# Investors Meeting for Fiscal Year ended March 31, 2017

May, 2017

CHUBU Electric Power

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# 01 Outline of Financial Results for Fiscal Year ended March 31, 2017

Note: The Company's fiscal year (FY) is from April 1 to March 31 of the following year. FY2016 represents the fiscal year begun on April 1, 2016, and ended on March 31, 2017.

- Operating revenues (Consolidated and Non-consolidated) decreased for two consecutive years since FY2015.
- Ordinary income (Consolidated and Non-consolidated) decreased following FY2013, for the first time in 3 years. (We posted a deficit in FY2013.)
- [Consolidated] We recorded decreased sales and profit following FY2002, for the first time in 14 years.
- [Non-consolidated] We recorded decreased sales and profit following FY1998, for the first time in 18 years.

## [Consolidated]

(Rounded down to nearest 100 million yen.) (Billion yen,%)

| | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Operating revenues | 2,603.5 | 2,854.0 | (250.5) | (8.8) |
| Operating income | 136.4 | 284.9 | (148.5) | (52.1) |
| Ordinary income | 121.4 | 255.6 | (134.1) | (52.5) |
| Net income attributable to owners of parent | 114.6 | 169.7 | (55.0) | (32.4) |

*The number of consolidated subsidiaries [change from the same period of the previous year in parenthesis]
FY2016 : 29 subsidiaries (-23 companies) , 24 affiliates accounted for under the equity method (-18 companies)

## [Non-Consolidated]

(Rounded down to nearest 100 million yen.) (Billion yen,%)

| | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Operating revenues | 2,389.7 | 2,648.3 | (258.6) | (9.8) |
| Operating income | 117.2 | 265.2 | (147.9) | (55.8) |
| Ordinary income | 99.1 | 233.6 | (134.5) | (57.6) |
| Net income | 72.0 | 157.2 | (85.1) | (54.2) |

## [Principal Figures]

| | | FY2016 (A) | FY2015 (B) | Change (A-B) |
|---|---|---|---|---|
| Electricity sales volume | (TWh) | 121.8 | 122.0 | (0.2) |
| CIF price: crude oil | ($/b) | 47.6 | 48.8 | (1.2) |
| FX rate (interbank) | (yen/$) | 108.4 | 120.1 | (11.7) |
| Nuclear power utilization rate | (%) | - | - | - |

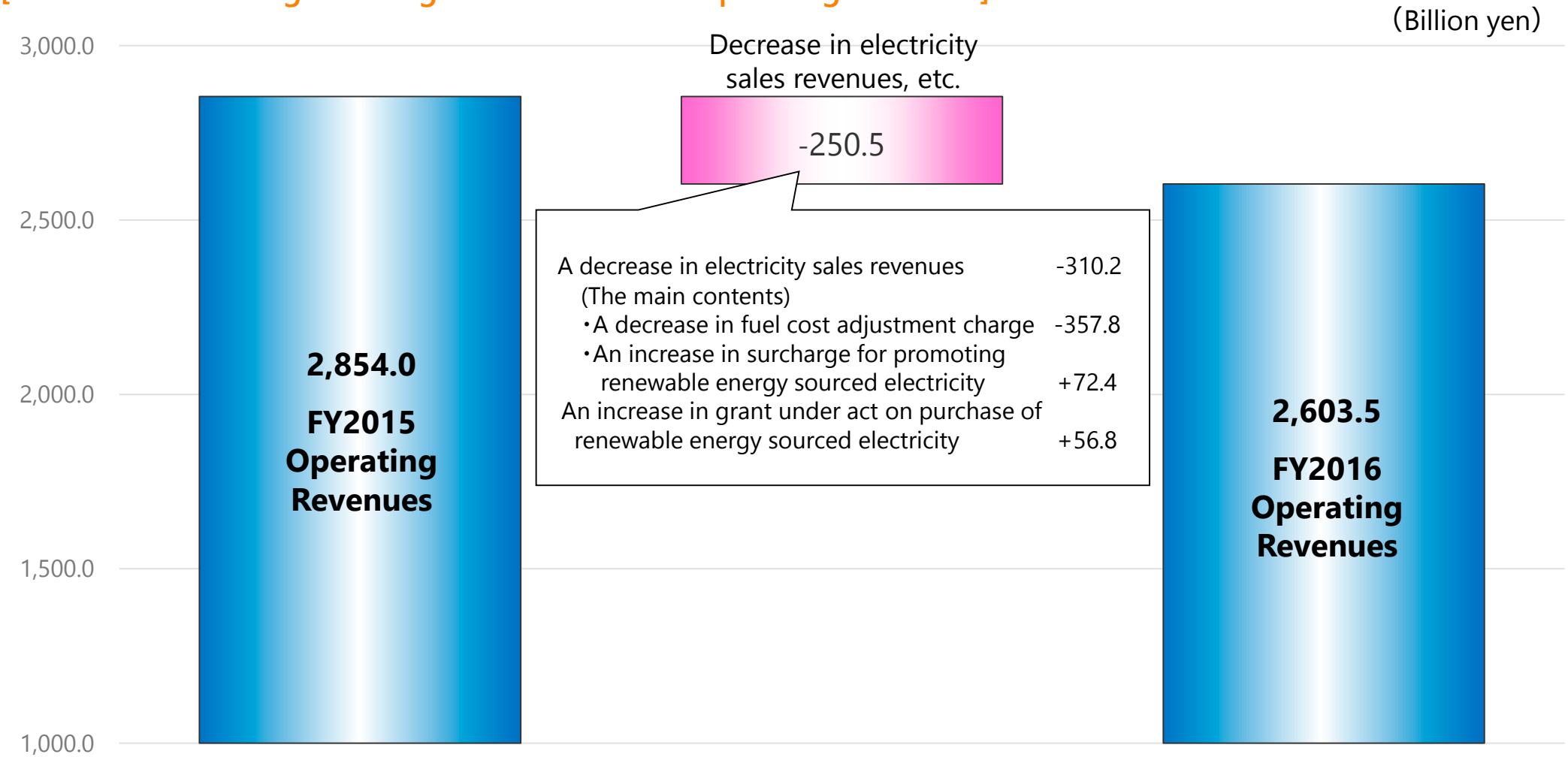
*CIF crude oil price for FY2016 is tentative.

# Summary of Financial Results <2>

**<Consolidated operating revenues>**

- Operating revenues decreased by 250.5 billion yen compared with FY2015, mainly due to a decrease in electricity sales revenues resulting from a decrease of fuel cost adjustment charge.

## [Factors contributing to change in Consolidated operating revenues]

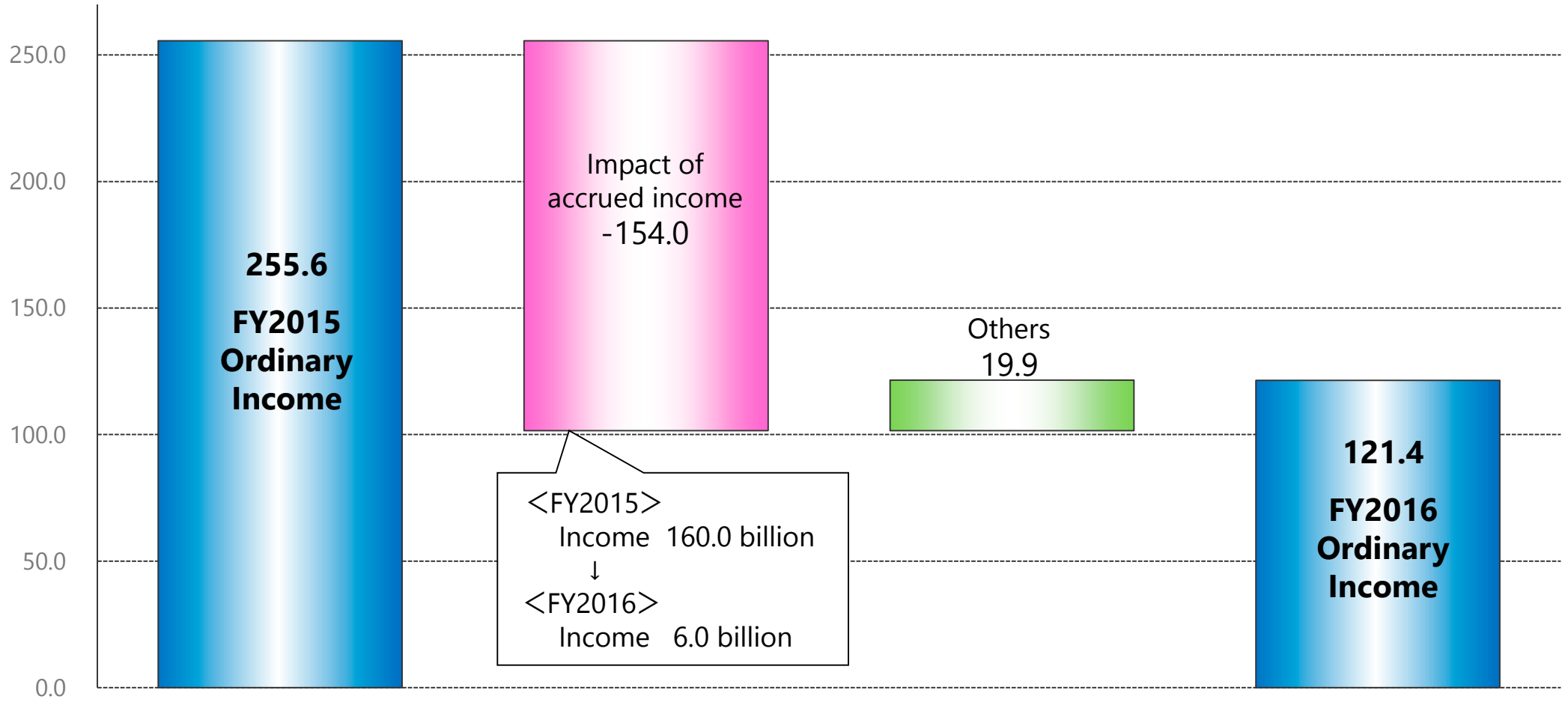


# Summary of Financial Results <3>

**<Consolidated ordinary income>**

- Consolidated ordinary income decreased by 134.1 billion yen compared with FY2015, mainly due to a reduction of accrued income incurred by fuel cost adjustment system and a decrease in fuel cost, affected by the fall of fuel price.

## [Factors contributing to change in Consolidated ordinary income]



**<Electricity Sales Volume>**

- **Amounted to 121.8TWh**, almost the same as in FY2015, mainly due to a sales increase in the Tokyo metropolitan area and an increase in air conditioning demand by lower temperature in this winter, in spite of effect of switches made to other operators due to intensified competition.

- **Low voltage : Increased by 1.5% to 38.8TWh,** compared with FY2015, mainly due to a sales increase in the Tokyo metropolitan area and an increase in air conditioning demand by lower temperature in this winter, in spite of customer's power saving effect and effect of switches made to other operators.
- **High voltage・Extra-high voltage : Dropped by 0.8% to 83.0TWh**, compared with FY2015, mainly due to a sales increase in the Tokyo metropolitan area and an increase of production in the automobile and semiconductor industry, in spite of effect of switches made to other operators.

(TWh,%)

| | | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|---|
| Electricity Sales Volume | Low voltage | 38.8 | 38.2 | 0.6 | 1.5 |
| | High voltage ・ Extra-high voltage | 83.0 | 83.8 | (0.8) | (0.8) |
| | Total | 121.8 | 122.0 | (0.2) | (0.1) |

**<Generated and Received Power>**

- **Hydro :** The flow rate fell short of the previous fiscal year; thus hydroelectric power output **decreased by 0.5TWh.**
- **Interchanged, purchased Power : Decreased by 1.9TWh**, mainly due to an increase in electricity sales volume to power exchange.
- **Thermal** : As a result above, thermal power output **increased by 3.2TWh**.

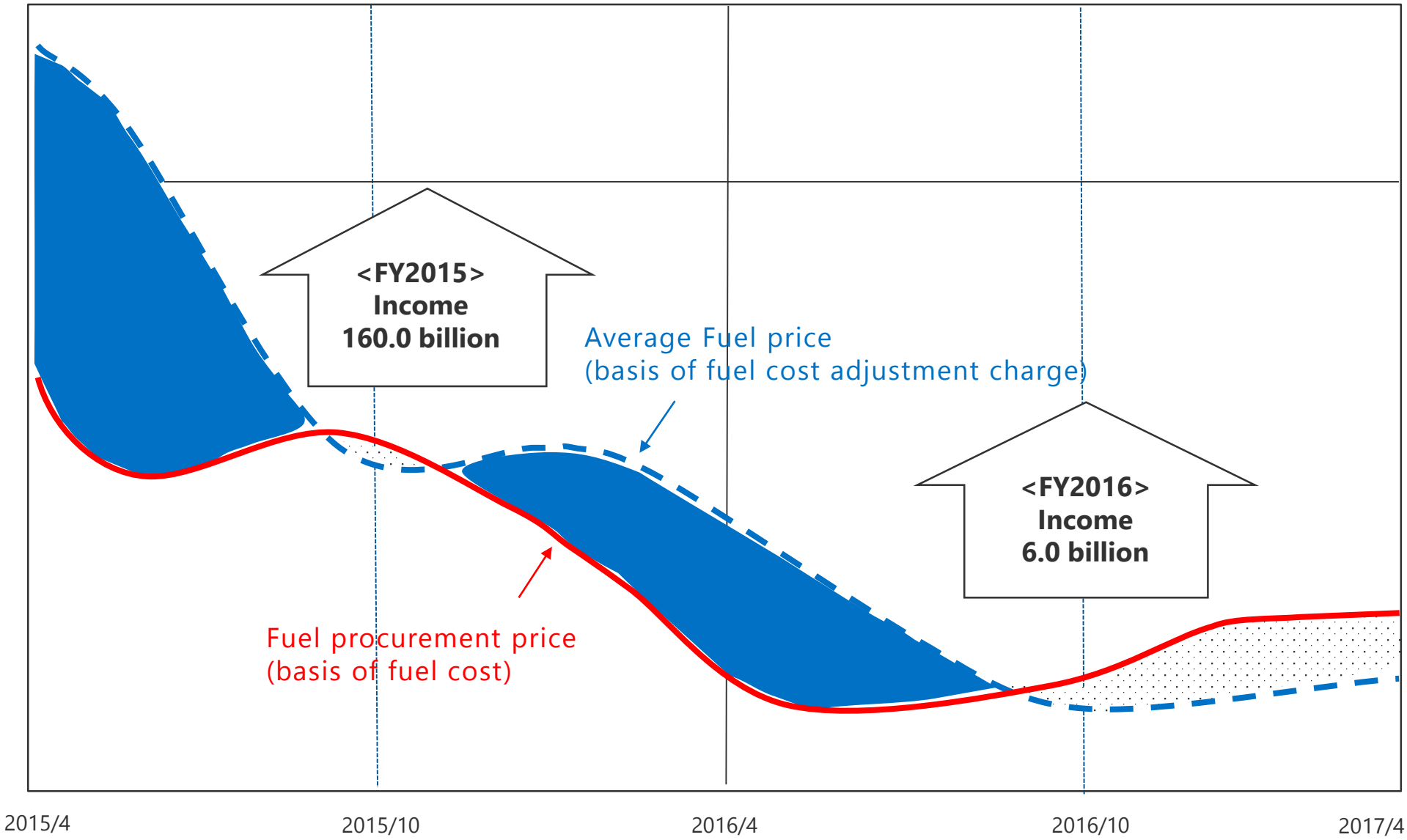
(TWh,%)

| | | | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|---|---|
| Generated and Received Power(*1) | Internally generated | Hydro | 8.6 | 9.1 | (0.5) | (6.2) |
| | | <flow rate> | <99.8> | <114.4> | <(14.6)> | |
| | | Thermal | 110.2 | 107.0 | 3.2 | 3.0 |
| | | Nuclear | (0.2) | (0.2) | (0.0) | 0.3 |
| | | <utilization rate> | <ー> | <ー> | <ー> | |
| | | Renewable energy | 0.0 | 0.1 | (0.1) | (32.9) |
| | Interchanged, Purchased power(*2) | | 9.8 | 11.7 | (1.9) | (16.8) |
| | Power used for pumped storage | | (1.1) | (0.6) | (0.5) | 78.4 |
| | | Total | 127.3 | 127.1 | 0.2 | 0.2 |

*1 From FY2016, the amount of power at the sending end has been mentioned as the amount of internally generated power. Change in the amount of power is calculated by converting the figure from the previous year to the sending end value.

