

JAPAN'S ENERGY POLICY AND JAPAN-RUSSIA ENERGY COOPERATION

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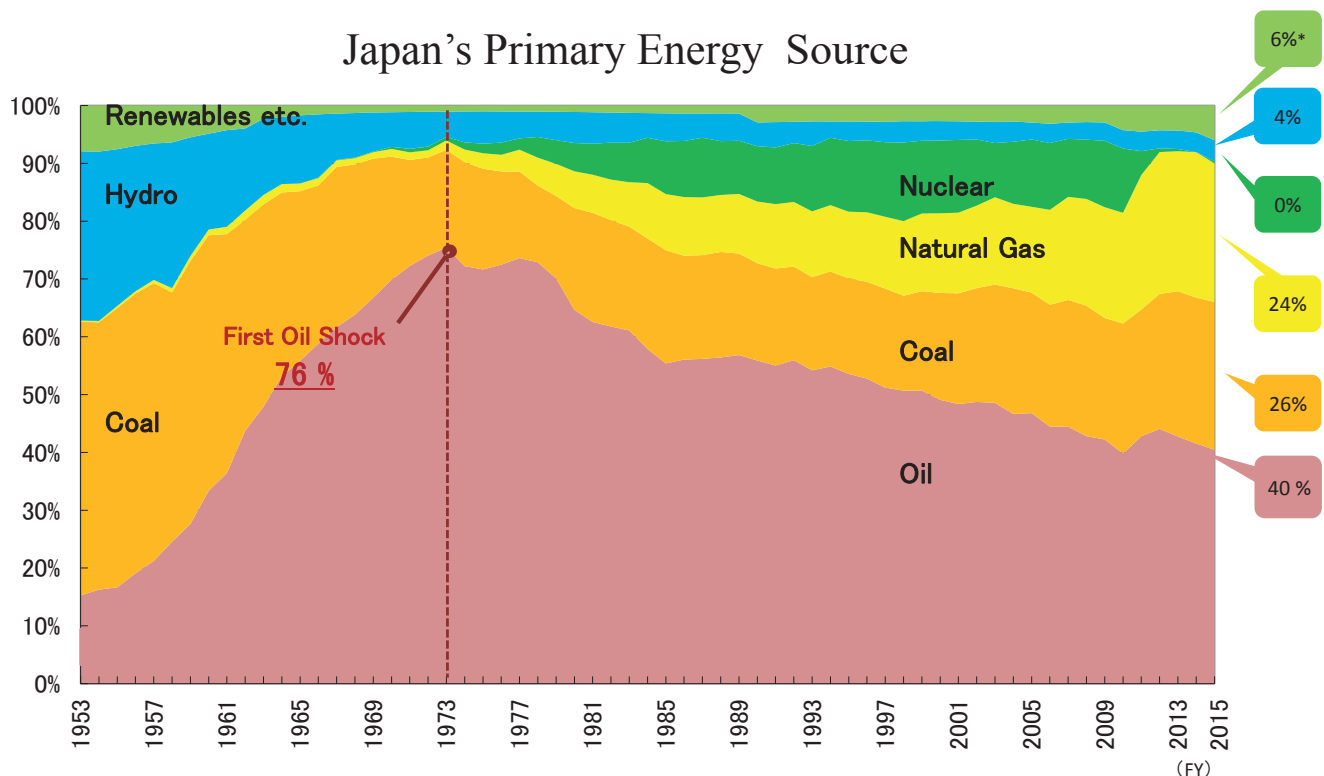
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1. Japan’s Energy Situation

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Japan’s Energy Supply Structure



* "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.

