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# Energy Sector

Hitachi IR Day 2019

**June 4, 2019**

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Executive Vice President and Executive Officer

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Hitachi, Ltd.

- The expanding energy market
- Grow the energy business and improve earning power
- Expansion of the service solution business  
Turning into a true global player
- Contribution to SDGs

# Energy Sector

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- 1. Direction of Hitachi's energy business**
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3. Review of 2018 Mid-term Management Plan and Targets for 2021 Mid-term Management Plan
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# 1-1. Paradigm Shift in the Energy Field

Changes in  
power suppliers

The trend is shifting  
towards renewable energy

**33** trillion yen

Renewable energy-related investment  
amount in 2018\*1

Photo: Ichigo Showamura Ogose ECO Power Plant(Ichigo ECO Energy Co., Ltd.)

Changes in  
consumers

Expansion of data center scale,  
industry's electrification, widespread of EV

**16.7** trillion yen

Data center-related investment amount in 2018\*2

**100** trillion yen at max.

Investment opportunities in power utilities  
along with the EV spread in 2030\*3

\*1 Source: World Energy Investment 2019 \*2 Source: Synergy Research Group(2019) \*3 Estimated by Hitachi

# 1-2. Expectations for the Energy Field to Achieve SDGs

## Solutions to energy access and poverty problems

**63** trillion ~ **95** trillion yen/year

Amount required for investment\*1

- Over 1 billion people live without electricity in the world
- Growing shortage of electricity in developing countries (unstable supply)
- Electric outages and grid constraints in over 30 countries

## Climate change and shift toward sustainable energy

**55** trillion ~ **85** trillion yen/year

Amount required for investment\*1

- Reduction of CO<sub>2</sub> emission is inevitable
- The key is energy-saving policy and use of renewable energy
- Response to diversification and uncertainty of energy resources

\*1 Source: Ministry of the Environment(2018)

# 1-3. Hitachi's Next Step Forward by M&A in the ABB PG Business

**1.8** billion people

Stable supply of energy around the world



Becoming the global leader in the energy solution business by Energy solution × Lumada

Over **60%**

Leads to the globalization goal of Hitachi Group (Overseas revenue ratio)



Utilize the regional business bases and the individual talent, and expand the European and Middle Eastern markets in addition to the North American, Chinese and Asian markets

**1** More than million companies

The number of ABB's customers\*<sup>1</sup>



Create new values and provide service solutions with Hitachi x ABB

\*1 Source: Material disclosed by ABB (2018)

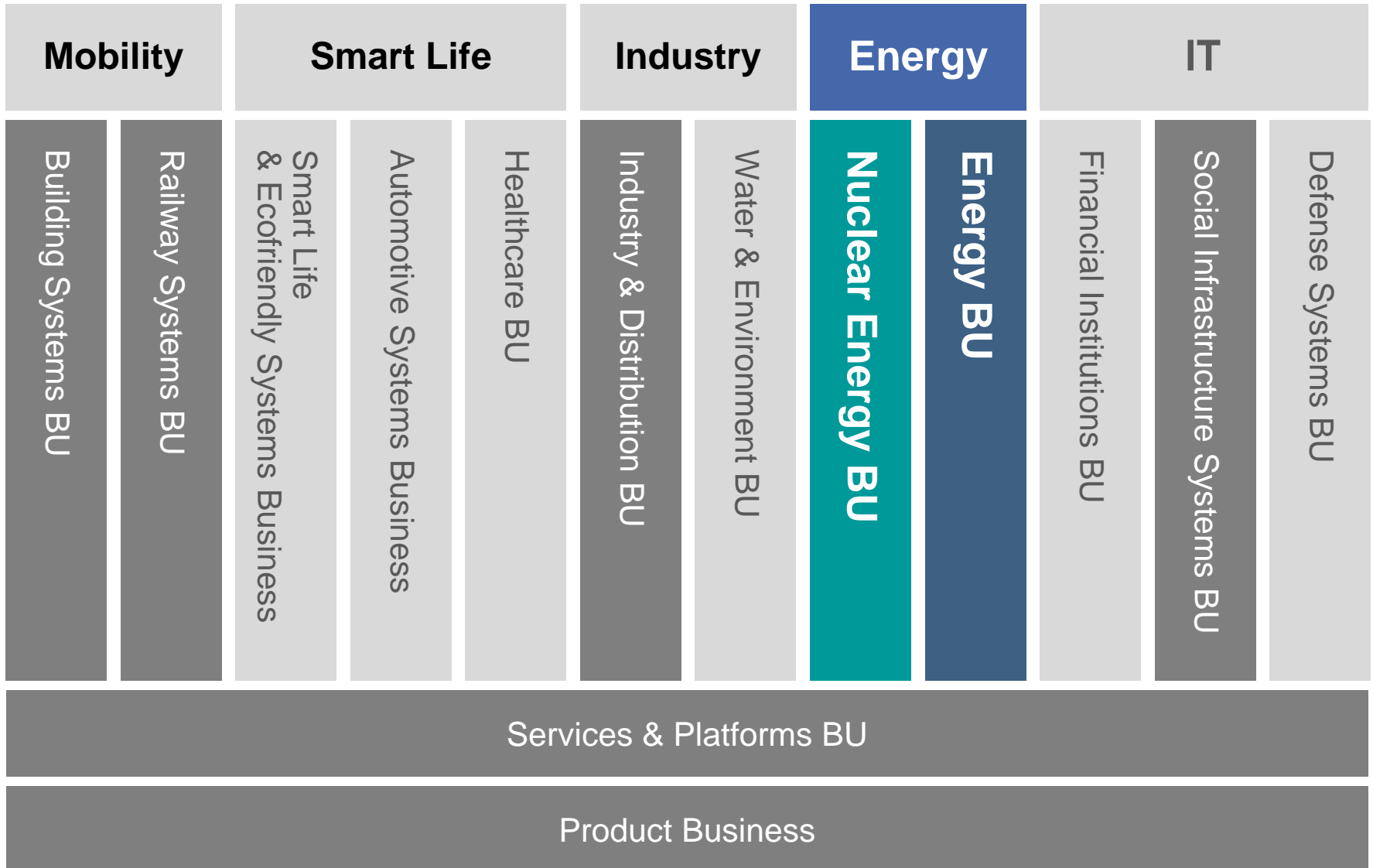
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# 2-1. Positioning of Energy Sector





# 2-2. Business Structure of the Energy Sector

## Nuclear Energy Business Unit

**41%**



Nuclear Power Plant (ABWR)