*2 Interchanged, Purchased power represent power output that we grasp at the end of the FY2016.

# (Reference) Impact of accrued income incurred by fuel cost adjustment system (Result)



# Summary of Forecast for FY2017 <1>



**<Forecast>**

- Operating revenues (consolidated and non-consolidated) will increase mainly due to an increase in electricity sales revenues resulting from an increase of fuel cost adjustment charge.
- Ordinary income (consolidated and non-consolidated) will decrease mainly due to a conversion of income incurred by fuel cost adjustment system time lag into loss.

## 【Consolidated】

(Features of consolidated financial results)

- Operating revenues will increase following FY2014, for the first time in 3 years.
- Ordinary income will decrease for 2 consecutive years since FY2016.

(Billion yen,%)

| | FY2017 (Forecast)(A) | FY2016 (Result)(B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Operating revenues | 2,760.0 | 2,603.5 | approx. 157.0 | 6.0 |
| Operating income | 115.0 | 136.4 | approx. (21.0) | (15.7) |
| Ordinary income | 100.0 | 121.4 | approx. (21.0) | (17.7) |
| Net income attributable to owners of parent | 70.0 | 114.6 | approx. (45.0) | (39.0) |

## 【Non-Consolidated】

(Features of non-consolidated financial results)

- Operating revenues will increase following FY2014, for the first time in 3 years.
- Ordinary income will decrease for 2 consecutive years since FY2016.

(Billion yen,%)

| | FY2017 (Forecast)(A) | FY2016 (Result)(B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Operating revenues | 2,510.0 | 2,389.7 | approx. 120.0 | 5.0 |
| Operating income | 95.0 | 117.2 | approx. (22.0) | (19.0) |
| Ordinary income | 75.0 | 99.1 | approx. (24.0) | (24.3) |
| Net income | 55.0 | 72.0 | approx. (17.0) | (23.6) |

# Summary of Forecast for FY2017 <2>

## 【Principal Figures】

(TWh,%)

| (Electricity sales volume) | FY2017 (Forecast)(A) | FY2016 (Result)(B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Low voltage | 37.7 | 38.8 | (1.1) | (2.8) |
| High voltage・Extra-high voltage | 81.6 | 83.0 | (1.4) | (1.7) |
| Total | 119.3 | 121.8 | (2.5) | (2.0) |

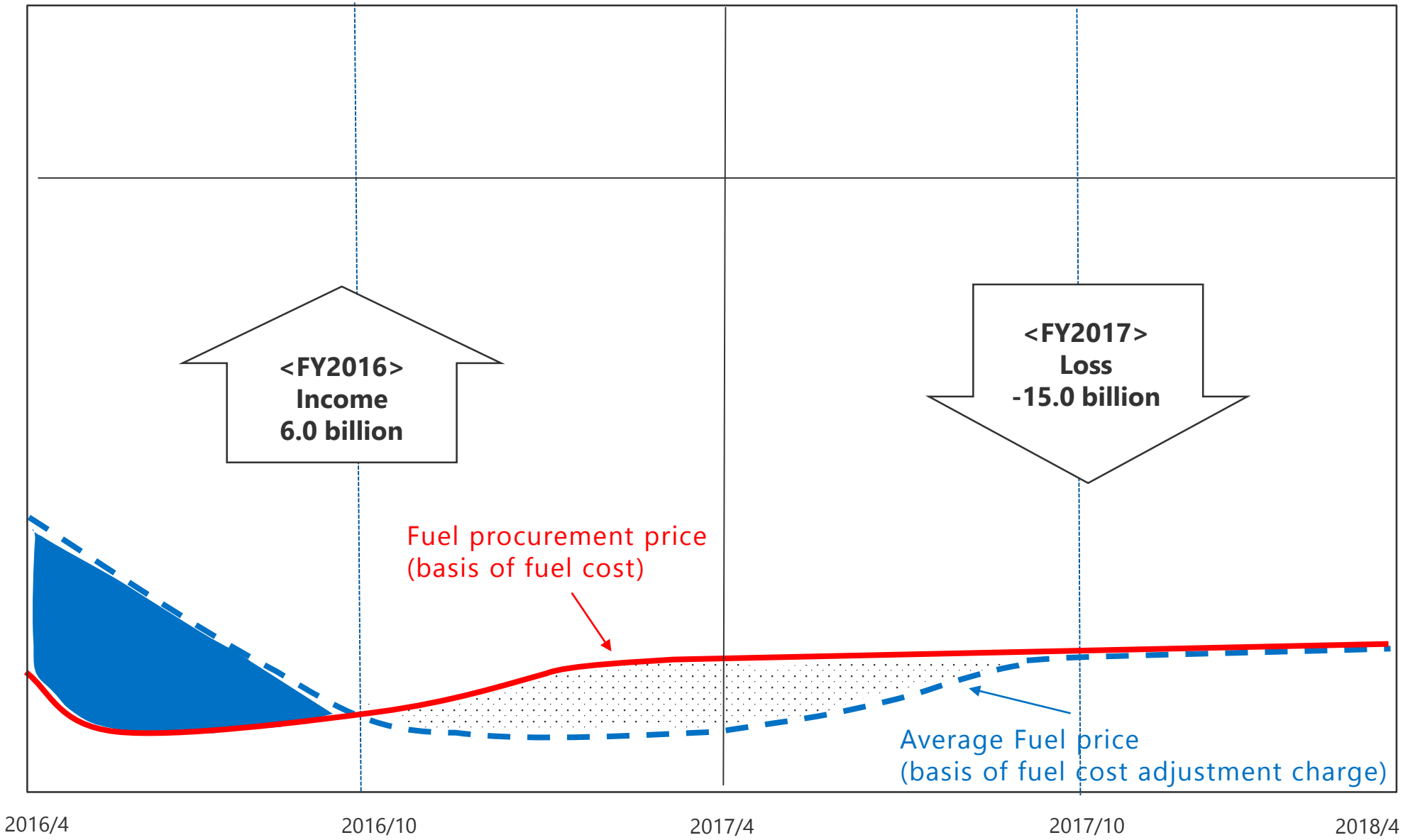
| (Other principal figures) | | FY2017 (Forecast) | FY2016 (Result) |
|---|---|---|---|
| CIF price: crude oil | ($/b) | approx. 55 | 47.6 |
| FX rate | (yen/$) | approx. 110 | 108.4 |
| Nuclear power utilization rate | (%) | - | - |

(Billion yen)

| (Income sensitivity) | | FY2017 (Forecast) | FY2016 (Result) | |
|---|---|---|---|---|
| CIF price: crude oil | (1$/b) | 7.5 | 8.5 | *1,2 |
| FX rate | (1yen/$) | 5.5 | 4.5 | *1 |
| Flow rate | (1%) | 0.5 | 0.5 | |
| Interest rate | (1%) | 5.0 | 5.0 | |

*1 These figures represent income sensitivity for fuel expenses. Fluctuation of CIF price (crude oil) and FX rate will be reflected in sales revenue, in cases where average fuel price fluctuates and fuel cost adjustment system will be applied.
*2 The impact value of crude oil price includes the impact of LNG price because LNG price is subject to crude oil price.

# (Reference)
# Impact of accrued income incurred by fuel cost adjustment system in FY2017 (Forecast)



# Profit Allocation Policy and Dividends for the Fiscal Year under Review, and the Fiscal Year to Come

## <Profit Allocation Policy>

- The Company will work to maintain stable dividends after taking account of financial condition and other factors, while continuously investing in building and operating facilities that are essential for a safe and stable supply of electricity.

## <Dividends for the fiscal year (FY2016)>

- For FY2016, on the assumption that we will work to further increase our management efficiency, the year-end dividends per share is expected to be **15 yen** in comprehensive consideration of med- and long-term financial position, managerial environment, etc.

| | Interim Dividends per share (yen) | Year-end Dividends per share (yen) | Annual Dividends per share (yen) |
|---|---|---|---|
| FY 2016 | 15 | 15 | 30 |
| FY 2015 | 10 | 15 | 25 |

## <Dividends for the fiscal year to come (FY2017)>

- For FY2017, on the assumption that we will work to further increase our management efficiency, annual dividends per share is expected to be **30 yen** in comprehensive consideration of med- and long-term financial position, managerial environment, etc.

# 02 Management Situation

# Mid-term target toward the achievement of "What We Aim For" (Initiatives for management issues)

| | |
|---|---|
| Chubu electric Power Group **"What We Aim For"** | - As a leading company that provides services that exceed expectations to customers ahead of our competitors, we will aim to become a **"total energy service corporate group that is one step ahead."** |

To achieve "What We Aim For," we will implement **four priority measures**

- Measures to increase the safety of the Hamaoka Nuclear Power Station
- Measures to accelerate growth
- Measures to ensure stable power supply for new era
- Measures to construct a business framework to make swift responses

## Quantitative mid-term target toward the achievement of "What We Aim For"

| | |
|---|---|
| Chubu electric Power Group **Mid-term target** | We will aim to achieve **"consolidated ordinary income of over 150 billion yen"** in FY2018. |

# Development of high efficiency Thermal Power Plants

## 【Outline of development of Nishi-Nagoya Thermal Power Plant Unit No.7】

| | |
|---|---|
| Output (at the generation end) | 2,376 MW |
| Thermal efficiency (LHV basis) | Approx. 62% |
| Fuel | LNG |

Effect due to start of operation
- LNG consumptions
  Reduce 0.5 million tons per year
- $CO_2$ emissions
  Reduce 1.4 million tons per year

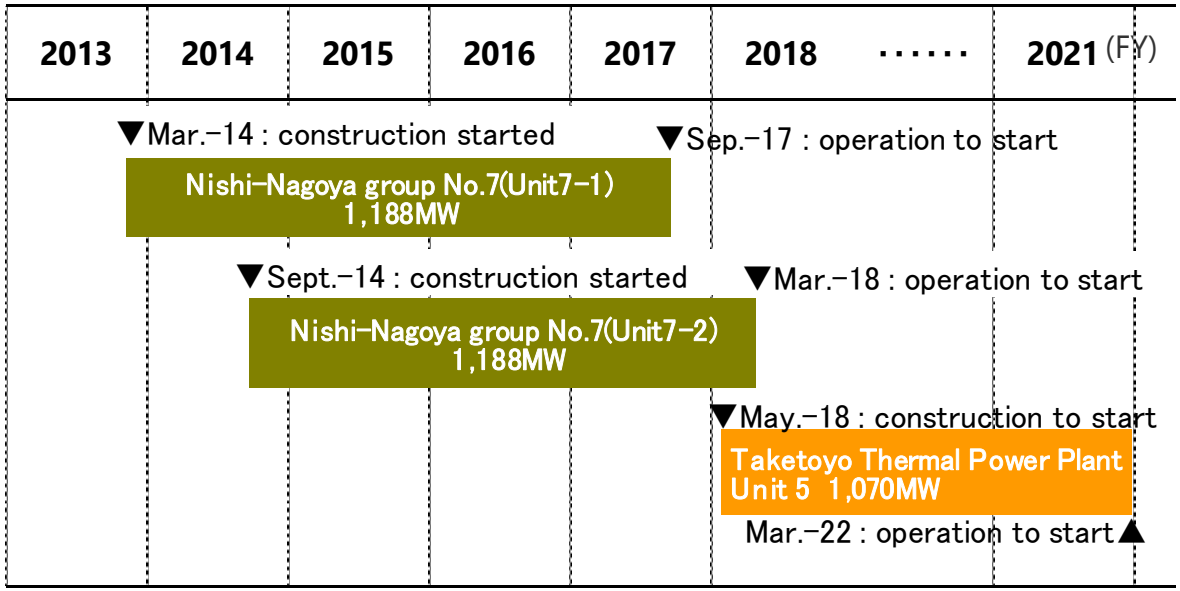
## 【Outline of development of Taketoyo Thermal Power Plant Unit No.5】

| | | |
|---|---|---|
| Output (at the generation end) | | 1,070 MW |
| Thermal efficiency (LHV basis) | | 46% |
| Fuel | | Coal・Wood biomass |
| Wood biomass | Mixed fuel burning ratio | Approx. 17% (Heating value ratio) |
| | Annual use of fuel | Approx. 0.5 million tons |
| | Electricity generated by Biomass power | Approx. 1.2 TWh per year |

Effect due to start of operation
- Secure the stable and reasonably priced base load power source
- $CO_2$ emissions
  Reduce 0.9 million tons per year*

* Comparison with single combustion of coal

## (Reference) Development schedule



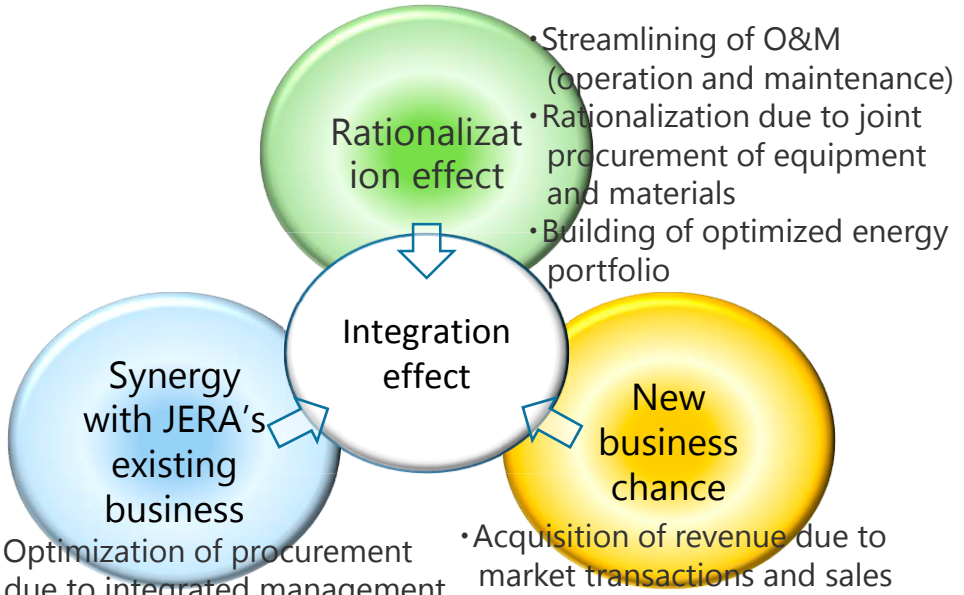

## 【Change of Total Thermal efficiency(LHV basis)】


(Note)"10 EPCos Total" values are based on " Environmental Action Plan by the Japanese Electric Utility Industry" published by The Federation of Electric Power Companies of Japan (FEPC)

# Business Expansion of JERA

- TEPCO Fuel & Power, Incorporated and Chubu Electric established "JERA Co., Inc." effective from April 30, 2015, as a new company that implements "a comprehensive alliance covering the entire energy supply chain, from upstream fuel and procurement through power generation." After establishing JERA, business was gradually transferred from both companies to JERA.
- In business that has been transferred so far, actions that could not be realized by Chubu Electric Power alone are initiated, and in March 2017, it has been agreed on to integrate fuel acceptance, storage and gas conducting business and existing thermal power generation business of both companies.
- In order to develop continuous growth strategies and further improve corporate values of JERA, examinations will be made in detail toward integration.