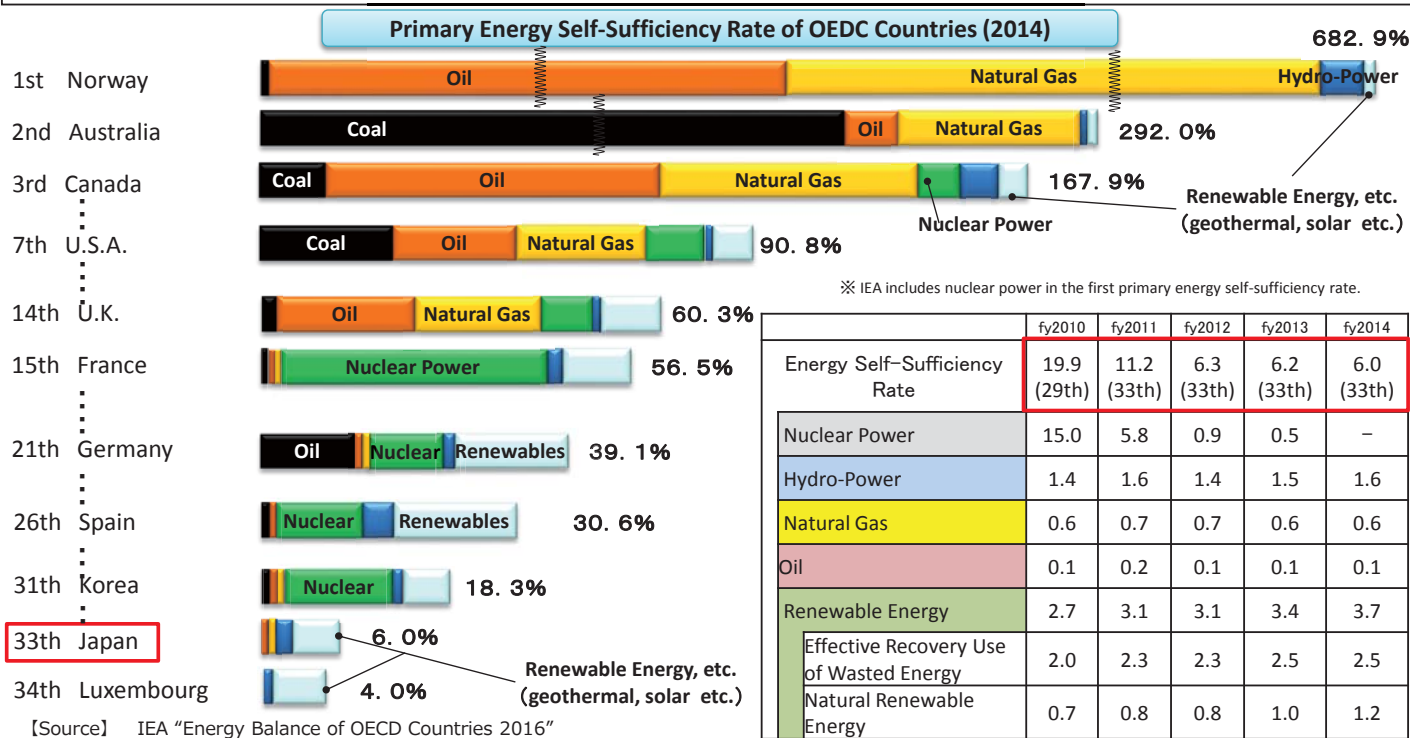
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Stable supply: Self-sufficiency

○ Significantly lower than before the earthquake (19.9% in 2010). Second lowest in 34 OECD countries.

