

**IRED Side event  
iiESI Asian Workshop**

# **JAPAN's Energy Situation**

**November 17, 2014**

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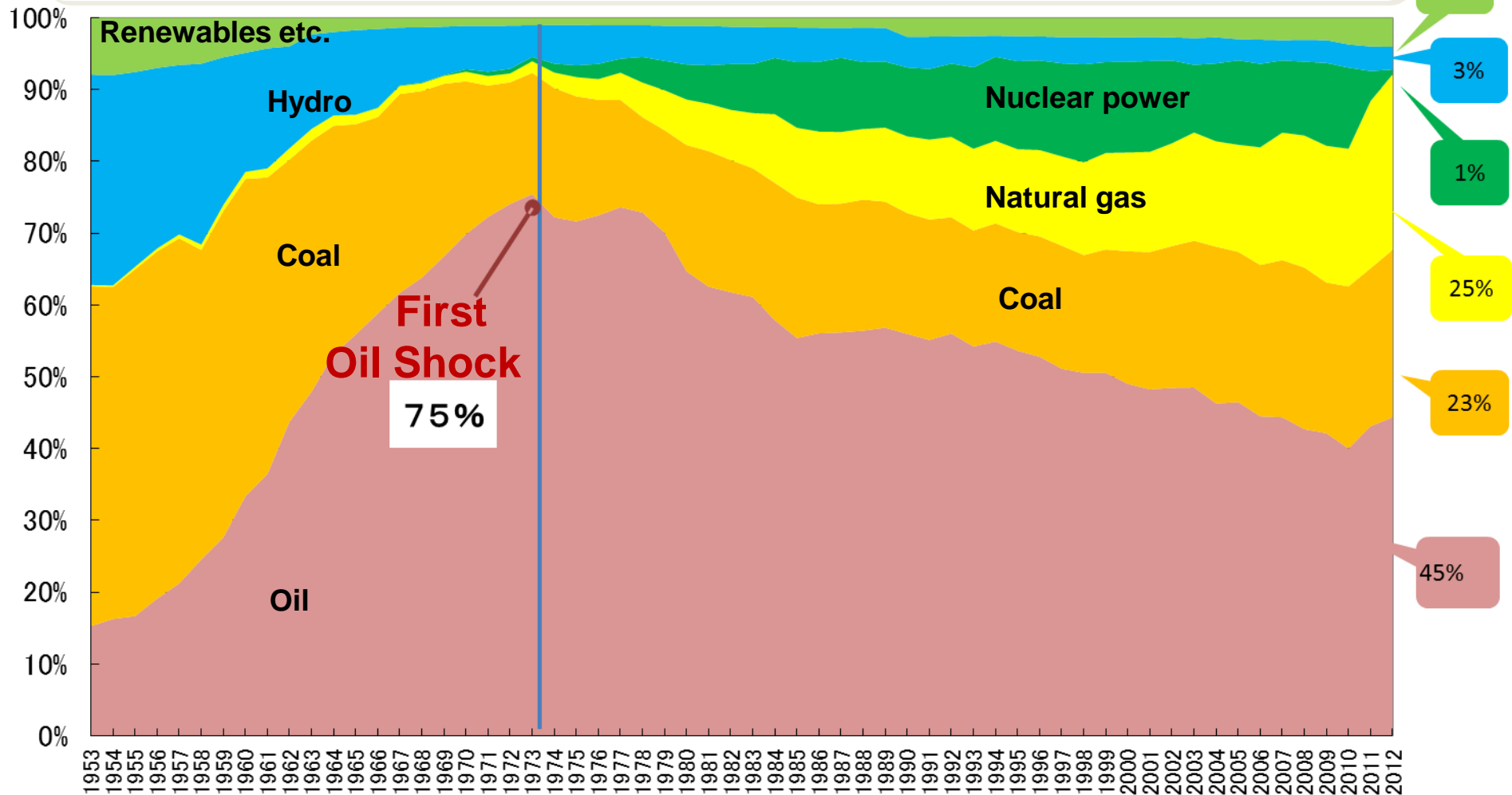
# Contents

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Many of the pages uses materials prepared by the courtesy of METI .

# 1. Energy

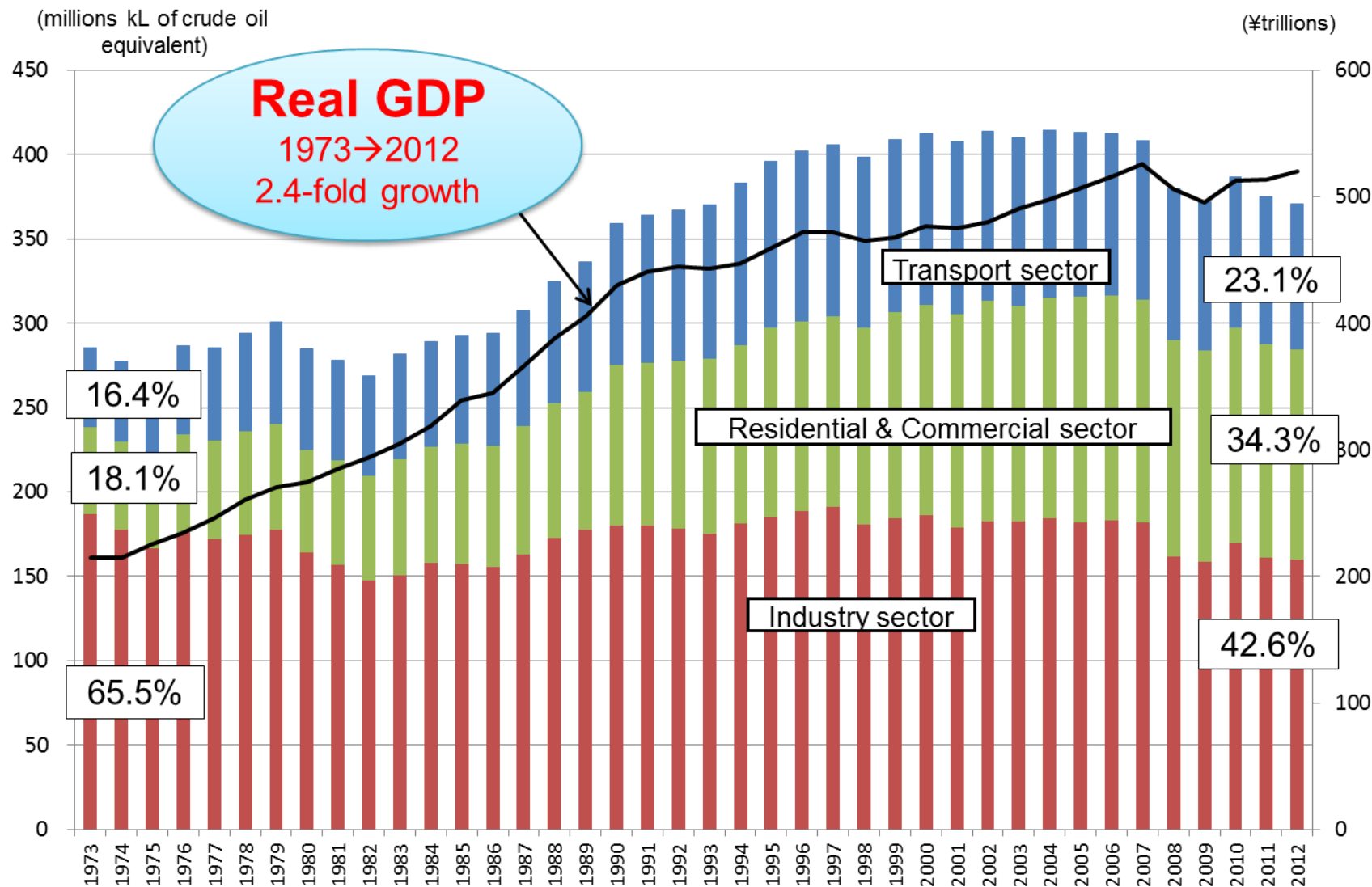
# Japan's Energy Supply Structure



\* "Renewables etc." consists of solar power (0.1%), wind power (0.2%), geothermal heat (0.1%), and biomass (3.3%).

Source: Prepared based on "Comprehensive Energy Statistics (Preliminary Report for 2012)" issued by the Agency for Natural Resources and Energy."

# Final Energy Consumption in Japan



Final energy consumption

1973→2012  
1.3-fold growth

Transport  
1973→2012  
1.8-fold growth

Residential & Commercial  
1973→2012  
2.4-fold growth

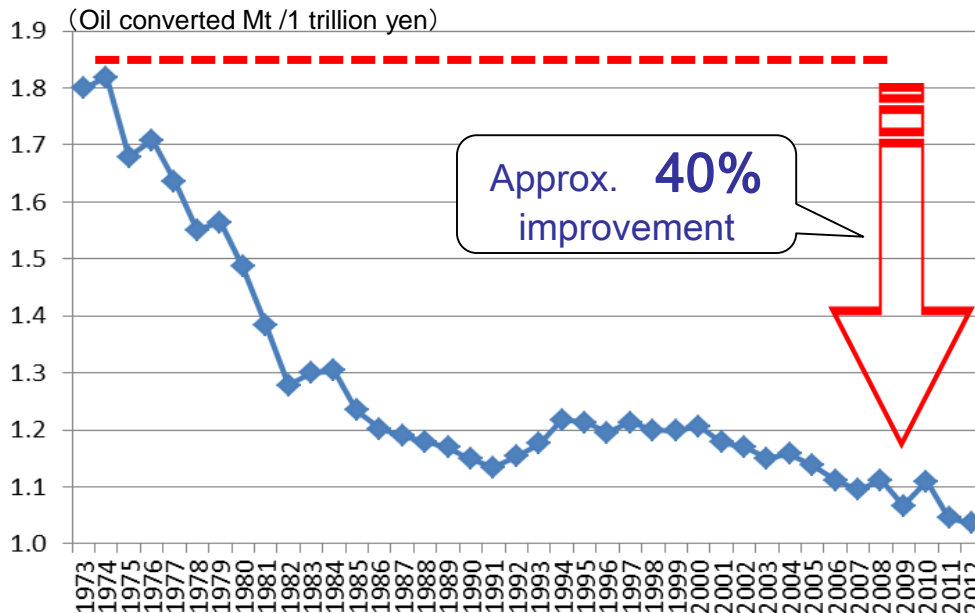
Industry  
1973→2012  
0.8-fold growth

Sources: "Comprehensive Energy Statistics (Preliminary Report for 2012)" and "Annual Report on National Accounts."

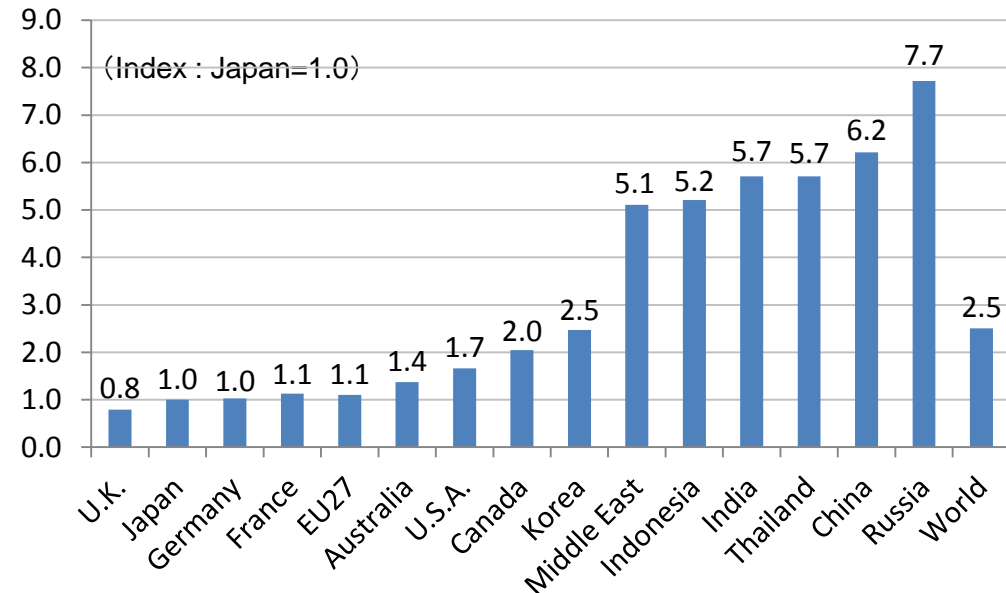
# Energy Consumption: Japan's Conservation Efforts

- Japan has improved energy efficiency by approx. 40% after the oil crises in the 1970s as a result of positive actions by both public and private industrial sectors.
- Japan intensively introduced "Energy Management System based on Energy Conservation Law", then achieved the lowest level of energy consumption per GDP in the world.