## Integration effect of existing thermal power generation business, etc




## Roadmap of the Comprehensive Alliance

| | |
|---|---|
| April 30, 2015 | Established JERA<br>Start new fuel procurement and fuel related business, new establishment and replacement of domestic thermal power stations and new overseas power generation business |
| October 1, 2015 | Integrated fuel transportation business and fuel trading business to JERA |
| July 1, 2016 | Integration of existing fuel businesses(upstream/procurement) and existing overseas power generation/energy infrastructure business to JERA |
| **March 28, 2017** | **Agreed on to integrate fuel acceptance, storage and gas conducting business and existing thermal power generation business to JERA** |
| 1st half FY 2017 | Conclusion of joint-venture agreement on integration of fuel receipt/storage and gas transportation businesses, and existing thermal power generation businesses to JERA. |
| 1st half FY 2019 | Integration of fuel receipt/storage and gas transportation businesses, and existing thermal power generation business (target) |

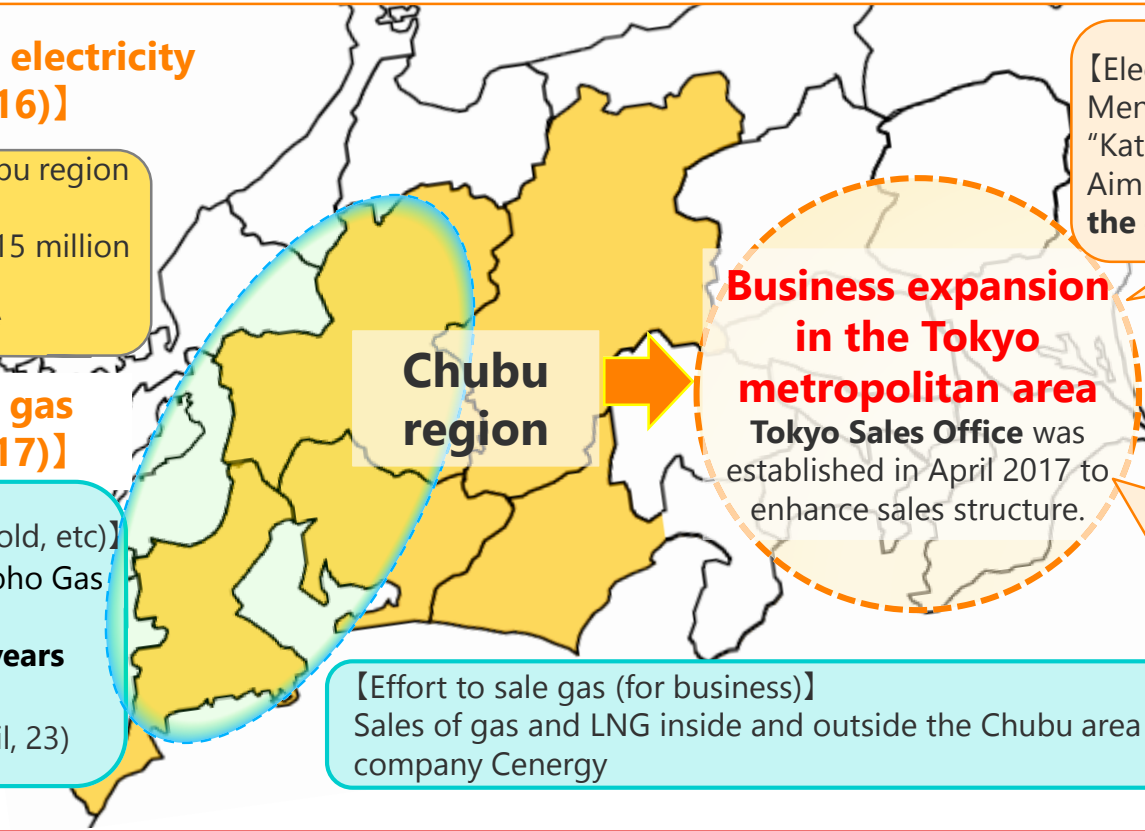
- Taking full liberalization of entry to gas business from April 2017 as an opportunity, gas has begun to be sold to household customers in addition to conventional customers for industrial use and business use.
- With competitive procurement capacity of JERA as a lever, total energy service will be expanded through development and provision of new services centering on "gas and power".

**【Full liberalization of the electricity retail markets (April 1, 2016)】**

New electric tariff menu in Chubu region (for household)
The number of applications : 1.15 million (As of the end of April, 10)
Change rate : **Approx. 30%***

**【Full liberalization of the gas retail markets (April 1, 2017)】**

【Gas retail sales target (for household, etc)】
Sales for household and other in Toho Gas area (Aichi, Gifu and Mie Pref.)
**200 thousand customers in five years**
The number of applications :
26 thousand (As of the end of April, 23)




【Electricity retail sales target (for household)】
Menu for the Tokyo metropolitan area "KatEne Plan"
Aim to achieve **200 thousand contracts at the earliest**

【Effort to sale electricity (for business)】
Sales utilizing customer base in the Chubu area and Diamond Power of group companies

【Effort to sale gas (for business)】
Sales of gas and LNG inside and outside the Chubu area coordinating with group company Cenergy

**Expansion of gas & electric power in the Chubu region and the Tokyo metropolitan area**

Electricity sales outside Chubu region, primarily Tokyo metropolitan area in 2030
→ Aim for increase to **20 TWh per year**
Gas/LNG sales in and outside Chubu region → Aim for increase to **3 MTPA**

* Estimated value of customers with benefit of electricity rate due to switch from conventional menu to new price menu ("Otoku Plan" , "Toku-toku Plan", "Biji-toku Plan"). (estimated value in March 2016)

# Safety improvement measures on Hamaoka Nuclear Power Station <onsite>

- Major construction works at Unit 4 have been completed excluding some construction works including re-examination of construction work details based on the situation in the field. We are presently undergoing inspections by the Nuclear Regulation Authority to ensure that the power plant is safe and complies with the new regulatory standards.

  (Reference) On-site survey was conducted by members of the Nuclear Regulation Authority regarding items concerning the plant in June 2015 and items concerning tsunami and earthquake in March 2017.

- We are strongly committed to preventing similar accidents that happened at Fukushima Daiich Nuclear Power Station, and will continue to strengthen our equipment "onsite" abilities, while fostering collaboration with related organizations to enhance our "offsite" abilities to prepare against nuclear accidents.

## Onsite（in the premises of the plant）

The risk of nuclear accidents

**1 Prevent the occurrence of any problems**
We designed the nuclear power plant to be free from problems that could lead to accidents, and work to maintain and manage the quality.

Even if a problem takes place,

**2 Prevent any problem from developing into an accident**
We work to identify a problem as early as possible and suspend the operation of the reactor as necessary, thereby preventing the problem from developing into an accident

Even if the problem leads to an accident,

**3 Be prepared for an accident; prevent an accident from escalating to a severe accident**
We ensure that the plant has enough functions to cool the reactors and their containers. We also take multifaceted measures to prepare for the loss of these functions, thereby preventing a serious meltdown of the reactor core (severe accident).

Even in the event of a reactor core meltdown,

**4 Mitigate the influence of a severe accident**
We will mitigate the influence of a severe accident by making flexible responses, including using portable power sources and water injection and heat removal equipment.

Reduced to the minimum
Still some risks remain

Low

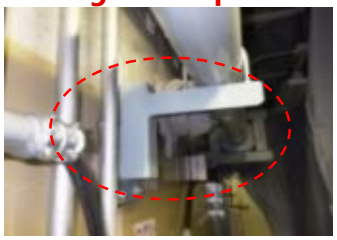
**Offsite（next page）**

Preventing accidents

Preparing for accidents

## <Enhancement of the equipment measures>

### Resistance against large earthquakes



Work to reinforce supports for pipes

### Do not allow flooding by tsunami

Protection wall (height:22m above sea level)

### Secure multi-layered measures, including power source and water injection heat removal equipment

**More power supply**

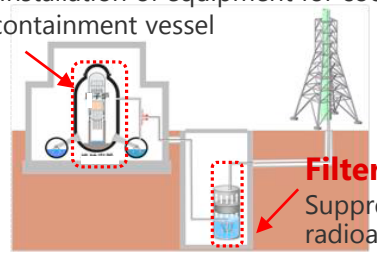
Gas turbine generator

**More water injection**

Mobile water injection pump

### Prevent breakage of containers

Installation of equipment for cooling top cover of containment vessel



**Filter vent equipment**
Suppress the serious release of radioactive substances

## <Enhancement of onsite staff's abilities>

### Efforts for effectively functioning equipment

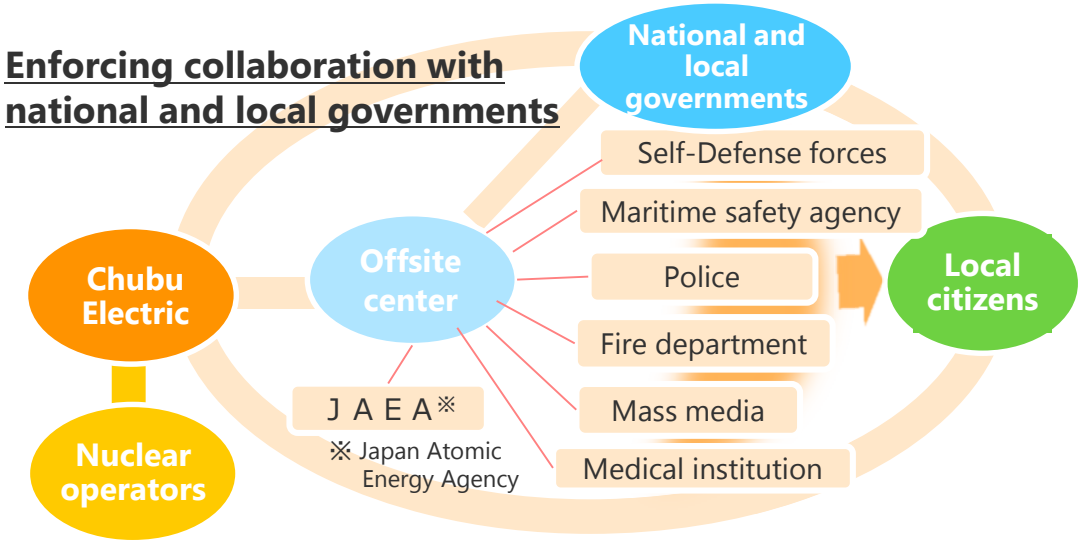
Emergency Response Force (ERF)
Securing of initial response personnel 24 hours a day, 365 days a year

Operation of Mobile water injection pump

## Offsite（outside of the power plant site）

As preparation for nuclear disasters, coordination with the national government and local governments will be enhanced so that support and cooperation concerning evacuation of residents can be provided with the local community.

### Enforcing collaboration with national and local governments




### Strengthen the system for issues on resident evacuation

### Nuclear disaster training held by Shizuoka Prefecture

Training to check the contamination level

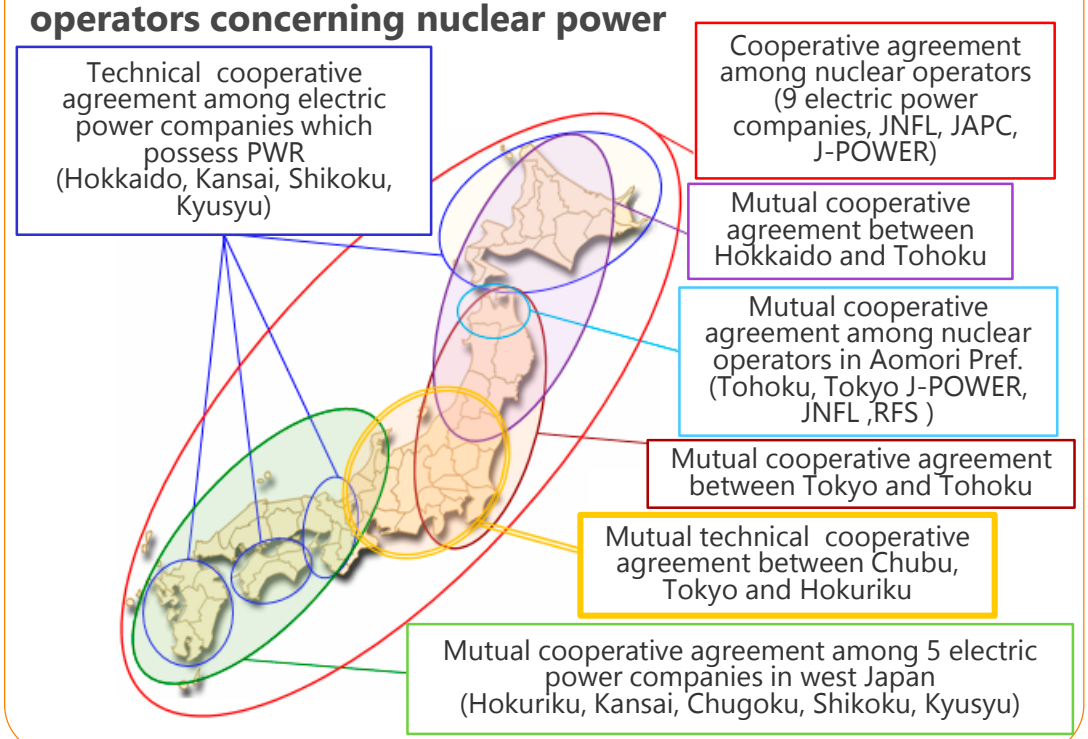
Training of transport of patients with risk of exposure to medical institutions

## Mutual cooperative systems

On March 7, 2017, Chubu Electric Power concluded an agreement on mutual technical cooperation regarding improvement of nuclear safety with TEPCO Holdings and Hokuriku Electric Power.

By having knowledge shared among the 3 companies, safety is further enhanced, and due to mutual cooperation in support for settling the accident and support for evacuation of residents when a nuclear disaster occurs, effectiveness of response actions for a nuclear disaster is further improved.

### Nationwide expansion of cooperative agreement of operators concerning nuclear power



# Efforts for development of business structure that can adapt to change of environment

## 【Reinforcement of business foundation utilizing ICT and expansion of business areas】

- ICT such as IoT, big data and AI will be utilized for reinforcement of business foundation, and examinations will be made for provision of new services.

＜Specific examples＞

| | |
|---|---|
| Operation support service of thermal power generation | Monitoring of signs of equipment failure by utilizing big data and analysis technology |
| New service due to IoT of telegraph poles | Watching service for children and senior citizens by installing various sensors to telegraph poles |
| Achieve the sophistication and efficiency power transmission/distribution business | Use of advanced technology for formation, maintenance and management of equipment |
| Services for household | Energy management service utilizing IoT |

## 【Development of business structure according to change of market structure】

- Outlook that electricity demand in Japan will drastically decrease and will not structurally expand in the future
- Increase of share of new electricity due to further intensified competition as an impact of full liberalization of entry to electricity business

Development of business structure where efforts are proactively made for establishment of new revenue base including gas & power
Further improvement of corporate values by continuing to realize efficient management and creating new business and innovative service ahead of other companies

# 03 Reference Data(1): Financial Results

# Consolidated Statements of Income

(Rounded down to nearest 100 million yen.) (Billion yen,%)

| | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Operating revenues | 2,603.5 | 2,854.0 | (250.5) | (8.8) |
| Non-operating revenues | 18.4 | 19.3 | (0.8) | (4.5) |
| Ordinary revenues | 2,621.9 | 2,873.3 | (251.3) | (8.7) |
| Operating expenses | 2,467.0 | 2,569.0 | (101.9) | (4.0) |
| Non-operating expenses | 33.4 | 48.6 | (15.2) | (31.4) |
| Ordinary expenses | 2,500.5 | 2,617.7 | (117.2) | (4.5) |
| <Operating income> | <136.4> | <284.9> | <(148.5)> | <(52.1)> |
| Ordinary income | 121.4 | 255.6 | (134.1) | (52.5) |
| Reserve for fluctuation in water levels | (0.3) | 12.2 | (12.5) | - |
| Extraordinary income(*) | 30.2 | 10.8 | 19.4 | 180.2 |
| Income taxes | 35.2 | 82.1 | (46.9) | (57.1) |
| Net income attributable to non-controlling interests | 2.2 | 2.2 | (0.0) | (1.0) |
| Net income attributable to owners of parent | 114.6 | 169.7 | (55.0) | (32.4) |

* FY2016 : Gain on change in equity
FY2015 : Reversal of provision for loss in conjunction with discontinued operations of nuclear power plants

# Non-consolidated Statements of Income <1>: Operating revenues

(Rounded down to nearest 100 million yen.) (Billion yen,%)

| | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Electricity sales revenues | 2,027.6 | 2,337.8 | (310.2) | (13.3) |
| Sold power to other electric utilities, and transmission revenue, etc. * | 85.9 | 63.0 | 22.9 | 36.4 |
| Grant under act on purchase of renewable energy sourced electricity | 203.4 | 146.5 | 56.8 | 38.8 |
| Other | 26.5 | 25.0 | 1.5 | 6.4 |
| Electric utility operating revenues | 2,343.5 | 2,572.4 | (228.8) | (8.9) |
| Incidental businesses operating revenues | 46.1 | 75.8 | (29.7) | (39.2) |
| Total operating revenues | 2,389.7 | 2,648.3 | (258.6) | (9.8) |

【Major factors for Change】

- A decrease in fuel cost adjustment charge : -357.8
- An increase in surcharge for promoting renewable energy sourced electricity : +72.4

- An increase in purchase of renewable energy sourced electricity

- A decrease in gas supply business

* Sold power to other utilities, Sold power to other suppliers, Transmission revenue and Settlement revenue among utilities

