METI
Ministry of Economy, Trade and Industry

# Japan's strategies and Challenges
## ~Renewable Energy and Energy Efficiency~

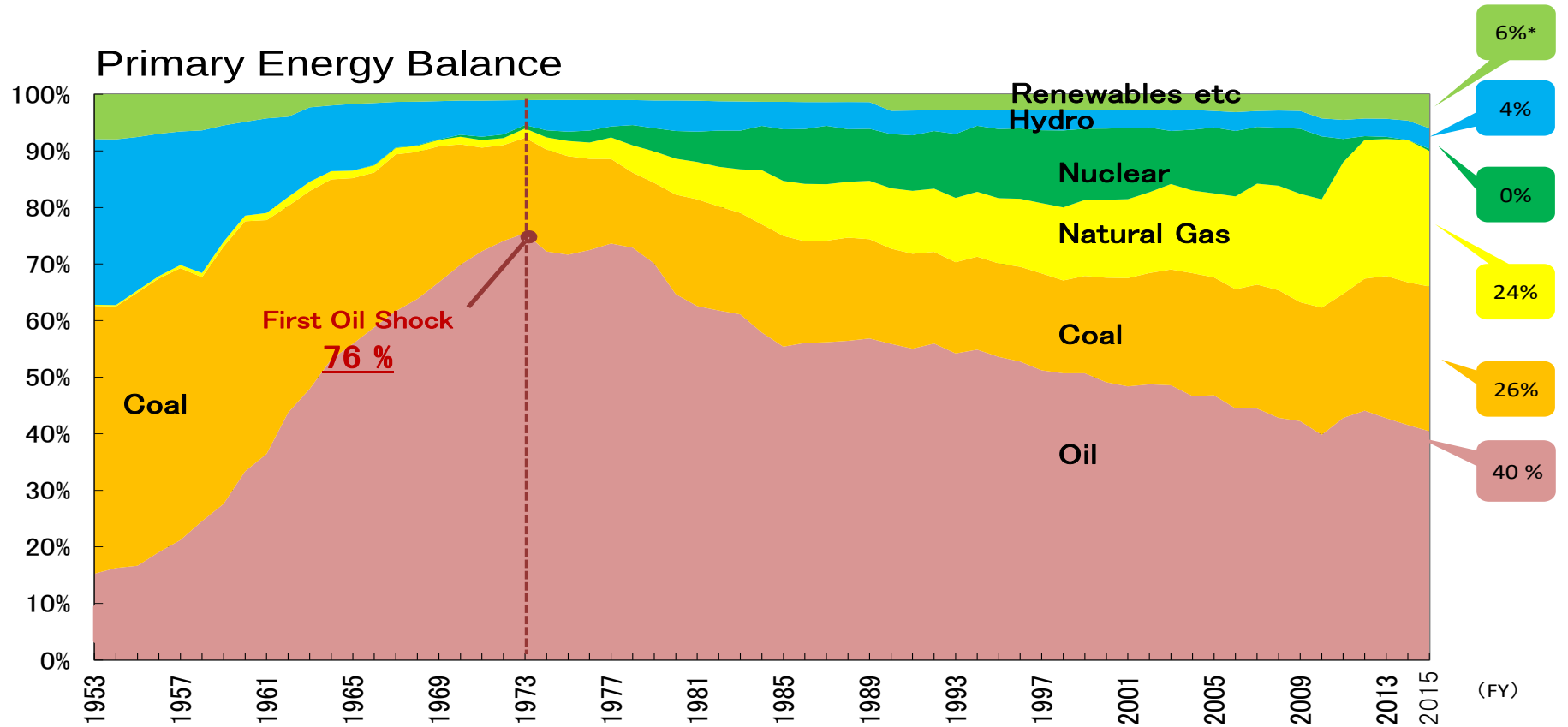
Nov 14th, 2018

Agency for Natural Resources and Energy

Ministry of Economy, Trade and Industry, Japan

# Japan's Energy Balance in History

- Japan has changed energy mix to balance energy supply and demand each time we faced challenges.
  - 60's：national coal to oil, 70's：Oil crisis, 90's：Liberalization and global warming, in 2011：the Great East Earthquake and Fukushima Accident




Post war reconstruction (1950s)

Rapid economic growth(1960-)

Two oil crises (1970s)

Liberalization of markets and global warming (1990s-)

Great East Japan Earthquake and 1F accidents (2011-)

From domestic coal to petroleum (1960s)

・From oil to gas and nuclear

・the world's high level of energy efficiency

・Focus of Nuclear ・Focus of Renewable

* "Renewables etc." consists of solar power (1.5%), wind power (0.2%), geothermal heat (0.1%), and biomass (1.9%), effective recovery use of wasted energy(2.2%).

