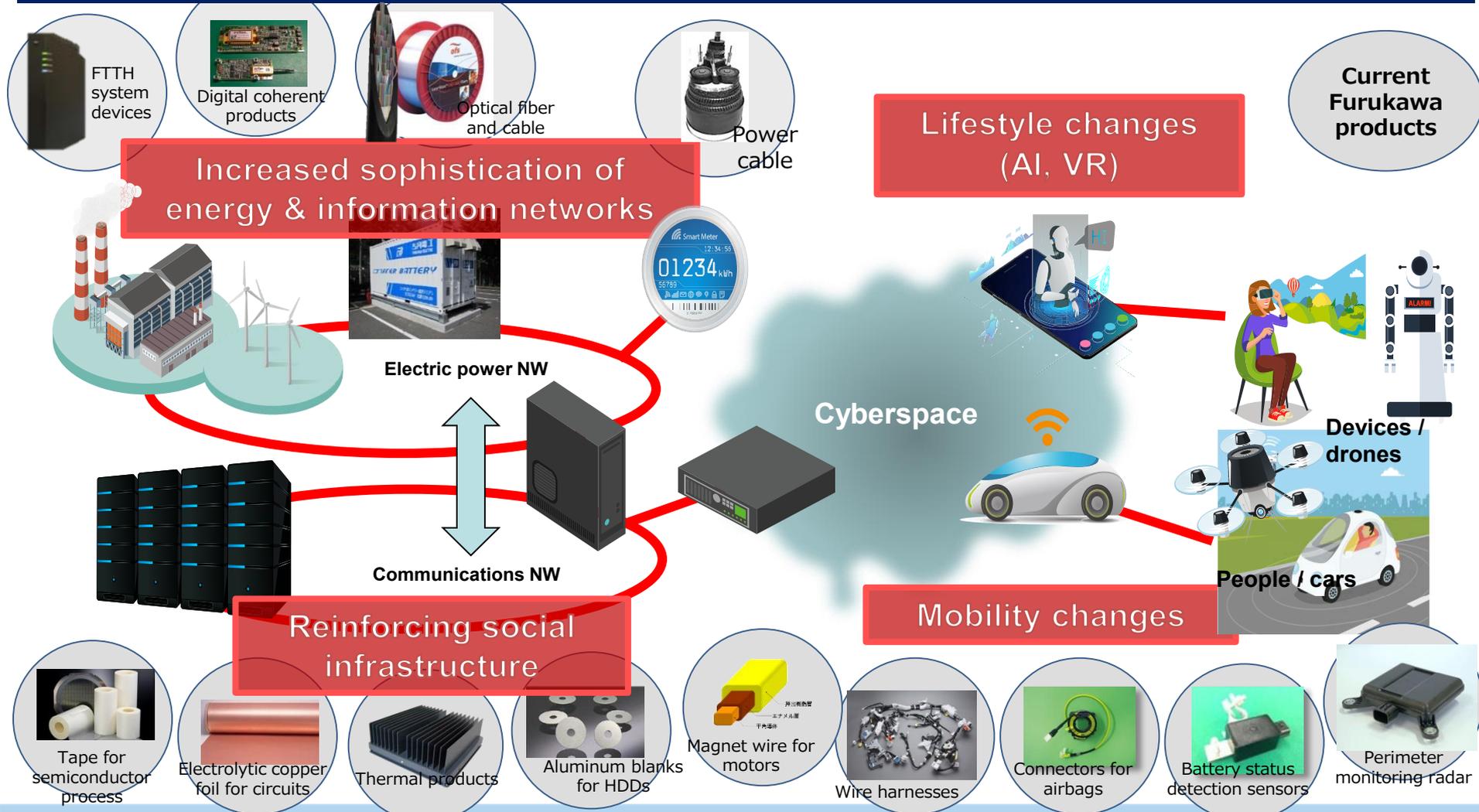
Sales and operating income forecast (Units: JPY billion)



Breakdown of the trends in power cable sales



Through the connection, transmission and storage of energy, information and heat, Furukawa Electric will contribute to the changes in society mainly in the areas of infrastructure, automotive products and a fusion thereof



Thank you!

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