# Non-consolidated Statements of Income <2>: Operating expenses

(Rounded down to nearest 100 million yen.) (Billion yen,%)

| | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Salaries and employee benefits | 176.2 | 181.5 | (5.3) | (3.0) |
| Fuel | 614.5 | 805.6 | (191.0) | (23.7) |
| Nuclear back-end expenses *1 | 13.3 | 16.6 | (3.3) | (20.0) |
| Purchased power, and transmission charges, etc. *2 | 356.9 | 326.6 | 30.3 | 9.3 |
| Maintenance | 204.6 | 200.9 | 3.7 | 1.8 |
| Depreciation | 236.2 | 239.3 | (3.0) | (1.3) |
| Taxes other than income taxes | 123.8 | 125.2 | (1.4) | (1.1) |
| Levy under act on purchase of renewable energy sourced electricity | 233.4 | 161.0 | 72.4 | 45.0 |
| Other | 272.4 | 260.2 | 12.2 | 4.7 |
| Electric utility operating expenses | 2,231.7 | 2,317.3 | (85.5) | (3.7) |
| Incidental business operating expenses | 40.6 | 65.7 | (25.0) | (38.1) |
| Total operating expenses | 2,272.4 | 2,383.0 | (110.6) | (4.6) |

【Major factors for Change】

- A decrease in fuel price

- An increase in purchase of renewable energy sourced electricity

- A decrease in gas supply business

*1 Reprocessing of irradiated nuclear fuel, Preparation of reprocessing of irradiated nuclear fuel, Contributions for reprocessing of irradiated nuclear fuel, Designated radioactive waste disposal expenses, Decommissioning nuclear power plants

*2 Sold power to other utilities, Sold power to other suppliers, Portion of the existing power generation expenses such as spent fuel reprocessing for which contracts have been signed, transmission charges, supply connection transmission charges, Settlement revenue among utilities

# Non-consolidated Statements of Income <3>: Net income

(Rounded down to nearest 100 million yen.) (Billion yen,%)

| | FY2016 (A) | FY2015 (B) | Change (A-B) | Change (A-B)/B |
|---|---|---|---|---|
| Operating income | 117.2 | 265.2 | (147.9) | (55.8) |
| Non-operating revenues | 13.0 | 13.8 | (0.8) | (6.0) |
| Non-operating expenses | 31.1 | 45.4 | (14.2) | (31.4) |
| Ordinary revenues | 2,402.7 | 2,662.2 | (259.4) | (9.7) |
| Ordinary expenses | 2,303.6 | 2,428.5 | (124.8) | (5.1) |
| Ordinary income | 99.1 | 233.6 | (134.5) | (57.6) |
| Reserve for fluctuation in water levels | (0.3) | 12.2 | (12.5) | - |
| Extraordinary income | - | 10.8 | (10.8) | - |
| Income taxes | 27.4 | 75.0 | (47.5) | (63.4) |
| Net income | 72.0 | 157.2 | (85.1) | (54.2) |

【Major factors for Change】

- Electricity business : -143.2
- Incidental business : -4.7

- A decrease in interest expenses

- FY2015 : Reversal of provision for loss in conjunction with discontinued operations of nuclear power plants

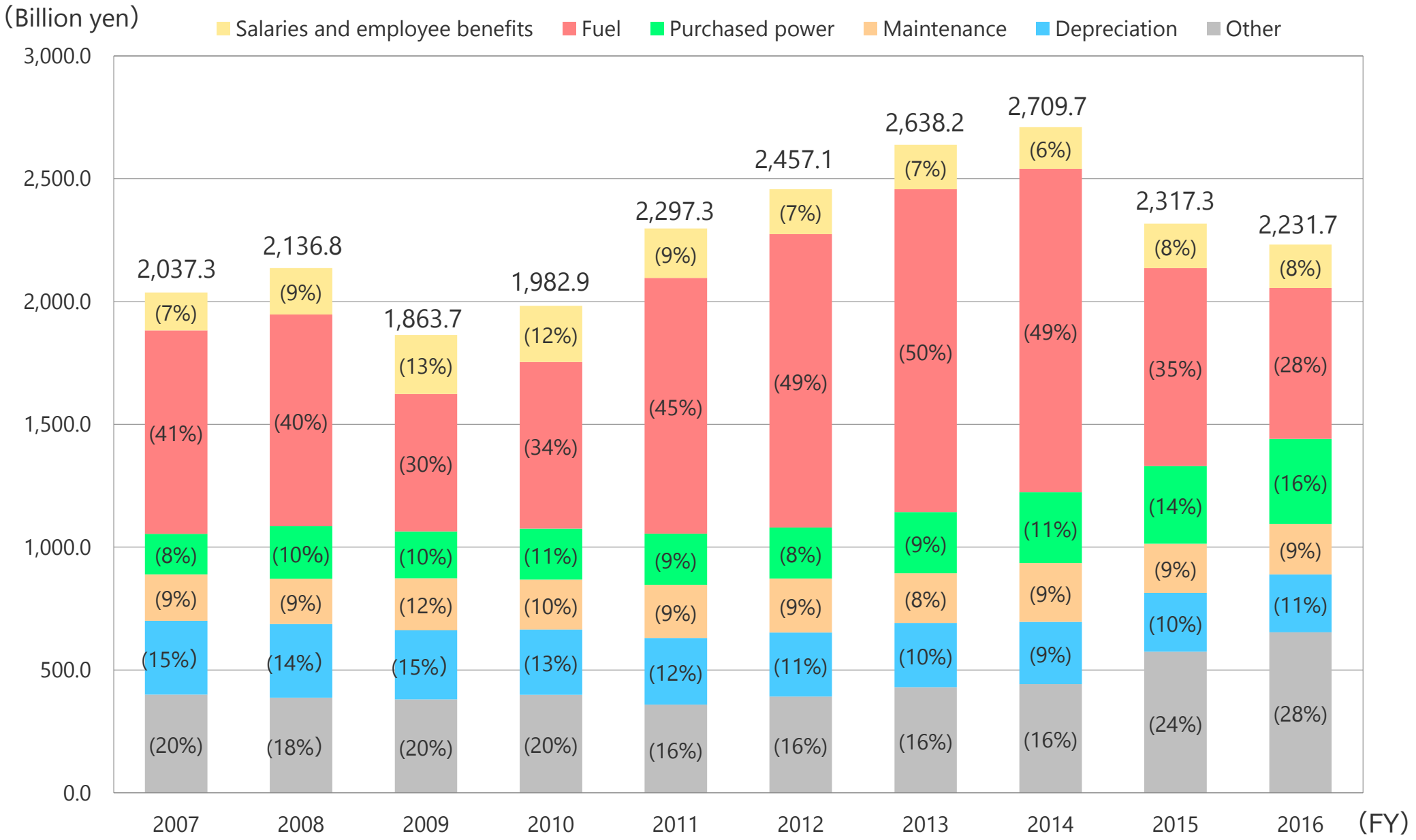
# Consolidated and Non-consolidated Financial Standing

(Rounded down to nearest 100 million yen.) (Billion yen)

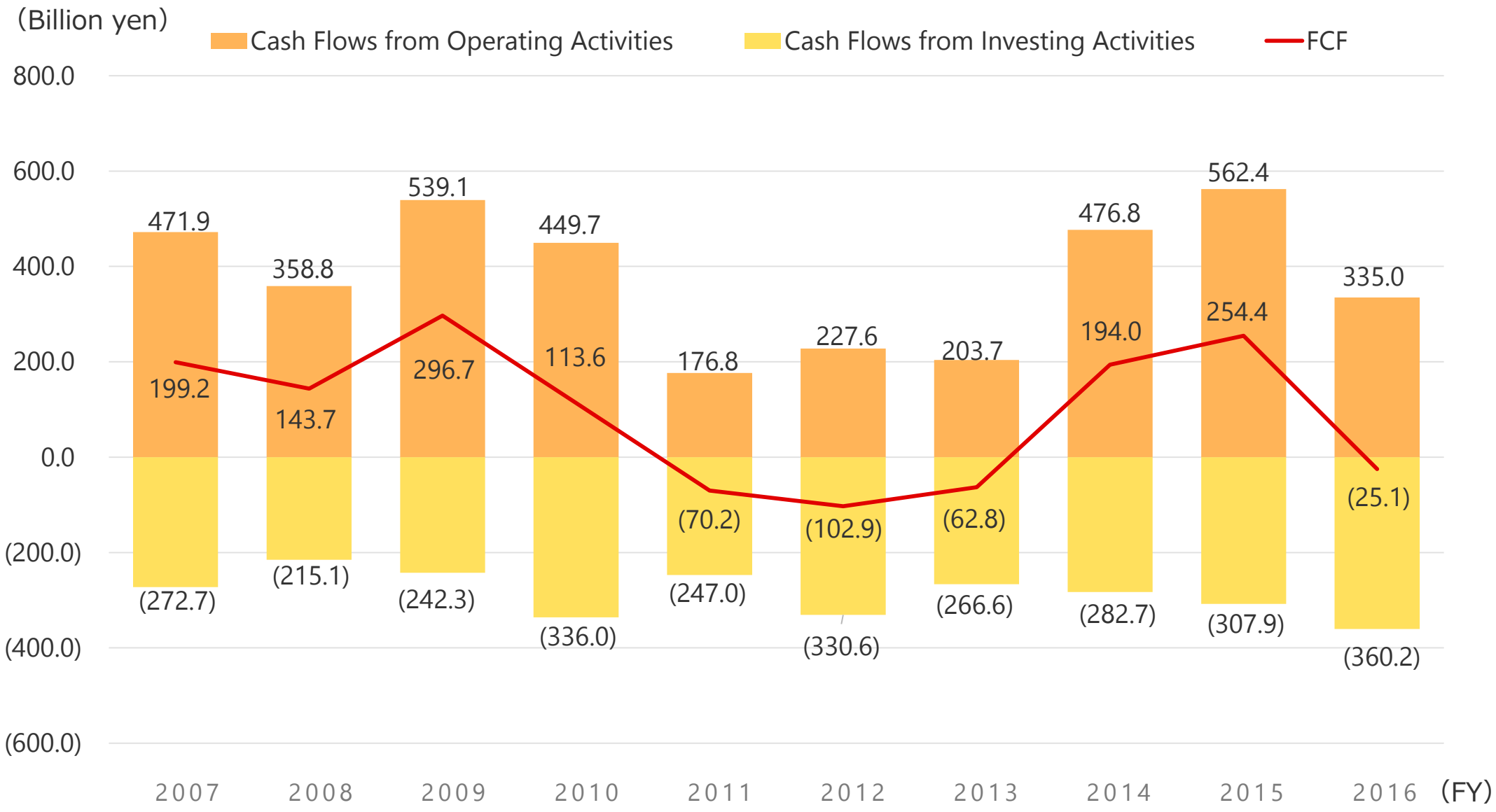
| | 2017.3 (A) | 2016.3 (B) | Change (A-B) |
|---|---|---|---|
| Assets | 5,412.3 | 5,538.9 | (126.6) |
| | <4,956.5> | <5,065.5> | <(109.0)> |
| Liabilities | 3,687.5 | 3,901.8 | (214.2) |
| | <3,535.9> | <3,697.3> | <(161.3)> |
| Net assets | 1,724.7 | 1,637.1 | 87.6 |
| | <1,420.5> | <1,368.2> | <52.3> |
| Shareholders' equity ratio (%) | 31.1 | 28.9 | 2.2 |
| | <28.7> | <27.0> | <1.7> |
| Outstanding interest-bearing debt | 2,674.7 | 2,625.4 | 49.2 |
| | <2,662.8> | <2,629.8> | <33.0> |

Non-consolidated figures in <>.

# Electric utility operating expenses (Non-Consolidated)

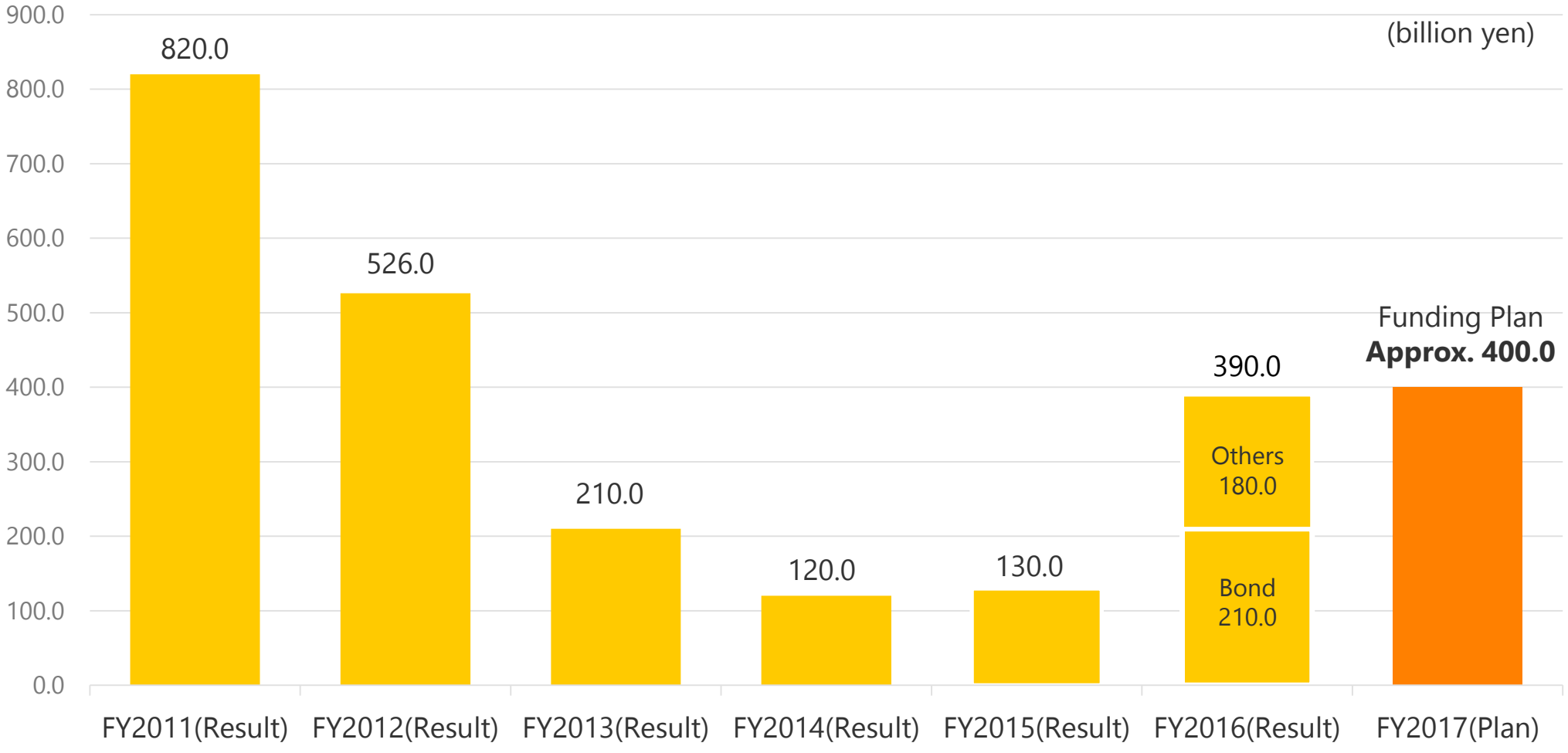


# Cash Flow (Consolidated)



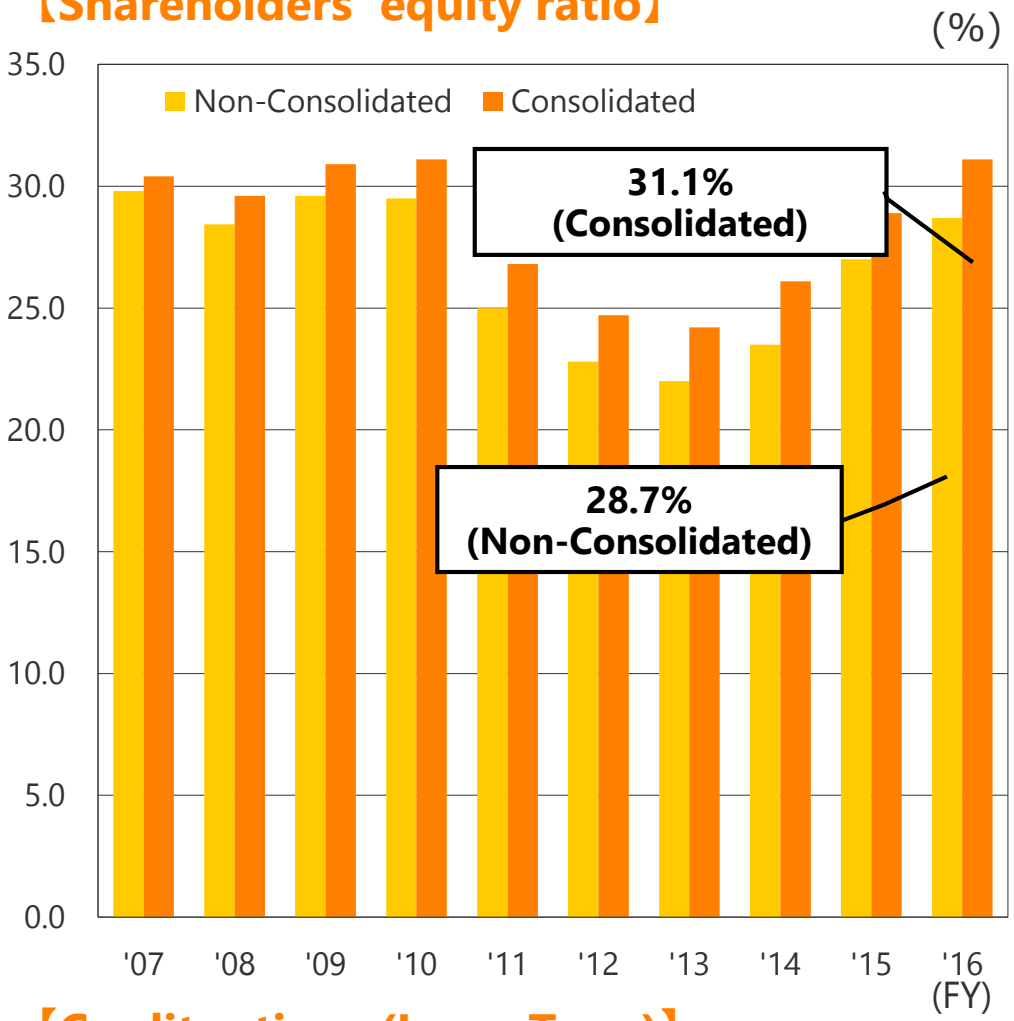
# Fund Raising

- We raised total approximately 1,500 billion yen in long-term funding for 3 years since the shutdown of Hamaoka Nuclear Power Station.
- We raised 390 billion yen in long-term funding in FY2016.
- We plan to raise approximately 400 billion yen in long-term funding in FY2017.