Remotely Operated Vehicle\*1



Fuel transport and storage casks

## Energy Business Unit

**59%**



Substation, Breakers, Transformer

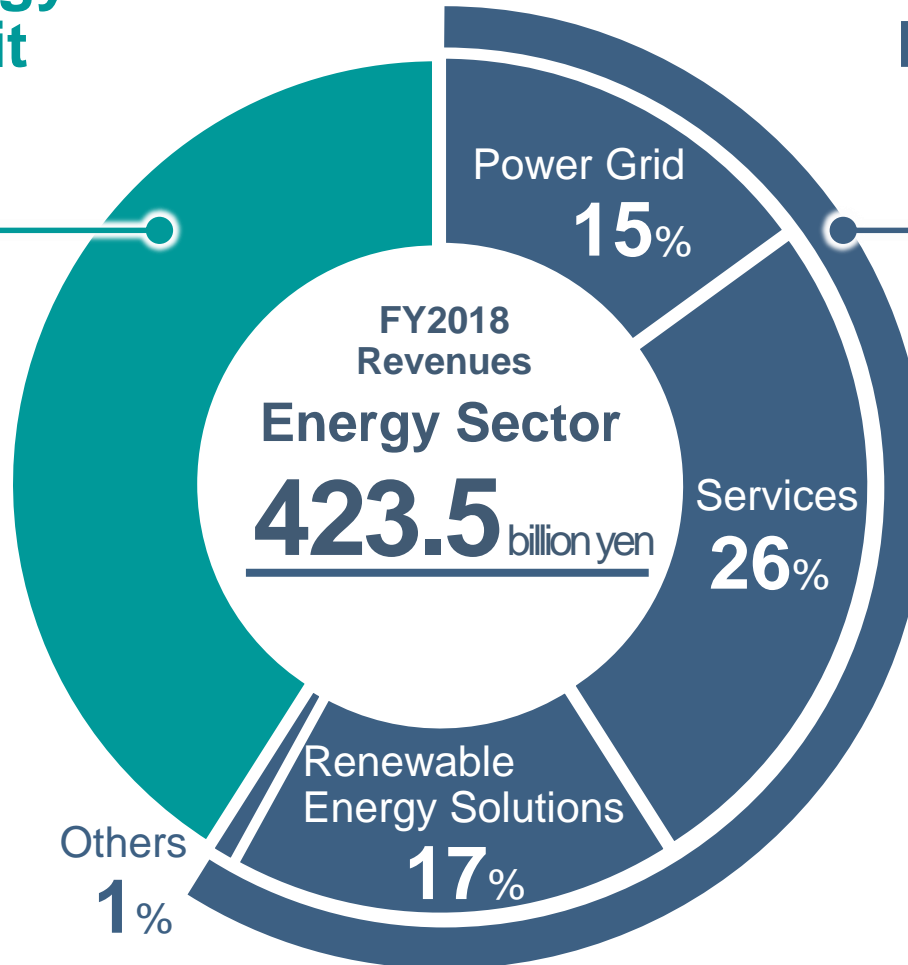


Control system maintenance services



Photo: Ichigo Showamura Ogose ECO Power Plant (Ichigo ECO Energy Co., Ltd.)

Mega solar



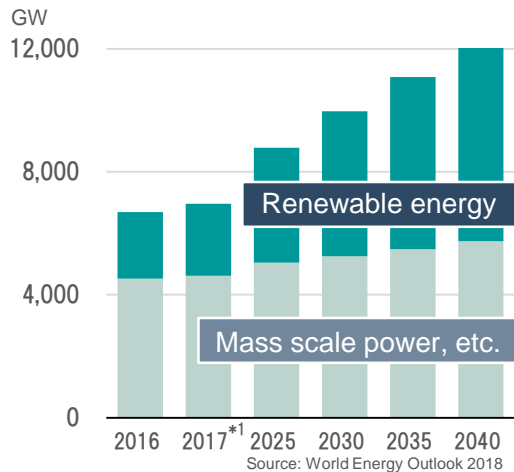
Including the control systems business recorded in IT segment.

\*1 The development was executed as one of the assignments of the International Research Institute for Nuclear Decommissioning (IRID) with subsidies for the expenses of decommissioning and contaminated water disposal provided by the Agency for Natural Resources and Energy.

## Generation capacity in renewable energy and digitization are expanding while investment in renewable energy and grid remain strong

### Generation capacity Global

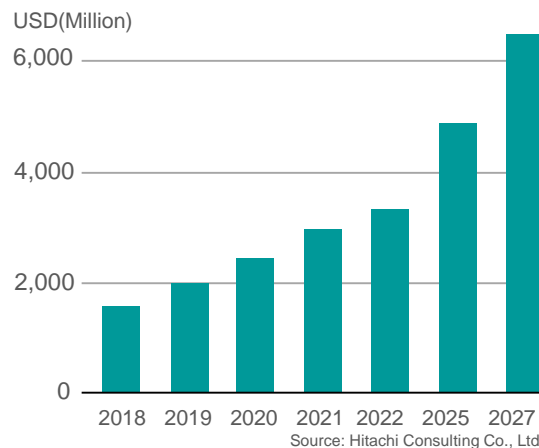
2,160 → 6,500GW  
(2016-2040)



Renewable energy becomes the main power source

### Digitalization forecast European market grid edge area

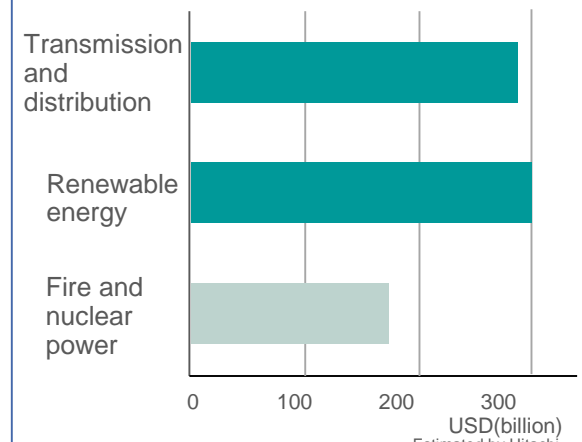
CAGR16.8%  
(2018-2027)



Digital market is expanding in the grid field

### Investment record Transmission and distribution + renewable energy (Global)

Approx. \$600.0 billion  
(2018)



Investment in renewable energy and grid remain strong

\*1 The figures of 2017 are estimated value.

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# 3-1. Review on 2018 Mid-term Management Plan (Summary)

The adjusted operating income ratio exceeds the original target and profitability increases drastically

FY2018

7.5%

423.5 billion yen  
[7.1%]

Increased earning power

- Expansion of collaborative creation energy solution business
- Enhanced high-value added service business

FY2017

5.7%

450.9 billion yen

Conversion of business portfolio

- Launch of high-value added service
- Enhanced solution business

FY2016

1.8%

495.7 billion yen

Measured against low-profit businesses

- Promotion of business structural reforms
- Reduction of loss cost and improvement of productivity

Upper row: Adjusted operating income ratio; Lower row: Revenues including the control systems business recorded in IT segment. The value in [ ] is the target value at the time of announcement in June 2016.

## 3-2. Review on 2018 Mid-term Management Plan (Major Achievements)

### The energy solution business and service business are growing steadily

#### Collaborative creation energy solution business

Joint investment in wind power generation  
business with a local company  
Construction of power plant and provision of  
O&M service

(Manyo-no-Sato Wind Power Plant)  
(Contract concluded in April 2018)