## Primary energy use per real GDP of Japan



## Primary energy supply per GDP (2011)



# Energy Conservation Law

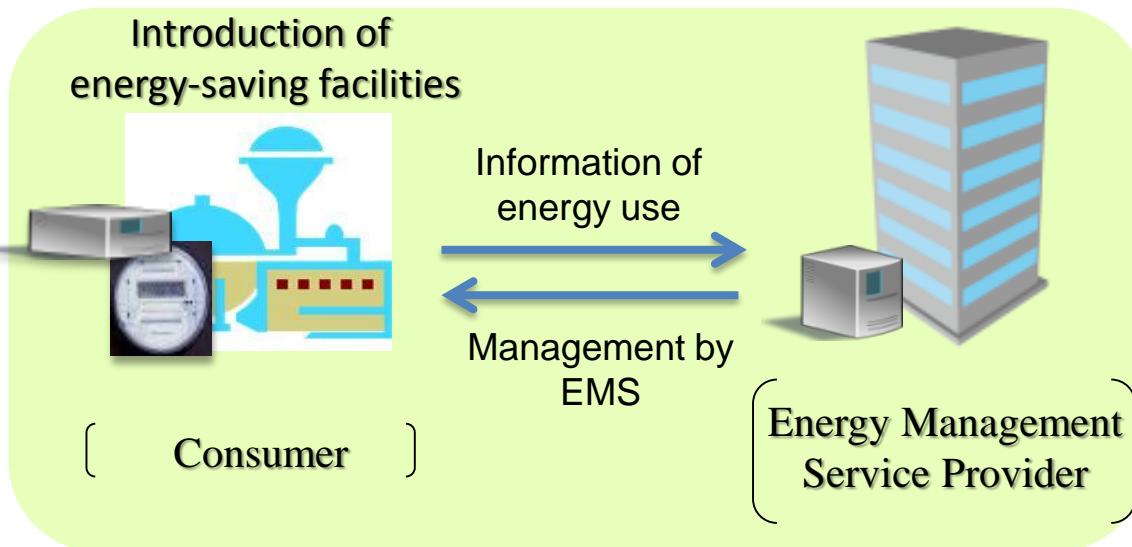
- “Energy Conservation Law” was introduced in 1979 .
- The Law covers energy consumption in industry, commercial & residential and transportation sectors.
- The Law specifies
  - 1) the framework which requires the business operators to annually measure and report their energy consumption to the Government,
  - 2) energy efficiency standards for buildings and houses, and
  - 3) the “Top Runner program” which is applied to household appliances, equipment and automobiles.

	Industry sector	Consumer sector		Transportation sector
		Commercial sector	Residential sector	
Regulatory measures	<ul style="list-style-type: none"> <li>✓ Annual reports to the Government by business operators with 1,500 or more kl/yr energy consumption</li> <li>✓ 15,000 manufacturing plants &amp; offices</li> <li>✓ Reduction efforts of 1% per year</li> </ul>			<ul style="list-style-type: none"> <li>✓ Periodic reports by freight carriers and consigners</li> <li>✓ Reduction efforts of 1% per year</li> </ul>
		<ul style="list-style-type: none"> <li>✓ Energy efficiency standards for buildings and houses (300m<sup>2</sup> or more)</li> </ul>		<ul style="list-style-type: none"> <li>✓ Top runner standards for household appliances , equipment, automobiles etc., 28 items in total (Account for about 70% of household energy consumption)</li> </ul>

# Acceleration of Use of Energy Management System

- Energy Management Business, such as ESCO, Energy Service Company, is becoming more common.
- In addition, the energy management business including the multi-base package management for two or more consumers and demand watch and control, is also expanding.
- Registration system for energy management service provider is established and program in which they achieve more efficient and effective energy-saving by introduction of Energy Management System (EMS), is added to object program in Subsidies for Supporting Business Operators Strive to Rationalize Their Energy Use in FY 2014 budget.

## Energy Management Business



## Main Service Contents

### Visualization service

Give electricity consumption in real time(at 30minutes interval)

### Demand Response service

Reduce the load on power grids

### Diagnostic service

Provide continuous energy-saving advice and make a proposal about renewal of facilities and systems.

### Energy-saving service

Provide Energy-saving service such as energy-saving advice, tuning and ESCO



# Energy Management at Demand Side

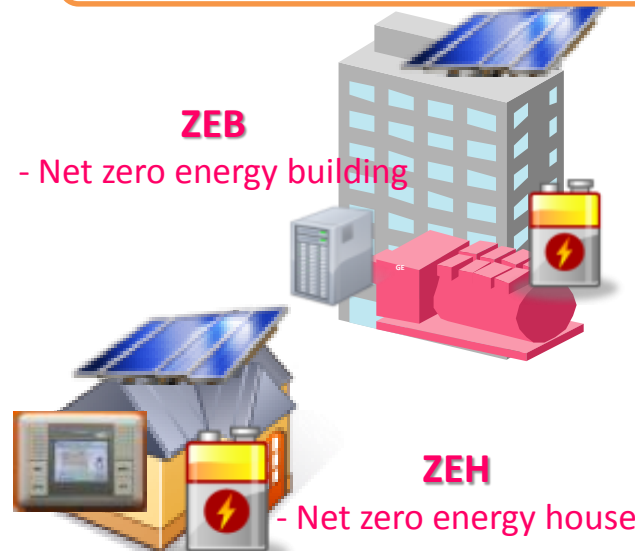
- Handle electricity supply-demand problem with promotion of introduction of HEMS / BEMS, high efficient air conditioners, lighting and hot-water supply.
- Pursue energy efficiency of entire systems by managing entire houses and buildings.
- In addition, more efficient energy management can be realized by cross-management of houses and buildings, or regional management.

Installation of energy management equipment



Cooperate by buying equipment such as efficient air conditioners and lighting, and controlling them with HEMS or BEMS.

Optimize houses and buildings



"Net zero energy" means that net annual primary energy consumption is approximately zero.

Regional or cross-regional optimization

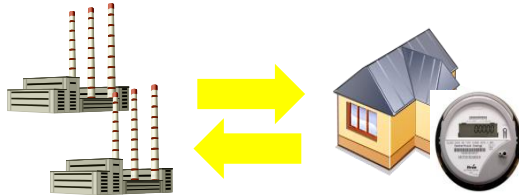


# Demonstrations of Smart Community in Japan

- Starting in FY2011, large-scale smart community demonstration projects have been proceeding in 4 regions across Japan that constitute representative examples of different concepts, with the participation of many residents, local governments, and corporations.

## Housing development (Keihanna Science City)

Demand response demonstration based on a point system is being implemented for general households (approximately 700 households) where PV or HEMS automatic control has not been introduced.

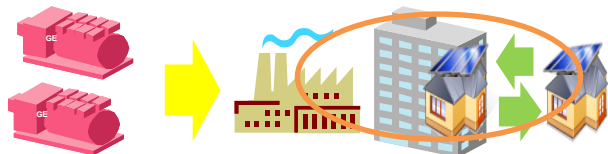


## Keihanna Science City

## Kitakyushu City

## Designated supply area (Kitakyushu City)

In an area where power is supplied by Nippon Steel Corporation, a pricing system is being implemented where the energy price fluctuates for 2 hours afterwards in accordance with the state of supply and demand of energy for the day, applicable to 50 business establishments and 230 households.



## Wide-area metropolis (Yokohama City)

Introduction of an energy management system for an existing wide-area metropolis. As the sample number is high (4,000 households), demonstration using a variety of strategies is possible.



## Yokohama City

## Toyota City

## Separated housing (Toyota City)

Automatic control of home appliances in 67 homes. Secondary cells equipped in vehicles are used to supply energy to households. Approaches to drivers for reducing a traffic jam

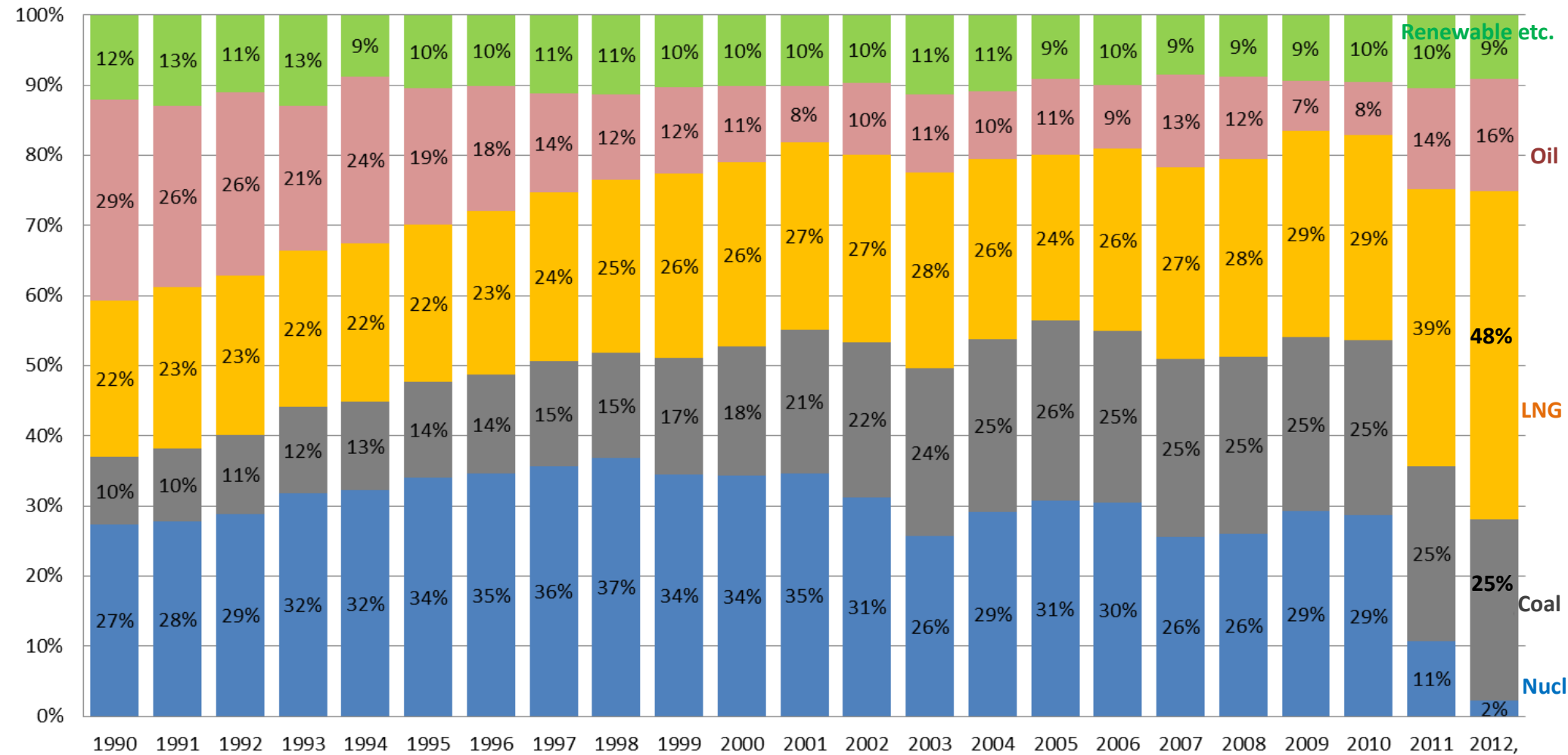


## 2. Electricity

# Generation Mix in Japan

■ LNG increase compensates for the decline of nuclear power.