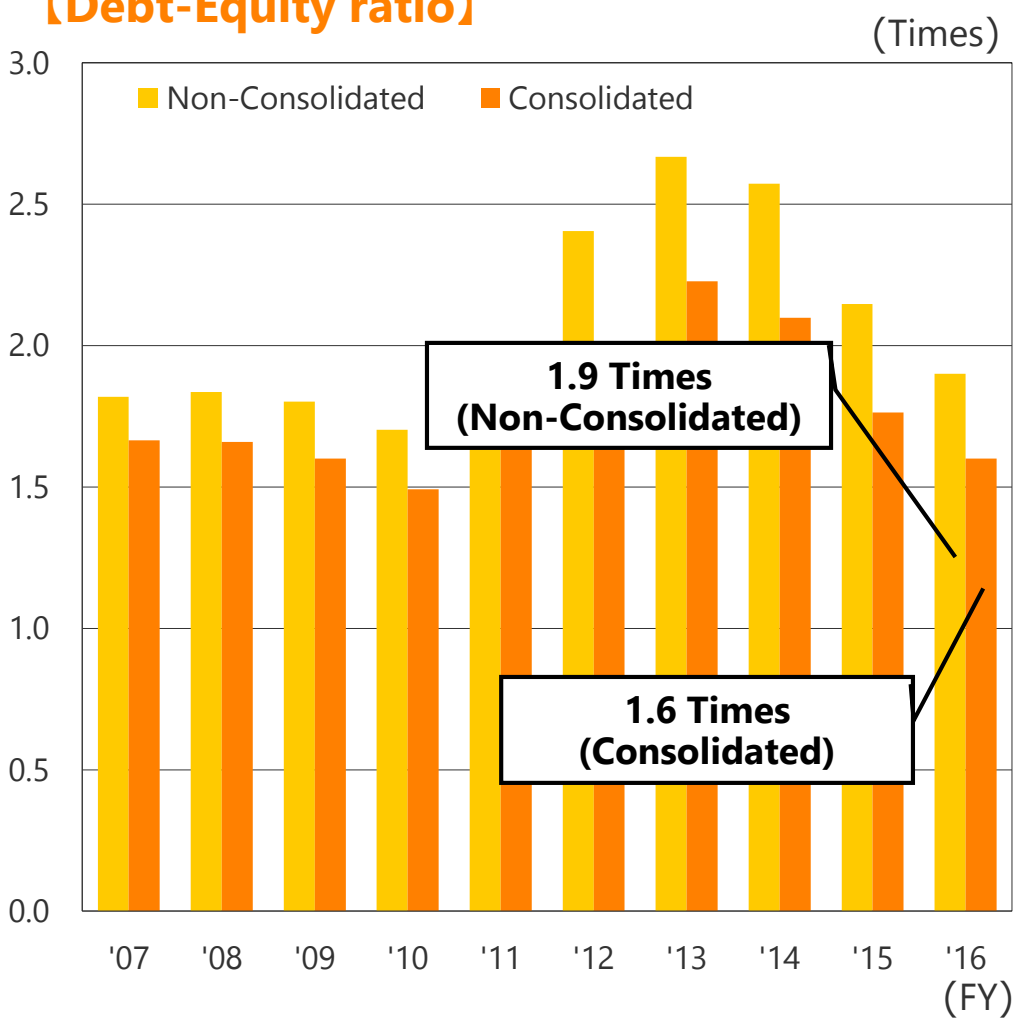


# Financial Ratio, Credit Ratings

## 【Shareholders' equity ratio】




## 【Debt-Equity ratio】




## 【Credit ratings (Long-Term)】

| Moody's | R&I | JCR |
|---|---|---|
| A3 | A+ | AA |

# 03 Reference Data (2) : Management Information

# Schedule of the Electricity System Reform

## 【Schedule of the Electricity System Reform】

| | Schedule for implementing the measures | Schedule for Enacted the bill |
|---|---|---|
| 3rd phase:<br>Further securing the neutrality of the power transmission/distribution sector through legal unbundling; Fully liberalizing electricity rates | In April 2020 | Enacted on June 17, 2015 |

## <Reference>Development of markets and rules for competitive activation (Subcommittee for accomplishment of the Electricity System Reform)

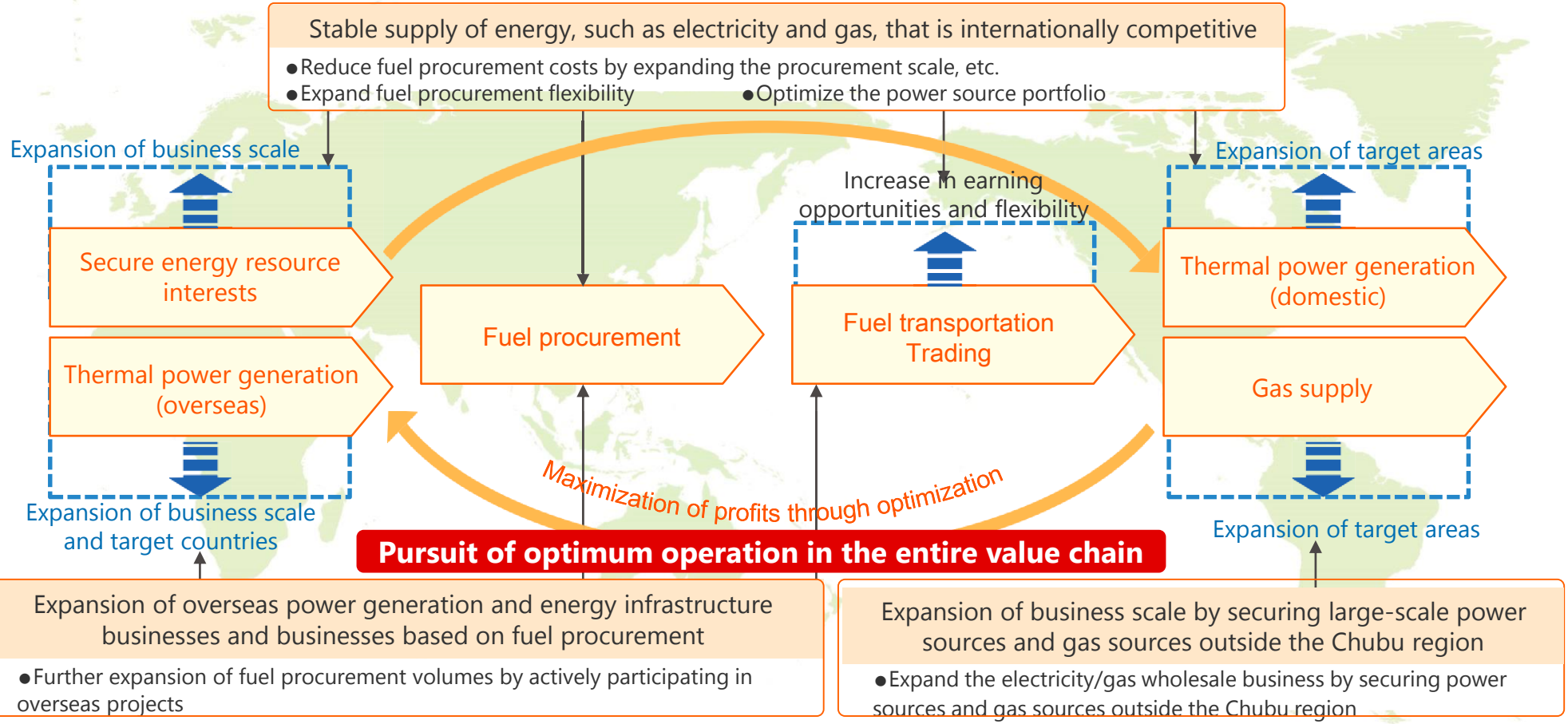
| | Timing for the introduction | Contents |
|---|---|---|
| Establishment of the Base-load power market | FY2019 | ・Establishment of a market that provides PPS with easy access to base-load power<br>・Institutionalizing major electric power companies' supply of base-load power to the market |
| Revision of utilization rule of interconnection line | FY2018 | ・Change the current utilization rule of interconnection line from "first-come priority" to an indirect auction system via spot market based on market principle |
| Introduction of Capacity mechanism | FY2020 | ・Introduction of a framework to ensure power supply and coordination capabilities that are required over the medium- to long-term |
| Establishment of the Non-fossil value trading market | FY2019 | ・Establishment of a market where retailers can procure non-fossil value |

## 【Revision of the Gas Business Act】

| | Scheduled for implementing the measures | Scheduled for enacted the bill |
|---|---|---|
| Full liberalization of the gas retail market | In April 1, 2017 | Enacted on June 17, 2015 |
| Legal unbundling of the gas pipeline business (Tokyo Gas Co., Ltd., Osaka Gas Co., Ltd., and Toho Gas Co., Ltd) | In April 2022 | |

# Initiatives of JERA <1>

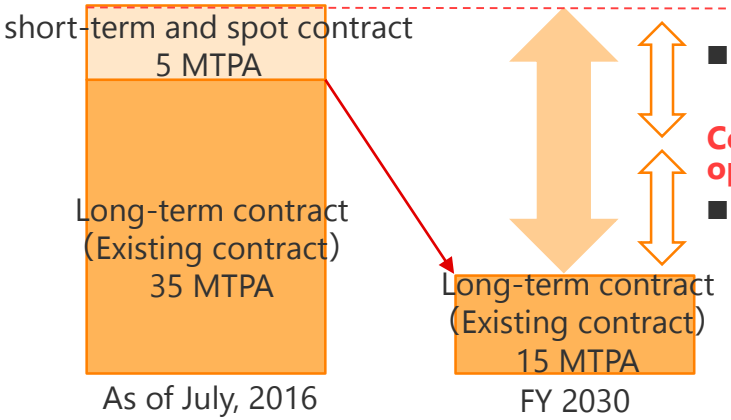
- JERA will expand business based on investment profits from each business and profits generated from the optimization of the value chain.
  - ➢ We will divide the value chain from the securing of interests of energy resources to procurement, transportation, gas supply and power generation (domestic and abroad) for each business, and aim to increase the investment returns of each business domain.
  - ➢ At the same time, on the operation side we will establish a system that can control profits and risks by optimizing the allocation of managerial resources and operations, in view of the activities of the entire value chain. As a competitive and innovative supplier, we intend to survive the competition both in the Japanese and global markets.



## 【Fuel business (upstream, procurement, transportation, trading)】

Optimum portfolio is create using the world's largest procurement scale and trading, and fuel procurement that can flexibly respond to change of business environment in the future is realized.

**○Creation of optimum portfolio of LNG**




■ Procurement with short-term and spot contract

**Combine various contracts to form the optimum portfolio***

■ Procurement with long-term contract
Examination of acquisition of upstream concession at the same time

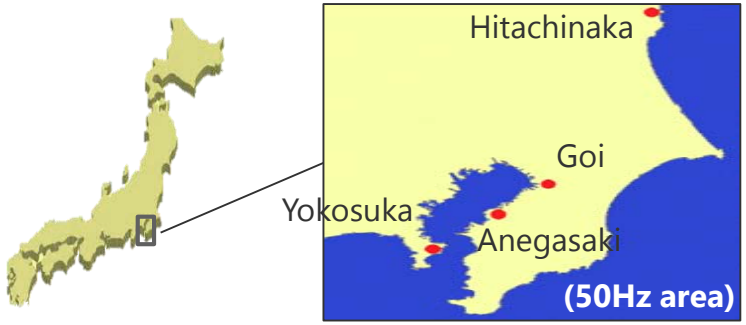
Factors contributing to change in handling scale
- Expansion of external sales
- Improvement of power generation efficiency
- Energy Policy

* Procurement by combining short-term and spot contract which has exceptional elasticity of procurement amount and long-term contract which has exceptional economy and stability

## 【Domestic power generation business (new establishment and replacement)】

Bring together the knowledge and technology of both companies to establish and replace thermal power stations, and thereby seek a balance between achieving improved competitiveness and addressing global warming issues.

| Place (Fuel) | Output | Start of operation |
|---|---|---|
| Hitachinaka (Coal) | 650 MW | 1st half FY 2021 |
| Goi (LNG) | Approx. 2,340 MW | FY 2022 - FY 2023 |
| Anegasaki (LNG) | Approx. 1,950 MW | FY 2022 - FY 2023 |
| Yokosuka (Coal) | Approx. 1,300 MW | FY 2023 |