#### High value-added services (Problem solution type)

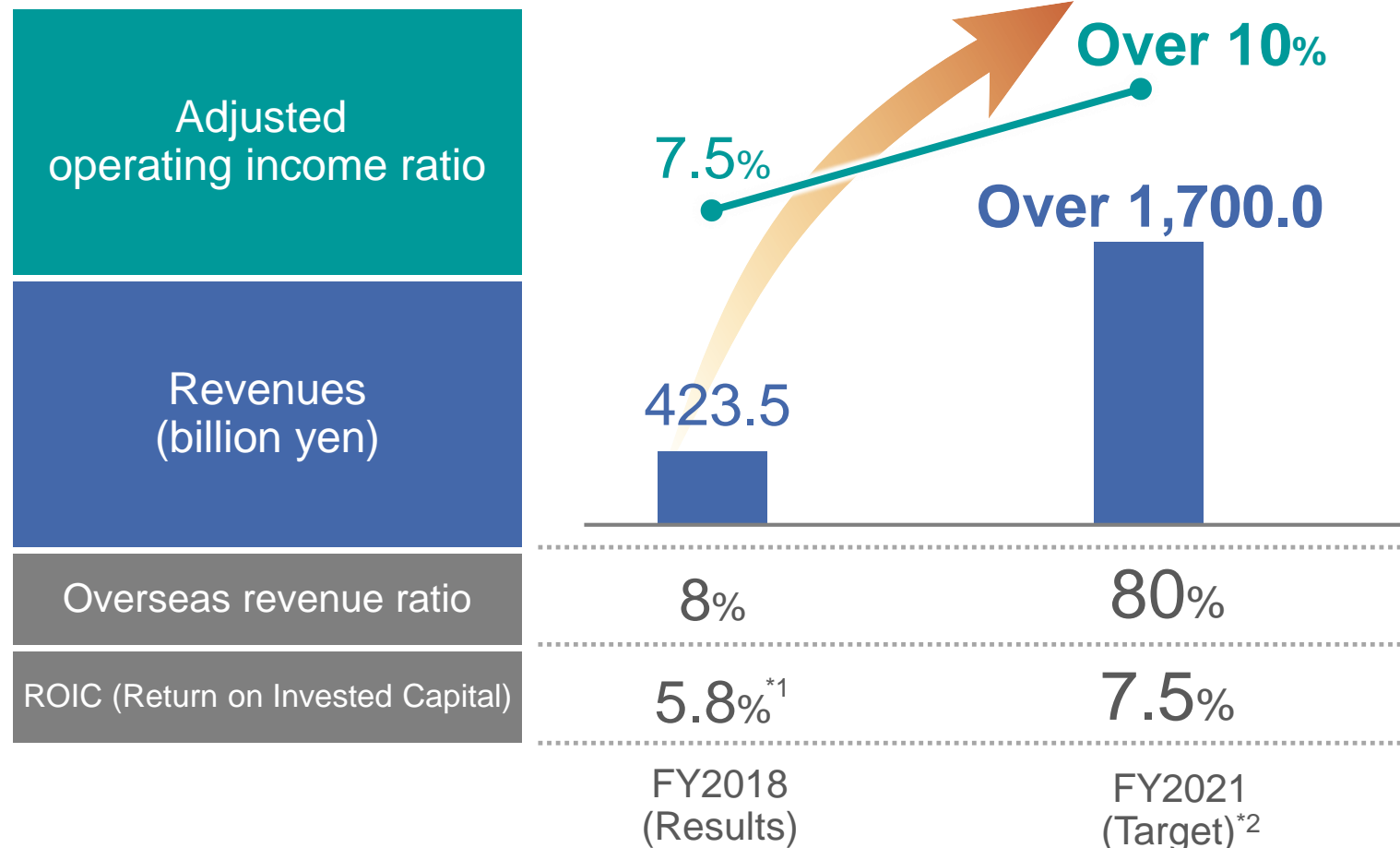
Provision of distributed power solutions where  
Hitachi's coordinating capability addresses  
the customer's energy-saving issues

(Tosoh Corporation –  
Yokkaichi Manufacturing Complex)  
(Contract concluded in October 2017)



# 3-3. Target of 2021 Mid-term Management Plan

**Aim to achieve an adjusted operating income ratio of over 10% by expanding the service and solution business**



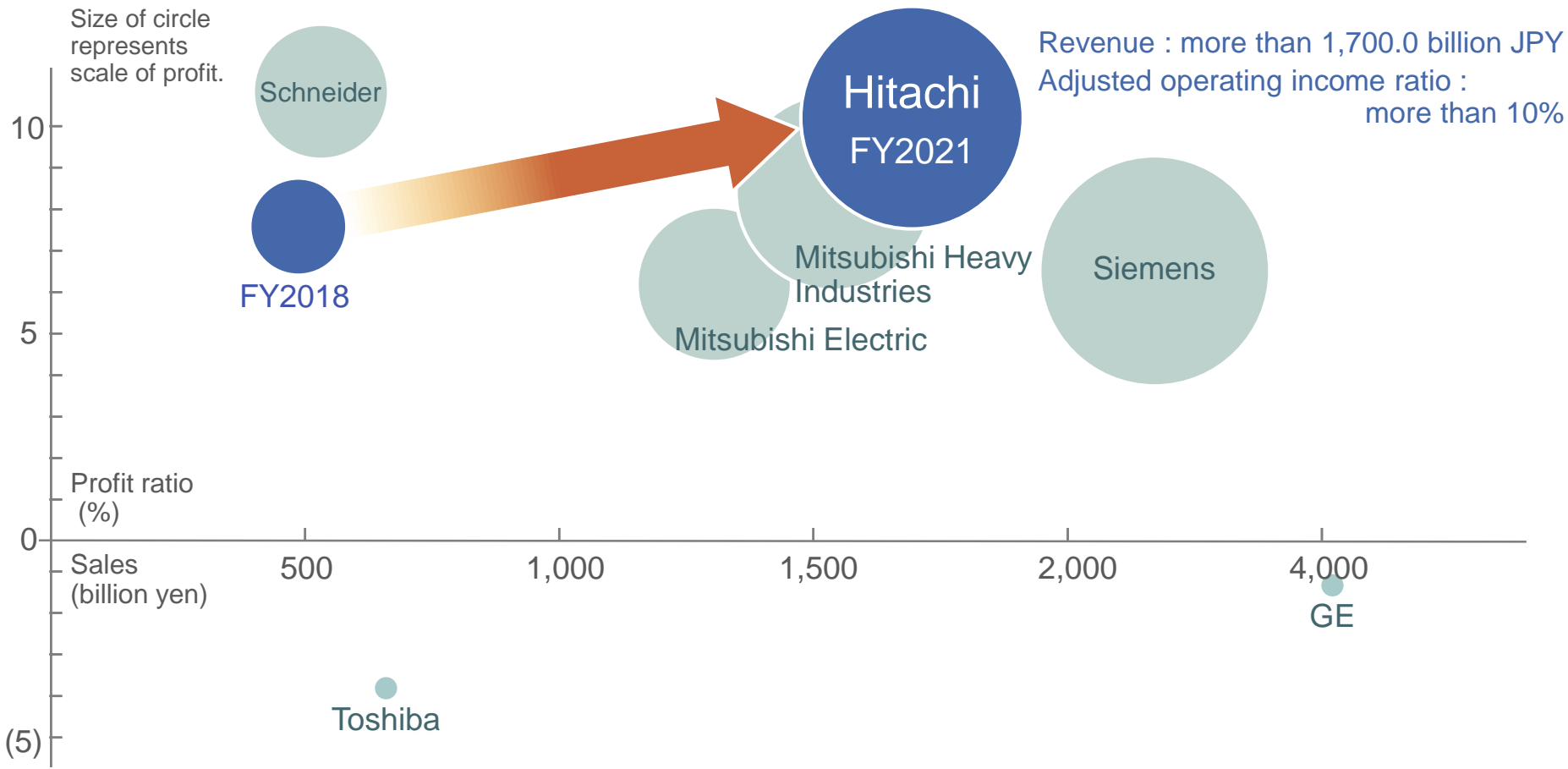
Including the control systems business recorded in IT segment.

<sup>\*1</sup> Figures reflect the impacts, such as the effect of impairment loss due to the suspension of UK nuclear power stations construction project.

<sup>\*2</sup> Estimated by Hitachi, including synergy based on the performance figures of power grid division submitted by ABB.

# 3-4. Targeted Presence (Targeted Position)

**Expand its energy business to become a global leader**



Notes: The values of Hitachi Ltd. are the revenue and adjusted operating income in the energy sector. The values of General Electric Company are the revenues and profit in Power/Renewable Energy (Source: 2018 Annual Report). The values of Siemens are the revenues and profit in Siemens Gamesa/Energy Management (Source: Annual Report 2018). The values of Schneider Electric SE are the revenues and adjusted EBITA in Medium Voltage (Source: Registration Document 2018). The values of Toshiba Corporation are the sales and operating profit and loss in the energy system solution segment (Source: Summary of financial results for the financial year ending March 2019). The values of Mitsubishi Heavy Industries Ltd. are the revenues and net operating profit in the power segment (Source: Financial briefing material for FY2018). The values of Mitsubishi Electric Corporation are the sales and operating profit in the heavy electric machinery segment (Source: Outline of consolidated settlement for FY2018).