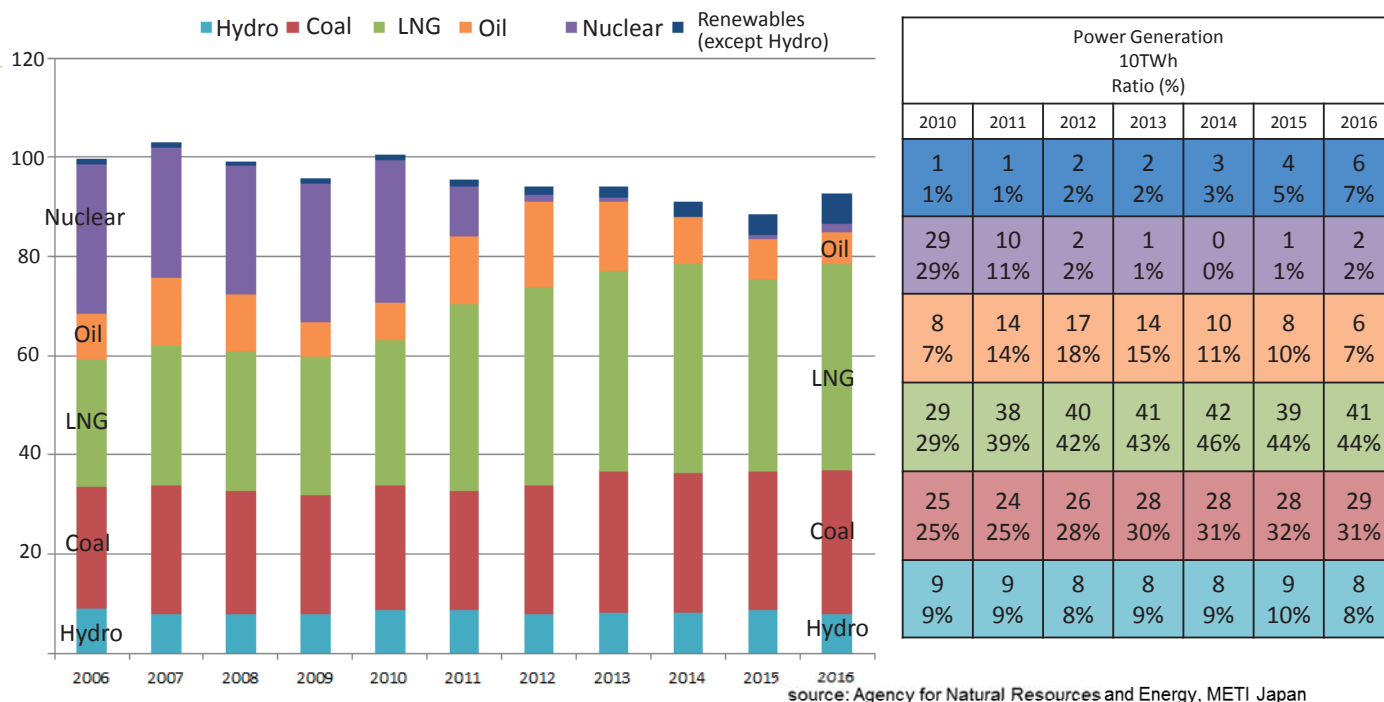
○ Aim to improve to about 25%, higher than before the earthquake

*IEA regards nuclear power as domestic energy and includes it in primary energy self-sufficiency. The Strategic Energy Plan of Japan regards nuclear power as semi-domestic energy.



Trend in Domestic Power Generation Ratio

- The nuclear power ratio in domestic power generation has decreased after the Great East Japan Earthquake due to the long-term shutdown of nuclear power plants.
- On the other hand, the thermal power ratio has increased to 80%. Currently, LNG thermal power alone accounts for nearly 40% of domestic power generation.