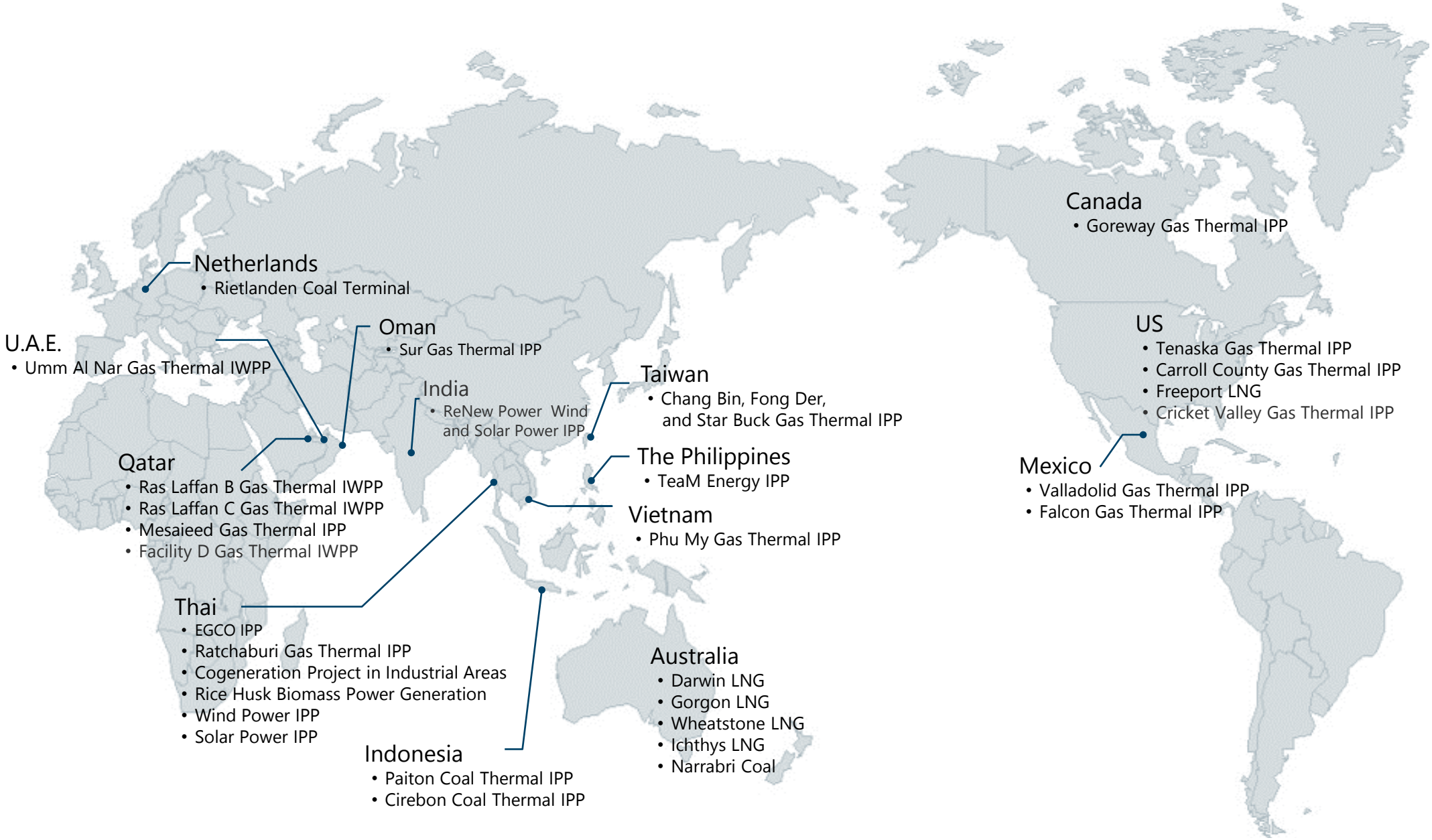



## 【Overseas power generation business】

By expanding power generation and energy infrastructure business overseas, economic growth and reduction of environmental load in developing countries are supported and new revenue source is acquired.

| | | |
|---|---|---|
| (US) Participation in Cricket Valley Gas Thermal IPP | Jan, 2017 | The first new power generation project outside of Japan in which JERA will take part, after succession of overseas power generation business |
| (India) Participation in Renewable Energy Business | Feb, 2017 | Acquisition of a part of shares from ReNew in India.<br>Aim to construct the power generation portfolio that includes renewable energy. |

# (Reference) Overseas IPP and Fuel projects of JERA Group (As of April 2017)

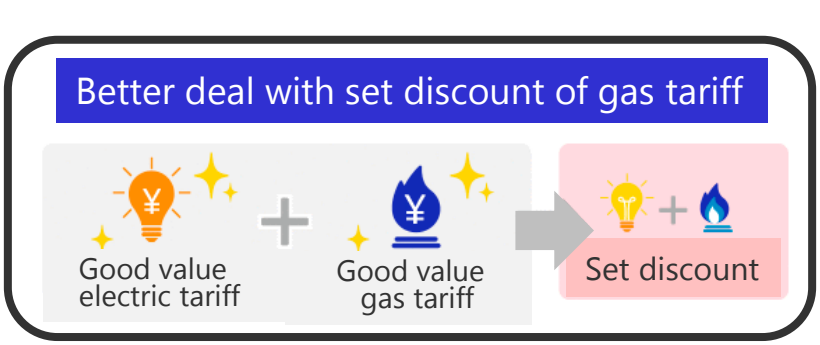


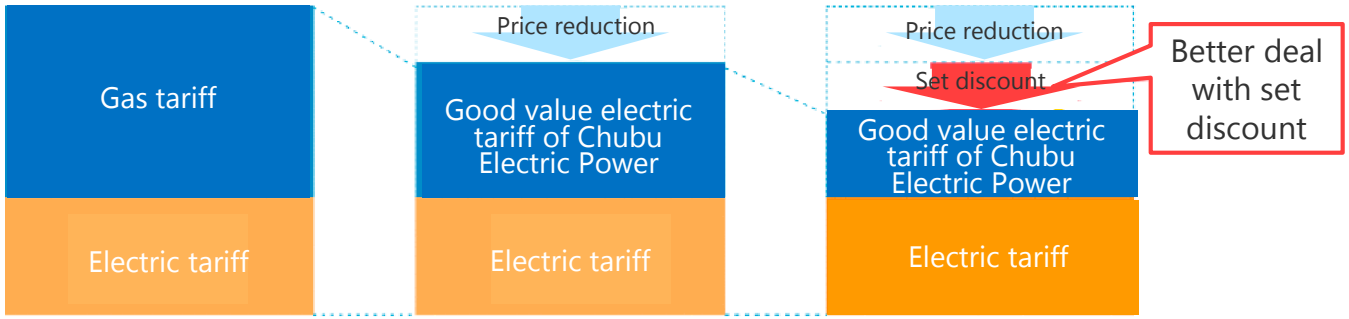
# Sales Strategy <1> : Optimum proposal of gas & electric power

- We arranged seven gas tariff menus, i.e. the KatEne Gas Plan for households and the BizEne Gas Plan geared toward businesses. They have been set at prices lower than the gas tariff menu offered by Toho Gas. Prices will be lower than the Gasuteki-Tokutoku menu (new Toho Gas tariff menu).
- We arranged a KatEne/BizEne Gas Set, which discounts 2% off the gas tariff by signing a contract both for electricity and gas.

| Menu | | | Discount rate *1 |
|---|---|---|---|
| Gas | Household | KatEne Gas Plan 1 | Be equal to 5-6% |
| | | KatEne Gas Plan 2 | Be equal to 6% |
| | | KatEne Gas plan 3 | Be equal to 6% |
| | Business | BizEne Gas Plan 1 | Be equal to 6-8% |
| | | BizEne Gas Plan 2 | Be equal to 7% |
| | | BizEne Gas Plan 3 | Be equal to 5% |
| | | BizEne Gas Plan 4 | Its merit varies significantly depending on the gas usage pattern and volume. |

| Menu | | | Discount rate *1 |
|---|---|---|---|
| Electricity | Electric lightning | Point Plan (10-30A) | Be equal to 1% |
| | | Otoku Plan (40-60A, 6kVA) | Be equal to 3% |
| | | Toku-Toku Plan (7kVA or more) | Be equal to 4-5% |
| | | Smart Life Plan *2 | Advantages according to the state of use of each time zone |
| | Power | Biji-Toku Plan *3 | Be equal to 5-7% |




Gas contract of Toho Gas

Gas contract of Chubu Electric Power

"Gas" and "electricity" set contract of Chubu Electric Power

*1 Both menus are compared based on model cases at the time of release.
*2 We developed new tariff menu "Smart Life Plan for Smart Airs" with TOYOTA HOUSING CORPORATION and the sales begun in April 2017.
*3 Biji-Toku Plan is excluded from the set discount offer.

# Sales Strategy <2> : Gas sales framework

- In 2001, Chubu Electric Power launched a natural gas sales operation geared towards large factories, harnessing its own pipelines. The company has since then been taking incremental steps to strengthen and expand its gas business.
- We started to sale gas to household and restaurant and other in April, 2017. (26 thousand applications as of end of April 2017)

## 【Entering into the gas retail business】

Chubu Electric Power
Energy Department
Gas retail section
(Directly-managed team)

Promotion methods

Door-to-door sales

TVCM DM

KatEne BizEne

Partners for sales

Sales by agent, etc
・Chubu Telecommunications (ctc)
・Community Network Center（CNCi）Group 11 companies
・CCJ Group 2 companies
・TOENEC

Partners for security

Security
・Iwatani
・GASTEC SERVICE
・Ogaki gas
・CHUBU SEIKI

Security operation framework
(including directly-managed team)
28 office, 300 persons

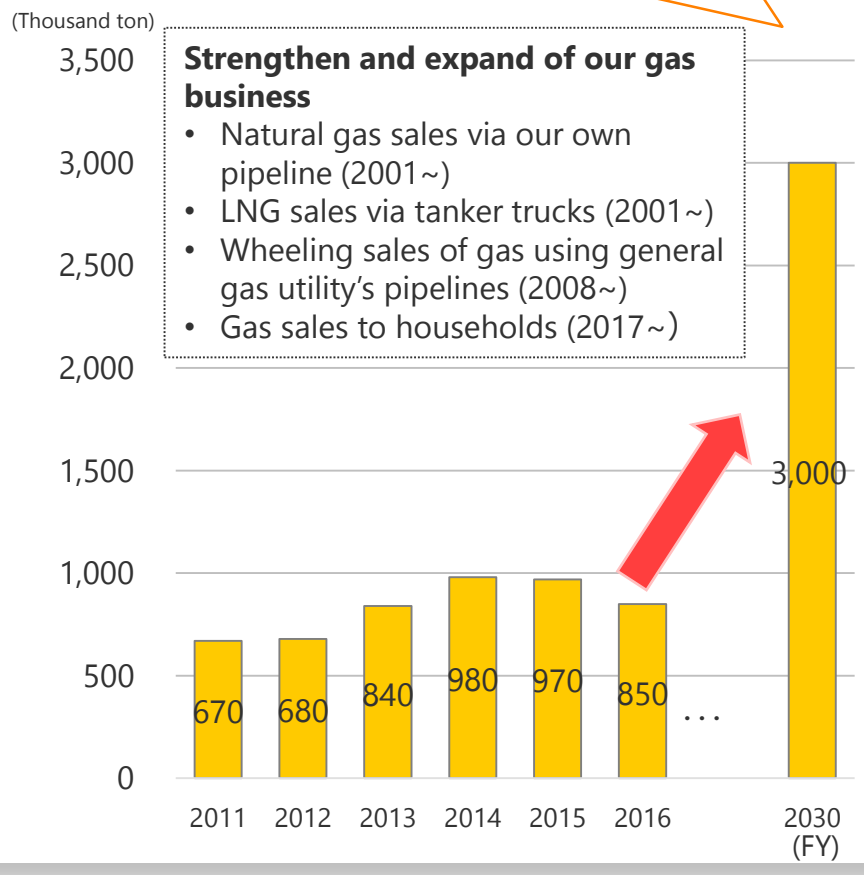
Aichi Pref., Gifu Pref. and Mie Pref.
Customers using city gas provided by Toho Gas
(Approx. 2.3 million customers)

Perfect opportunity to expand our share in the gas market.
Our aim is to attract 200 thousand customers by the end of FY 2021
(Around 10% of Toho Gas customers)

## 【Sales volume and Sales target of Gas and LNG】

Accelerating gas and LNG sales in and outside the Chubu region
Sales target in FY2030 3MTPA

**Strengthen and expand of our gas business**
- Natural gas sales via our own pipeline (2001~)
- LNG sales via tanker trucks (2001~)
- Wheeling sales of gas using general gas utility's pipelines (2008~)
- Gas sales to households (2017~)



# Sales Strategy <3> : Electricity sales framework in the Tokyo metropolitan area

## 【Electricity tariff menu in the Tokyo metropolitan area (KatEne Plan) 】

Features

**① Top-class low price**

- Discount rate is 5-10% (KatEne point included) compared with TEPCO Energy Partner's existing menu.

**② Benefit arising for all customer in various consumption**

- By adopting a 3-stage fee system, the unit price of the basic charge and energy charge is reduced respectively.

## 【Partners】 Promote electric sales through multiple sales channels, including sales through partner companies as well as direct sales

| | Procurement | Sales channels | Overview |
|---|---|---|---|
| House hold | Chubu Electric | Chubu Electric | Sales of the KatEne plan |
| | | EDION | Introduce and sell the KatEne Plan |
| | | BIGLOBE | Joint development menu （KatEne Plan + Communication） |
| | | Shizuoka Bank | Joint development menu （KatEne Plan + Home loan） |
| | | Chubu Telecommunications (ctc) | Joint development menu （KatEne Plan + Communication） |
| | Diamond Power | 12 city gas companies | We provides electricity through Diamond Power to city gas companies.<br>Each city gas company sells tariff menus that suit each customer. |
| Business | Chubu Electric | | Negotiation-based sales in the Tokyo metropolitan area through the customer bases in the Chubu area |
| | Diamond Power | | Negotiation-based sales in the Tokyo metropolitan area through the customer acquisition |

## 【Securing power sources】

| Power sources | Output | Fuel | Operation commences |
|---|---|---|---|
| Suzukawa Energy Center Co., Inc.（Fuji-shi, Shizuoka） | 100MW | Coal | September 2016 |
| Hitachinaka Generation Co/, Inc.（Tokai-mura, Naka-gun, Ibaraki） | 650MW | Coal | FY2020 |

# Sales Strategy <4> : Enhancement of points of contact with customers

＜Low voltage ＞
- Various services with high added values that contribute to convenient and comfortable life as “daily-life coordinator” are developed and provided.

＜High voltage・Extra-high voltage ＞
- Total energy solution is proactively promoted for various problems of corporate customers, thereby contributing to business of customers.
- Energy service activities coordinating with Cenergy Co. and Toenec Co. in the Chubu Electric Power group are carried out.

## 【Web service for household “KatEne” 】

### Member acquisition situation

More than 1.6 million Club KatEne members (As of the end of April, 2017)

Aim for 2 million members by the end of FY2017

### Main service

○Energy consumptions visualization

○Energy saving consultation

○Point service (KatEne Point)

○Shopping

○Home service

## 【Total energy solution service】

### Energy solution

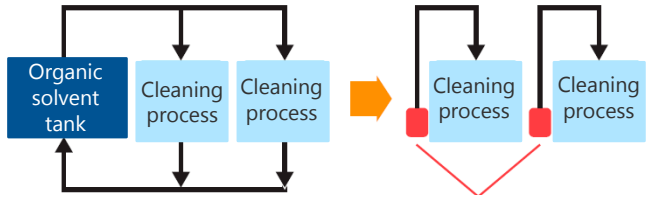
Response to wide range of needs of customers associated with from improvement of operation to repair of equipment
Proactively engage in needs concerning saving of gas, more than ever

### Energy saving support service in overseas

Support energy conservation of customers in overseas offices where there is more room for energy conservation compared to Japan

### Development-integrated solution

Chubu Electric Power provides “development-integrated solution” which repeats trial and error with customers including technical development for diversified and complicated problems of customers.




Products developed by Chubu electric
Portable heated steam type cleaning equipment

Improvement with the cleaning method using superheated steam was adopted by Toyota Motor Corporation in its degreasing process.

Compact line due to distributed installation of cleaning equipment
Environment is improved with clean cleaning method that does not use organic solvent

# Hamaoka Nuclear Power Station <1> : The state of Power Station

- For Unit 4, application for review for checking conformity to New Regulatory Standards was submitted on February 14, 2014. For Unit 3, application for review for checking conformity to New Regulatory Requirements was submitted on June 16, 2015.
- For Unit 5, examination of restoration plan for the equipment where sea water entered due to damage of main condenser tube that occurred in 2011 will be advanced and actions for conformity to New Regulatory Standards will continue to be examined.

| | Unit 3 | Unit 4 | Unit 5 |
|---|---|---|---|
| Output | 1,100 MW | 1,137 MW | 1,380 MW |
| Start of operation | August 28, 1987 | September 3, 1993 | January 18, 2005 |
| Passed years (As of the end of April, 2017) | 29 years | 23 years | 12 years |
| Application for examination to check for compliance with the new regulatory standards | June 16, 2015 | February 14, 2014 | — (Dealing with the seawater infiltration event) |

| Unit 1 | Unit 2 |
|---|---|
| In the decommissioning process (End of operation on January 30, 2009) | |
| Shift to the 2nd phase of the decommissioning process on February 3, 2016 | |

# Hamaoka Nuclear Power Station <2> : Progress of the Nuclear Regulation Authority's review to verify compliance with the New Regulatory Standards

- As to Unit No.4, the application form for Change in reactor establishment permission that we submitted has been reviewed by the Nuclear Regulation Authority in two separate categories (matters related to earthquakes/tsunami, etc., and the plant).
- On March 27 and 28 this year, on-site survey was conducted by the Nuclear Regulation Authority regarding items concerning earthquake and tsunami.