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## Innovation for a “Profitable Business,” and realizing an adjusted operating Income ratio exceeding 10%

Concentrating on growing fields

Centered on the high value-added service business and the energy solution business

- Transfer to and acceleration of the service solution business
- Enhancement and overseas development of the energy solution business
- Expansion of the power grid business
- Promotion of the nuclear energy business that supports low-carbon society

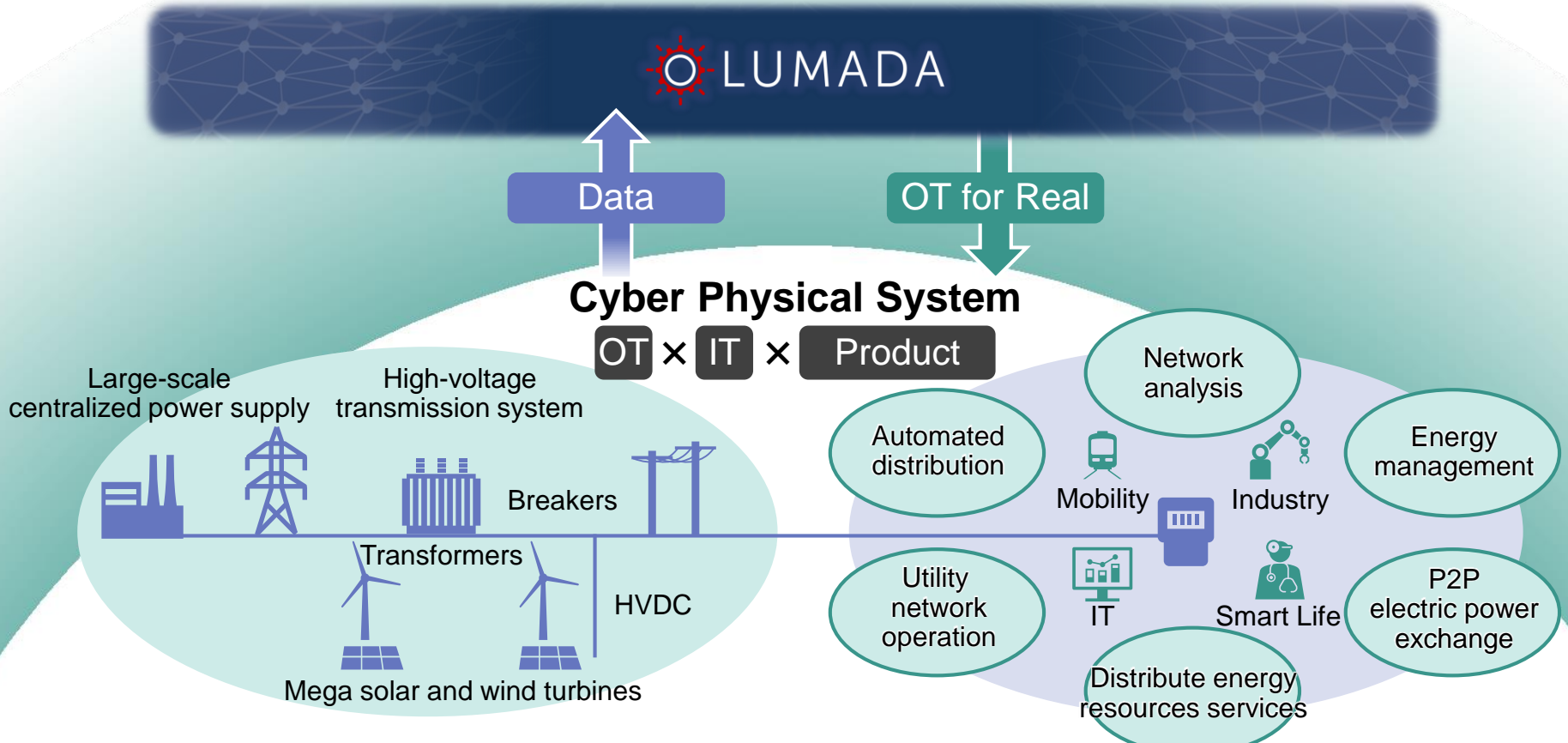
Cost structure reform

Promotion of business structural reform and improvement of the asset efficiency

- Centering on and strengthening high-profit products
- Aggregation of organic businesses and push cost structural reform
- Improvement of the rate on invested capital

## Accelerating new innovations by a combination of ABB PG business and Lumada

- Collaborative creation of solutions with all the users and partners related to energy
- Global development using products, software, and footprints of the ABB PG Business



## Centralizing of high value-added service businesses and energy solution business Expansion of energy solutions × Lumada

Transfer to  
and acceleration of  
the service solution business

 LUMADA

Energy solutions × Lumada

Enhancement and  
overseas development of  
the energy solution business

### High value-added service business

- Building and N-fold multiplication of service platform using the power of work sites and digital technologies
- Enhancement of the solution business for customers using our leading technologies such as predictive diagnosis analysis

### Energy solution business

- Using the products and the footprint of the ABB PG business, Hitachi will globally develop the collaborative solution business

### Renewable energy business

- Aggregating the renewable energy resources in the Hitachi Group to enhance the solution structuring power
- Strengthening partnership with Enercon and expand solution business combining wind turbine and digital technologies

### The power grid business is expanding as a growing field

Enhancement of  
the power grid business

#### Enhancement of business for industry field

- Expanding solution business for expanding data centers, factory electrification, and EV-related business

#### Further expansion of the HVDC business share

- Positive development into the offshore wind power market and inter-regional or inter-country DC power transmission
- Fusion of DC transmission technologies of the ABB PG business and Hitachi's digital technologies

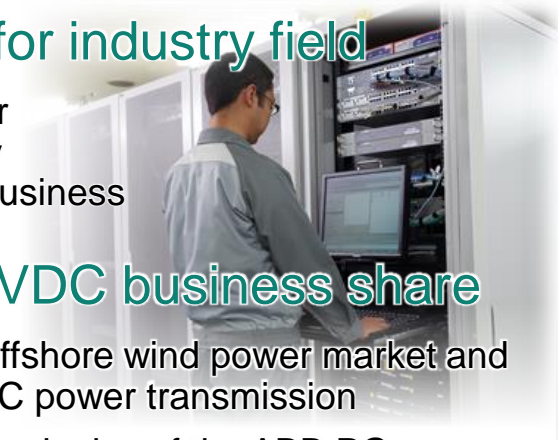
#### Steady progress on decommissioning of Fukushima Daiichi Nuclear Power Plant

- Development of the state-of-the-art technology for debris removal

#### Promotion of work corresponding to new regulations toward early restart of the power plants

- Steady progress on work corresponding to the criteria of new regulations and license-obtaining activities

Promotion of  
the nuclear energy business  
that supports  
a low-carbon society



# 4-5. Concentrating on Growing Fields (Initiative Cases)

Steady progress on the growth business for improving customer value

## Power grid

Construction of the system that uses self-exciting converter by combining the technologies and products of Hitachi and ABB  
(Chubu Electric Power Higashi Shimizu Substation)  
(Contract concluded in March 2019)



By courtesy of ABB

## Energy solutions × Lumada

Increased inspection/maintenance work efficiency and improved maintenance skills of the operators through unified management of the gas turbine facility information in the cloud.  
(TOA Oil Mizue Power Station)  
(Contract concluded in April 2019)