Source: Prepared based on "Comprehensive Energy Statistics 2016" issued by the Agency for Natural Resources and Energy.

# Challenges to overcome the high cost structure

## Photovoltaic power

| | FY2010 | | FY2016 | FY2030 |
|---|---|---|---|---|
| **Photovoltaic** | 0 % | **+5 %** | 5 % | 7 % |
| Wind | 0 % | +1 % | 1 % | 2 % |
| Biomass | 1 % | + 1% | 2 % | 4~5 % |
| Geothermal | 0 % | | 0 % | 1 % |
| Hydro | 7 % | | 7 % | 9 % |

## The path to the major power source

**<Rectifying high cost>**

Comparison of the price of renewable energy between Japan and Germany (change from 2012 to 2016) [Yen/kWh]

| | **Photovoltaic** | **Wind** |
|---|---|---|
| Japan | 40 yen ⇒ **24 yen** | 22 yen ⇒ **22 yen** |
| Germany | 22 yen ⇒ **9 yen** | 11 yen ⇒ **9 yen** |

**<Enhancing competitiveness of industries>**

Comparison of the scale of leading companies between other countries and Japan (2016)

| **Scale of manufacturers in the field of photovoltaic power generation** Trina Solar (China) / Company A (Japan) | **Scale of manufacturers in the field of wind power generation** Vestas (Denmark) / Company B (Japan) | **Scale of business involving power generation by renewable energy** Iberdrola (Spain) / Company B (Japan) |
|---|---|---|
| **5 times larger** | **80 times larger** | **5 times larger** |

## Measures needed to increase renewable sources dramatically

**<Securing adjustment of electricity supply and demand>**

**Due to the intermittency of renewables, mitigation of changes is indispensable.**

**Innovation for adjustment measures, e.g., storage batteries**

**<Securing power grids>**

**Distribution of renewable energy power sources is different from that of the conventional large-scale power sources**

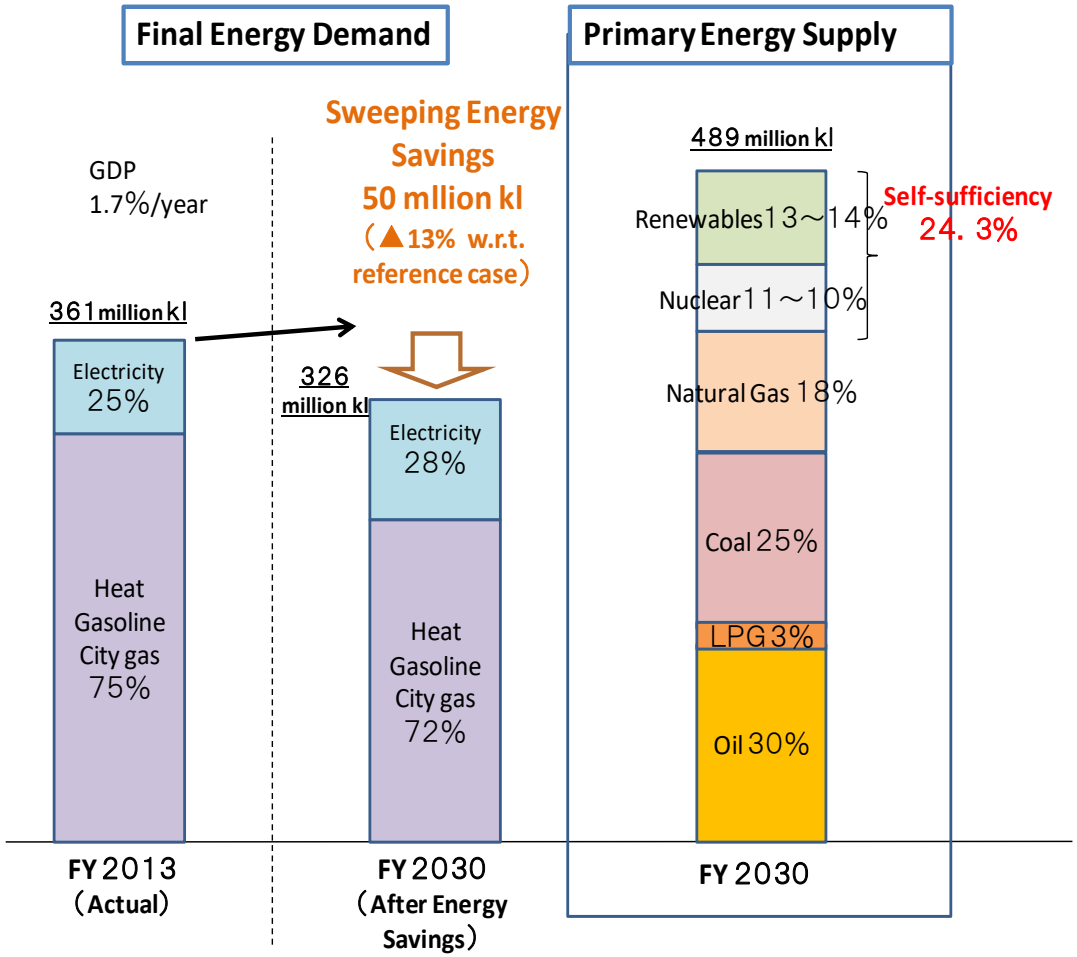
**[i] Improving and developing the operation of power grids**
**[ii] Promoting dispersed power systems combined with storage batteries**