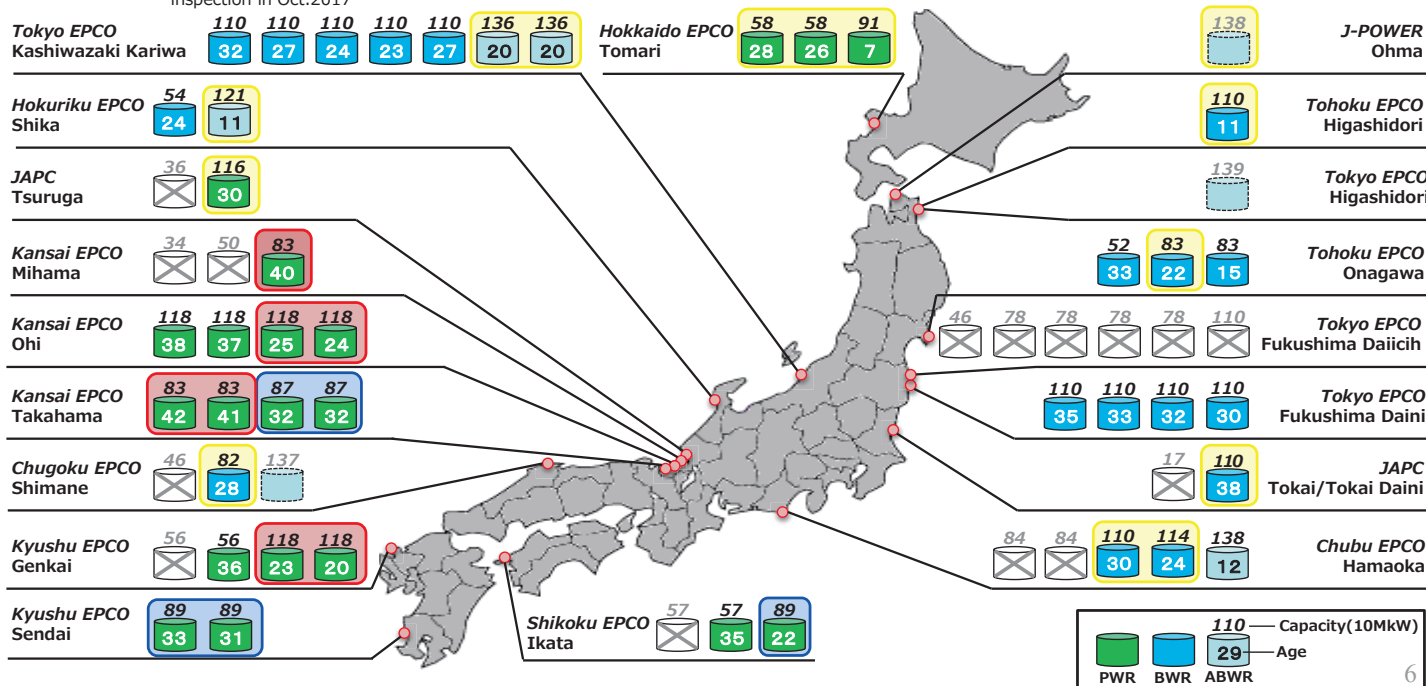


Nuclear Power Plants in Japan

In Operation 5 reactors ■	Passed NRA Review for the Permission for Changes in Reactor Installation 7 reactors ■	Under NRA Review 14 reactors ■	already decided to Decommission 15 reactors ■
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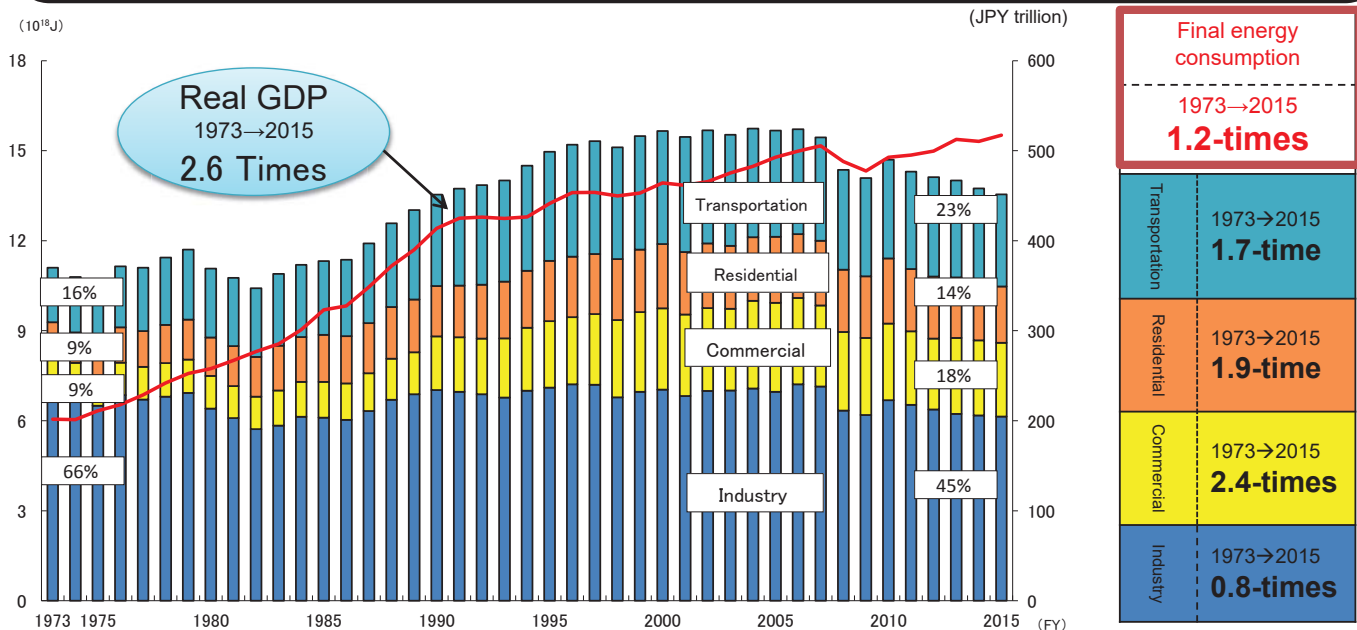
*Sendai Unit .3: Stop by the periodic inspection in Oct.2017