## Promotion of business structure reform and improvement of asset efficiency

Focus on  
and enhancement of  
high value-added products

### Focusing on highly profitable products and services

- Focus on large-scale/extra-high voltage transformers, UHV in China and services
- Expand partnership with Enercon to unify wind turbines

Aggregation of business  
and cost structural reform

### Achieving higher profitability by aggregating businesses

- Significant reduction in costs by consolidating the wind power business
- Reducing costs by streamlining organization and consolidation of some bases

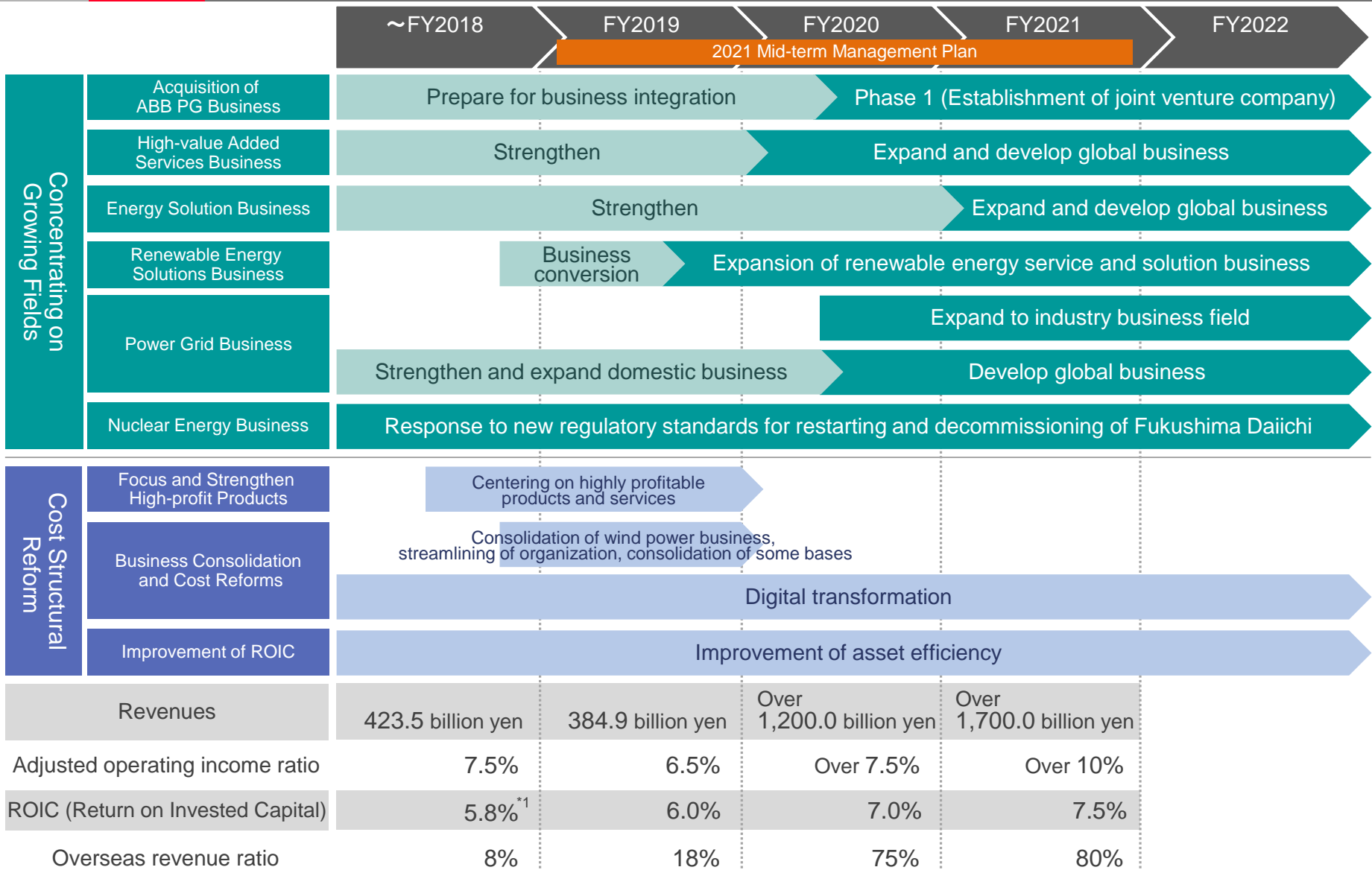
Improvement of ROIC  
(Return on Invested Capital)

### Promotion of digital transformation

### Improvement of asset efficiency

- Improvement of investment and asset efficiency
- Selling and weight saving of assets by reviewing the business portfolio
- Compression of working capital (improvement of CCC)