# Energy Supply/Demand Structure toward $CO_2$ Emissions Reduction Target in 2030

○ While energy demand growth is projected in line with economic growth (**an average 1.7%**), energy efficiency is expected to improve as much as after the oil crises thorough energy conservation (**35% in 20 years**).

○ **Energy supply/demand structure improvement** (energy self-sufficiency rate: 6% in 2014 ⇒**24.3%** in 2030)

○ **Japan's $CO_2$ emissions reduction target** (**26% $CO_2$ emissions reduction** in 2030 compared with 2013 level)




(Source) METI "Long-term Energy Supply/Demand Outlook" p.5 (July 16, 2015)

# Measures and Energy Saving Potential by Sector

Industry <▲10.42 million kl>
- Energy-intensive industry (iron/steel, chemical, cement, paper/pulp)
- Voluntary agreement
- Energy management
- IT technology and energy management
- Innovative technology
- COURSE50 ($Co_2$ Ultimate Reduction in Steelmaking process by Innovative technology for cool Earth 50)
- Use of CO2 as feedstock
- Advanced EE technology
- boiler, cogeneration

Transport <▲16.07 million kl>
- Next generation vehicles, fuel economy improvement
- next generation vehicles to represent 1unit /2units
- more than 100,000 fuel cell vehicles to be sold annually
- Traffic stream management

Commercial <▲12.26 million kl>
- Building EE improvement
- Large-scale buildings' compliance on EE standards
- LED and OEL diffusion
- BEMS and energy management
- half of buildings to install BEMS
- Awareness promotion

Residential <▲11.60 million kl>
- Building EE improvement
- Residential buildings' compliance on EE standards after 2020

LED and OEL diffusion
- HEMS and Energy management
- all residential households to introduce the system
- Awareness promotion

# Overview of Act on the Rational Use of Energy

- The Law provides guidelines for factories, commercial business entities and transport business entities and owners to follow and requires them to report their energy efficiency activities, middle and long-term plans. If their activities are not sufficient, necessary instructions and guidance will be made.
- For manufactures of appliances and automobiles are required to meet the respective targets. Necessary recommendations will be made if not sufficient actions are taken.