As of 4th, Oct, 2017



Trends in Final Energy Consumption in Japan

- The final energy consumption of Japan has basically consistently increased, except for periods immediately following the two oil crises and the recent economic downturn.
- Until 2015 the GDP continued increasing to about 2.6 times the 1973 level and the consumption of energy for individual sectors significantly increased with the Consumer sector (Residential + Commercial) increasing to **about 2.2 times**, while the transportation sector increased to **about 1.7 times**, whereas the industrial sector decreased to **about 0.8 times**.



Sources: "Comprehensive Energy Statistics" and "Annual Report on National Accounts."

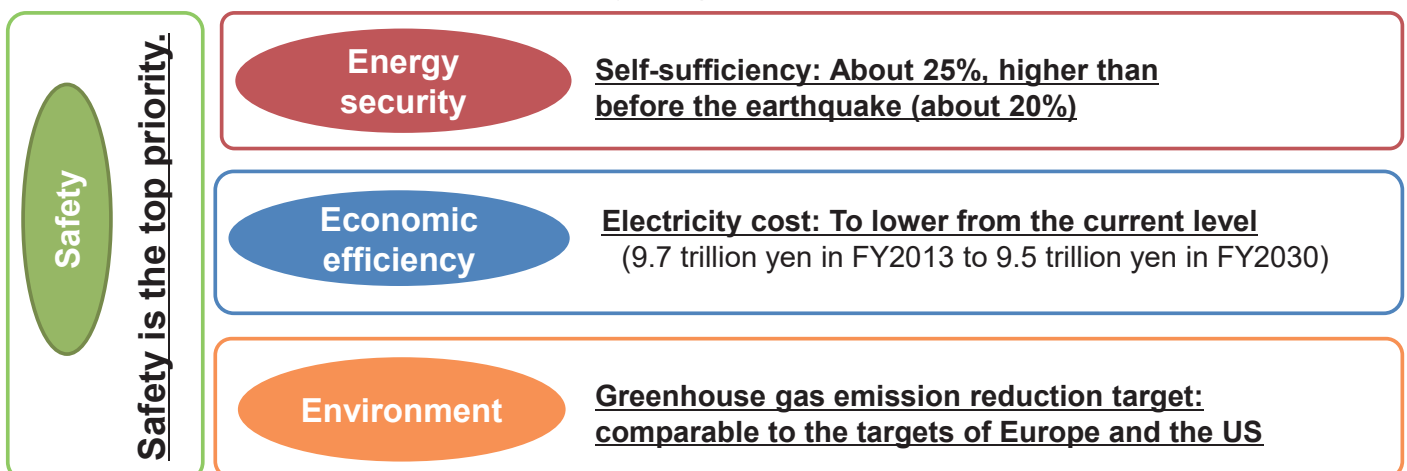
2. Long-term Outlook

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Basic Principle for Drawing the Long-Term Energy Supply and Demand Outlook