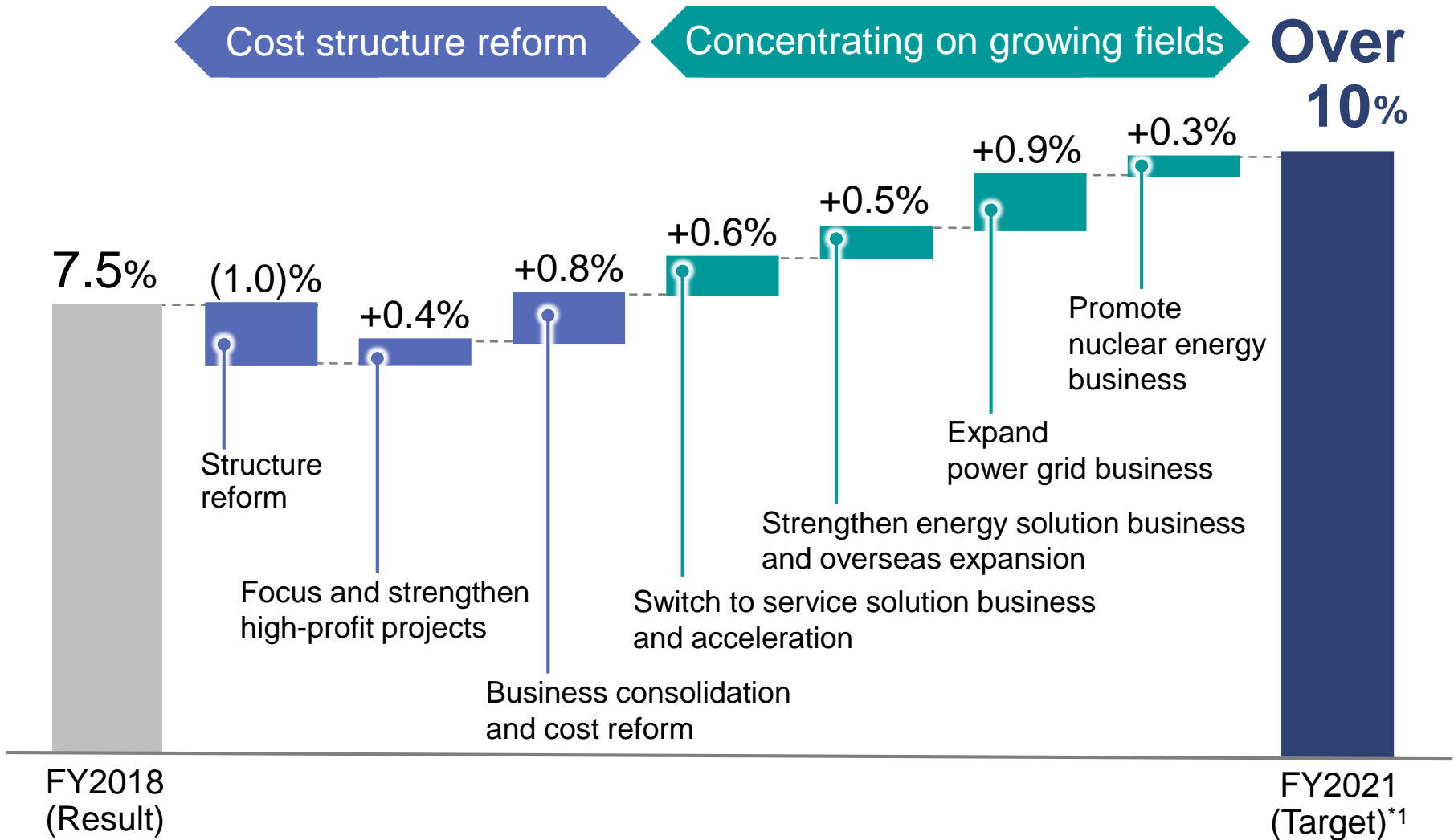
# 4-7. Road Map



The performance targets for fiscal 2020 and 2021 were estimated by Hitachi, including establishment time of joint venture and synergy based on the performance figures of power grid division submitted by ABB.  
Including the control systems business recorded in IT segment.

\*1 Figures reflect the impacts, such as the effect of impairment loss due to the suspension of UK nuclear power stations construction project.

# 4-8. Change Factor of the Adjusted Operating Income Ratio



Including the control systems business recorded in IT segment.

\*1 Estimated by Hitachi, including synergy based on the performance figures of power grid division submitted by ABB.



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# 5-1. Towards the Creation of New Value in the Energy Field

## Open innovation in the energy field through academic-industrial collaborative creation

Hitachi the University of Tokyo Laboratory

Creation of vision and innovation towards realization of Society 5.0

Hitachi

Social innovation business  
OT x IT x Product



The University of Tokyo

Advanced research  
Various research and demonstration fields

### Long-term energy scenario

Planning of long-term scenario towards the goal of the Paris Agreement

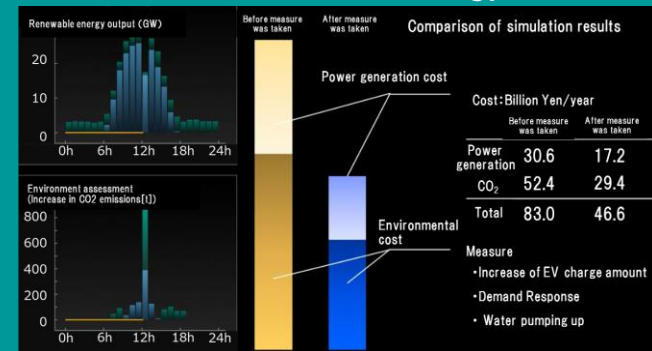
Planning of several energy scenarios

- Degree of dispersed population
- Advancement of decarbonization



### Evaluation platform

Evaluate social benefit of all possible expansions of renewable energy



Introduction of renewable energy and building out a network in line with the scenario



## Energy solutions × Lumada

Grid and renewable energy solutions, energy management, energy saving and decarbonization solutions, etc.

E.g. Managing 25% of the world's substations and supplying stable energy to about 1.8 billion people



### Transform into a “Profitable Business,” and become a global leader

Revenues

Over 1,700.0 Billion yen

Profitability

(Adjusted operating income ratio)

Over 10 %

ROIC

(Return on Invested Capital)

7.5 %

Globalization

(Overseas revenue ratio)

80 %



## Society 5.0

### Supporting stable supply of energy to realize the sustainable society

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# 6-1. FY2018 Results (Power and Energy Business)

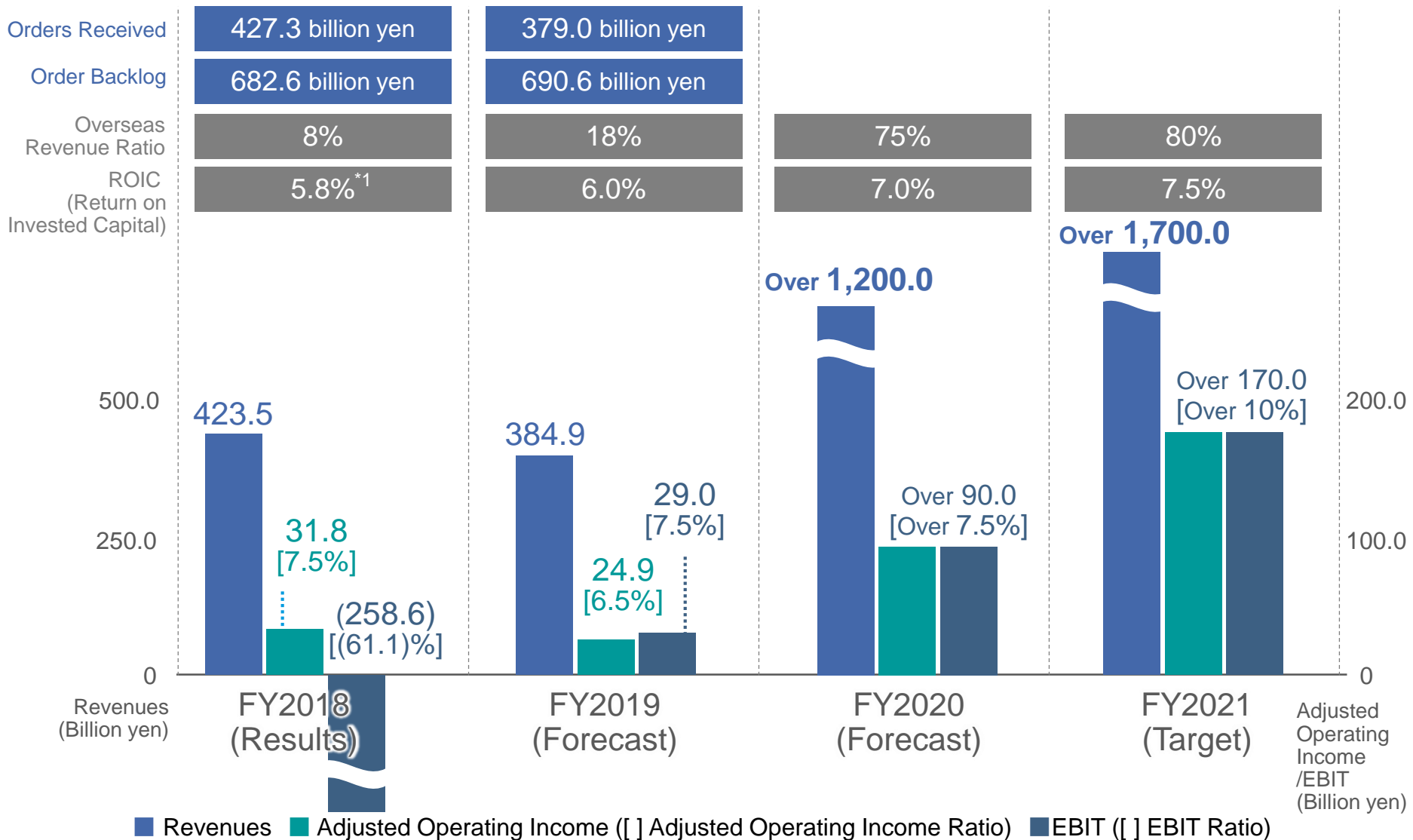
	FY2017	FY2018 (Initial Forecast) <sup>*1(1)</sup>	FY2018 (2)	Difference (2)-(1)	FY2018 <sup>*2</sup>
Revenues	450.9 billion yen	456.0 billion yen	423.5 billion yen	(32.5) billion yen	456.6 billion yen
Overseas Revenue Ratio	9%	11%	8%	-	-
Adjusted Operating Income	25.6 billion yen	28.9 billion yen	31.8 billion yen	+2.9 billion yen	35.9 billion yen
Adjusted Operating Income Ratio	5.7%	6.3%	7.5%	-	7.9%
EBIT	40.1 billion yen	36.6 billion yen	(258.6) billion yen	(295.2) billion yen	(254.8) billion yen
EBIT Ratio	8.9%	8.0%	(61.1)%	-	(55.8)%
CCC	75.0 days	70.0 days	65.0 days	-	-
Orders Received	495.9 billion yen	443.5 billion yen	427.3 billion yen	(16.2) billion yen	-
Order Backlog	683.8 billion yen	671.3 billion yen	682.6 billion yen	+11.3 billion yen	-

Including the control systems business recorded in IT segment.