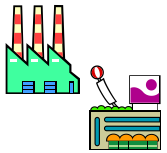
## Direct Regulation

### Factory・Business

**Aspirational Target**

**Factories/commercial businesses**

・Aspirational target



**Reporting Obligation**

**Special business entities**

**（Annual energy consumption over 1,500kl/year）**

・Designation of energy manager
・Reporting obligation of middle, long-term plan
・Reporting obligation of annual energy consumption

### Transport

**Freight/passenger transport businesses**

・Aspirational target

**Special business entities**

**（Owning trucks of more than 200 units）**

・Reporting obligation of middle, long-term plan
・Reporting obligation of annual energy consumption

**Freight owner**

・Aspirational target

**Special business entities**

**（freight transport goods of more than 30 million ton km per year）**

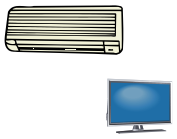
・Reporting obligation of middle, long-term plan
・Reporting obligation of annual energy consumption

## In-direct Regulation

### Top Runner Program

**Manufactures（At above certain level）**

・32 products are under the energy efficiency improvement target



### Information

**Retailers of appliances and energy**

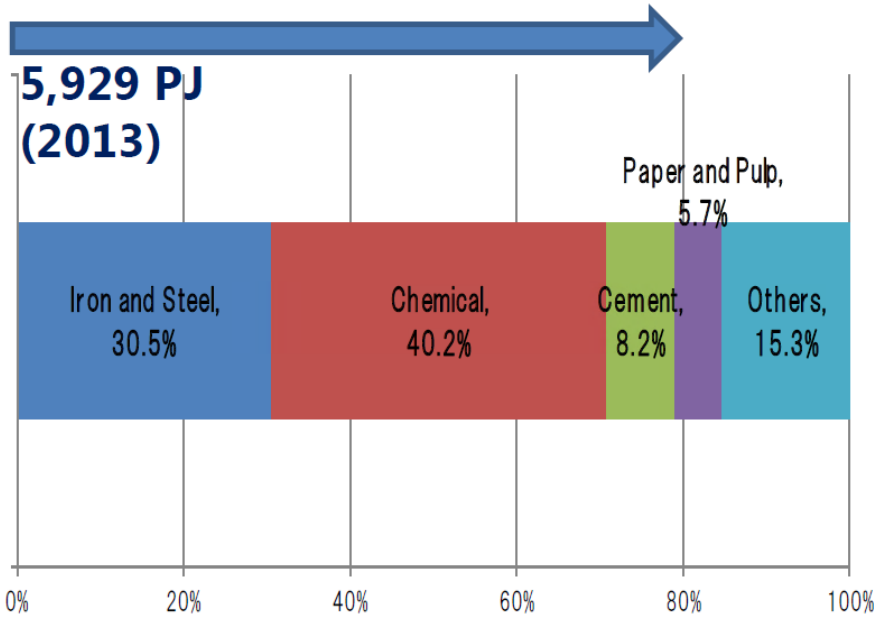
・Information provision to consumers（Aspirational goal）

※Building energy efficiency is regulated under the building energy conservation law since 2019.

# Benchmark System

- 6 industry sub-sectors for 10 categories are under the benchmark system. Benchmark system allows the comparison of EE&C among the same type industry category.
- Those industries that belong to top 10-20% of each industry sub-sector are better rated in the annual reporting system.

**Coverage of Benchmark System:**
**80% of industrial energy consumption**




Industry Sub-sector Covered by Benchmark System;

1. Iron and Steel (Blast Furnace)
2. Iron and Steel (EAF,Ordinary Steel)
3. Iron and Steel (EAE,Special Steel)
4. Electric Suppliers
5. Cement
6. Paper
7. Pulp
8. Refinery
9. Chemical
10. Chlorine production