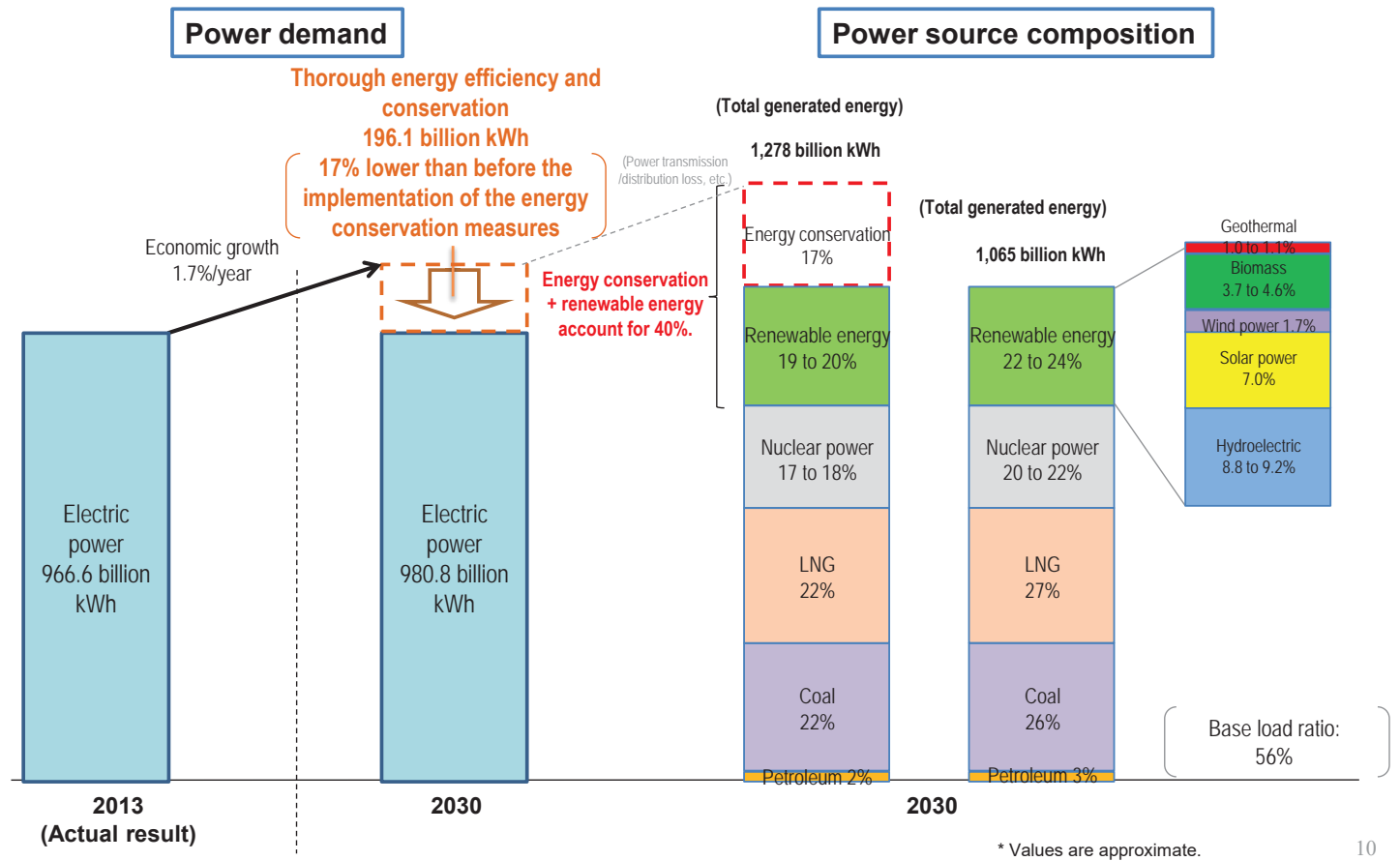
- Through the process to simultaneously achieve specific policy targets related to **safety, energy security, economic efficiency, and environment**, which are basic viewpoints of the energy policy,
- Draw an outlook based on the basic guideline of the policies given in the Strategic Energy Plan, such as **reducing dependence on nuclear power generation as much as possible by promoting thorough energy efficiency and conservation, introduction of renewable energy, and introduction of efficient thermal power plants**