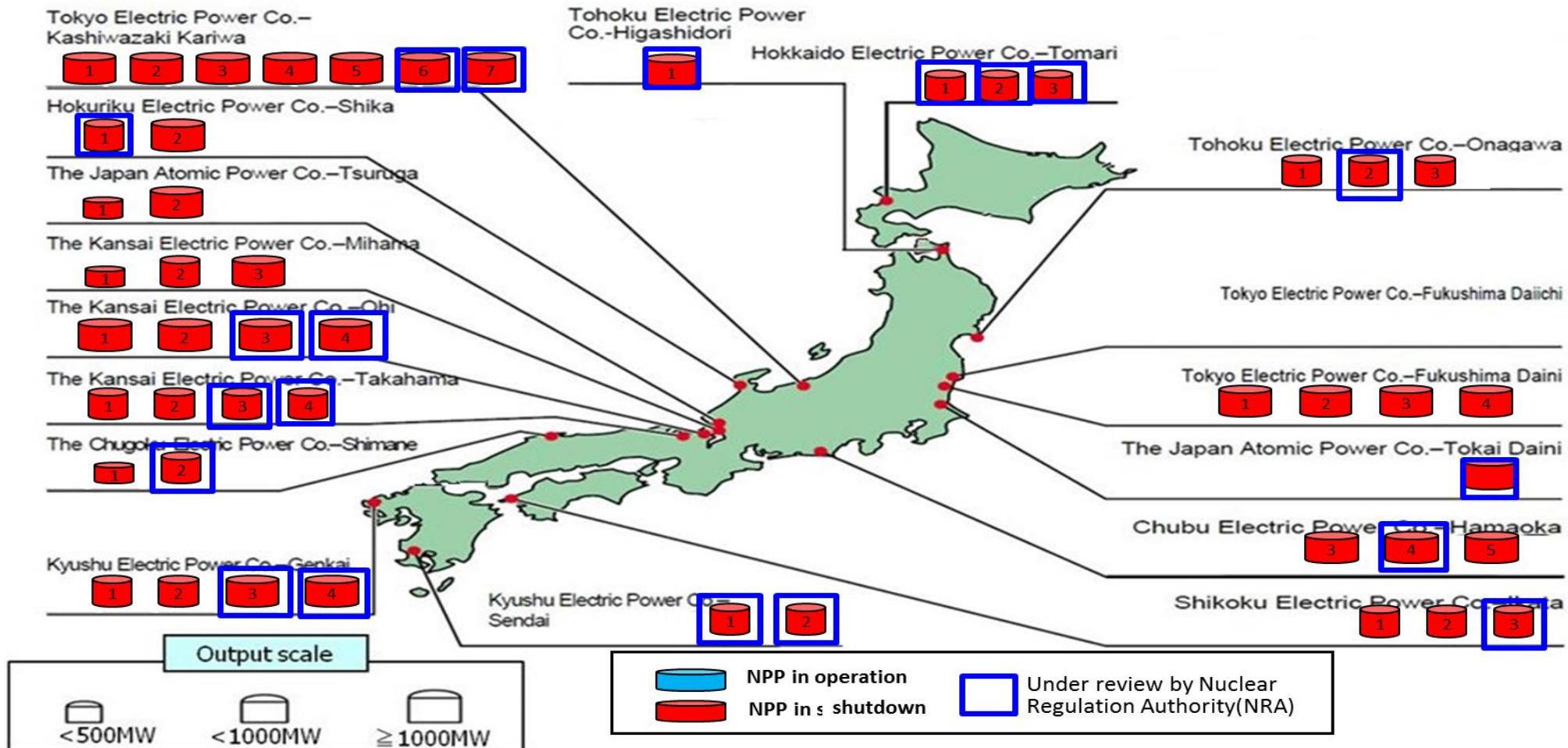
## Electricity Generation by Fuel



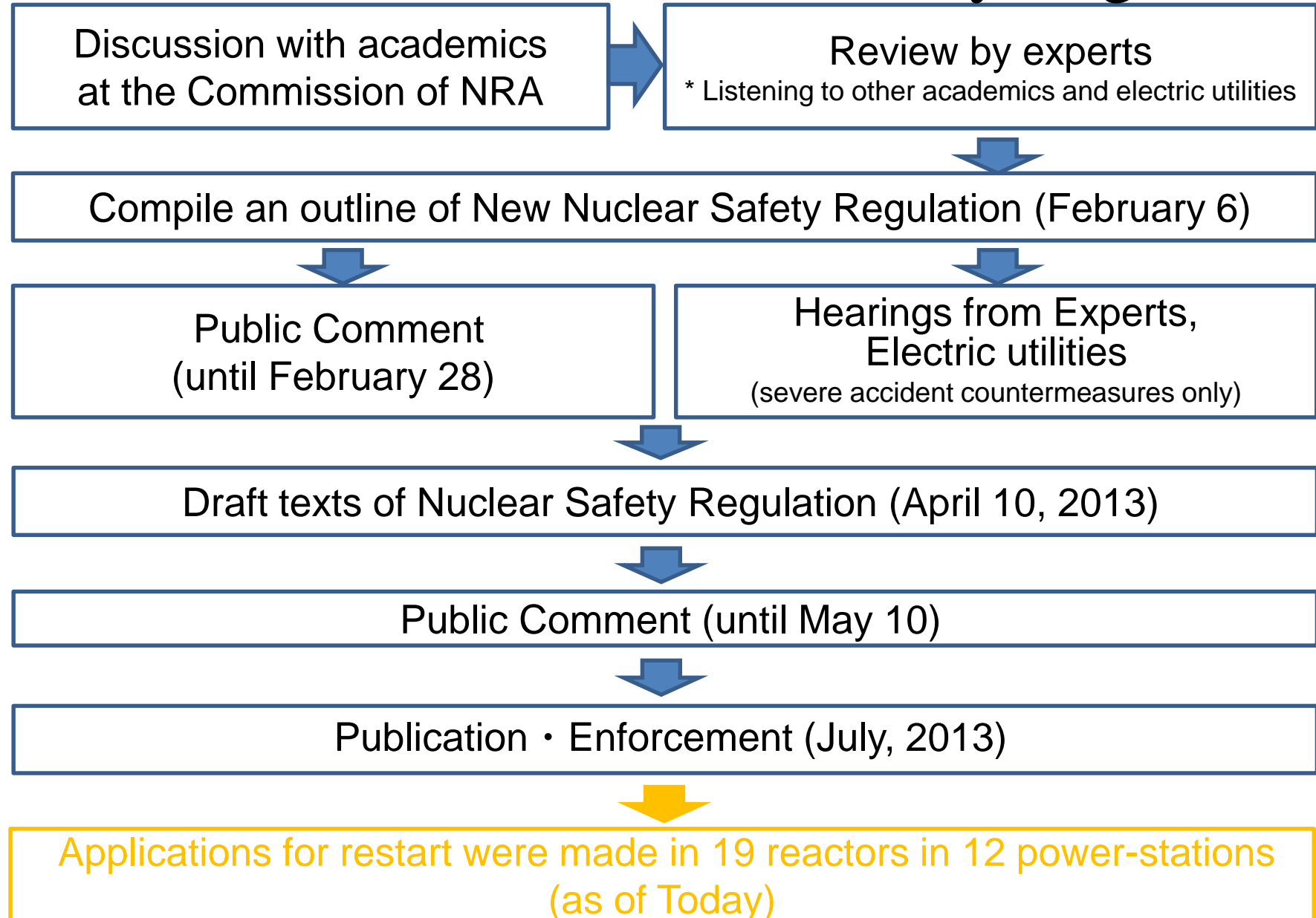
Source: Compiled by METI based on "Outline of Electric Power Development in FY 2010" etc.

# Nuclear Power Plants in Japan

- There are 48 nuclear power plant units in Japan.
- All units (in red) are in a state of temporary shutdown as of February 24 2014.
- 20 units (in blue squares) are under review for restart by the Nuclear Regulation Authority in accordance with its new safety regulations.



# Schedule of The New Nuclear Safety Regulation

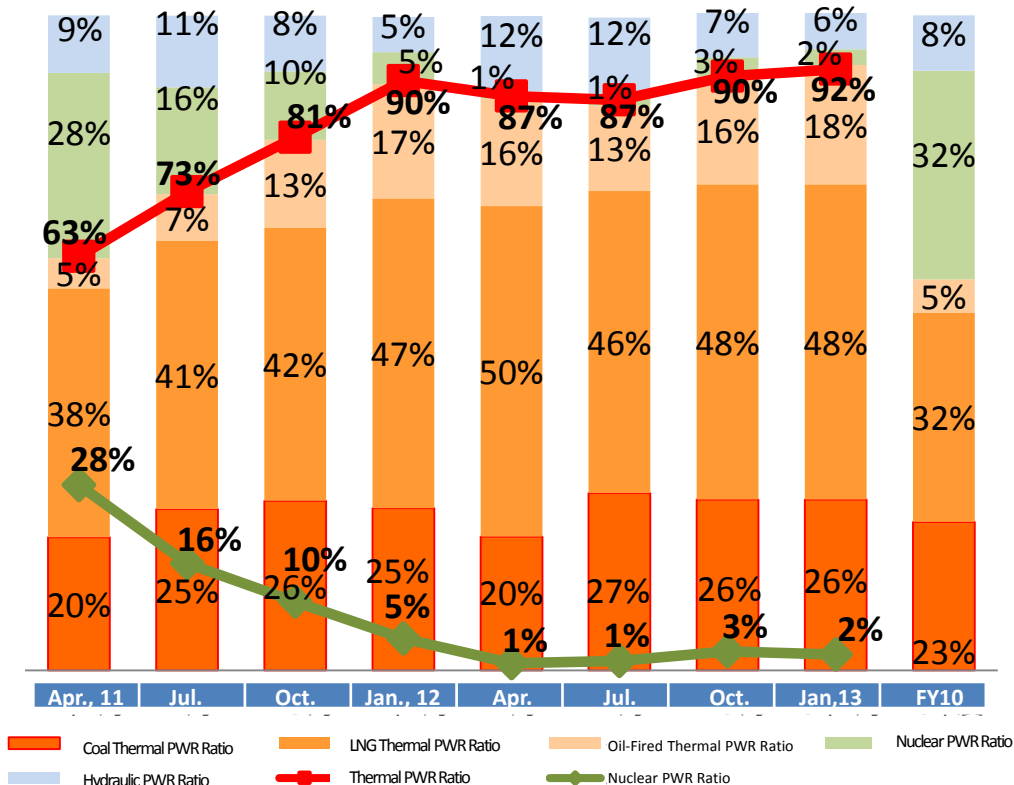




# Power Generation Share after the Quake

- The nuclear share in domestic electricity production has dramatically decreased due to the shut-down for periodical inspection after the quake. (Oh-I No. 3 and 4 resumed in July, 2012.)
- The thermal power share has increased up to 90%. The share of LNG thermal is about 50%.
- The replacement fuel costs of thermal generation is estimated to increase from FY2010 3.1 trillion Yen in FY2012 and 3.6 trillion Yen, respectively.

**Trend of Generation Share after 2010**  
(10 utilities and wholesale electricity utility)



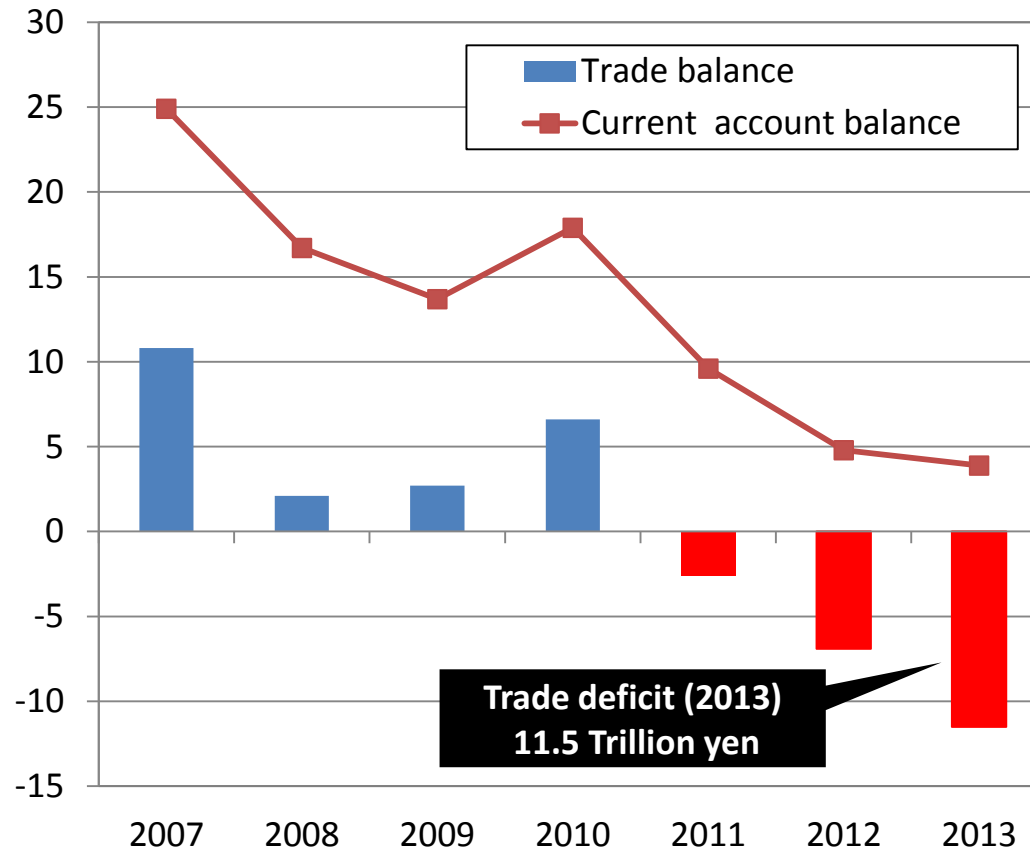
**Fuel Cost Increase**

Power Category	Fuel Cost (FY2012) (Yen/kWh)	Cost Impact Trillion Yen)	
		Estimation in FY2012	Estimation in FY2013 (※)
Nuclear	1	- 0.3	- 0.3
Coal	4	+ 0.1	+ 0.1
LNG	11	+ 1.4	+ 1.7
Oil	16	+ 1.9	+ 2.1
Total	—	<b>+ 3.1</b>	<b>+ 3.6</b>

# Impact of Fuel Import Cost on Japanese Economy

- In 2011, due to the increase in fuel import costs, Japan recorded a trade deficit for the first time in 31 years. The trade deficit is **11.5 trillion yen** in 2013.
- Lowering fuel import costs is an urgent task for the Japanese government.