\*1 Published on June 8, 2018.

\*2 Values after retroactive adjustment is made considering the effect of the changes in the business segment structure from FY2019.

# 6-2. Business Forecast and Target (Energy Sector) HITACHI Inspire the Next



The performance targets for fiscal 2020 and 2021 were estimated by Hitachi, including establishment timing of joint venture and synergy based on the performance figures of power grid division submitted by ABB. Including the control systems business recorded in IT segment.

\*1 Figures reflect the impacts, such as the effect of impairment loss due to the suspension of UK nuclear power stations construction project.

## 6-3. Revenues by Business Unit

### FY2018 Results

	FY2017	FY2018 (Initial forecast) <sup>*1</sup> (1)	FY2018 (Results)(2)	Difference (2)-(1)	FY2018 (Results) <sup>*2</sup>
Nuclear Energy Business Unit	187.5 billion yen	182.0 billion yen	171.6 billion yen	(10.4) billion yen	171.6 billion yen
Energy Business Unit	273.1 billion yen	284.0 billion yen	271.5 billion yen	(12.5) billion yen	304.2 billion yen

### Business Performance Trend

	FY2018 (Results)	FY2019 (Forecast)	FY2020 (Forecast)	FY2021 (Target)
Nuclear Energy Business Unit	171.6 billion yen	153.0 billion yen	Over 170.0 billion yen	Over 180.0 billion yen
Energy Business Unit	271.5 billion yen	246.9 billion yen	Over 1,030.0 billion yen	Over 1,520.0 billion yen

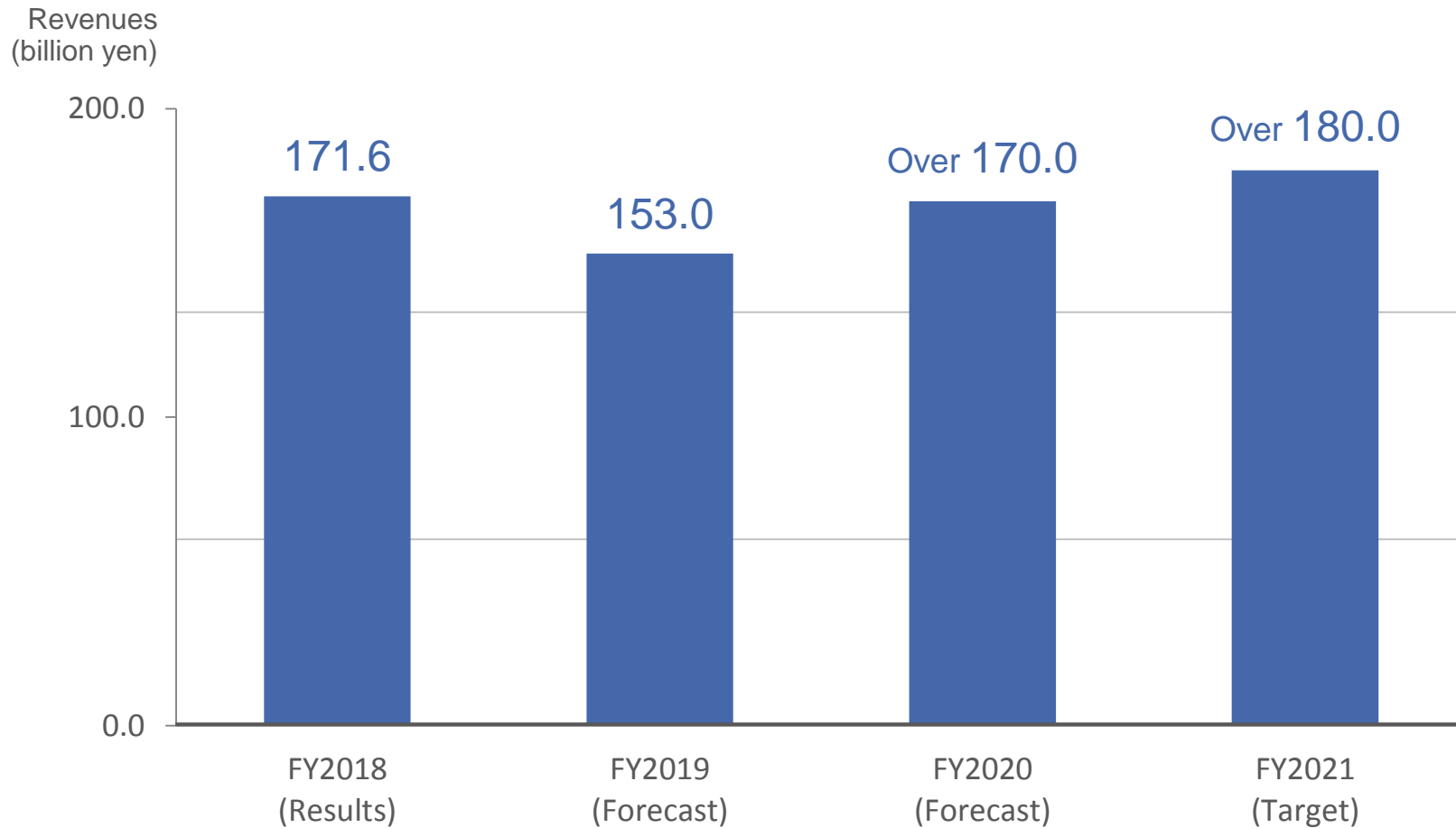
The performance targets for fiscal 2020 and 2021 were estimated by Hitachi, including establishment timing of joint venture and synergy based on the performance figures of power grid division submitted by ABB.  
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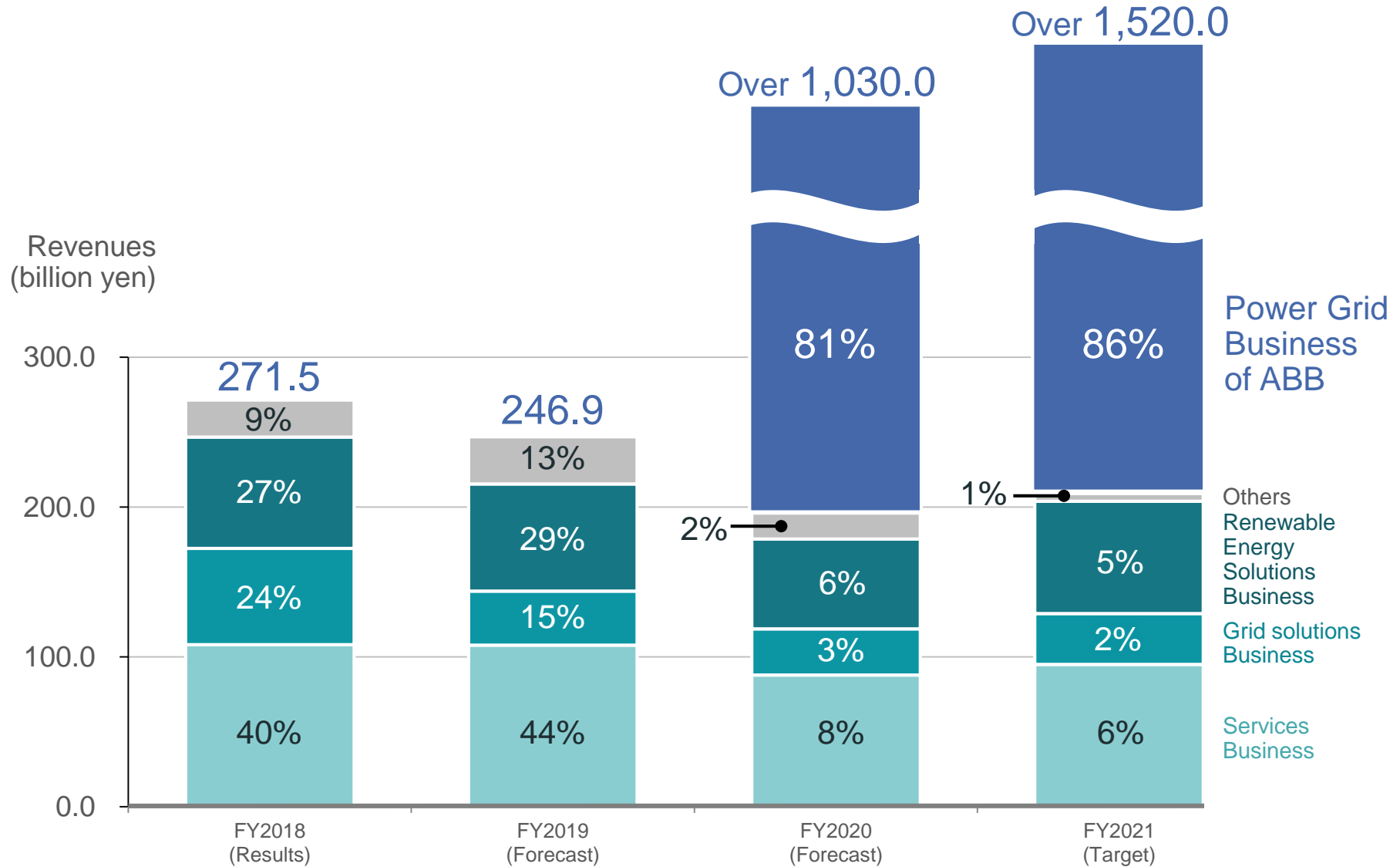