As of the end of April 2017

| Matters subject | Matters related to earthquakes/tsunami, etc. | Matters related to the plant |
|---|---|---|
| Number of examination meetings to be held | 17 times | 57 times |
| | Joint meetings: 2 times | |
| Main item subject | Earthquakes/tsunami/Volcanoes | Design basis measures<br>Severe accidents, etc. |
| Main topics of discussion in recent examination meetings | Assessment of seismic motion<br>-Explanation pertaining to the interplate earthquakes that have dominant effects on the seismic ground motion at the premises and oceanic intraplate earthquakes<br><br>Assessment of geological features and geological structure around the premises<br>-Explanation pertaining to the impact of the fold zone (A-17 fault, etc.) identified around the premises, on the evaluation of activity / seismic motion<br><br>On-site survey<br>-On-site survey was conducted concerning geological features and geological structure of the site premises as well as the area around the site. | Spent fuel dry storage facility<br>-Explanation pertaining to the method of evaluating fires caused due to crashing of airplanes, tornados, thunderbolts with respect to the spent fuel dry storage facility<br><br>Effectiveness assessment of severe accidents<br>-Answers about selection of the accident sequence, and effectiveness assessment of prevention of core damage |
| Future schedule | -Tsunami assessment, stability of foundation ground etc. | - Probabilistic risk assessment<br>- Tornados impact assessment, etc. |

# Hamaoka Nuclear Power Station <3> : Seawater inflow via damaged tubes in the main condenser for Hamaoka Reactor No.5

## 【Fact】

- On May 14, 2011, when preparing for cold shutdown after reactor No. 5 was suspended, a portion of the tubes in the main condenser, through which seawater flowed to cool steam, was damaged. 400 tons of seawater flowed into the main condenser and 5 tons of sea water into the reactor.

## 【Inspection results】

**□ Reactor Pressure Vessels and Structure in the Reactor**

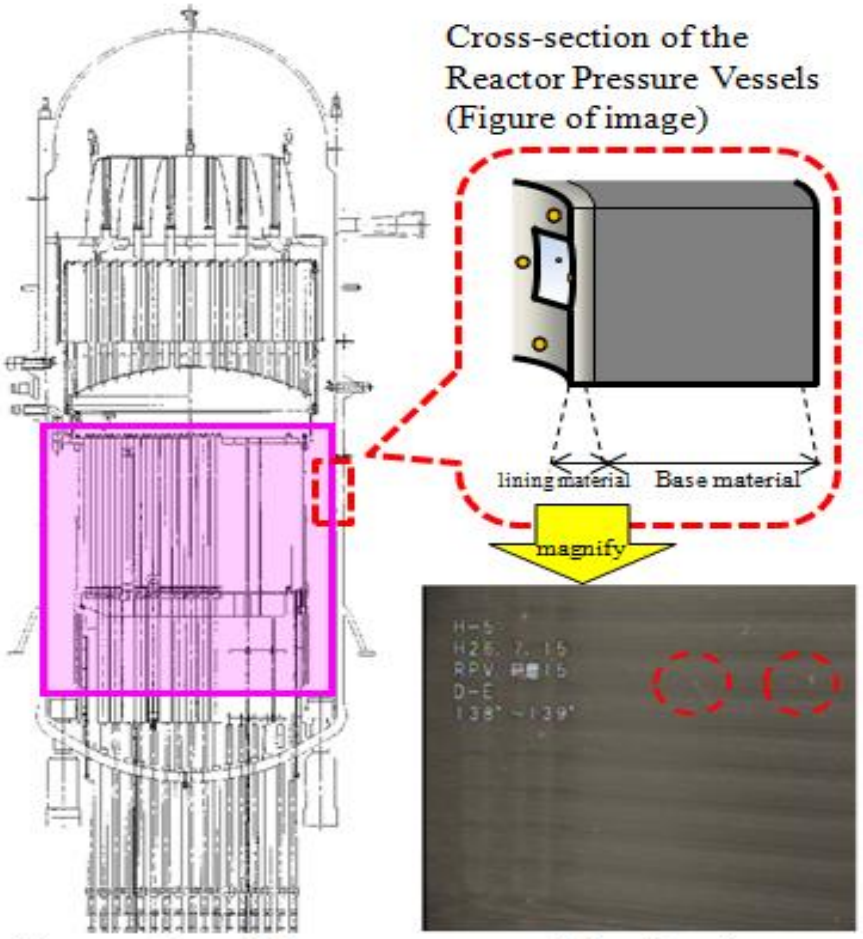
- We found parts of lined portions in the nuclear pressure vessels and in some equipment were corroded. However, the evaluation results showed that the control rods and neutron detectors needed to be replaced but that other devices could continue to be used.

**□ Other Reactor and Turbine Equipment**

- We found corrosion in some equipment. However, We assessed that we would be able to maintain the functions of each equipment by repairing or replacing the defective parts.

## 【Future plan】

- We plan to consider restoration plans such as examining the necessary specific measures toward individual devices.
- As for Reactor No.5, we will summarize the total plan, which is not only the restoration plan in the event of seawater inflow but also such as anti-tsunami measures that conform to the new regulations.
- Our total plan will be evaluated at the Nuclear Regulation Authority.



# Hamaoka Nuclear Power Station <4> : Activities to take part in dialogue with local residents

- On the Hamaoka Nuclear Power Station, we have been steadily promoting further safety measures including facilities measures and disaster prevention measures together with gaining public understanding as a package.
- The Company will endeavor more than ever to focus on interactive communication with local residents and our stakeholders by transmitting information including risks in an easy-to-understand manner and with respect, listening with sincerity to customers' voices on uncertainty and doubts, concerns and questions them respectfully.

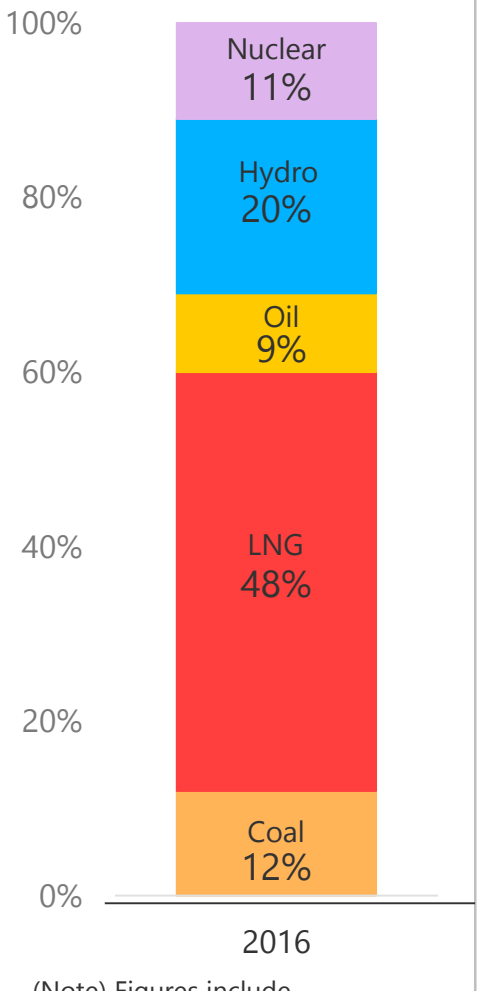
## 【Activities to take part in dialogue for 4 cities concerned】

| | |
|---|---|
| Tour of the Hamaoka Nuclear Power Station | We provide opportunities to confirm the safety measures at the Hamaoka Nuclear Power Station on the spot directly for local residents. In addition, we are making efforts to communicate with local residents by setting up opportunities to engage in dialogue with employees who works in Hamaoka Nuclear Power Station actually.<br>Visitors : 31 thousand people in a year(Average for FY2012-FY2016)<br>  <br>Displaying a movable water pumper▲ |
| Caravan activities | About once or twice each month the caravan team visits shopping centers and other facilities in the vicinity of the Hamaoka Nuclear Power Station to communicate the progress of the safety measures to locals and to directly ask for their opinions.<br>FY2016 (result) : 17 times and 1,817 persons listened to our explanations. |
| Visit and dialogue | We visit people living in the vicinity of the Hamaoka Nuclear Power Station to engage in dialogue with them and we introduce our measures to as many people as possible and to solicit the opinions of local residents.<br>Visiting targets : Approx. 84 thousand households<br>*And we implement second round of visit and dialogue from November 2015. (Progress rate : Approx. 99% end of March 2017) |
| Opinion-exchange meetings | We plan and hold opinion-exchange meetings with local government and woman's organizations and participate in the meeting held by the governments in order to exchange opinions with various organization continuously, thereby increasing the opportunities to engage in dialogue with people living in the vicinity<br>"Shaberi-ba"▶<br>  <br><Opinion-exchange meetings targeting women, "Shaberi-ba"><br>We hold "Shaberi-ba" that is opinion-exchange meeting with women's organizations in the vicinity of the Hamaoka Nuclear Power Station by group work in order to share concerns and questions about nuclear power.<br>FY2016 (result) : 14 times<br><Participating in opinion-exchange meetings held by the government><br>We are making an effort to communicate with as many people as possible by participating in opinion-exchange meetings held by Omaezaki city and Makinohara city.<br>FY2016 (result) : 23 times<br>Opinion-exchange meeting held by Omaezaki city▶<br>  |

# Composition of Power Sources and Electric Power Output (FY2016)

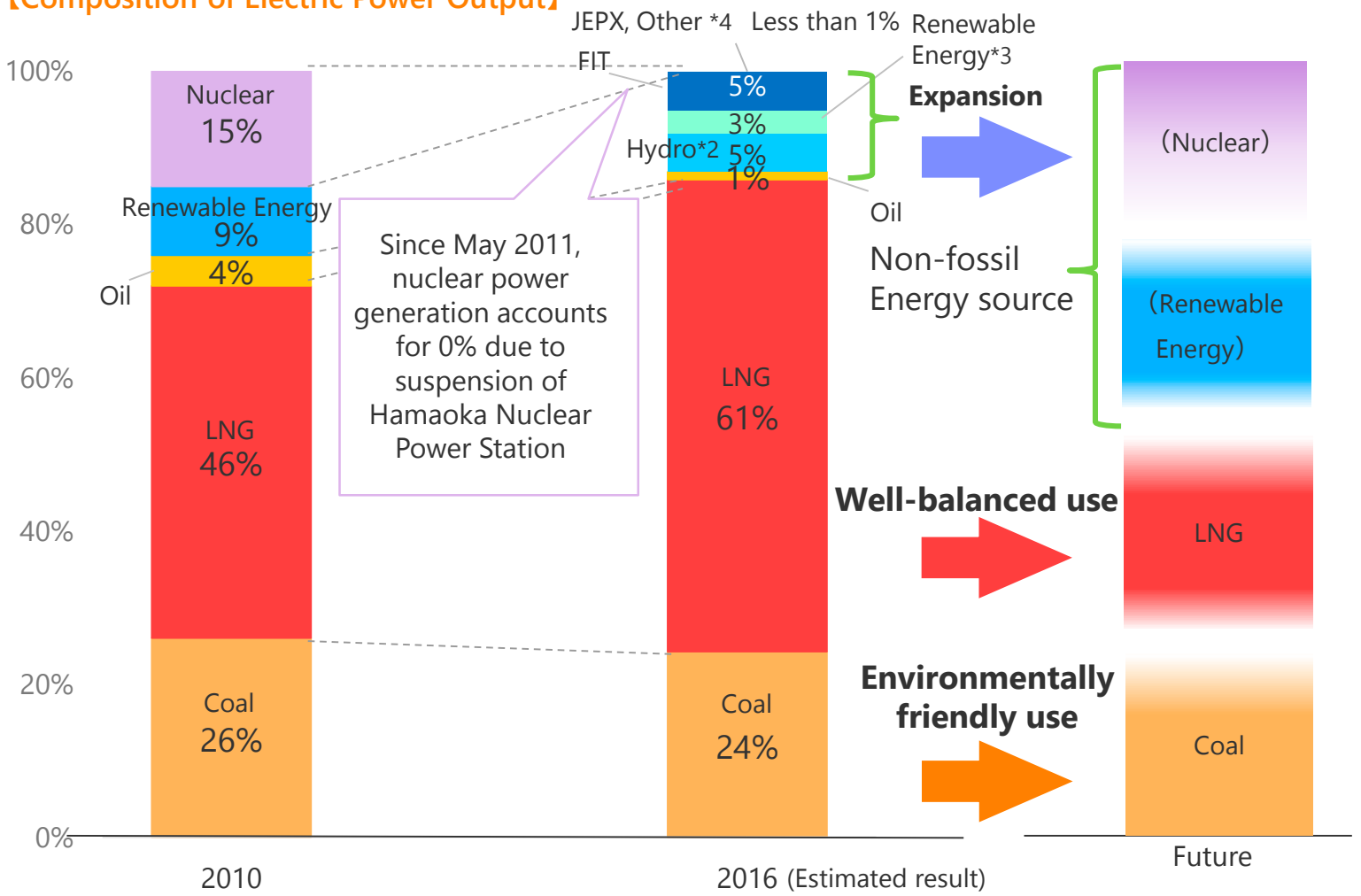
- Based on energy mix of Japan, aim for optimum composition of power sources by combining various types of power source, such as nuclear power, thermal power and renewable energy, in a well-balanced manner from the standpoint of "S+3E" while taking aging of equipment into account.

## 【Composition of power sources】




(Note) Figures include purchased power

## 【Composition of Electric Power Output】

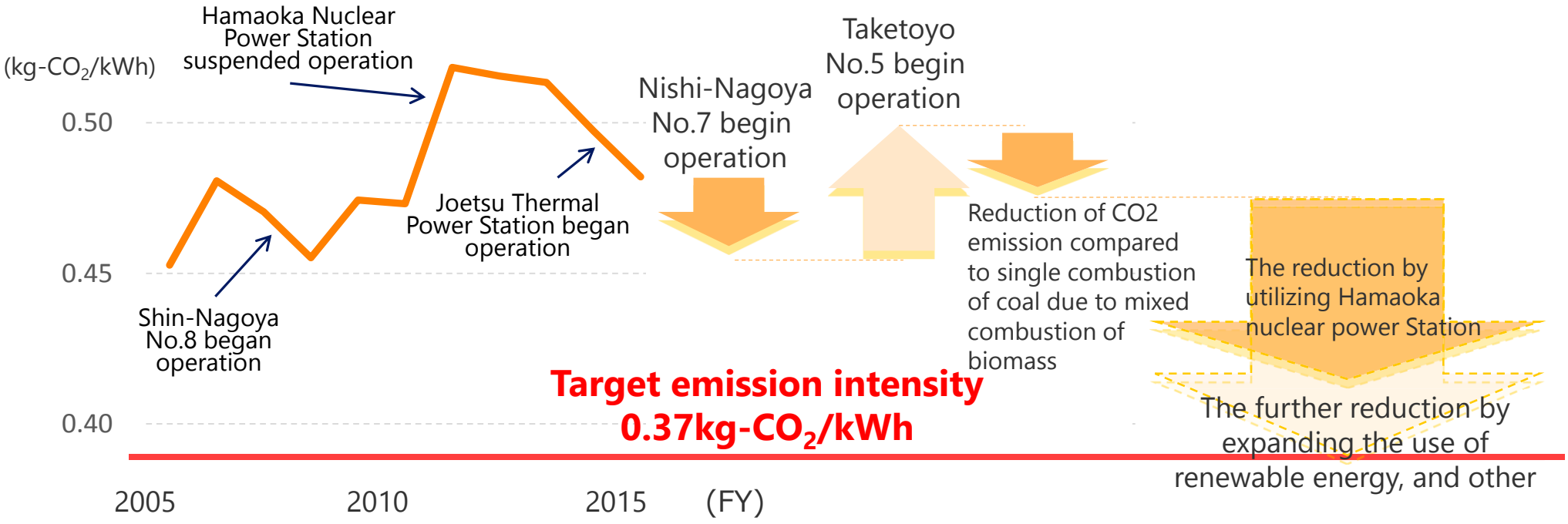



*1 Figures include interchanged, purchased power *2 Over 30 MW
*3 Excluding over 30 MW hydro and FIT-based
*4 Figures in JEPX represent procurement from Japan Electric Power Exchange and Others represent output from purchased power of which we cannot specify the power source.

# Responses to Global Warming ~ Reduction of $CO_2$ emissions ~

- In order to achieve the target value of the country's CO2 emission rate in FY2030 through voluntary frameworks structured in the entire electric utility industry, take various actions such as making thermal power facilities highly efficient and continuously utilizing nuclear power generation which largely contributes to reduction of CO2 emission.