<Policy target for 3E+S>



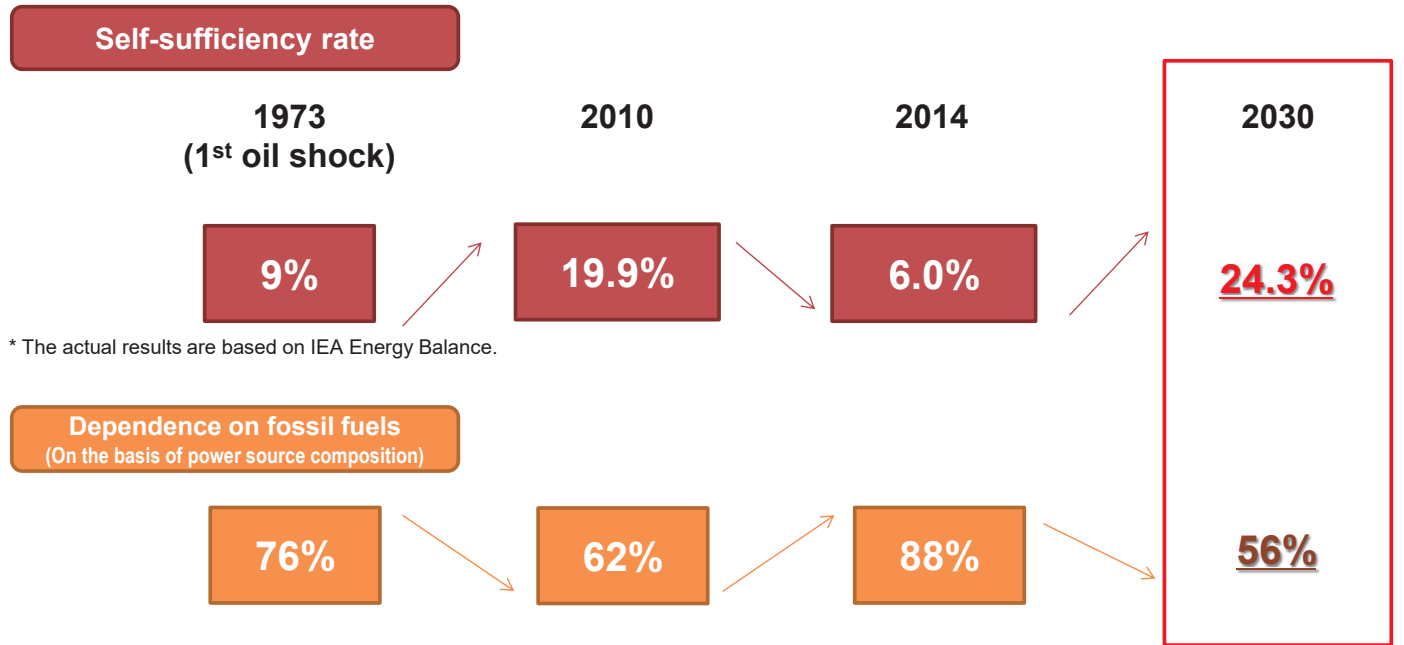
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Power Demand and Power Source Composition



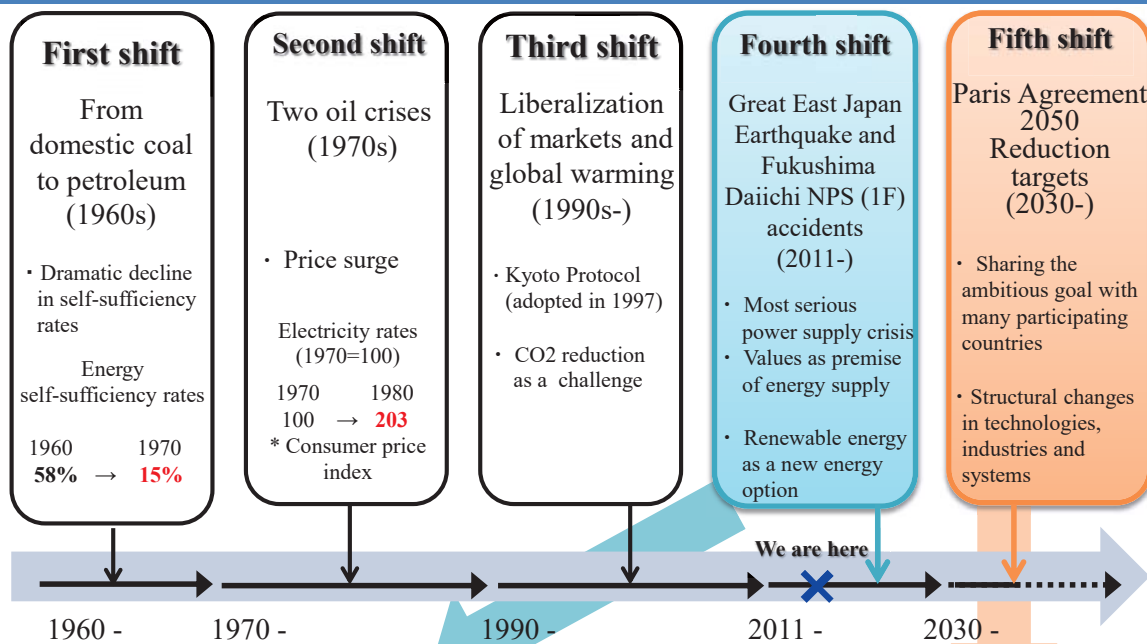
Stable Supply, Self-Sufficiency Rate and Dependence on Fossil Fuels

- The self-sufficiency rate will be improved from approx. 6.0% to 24.3%.
- The dependence on fossil fuels (on the basis of power source composition) will be also reduced from approx. 88% in 2013 to 56%.