# 6-4. Business Forecast and Target (Nuclear Energy Business Unit)



Including the control systems business recorded in IT segment.

# 6-5. Revenue Breakdown (Energy Business Unit)



Estimated by Hitachi, including establishment timing of joint venture and synergy based on the performance figures of power grid division submitted by ABB. Including the control systems business recorded in IT segment.

## 6-6. Terminology

- ABWR : Advanced Boiling Water Reactor
- CAGR : Compound Average Growth Rate
- CCC : Cash Conversion Cycle
- EBIT : Earnings Before Interest and Taxes
- EV : Electric Vehicle
- GIS : Gas Insulated Switchgear
- GW : Giga Watt
- HVDC : High Voltage Direct Current
- IoT : Internet of Things
- O&M : Operation & Maintenance
- OT : Operational Technology
- P2P : Peer to Peer
- PG : Power Grid
- ROIC : Return on Invested Capital
- SDGs : Sustainable Development Goals

Certain statements found in this document may constitute “forward-looking statements” as defined in the U.S. Private Securities Litigation Reform Act of 1995. Such “forward-looking statements” reflect management’s current views with respect to certain future events and financial performance and include any statement that does not directly relate to any historical or current fact. Words such as “anticipate,” “believe,” “expect,” “estimate,” “forecast,” “intend,” “plan,” “project” and similar expressions which indicate future events and trends may identify “forward-looking statements.” Such statements are based on currently available information and are subject to various risks and uncertainties that could cause actual results to differ materially from those projected or implied in the “forward-looking statements” and from historical trends. Certain “forward-looking statements” are based upon current assumptions of future events which may not prove to be accurate. Undue reliance should not be placed on “forward-looking statements,” as such statements speak only as of the date of this document.

Factors that could cause actual results to differ materially from those projected or implied in any “forward-looking statement” and from historical trends include, but are not limited to:

- economic conditions, including consumer spending and plant and equipment investment in Hitachi’s major markets, particularly Japan, Asia, the United States and Europe, as well as levels of demand in the major industrial sectors Hitachi serves;
- exchange rate fluctuations of the yen against other currencies in which Hitachi makes significant sales or in which Hitachi’s assets and liabilities are denominated;
- uncertainty as to Hitachi’s ability to access, or access on favorable terms, liquidity or long-term financing;
- uncertainty as to general market price levels for equity securities, declines in which may require Hitachi to write down equity securities that it holds;
- fluctuations in the price of raw materials including, without limitation, petroleum and other materials, such as copper, steel, aluminum, synthetic resins, rare metals and rare-earth minerals, or shortages of materials, parts and components;
- the possibility of cost fluctuations during the lifetime of, or cancellation of, long-term contracts for which Hitachi uses the percentage-of-completion method to recognize revenue from sales;
- credit conditions of Hitachi’s customers and suppliers;
- fluctuations in product demand and industry capacity;
- uncertainty as to Hitachi’s ability to implement measures to reduce the potential negative impact of fluctuations in product demand, exchange rates and/or price of raw materials or shortages of materials, parts and components;
- uncertainty as to Hitachi’s ability to continue to develop and market products that incorporate new technologies on a timely and cost-effective basis and to achieve market acceptance for such products;
- uncertainty as to Hitachi’s ability to attract and retain skilled personnel;
- increased commoditization of and intensifying price competition for products;
- uncertainty as to Hitachi’s ability to achieve the anticipated benefits of its strategy to strengthen its Social Innovation Business;
- uncertainty as to the success of acquisitions of other companies, joint ventures and strategic alliances and the possibility of incurring related expenses;
- uncertainty as to the success of restructuring efforts to improve management efficiency by divesting or otherwise exiting underperforming businesses and to strengthen competitiveness;
- the potential for significant losses on Hitachi’s investments in equity-method associates and joint ventures;
- general socioeconomic and political conditions and the regulatory and trade environment of countries where Hitachi conducts business, particularly Japan, Asia, the United States and Europe, including, without limitation, direct or indirect restrictions by other nations on imports and differences in commercial and business customs including, without limitation, contract terms and conditions and labor relations;
- uncertainty as to the success of cost structure overhaul;
- uncertainty as to Hitachi’s access to, or ability to protect, certain intellectual property;
- uncertainty as to the outcome of litigation, regulatory investigations and other legal proceedings of which the Company, its subsidiaries or its equity-method associates and joint ventures have become or may become parties;
- the possibility of incurring expenses resulting from any defects in products or services of Hitachi;
- the possibility of disruption of Hitachi’s operations by natural disasters such as earthquakes and tsunamis, the spread of infectious diseases, and geopolitical and social instability such as terrorism and conflict;
- uncertainty as to Hitachi’s ability to maintain the integrity of its information systems, as well as Hitachi’s ability to protect its confidential information or that of its customers; and
- uncertainty as to the accuracy of key assumptions Hitachi uses to evaluate its employee benefit-related costs.

The factors listed above are not all-inclusive and are in addition to other factors contained in other materials published by Hitachi.

*Hitachi Social Innovation is*

**POWERING GOOD**

**HITACHI**  
Inspire the Next 