## 【Trends and outlook of $CO_2$ emission intensity (before reflecting $CO_2$ credits)】



# Renewable Energy <1>: Our efforts toward Promotion

(As of the end of March, 2017)

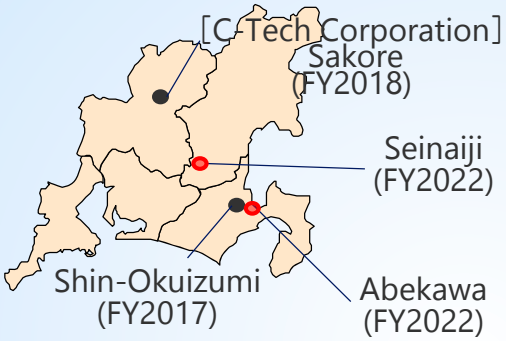
| | | Chubu Electric | (Reference)Chubu Electric Group |
|---|---|---|---|
| Hydro | operating | 196 Site : 5,450MW | Akigami : 0.29MW(FY2016) |
| | plan | Shin-Okuizumi : 0.29 MW (FY2017)<br>Seinaiji : 5.6 MW (FY2022)<br>Abekawa : 7.1 MW (FY2022)<br>1 Site：1.9MW | Sakore : 0.37MW(FY2018) |
| Wind | Operating | Omaezaki：22MW | 158MW |
| | Plan | — | — |
| Solar | Operating | Mega Solar Iida : 1.0 MW<br>Mega Solar Shimizu : 8.0 MW<br>Mega Solar Kawagoe : 5.5 MW<br>(Transferred from Taketoyo, and started to operation partially in January, 2017) | 250MW |
| | plan | Mega Solar Kawagoe : 2.0 MW | 4 Site : 17 MW (FY2017)<br>4 Site : 59 MW (FY2018) |
| Biomass | operating | Mixture of wooden chip<br>Mixture of fuel from carbonized sewage sludge | Taki bio power : 6.7 MW (FY2016)<br>Aichi clean : 0.549 MW (FY2016) |
| | plan | — | CEPO Handa biomass : 50 MW (FY2019) |

* Joint businesses are recorded in their entire amount instead of by equity interest.
(Reference) "Summary of electric power supply plan FY2017"

## Development locations of hydroelectric power station

- Conventional hydro
- Generation with minimum water level

Parentheses denote the commercial operation start year.



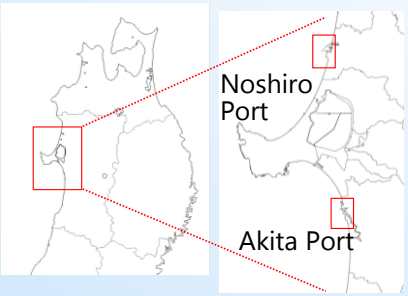


Shin-Okuizumi Hydroelectric Power Station under construction

### Wind Power Generation

Akita Port and Noshiro Port survey of development possibility of offshore wind power generation business in Akita Pref. (joint survey)

【Site map】




【Summary of Project】

Power generation method
: Offshore wind power generation

Site : Akita port area and Noshiro port area in Akita Pref.
(Total : Approx. 730ha)

Output
: Supposition total output 145 MW
(Akita port 65 MW,
Noshiro port 80 MW)

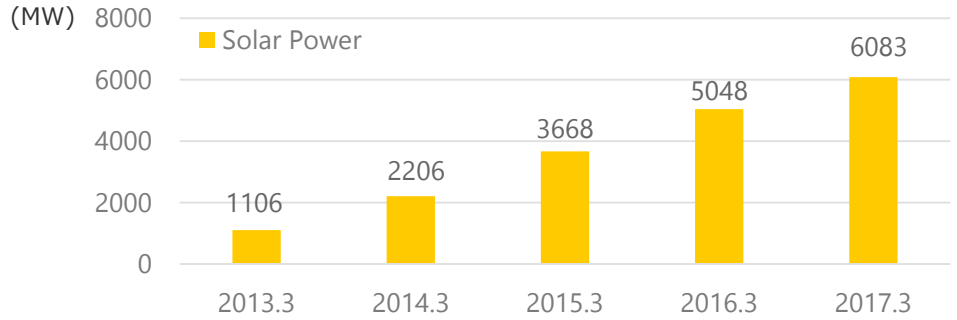
Project Period : 20 years (planned)

# Renewable Energy <2>: Actions for expansion of introduction of renewable energy

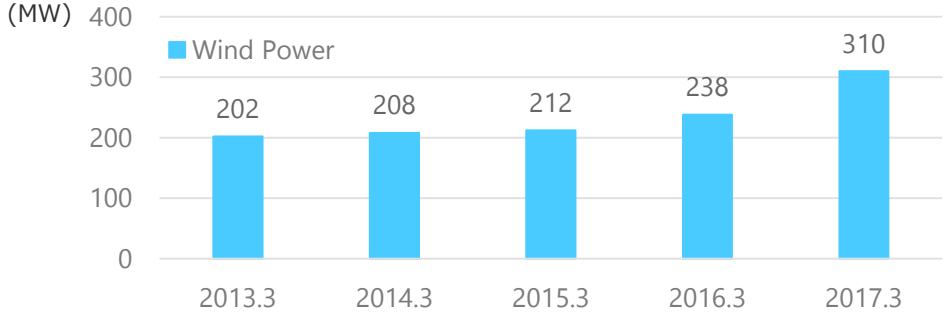
■ To realize energy mix of Japan, take actions for expansion of introduction of renewable energy such as efforts for adjusting supply and demand in a wide range for change of output of renewable energy and efforts for structuring distribution system to respond to change of voltage which tends to occur due to change of output.

## 【Introduction of renewable energy in Chubu region】

### ◆Solar Power Generation



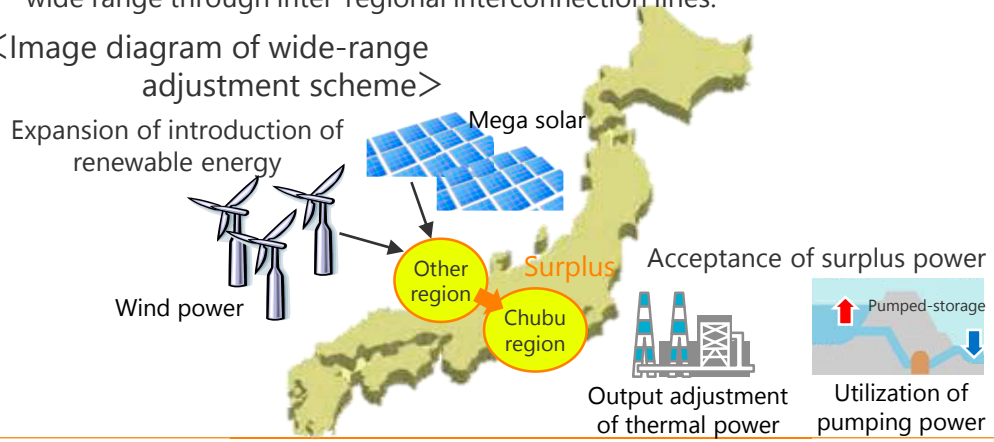

### ◆Wind Power Generation




## Utilization of wide-range adjustment scheme

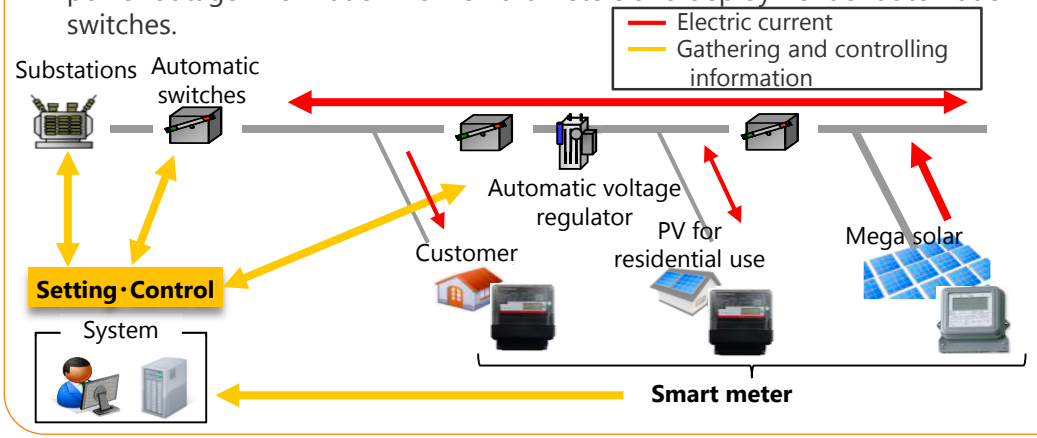
- When introduction of renewable energy expands, output largely changes due to weather conditions. It could be difficult to prepare all adjusted power sources for responding to such output change, in the supply area.
- Thus, expansion of introduction of renewable energy is supported such as lending electric power necessary for adjustment of supply and demand in a wide range through inter-regional interconnection lines.

<Image diagram of wide-range adjustment scheme>



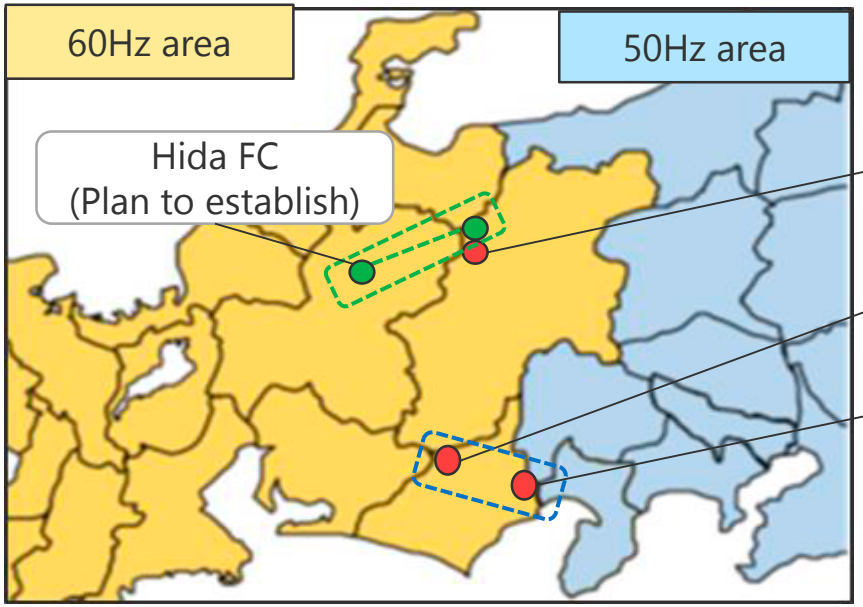

## Structuring of next-generation distribution system

- When introduction of renewable energy, which has the characteristic of unstable output, expands, voltage tends to change easily. By utilizing measurement data of smart meters that are currently being installed, voltage can be precisely controlled.
- During power outage, failure zone will be kept as minimum as possible due to power outage information from smart meters and deployment of automatic switches.



# Reinforcement of the Frequency converter (FC)

- In order to stably supply electricity when power outage occurs in a wide range due to stoppage of large-scale power source, efforts will be made to increase FC by 900 MW to a total of 2,100 MW in FY2020 so that lending of electricity between regions with different frequency can be expanded.
- Furthermore, in order to increase FC to a total of 3,000 MW in FY2027, in accordance with the Cross-regional Network Development Plan drawn up in the Organization for Cross-regional Coordination of Transmission Operators, reinforcements including development of surrounding systems will be aimed for.




| | Present | End of FY2020 | End of FY2027 |
|---|---|---|---|
| Shin-Shinano FC | 600MW | **1,500MW (+900MW)** | 1,500MW |
| Sakuma FC | 300MW | 300MW | 600MW (+300MW) |
| Higashi-Shimizu FC | 300MW | 300MW | 900MW (+600MW) |
| Total | 1,200MW | 2,100MW (+900MW) | 3,000MW (+900MW) |

## 【Joint procurement and competitive ordering of equipment and materials】

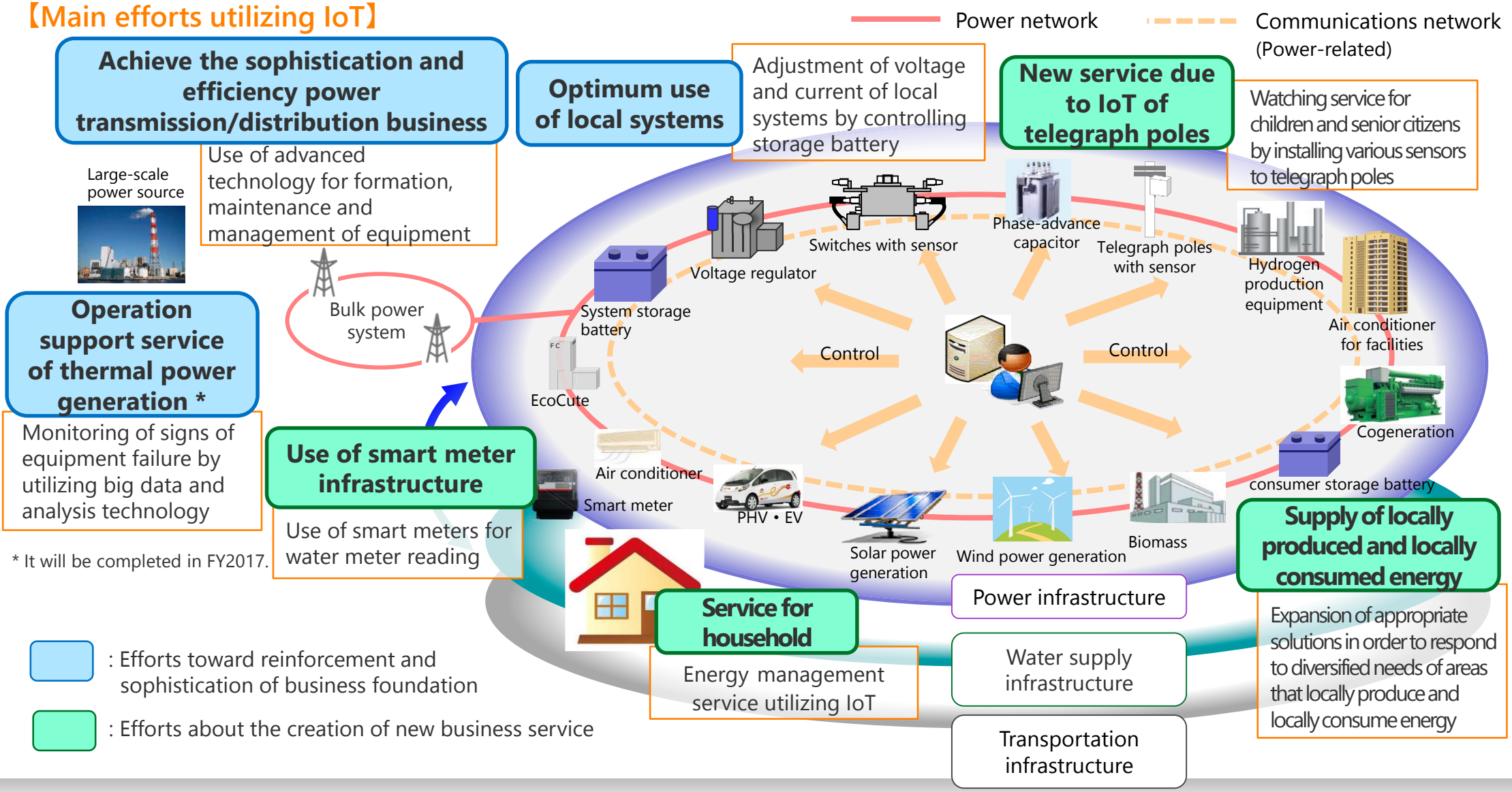
- Equipment and materials intended for reinforcement of New Shinano FC are jointly procured by Chubu Electric Power and TEPCO Power Grid with the purpose of reducing procurement price due to economy of scale.
- For equipment and materials intended for reinforcement of East Shimizu FC and Sakuma FC, manufacturers desiring to make a bid will be jointly advertised for with joint procurement by Chubu Electric Power and J-POWER in mind.

# Reinforcement of business foundation utilizing ICT and expansion of business areas

CHUBU Electric Power

■ ICT such as IoT, big data and AI will be utilized for reinforcement of business foundation, and examinations will be made for provision of new services.

## 【Main efforts utilizing IoT】




* It will be completed in FY2017.

: Efforts toward reinforcement and sophistication of business foundation

: Efforts about the creation of new business service

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