## Trade balance and current account balance (trillion yen)

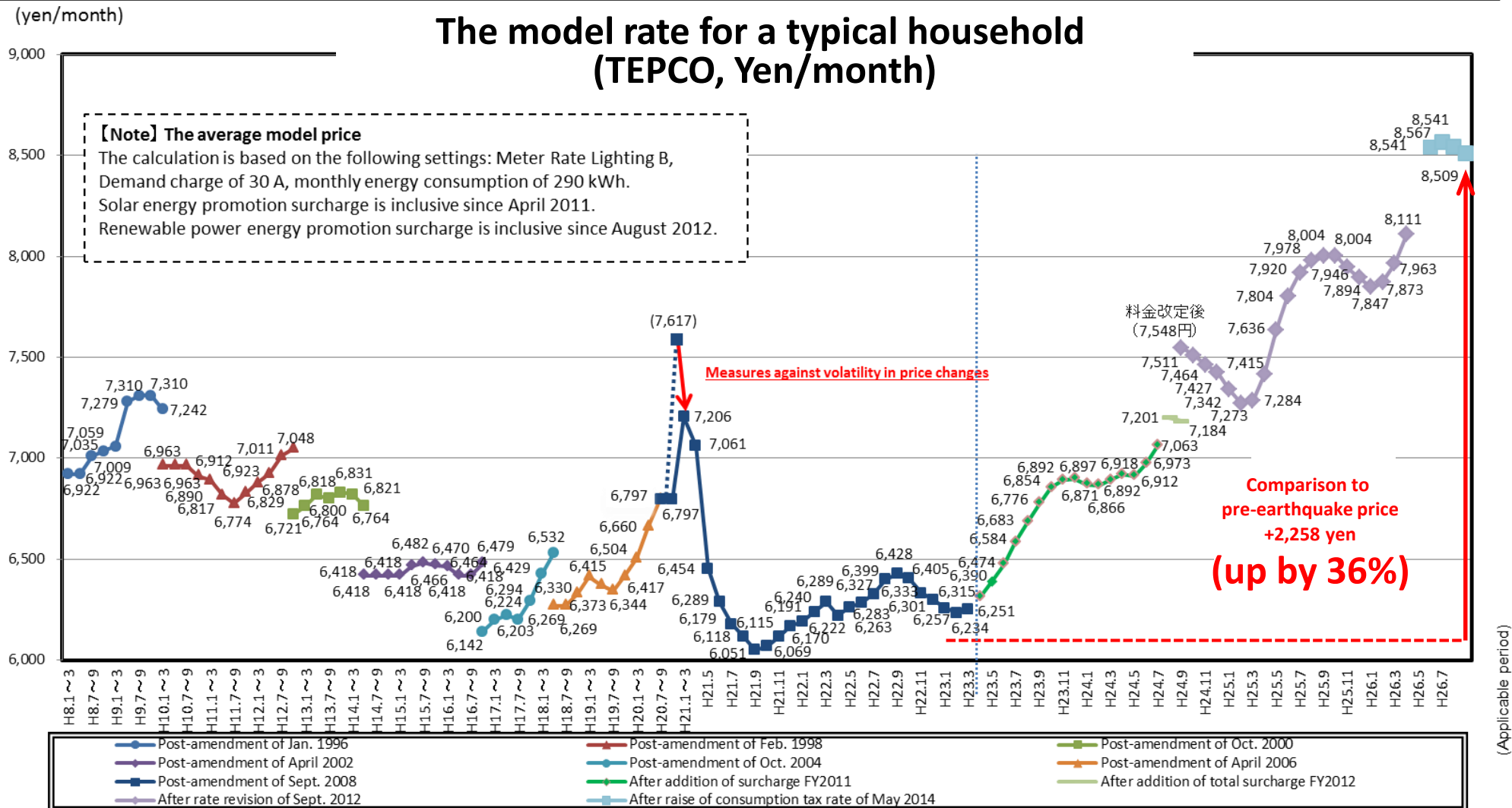




# Electricity cost fluctuation

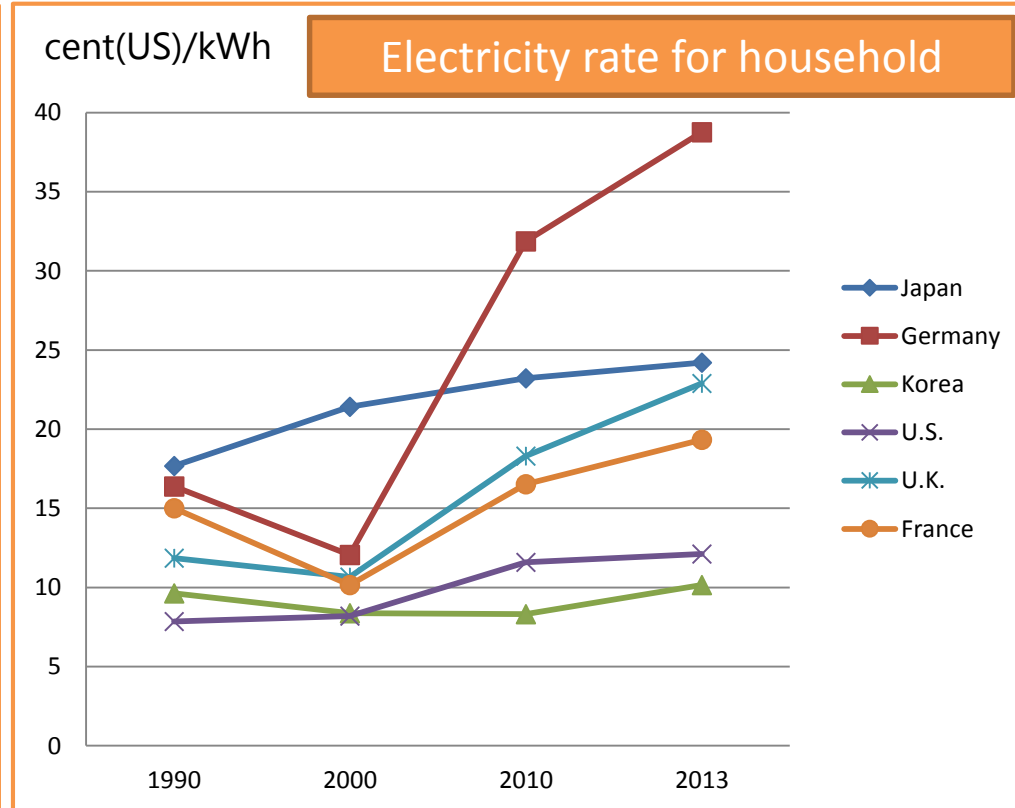
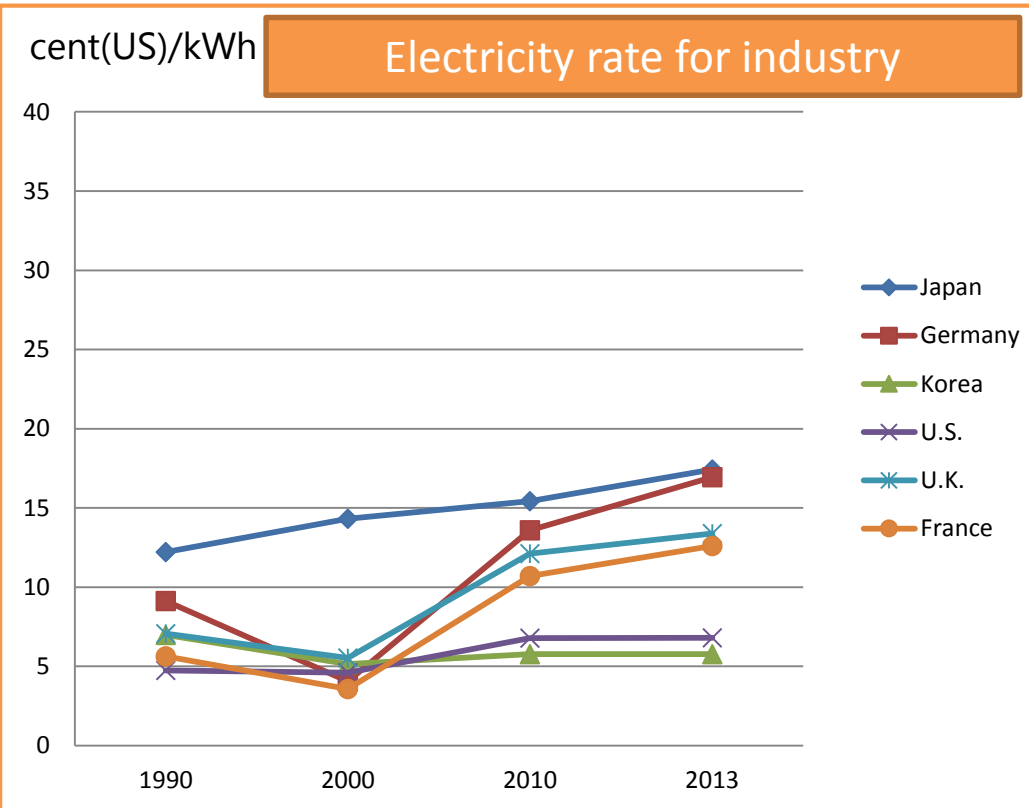
- The Japan's electricity rate (model rate for a typical household) is higher by 20% on average compared to that before the earthquake, due to the rate revisions due to the increased fossil fuel consumption as a result of suspended NPPs, and the rising prices of fuel.

## The model rate for a typical household (TEPCO, Yen/month)



# Comparison of Electricity Rate

- After the Earthquake, the electricity rate of Japan keeps rising due to the rate revisions owing to the increase of fossil fuel costs, and the rising renewable power energy promotion surcharge.  
(¥0.29JPY/kwh (2012) → 0.4JPY/kwh (2013) → 0.75JPY/kwh (2014))

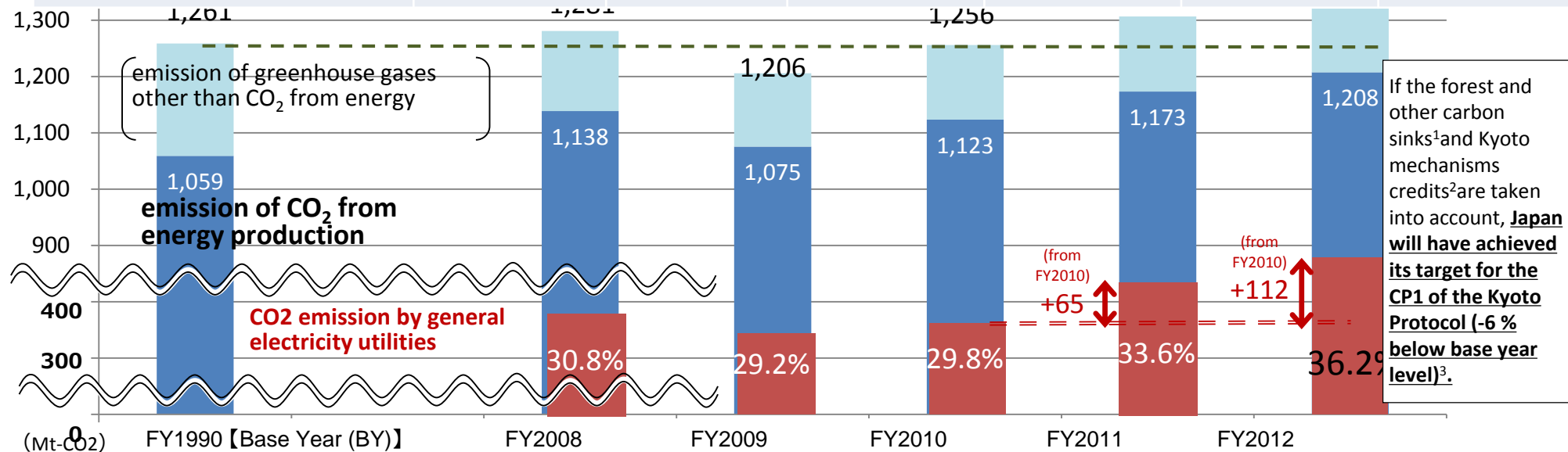


※Electricity rate for industry of Korea use the 2009 data for 2010 and 2013, and that of U.K. use the 2012 data for 2013  
Source: IEA Energy Prices and Taxes (using the exchange rate of OECD)

# CO2 emission before and after the Earthquake

- CO2 emission in FY2012 increased by 84 million tons compared with FY2010.
- Although the emission except for electricity (\*) decreases slightly, that of electric utilities increased by 112 million tons in due to the increased use of thermal power generation to make up for the lack of nuclear.

(Million t-CO <sub>2</sub> )	BY (FY1990)	FY2008	FY2009	FY2010	FY2011	FY2012
<b>Greenhouse gas emission</b>	<b>1, 2 6 1</b>	<b>1, 2 8 1</b> (+1.6% from BY)	<b>1, 2 0 6</b> (▲4.4% from BY)	<b>1, 2 5 6</b> (▲0.4% from BY)	<b>1, 3 0 7</b> (+3.6% from BY)	<b>1, 3 4 3</b> (+6.5% from BY)
<b>CO<sub>2</sub> emission for energy</b>	<b>1, 0 5 9</b>	<b>1, 1 3 8</b>	<b>1, 0 7 5</b>	<b>1, 1 2 3</b>	<b>1, 1 7 3</b>	<b>1, 2 0 8</b>
Of which, for electricity	—	3 9 5	3 5 3	3 7 4	4 3 9 +65 ▲15	4 8 6 +112 ▲27
Of which, for non-electricity	—	7 4 3	7 2 2	7 4 9	7 3 4	7 2 2



1: Removals by forest and other carbon sinks (forest carbon sink measures and urban revegetation etc) that can be used toward achieving the target. The removals by forest carbon sink measures exceeded the upper limit (238.3 Mt-CO<sub>2</sub> for the five years) set for Japan for use toward achieving the target, therefore the value is the upper limit per year.

2: Acquired by the government: Total credits that were acquired as of FY2013 year-end through the Kyoto Mechanisms Credit Acquisition Program (97.493 Mt) Acquired by the private sector: The amount of credits that were acquired by the Federation of Electric Power Companies of Japan (According to the Environmental Action Plan by the Japanese Electric Utility Industry [FY2013])

3: Total emission and removals for the Kyoto Protocol target will be finalized after the technical review process under the Kyoto Protocol and the Convention to be conducted in FY2014. Also, the Kyoto mechanisms credits will be finalized after the true-up period for the first commitment period (expected to be completed in the second half of 2015 or later).