# Widening the Coverage of Benchmark System

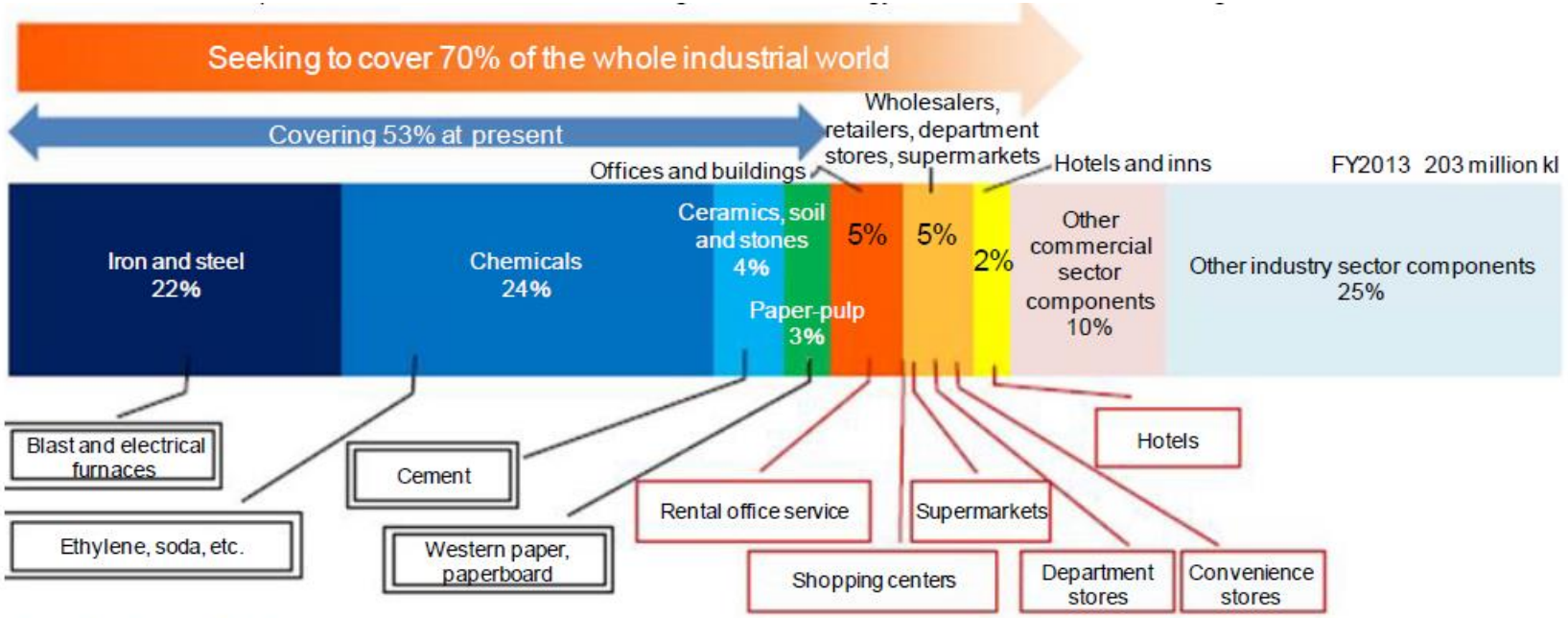
Dialogue between Public and Private Sector (26 Nov, 2015)

## Prime Minister's Statement

We plan to expanding the benchmark system to the service industry with the coverage becoming 70% of total energy consumption of industry/commercial sectors.

**Dialogue between public and private sectors**

Based on the Japan Revitalization strategy 2015(Cabinet decision on June 30,2015), the dialogue between the public and private sectors for future investment is held for the two sectors to clarify the path the Japanese economy should follow in the age of uncertainties growing through the intensification of global competition and the rapid technological innovation and to share the government's desirable environment development course and the direction of private sector investment. The third dialogue dealt with energy-related investment and challenges.



# Hydrogen Energy Ministerial Meeting

**【Purpose】**

- **Realize hydrogen as key technology and to be a new energy alternative for de-carbonization by connecting resources such as fossil fuel and Carbon Capture, Utilization and Storage(CCUS), or renewable energy**
- **Harmonize and cooperate for enhancing utilization of hydrogen at a global scale**
- **Verify and Discuss on**
  - ✓ **Innovative challenges and latest knowledge**
  - ✓ **Possibility of international cooperation**
  - ✓ **Future direction**

  **for formulating global initiative on hydrogen**

Hydrogen Energy Ministerial Meeting

H2EM 2018

- Date: 23rd October 2018
- Venue: DAI-ICHI HOTEL TOKYO, Japan
- Host: Ministry of Economy, Trade and Industry, Japan
- Attendees : Ministers, Government officials, Private Sectors
- Participating Countries: Australia, Austria, Brunei, Canada, China, Germany, Iceland, Indonesia, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Qatar, South Africa, South Korea, Spain, United Arab Emirates, United Kingdom, United States of America, EC, IEA
  (21 countries, 1 region, and 1 organization)

# “Tokyo Statement”

Collaboration on Technologies and Coordination on Harmonization of Regulation, Codes and Standards

Promote Information Sharing, International Joint Research and Development emphasizing Hydrogen Safety and Infrastructure Supply Chain

Study and Evaluate Hydrogen’s Potential across Sectors including its Potential for Reducing both CO2 Emissions and Other Pollutants

Communication, Education and Outreach