# History of Japan's Energy Policy

1970s

[(1) Responding to the oil crises (1970s-80s)]

Energy  
security

1973: First oil shock

1980s

1979: Second oil shock

[(2) Promoting regulatory reform (since 1990s)]

1990s

Energy  
security

+

Economic  
efficiency

[(3) Coping with global warming issues (since 1990s)]

Energy  
security

+

Economic  
efficiency

+

Environment

= 3Es

2000s

1997: Kyoto Protocol adopted

2005: Kyoto Protocol came into effect

[(4) Enhancing resource security (2000s)]

Energy  
security

+

Economic  
efficiency

+

Environment

Enhanced resource security



[(5) Strategic Energy Plan]

2002: Basic Act on Energy Policy enacted

2003: Strategic Energy Plan established (revised in 2007 and 2010)

[(6) New Strategic Energy Plan (April 2014)]

Safety

+

Energy  
security

+

Economic  
efficiency

+

Environment

+

Global  
viewpoint

+

Economic  
Growth

# 3. Electricity Industry Reform

# History of Reforms in Japan

No competition in the electricity market before 1995:  
10 vertically-integrated General Electricity Utilities (GEUs) dominated and controlled the market.

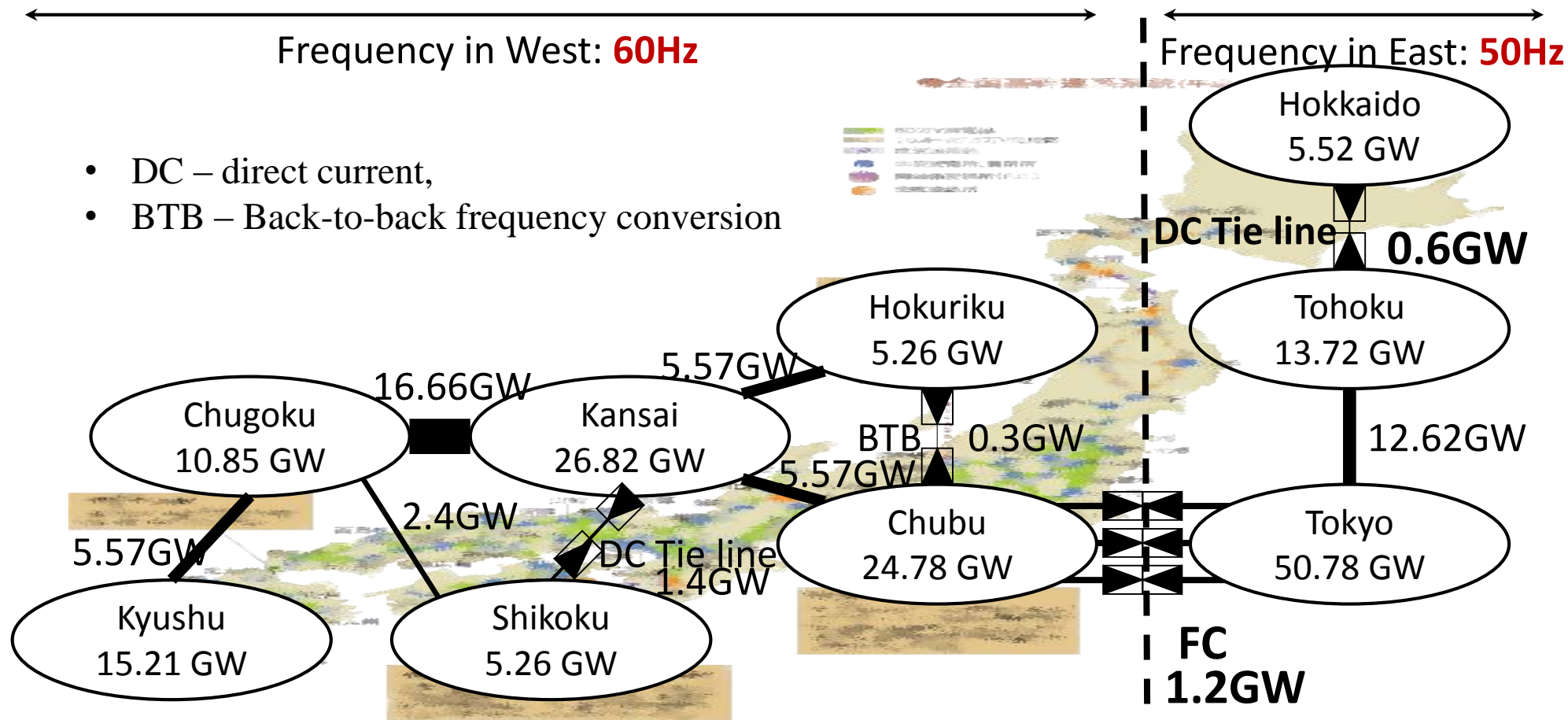


METI embarked series of reforms...

No.	Year enforced	Overview
1	1995	<ul style="list-style-type: none"><li>• Open the IPP (Independent Power Producer) market</li><li>• Allow specified-scaled and vertically integrated power generators</li></ul>
2	2000	<ul style="list-style-type: none"><li>• Introduce partial retail competition</li><li>• Accounting separation of transmission/distribution sector</li></ul>
3	2005	<ul style="list-style-type: none"><li>• Expand retail competition</li><li>• Establish the wholesale power exchange (JEPX) and its supporting body for transmission in wider areas</li></ul>
4	2008	<ul style="list-style-type: none"><li>• Modify the rule of wheeling rates</li></ul>

# Problem revealed by 3.11

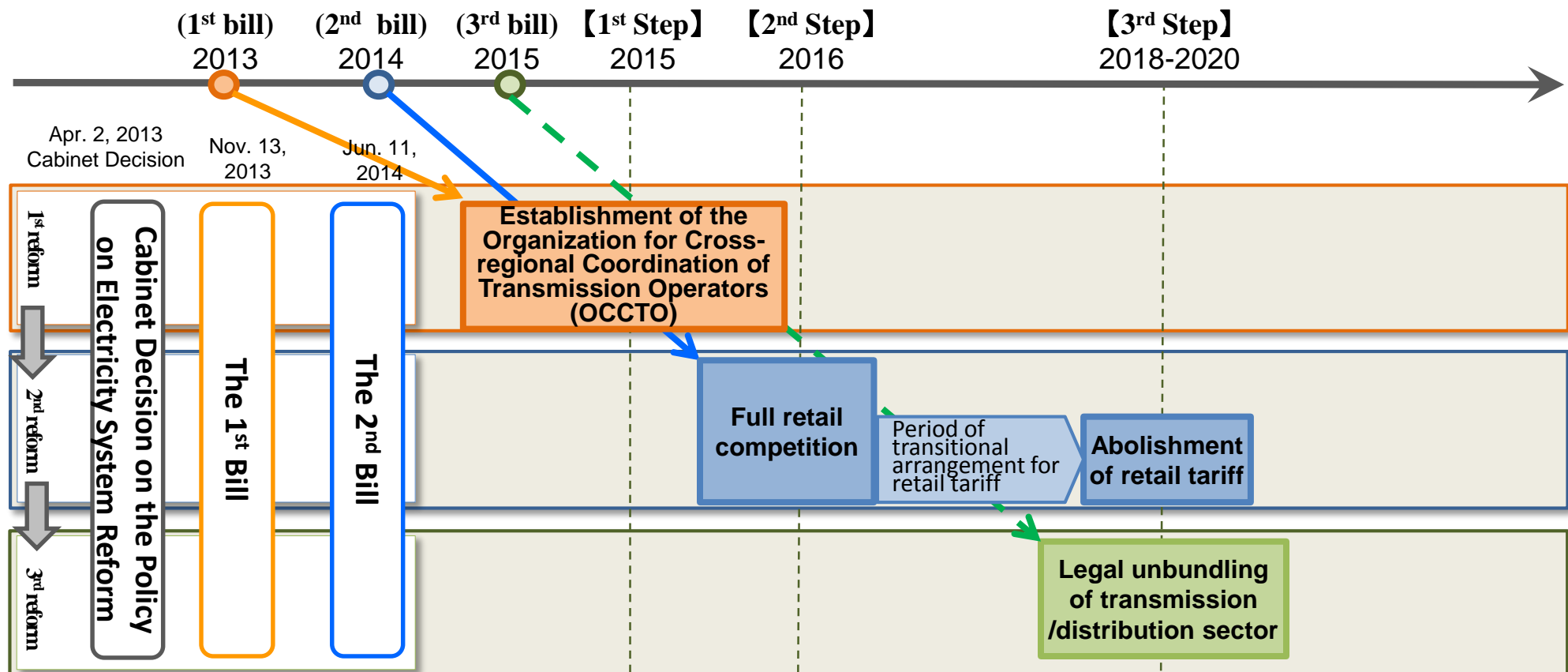
- The Great Earthquake in 2011 revealed negative aspects of regional monopoly system with 10 big and vertically integrated EPCOs:
  1. Lack of interconnections with enough capacity among regions
  2. Little competition and strong price control
  3. Limit in handling the change in energy mix including the increase in renewables



- DC – direct current,
- BTB – Back-to-back frequency conversion

# Roadmap for Electricity Market Reform in Japan

- 2 April 2013, Cabinet decided the “Policy on Electricity System Reform” to realize three objectives in Japan’s market with a three-step approach.
- 3 objectives:
  - (1) Securing a stable supply of electricity
  - (2) Suppressing electricity rates to the maximum extent possible
  - (3) Expanding choices for consumers and business opportunities



(※At around 2015: Transition to new regulatory organizations)



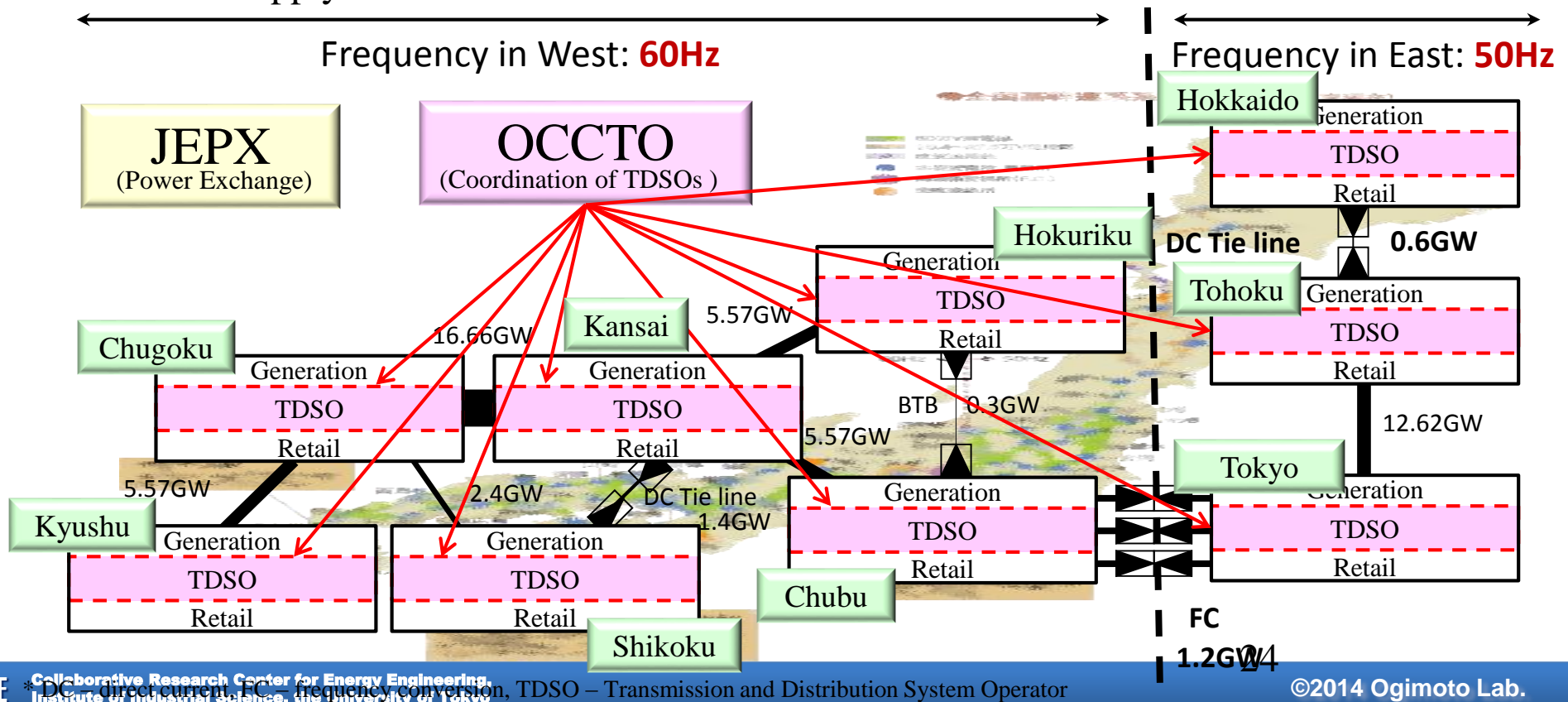
# 1st step: Establish the OCCTO

The 1<sup>st</sup> Bill

## ■ Establish the Organization for Cross-regional Coordination of Transmission Operators (OCCTO) in 2015

### ➤ Main functions of OCCTO

1. Aggregate and analyze the EPCO's supply-demand plans and grid plans, and order to change EPCO's plans such as tie lines construction
2. Order EPCOs to reinforce generations and power interchanges under a tight supply-demand situation



# 2nd step: Full Retail Competition

The 2<sup>nd</sup> Bill

- Expand retail competition to the residential sector in 2016, opening a new market
- Maintain regulated tariffs to 10 big EPCOs at around 2018-2020

Liberalized Sector  
(50kW~)



Large factory  
Large building



Building  
Medium factory



Small Factory

Market Share: 63%

Regulated Sector  
(~50kW)

Market Volume ; ¥7.5 trillion (= \$ 75bn, € 54bn)

Number of contracts

Residential Customers : 76.8m

Small shops and offices: 7.4m

Market Share: 37%



Small shop

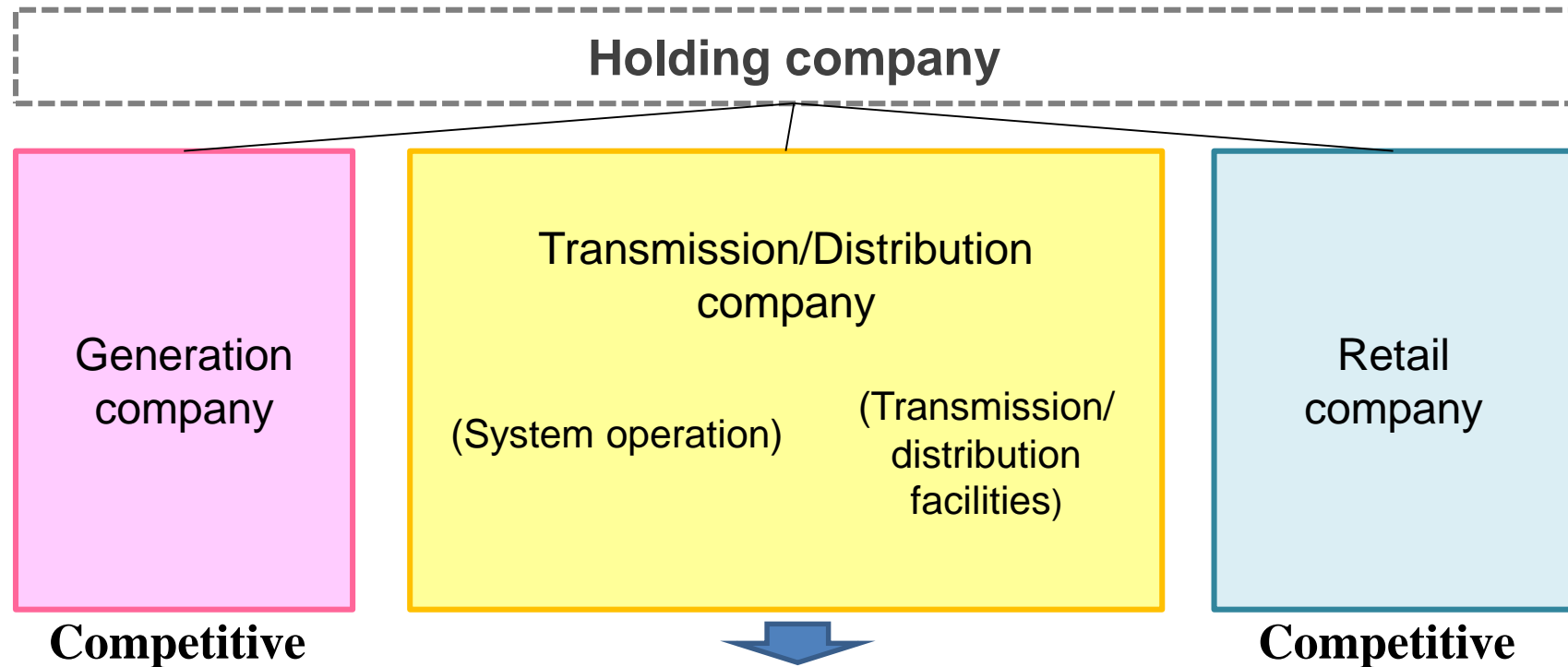


Residential Customer

# 3rd step: Unbundle the T/D sector

The 3<sup>rd</sup> Bill  
(will submit in  
2015)

- Unbundle the transmission/distribution sectors of big EPCOs by ITO-style (“legal unbundling”) in around 2018-2020



**Competitive**

**Competitive**

**Regulated**

- Regional monopoly
- Network tariff
- Responsibility for maintaining frequency & providing LR service
- Code of conduct

<Note>

- ✓ Big EPCOs will be required to unbundle transmission and distribution companies from generation ones or retail ones, in “legal unbundling.”
- ✓ Both the holding company style and the affiliated company style, in which a generation and retail company has a transmission and distribution company as a subsidiary company, are allowed.

# 4. Renewable Energy

# History of Japan's Policy of Renewable Energy

- Japan's measures to increase the use of renewable energy shifted from (1) financial support through subsidies, (2) aid through placing an obligation on electric power companies to source part of their electricity from renewable sources (the RPS scheme), to (3) the feed-in tariff (FIT) scheme that requires electric power companies to purchase electricity at fixed prices.

## Japan



### (1) Support through subsidies (1997–)

- Enactment of the Act on the Promotion of New Energy Usage (New Energy Act)
  - ✓ Provides partial financial aid to private companies implementing new-energy projects and guarantee on loans taken from financial institutions.
  - ✓ Provides financial aid to local governments implementing new-energy projects.

### (2) Support through placing an obligation (the RPS scheme) (2003–2012)

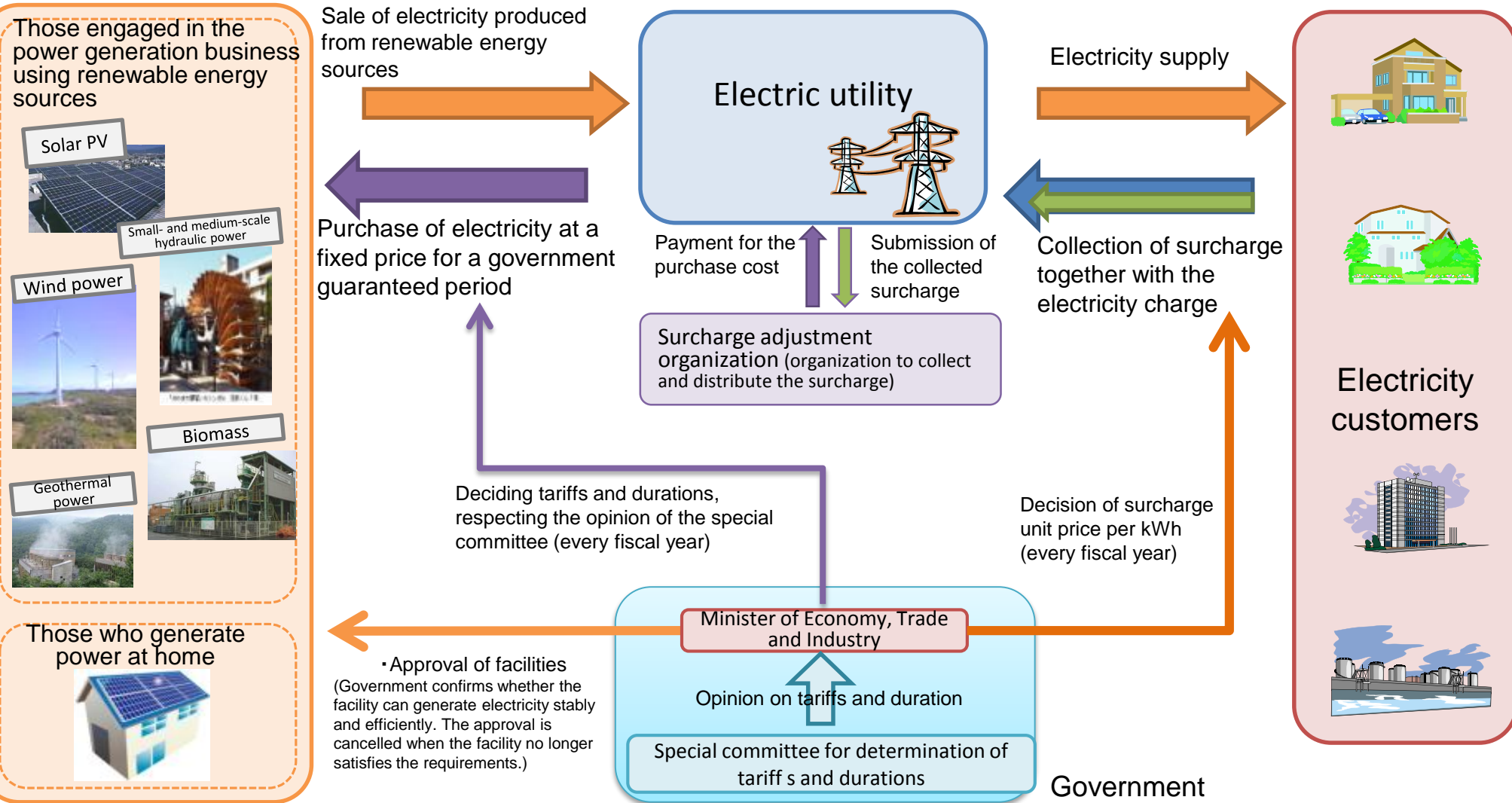
- Launch of the RPS Scheme in 2003
  - ✓ Requires electric power companies to source a specified proportion of their electricity from renewable sources (without fixed prices).

### (3) Support through buyback at fixed prices (to give prospects for recovering investment) (2009–)

- Launch of the Residential Surplus Electricity Purchasing Scheme in 2009
  - ✓ Requires electric power companies to purchase home-generated solar power of less than 500 kW at the procurement price and for the procurement period set by the government.
- Launch of the Feed-in Tariff (FIT) Scheme in 2012
  - ✓ Requires electric power companies to purchase electricity produced from renewable sources, including solar, wind, hydro, geothermal and biomass at the procurement price and for the procurement period set by the government.

# Basic Mechanism of the Feed-in Tariff Scheme

- Under the feed-in tariff scheme, if a renewable energy producer requests an electric utility to sign a contract to purchase electricity at a fixed price and for a long-term period guaranteed by the government, the electric utility is obligated to accept this request.



# Tariffs and Durations (PV, Wind, Geothermal and Hydro)

## ■ Act on Purchase of Renewable Energy Sourced Electricity by Electric Utilities (Feed-in Tariff Scheme for Renewable Energy)

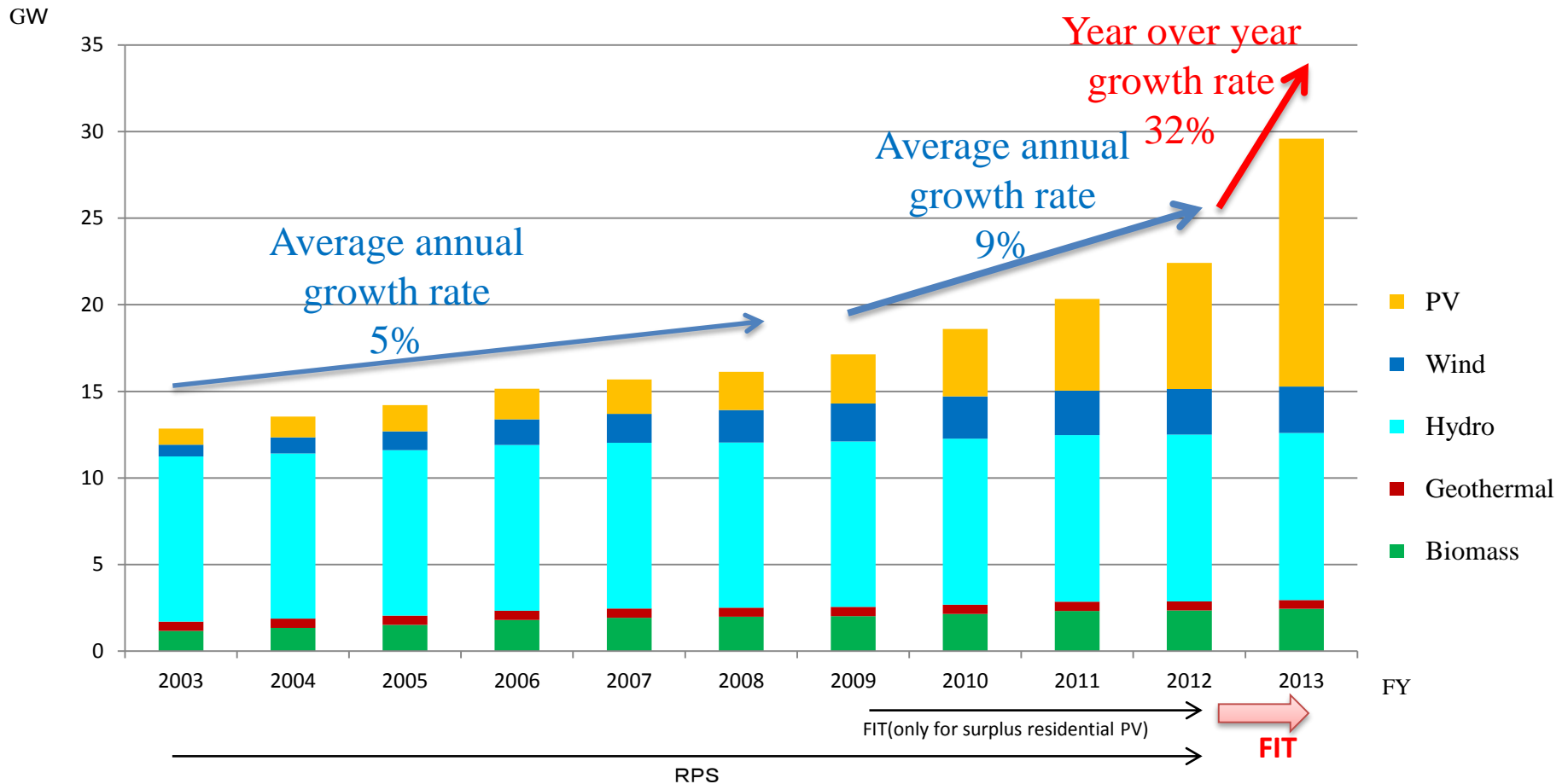
Approved at the 177th session of the Diet 2011 and started on July 1st, 2012.

Energy source	Solar PV		Wind power		Offshore Wind	Geothermal power	
Procurement category	10 kW or more	Less than 10 kW (purchase of excess electricity)	20 kW or more	Less than 20 kW	20 kW or more	15,000 kW or more	Less than 15,000 kW
Tariff ( per kWh )	<b><u>32</u> yen (+ tax)</b>	<b><u>37</u> yen</b>	<b><u>22</u> yen (+ tax)</b>	<b><u>55</u> yen (+ tax)</b>	<b><u>36</u> yen (+ tax)</b>	<b><u>26</u> yen (+ tax)</b>	<b><u>40</u> yen (+ tax)</b>
Procurement period	20years	10years	20years	20years	20years	15years	15years

Energy source	Small- and medium-scale hydraulic power			Small- and medium-scale hydraulic power(Utilization of existing headrace)		
Procurement category	1,000 kW or more but less than 30,000 kW	200 kW or more but less than 1,000 kW	Less than 200 kW	1,000 kW or more but less than 30,000 kW	200 kW or more but less than 1,000 kW	Less than 200 kW
Tariff ( per kWh )	<b><u>24</u> yen (+ tax)</b>	<b><u>29</u> yen (+ tax)</b>	<b><u>34</u> yen (+ tax)</b>	<b><u>14</u> yen (+ tax)</b>	<b><u>21</u>yen (+ tax)</b>	<b><u>25</u> yen (+ tax)</b>
Procurement period	20years			20years		

# Progress of RE Deployment

- The main driver shifted to RPS in 2003, and then, to Feed-in Tariff in 2009.
- As business environment from the financial point of view was improved, investment in RE has been stimulated. Then, extension and upgrading of the grid and regulatory reform become more important than ever.

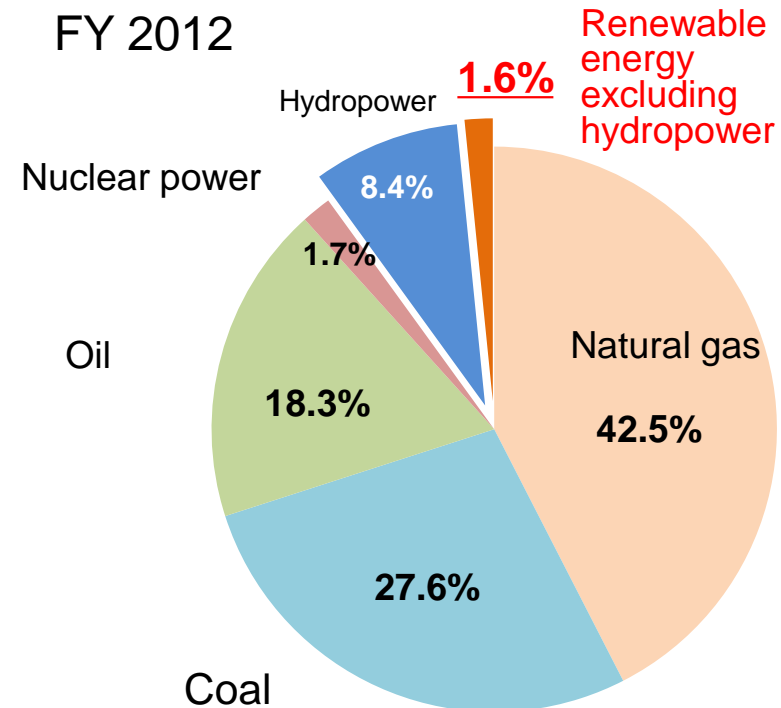
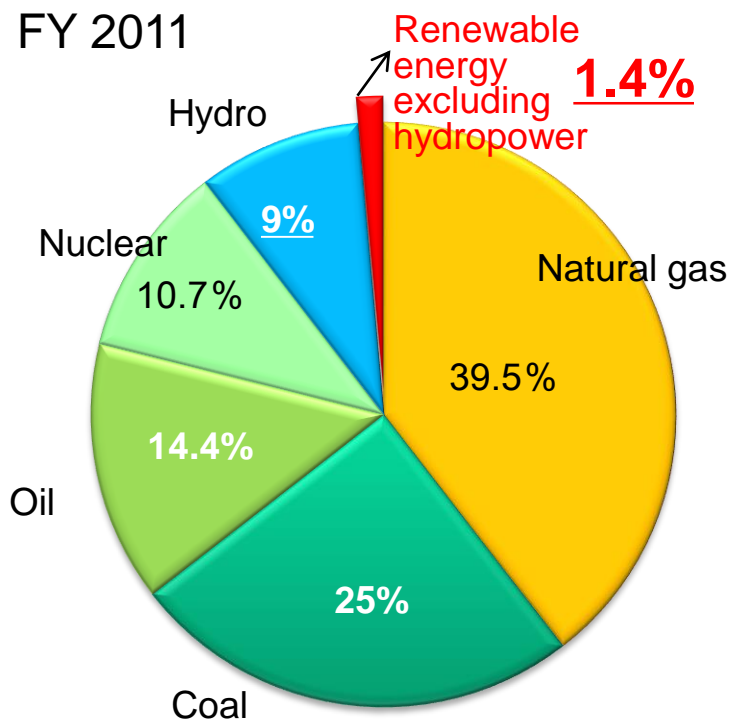




# Current Composition of Power Sources in Japan

- Among the total electricity generated in fiscal 2012, renewable energy, etc. accounted for approximately 10%; 8.4% of which is hydraulic power generation.
- Renewable energy other than hydro is still cost prohibitive.

Share of RE in the Generation mix of Japan



Note: "Etc." of "Renewable energy, etc." includes the recovery of energy derived from waste, refuse derived fuel (RDF) products, heat supply utilizing waste heat, industrial steam recovery, and industrial electricity recovery.

Source: Prepared based on the Agency for Natural Resources and Energy's "Outline of Electric Power Development in FY 2010"

# Status after the start of the Feed-in Tariff

- Since FIT started (July 2012), the capacity of RE increased by 8.95 GWW (45%) as of the end of March 2014, during 21 month.
- Among the Res, PV is the super-highest in the share of deployment and that FIT application

## <Deployment of renewable energy (as of the end of March 2014) >

	Accumulated capacity before FIT started	Deployed capacity after FIT started (July 2012 )	Certified capacity in FIT As of March, 2014	Target as of 2030
Solar power (residential)	4.7 GW	2.28 GW	2.69 GW	53.00 GW
Solar power (non-residential)	0.9 GW	6.44 GW	63.04 GW	
Wind	2.6 GW	0.11 GW	1.04 GW	10.00 GW
Mid- to small-sized hydraulic (Less than 30MW)	9.6 GW	0.01 GW	0.30 GW	5.56 GW
Biomass	2.3 GW	0.12 GW	1.57 GW	-
Geothermal	0.5 GW	0.00 GW	0.01 GW	1.65 GW
Total	20.6 GW	8.95 GW	68.6 GW	

# Trends in Japan's Solar Power Market

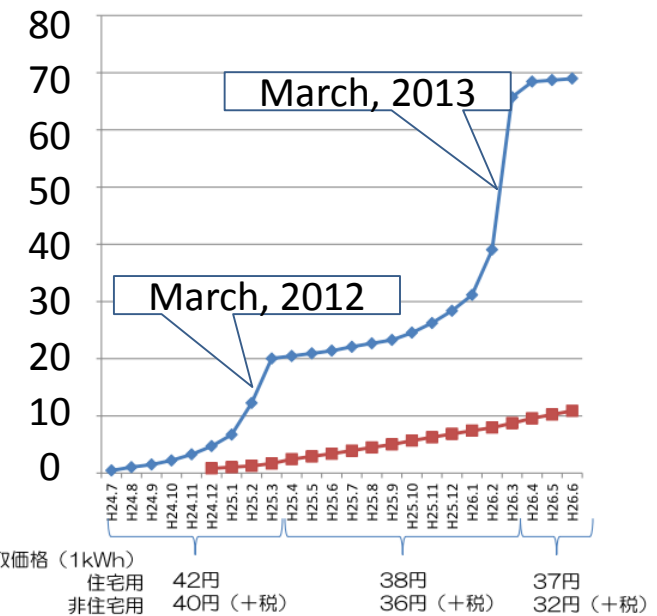
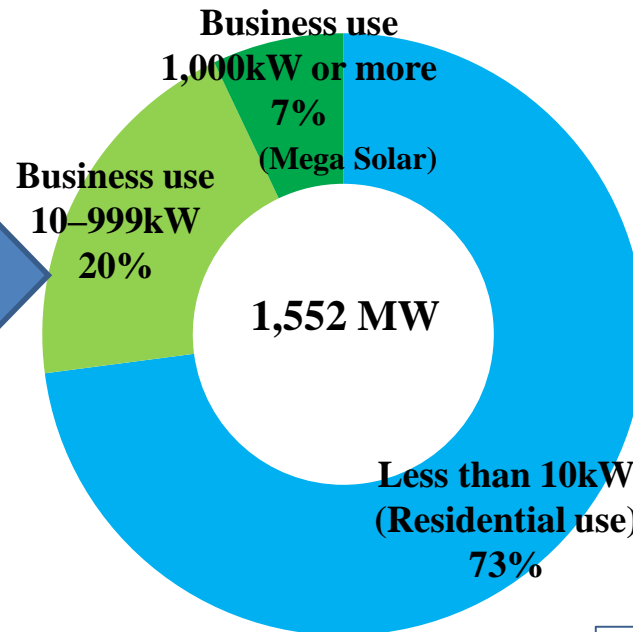
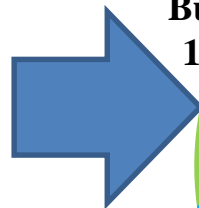
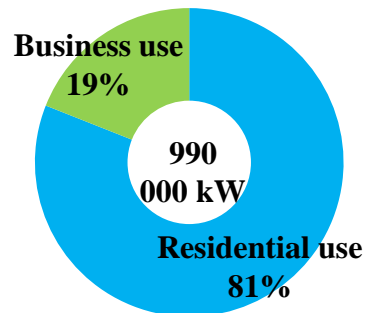
- Before the launch of the FIT scheme, residential use accounted for the majority of the market.
- The commercial market grew over time following the launch of the scheme, as seen in the increasing construction of mega solar power facilities (with capacity of 1000 kW or more), which were scarce before the launch.

## After the launch

(Deployed Capacity from April 2012 to February 2013)

## Deployment and Certification (GW)

### Before the launch (Installations in 2010)



# Acceleration of RE deployment

- Steps toward problem solution – Technology development & corroboration, transmission & distribution network construction, rationalization of procedure for environmental assessment

## Technology development & corroboration

[7MW station, world's largest in scale]



Blade radius: 80 m

## Floating wind power generation station off Fukushima aiming at first actual operation in world

(Two 7MW stations will be installed from 2014 and onward: **¥28 billion**)

## Construction of transmission and distribution networks

## GOJ paying for half the cost of constructing and testing transmission and distribution networks in appropriate places for wind power in Hokkaido and Tohoku

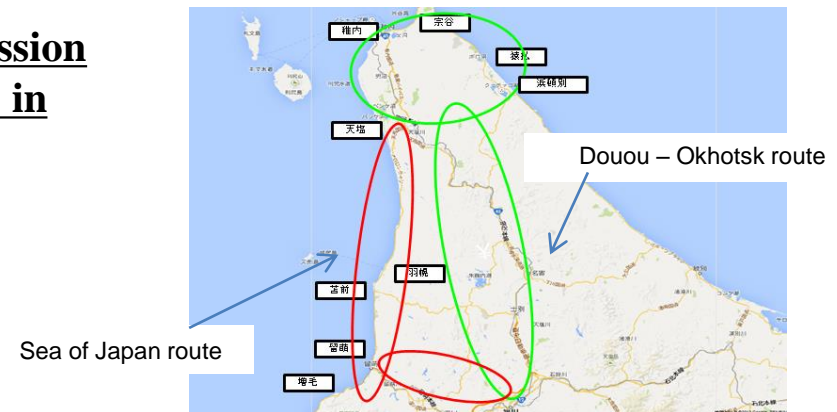
(2013: **¥25 billion**, 2014: **¥15.05 billion**)

## Rationalization of procedure for environmental assessment

## To shorten period of procedure for environment assessment of wind and thermal power generation, which usually takes 3 or 4 years

(2014: **¥2 billion**)

[Route scheduled for constructing transmission/distribution network in Hokkaido]

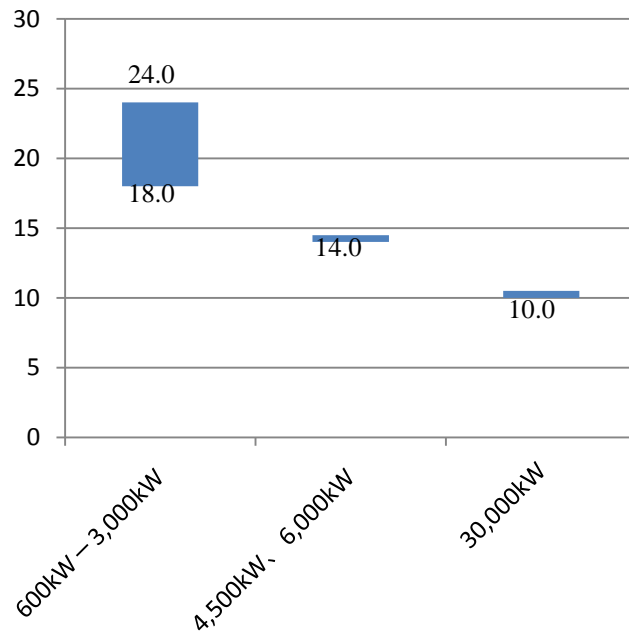


# Current Status of Wind Power (Onshore)

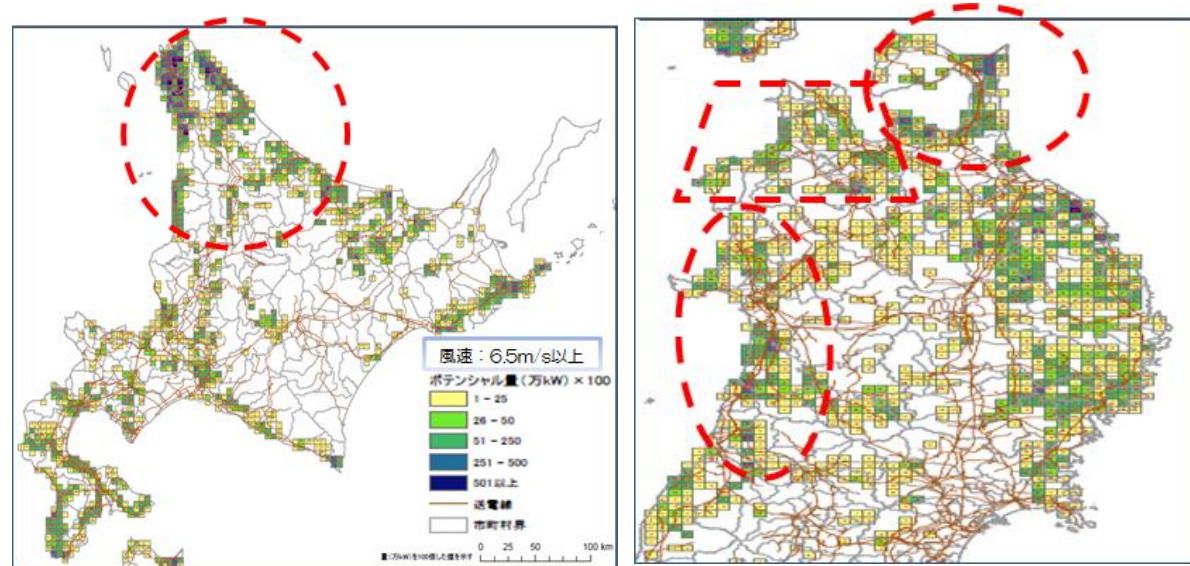
- Wind power generation costs are favorable even compared to thermal and hydro sources. As wind power is cost effective relative to other renewable sources, it is seen as a key to increasing the use of renewable energy. However, it should be noted that it has economies of scale.
- 66% of areas that have wind speed of over 6.5 meters per second—the level considered necessary to ensure business profitability—are concentrated in Hokkaido (45%) and Tohoku (21%).
- Challenges to increase installations of wind power include improving the power grid in sites suitable for wind power generation (part of Hokkaido and Tohoku) and streamlining regulations.

**Estimated wind power generation costs by capacity**  
(by NEDO)

(yen/kWh)



**Sites suitable for wind power generation**  
(part of Hokkaido and Tohoku)



# Current Status of Japan's Geothermal & Industry

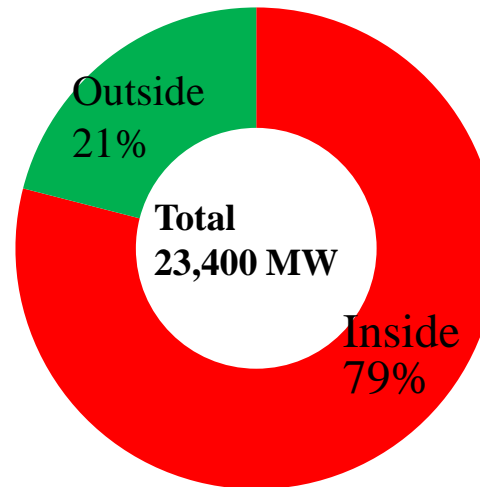
- Geothermal power, which has a higher operating rate (70%) compared to other renewable generation, is expected to serve as a long-term stable energy source.
- Japan has the world's third largest reserve of geothermal resources (23,400 MW) but has only 520 MW of installed capacity, *due to environmental and land-use constraints of people*.
- The government eased regulations on development in designated national parks and monuments that have abundant geothermal reserves and are concentrated with sites that allows for power generation at low cost (March 2012). Projects are underway in Hokkaido, Tohoku and Kyushu.
- Three Japanese manufacturers, Mitsubishi Heavy Industries, Toshiba and Fuji Electric, account for 70% of the global market of geothermal turbines.

## World geothermal resources

Country	Geothermal resources (10,000 kW)	Installed capacity of geothermal power (10,000 kW)
U.S.	3,000	309.3
Indonesia	2,779	119.7
Japan	2,347	52.0
Philippines	600	190.4
Mexico	600	95.8
Iceland	580	57.5
New Zealand	365	62.8
Italy	327	84.3

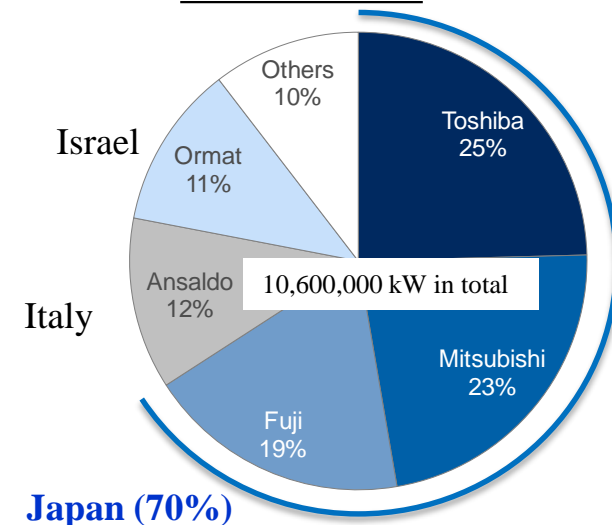
Source: Materials provided by the National Institute of Advanced Industrial Science and Technology, .

## Geothermal reserves in Japan (Inside or Outside of National Park)



Source: National Institute of Advanced Industrial Science and Technology, 2011

## Global geothermal turbine market share



Source: Bloomberg

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# Working Group on Grid Connection of RE

- The Ministry of Economy, Trade and Industry (METI) decided to newly **establish a Working Group on Grid Connection of Renewable Energy** under the New and Renewable Energy Subcommittee, the Committee on Energy Efficiency and Renewable Energy of the Advisory Committee for Natural Resources and Energy, in order to verify the utility companies' capacity of power grid connection for renewable energy, as well as to deliberate measures for increasing such capacity.
- **Background**: The introduction of the Feed-in Tariff Scheme has rapidly expanded the dissemination of photovoltaic power generation facilities, utility companies are now facing issues of the limited capacity of power grid systems and that of adjusting the supply-demand balance across their service areas, making it difficult for them to accept additional connection requests. **For example 18 GW FIT certification by the Government in Kyushu Island with 15 GW peak load.**
- **Objectives**: These issues may be an obstacle to introducing renewable energy sources to the maximum extent possible. **Japan should closely verify the adequacy of utility companies' current measures for accepting such connection requests and should quickly discuss possible measures to address such issues.**
- For this purpose, METI decided to newly establish the Working Group on Grid Connection of Renewable Energy of experts from a neutral stance, so as to verify the grid capacity, within which utilities are able to accept CONNECTION REQUESTSs, and to discuss possible measures for increasing such capacity.
- Regarding the members of the WG, **METI decided to invite experts who are familiar with the technology in the field**, considering the technical and highly-professional subjects to be discussed. In addition, METI has asked the related industries to attend the meeting as observers. For details of the members, see the Japanese language press release.
- **The WG meetings, the first second ones being held on October 16<sup>th</sup> and 30<sup>th</sup>, will have more meetings in December to draw some conclusions by the end of this year.**

# History of Japan's Energy Policy

1970s

[(1) Responding to the oil crises (1970s-80s)]

Energy  
security

1973: First oil shock

1980s

1979: Second oil shock

[(2) Promoting regulatory reform (since 1990s)]

1990s

Energy  
security

+

Economic  
efficiency

[(3) Coping with global warming issues (since 1990s)]

Energy  
security

+

Economic  
efficiency

+

Environment

= 3Es

2000s

1997: Kyoto Protocol adopted

2005: Kyoto Protocol came into effect

[(4) Enhancing resource security (2000s)]

Energy  
security

+

Economic  
efficiency

+

Environment

Enhanced resource security



[(5) Strategic Energy Plan]

2002: Basic Act on Energy Policy enacted

2003: Strategic Energy Plan established (revised in 2007 and 2010)

[(6) New Strategic Energy Plan (April 2014)]

Safety

+

Energy  
security

+

Economic  
efficiency

+

Environment

+

Global  
viewpoint

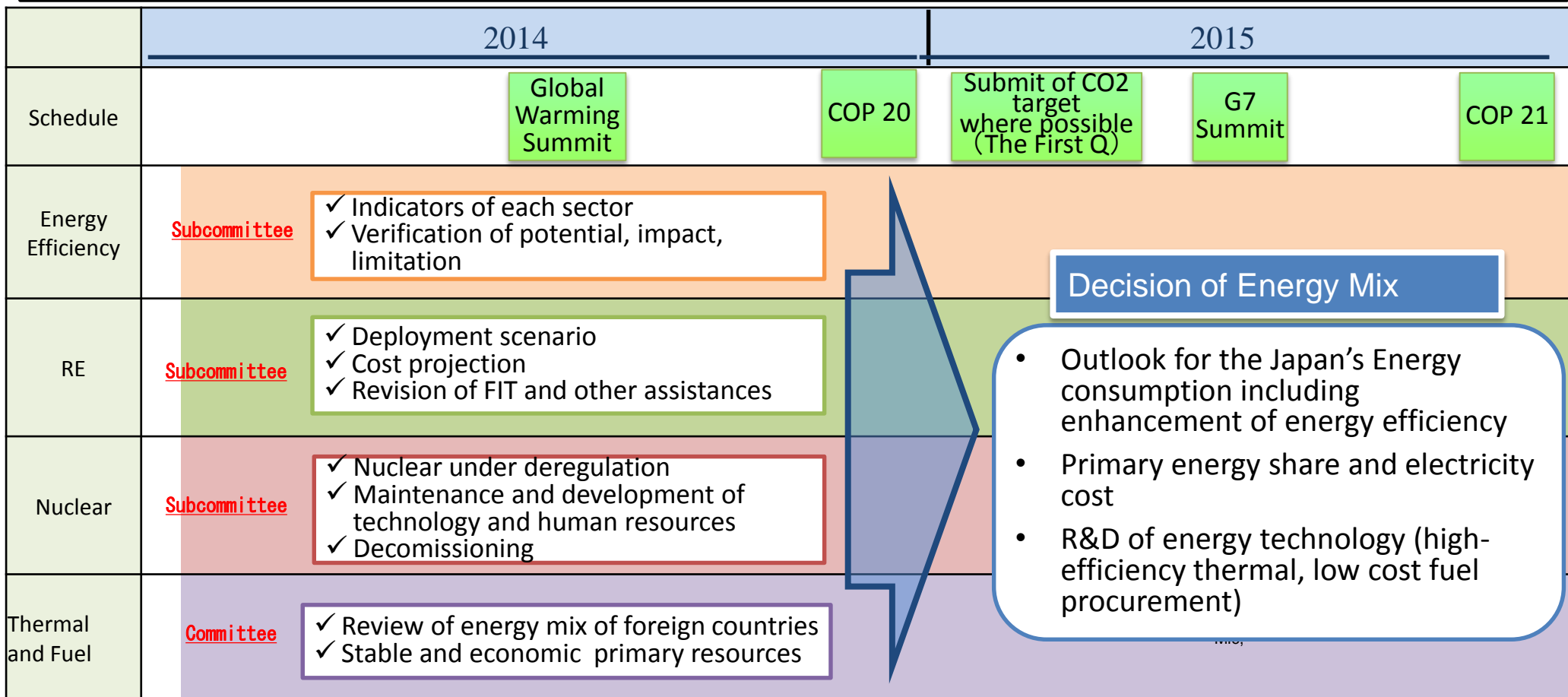
+

Economic  
Growth



# Decision for the new energy mix

- Based on the Strategic Energy Plan, the energy mix for the future will be decided in the near future.
- The official discussions have been paralleled subcommittees of Energy Efficiency, RE, Nuclear, and Thermal Generation and Fuel.
- The Energy mix will be decided based on the schedule of the restart of nuclear, RE integration, and the latest discussions on Global Environment including COP.



# Questions?

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