3. Policy Review

Major Stream of Energy Shifts



© Major changes in situations; forecasting future changes as an important perspective

- Decline of oil and renewable-energy prices
- Full-fledged development of storage batteries and the reality
- Presently, some countries are phasing out nuclear power, whereas many countries still make use of nuclear power.
- Full liberalization of markets and further popularization of renewable energy; degradation of investment environments
- No change seen in energy trends even after the United States' withdrawal from the Paris Agreement
- Ongoing expansion of global energy and electricity demand
- Rise of emerging companies; significant financial industries presence
- Growing geopolitical risks; strategies requested to address such risks

Strategic Energy Plan 2014 and Paris Agreement

○ Strategic Energy Plan 2014 setting goals to be achieved by 2030; progress made therein (as of FY2016)

- [i] Scenario for cutting CO2 emissions
(Target to be achieved by 2030 → 44% as the zero-emission power source rate)
→ From 10% in 2013 to 17% in 2016
(approx. renewable energy:15%; nuclear energy: 2%)
- [ii] Scenario for improving energy self-sufficiency rates
(Target to be achieved by 2030 → 24% as a self-sufficiency rate)
→ From 6% in 2013 to 8% in 2016
- [iii] Scenario for curbing costs
(Target to be achieved by 2030 → cut electricity costs as soon as possible)
→ Electricity rate hike by 30% after the occurrence of Great East Japan Earthquake in 2011 (recently by 10% after this)
(oil price↓, purchase cost of renewable energy ↑, coal-fired energy as an alternative for nuclear energy↑)
- Identifying issues standing in the way of realization
- 2030 = Working with a focus on realization

**Advisory Committee for
Natural Resources and Energy**

○ Paris Agreement

- Developed countries share very ambitious, high-level goals for decreasing greenhouse gas emissions by 2050.

	Japan (from 2013)	U.S. (from 2005)	Canada (from 2005)	Germany (from 1990)	France (from 1990)
2030	Down by 26%	Down by 26-28%	Down by 30%	Down by 40%	Down by 40%
2050	Down by 80%	Down by 80%	Down by 80%	Down by 80-95%	Down by 75%

* As for Japan, no base year for the 2050 target is determined yet.
* As for the U.S., 2025 target = decrease emissions by 26-28% from 2005 level.

- Common factors of participating countries
 - Technological innovations (nuclear energy, renewable energy, CCS, energy efficiency, etc.)
 - Contribution to related efforts overseas
 - Human resources development; accelerated investment
- Establish industrial structures and policies under which Japan can engage in technological innovation and investment as well as in contributions to related efforts overseas, as indispensable initiatives
- 2050 = pursuing all possibilities

**Round Table for
Studying Energy Situations**

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4. Japan – Russia Energy Cooperation

Promoting cooperation with Russia on energy (1)

1. The importance of cooperation between Japan and Russia

- From the viewpoints of Russia's potential for abundant natural resources, geographical proximity, and other advantages, the cooperation between Japan and Russia on energy is important for Japan to diversify its energy sources and ensure stable energy supply. In addition to the upstream oil and gas fields in which two countries have been traditionally working together, other types of cooperation are also making steady progress, including cooperation in the fields of energy conservation and renewable energy, such as wind power generation, and cooperation in the field of nuclear power, such as the decommissioning of the reactors at the Fukushima Daiichi Nuclear Power Station.

2. Japan-Russia Energy Initiative Council

- To ensure steady progress in Japan-Russia cooperation, the "Japan-Russia Energy Initiative Council" was established in November 2016 (chaired by Japan's Mr. Seko, Minister of Economy, Trade and Industry and Minister for Economic Cooperation with Russia, and chaired by Russia's Mr. Novak, Minister of Energy). Under the Council, three working groups were set up to study three fields of "hydro carbon," "energy conservation & renewable energy," and "nuclear power." Inviting participation from concerned private sector companies, these groups are driving this initiative by which public and private sectors are working in an integrated manner. (*The first council was held in November 2016 in Moscow, the second in January 2017 in Moscow, the third in April 2017 in Tokyo, and the fourth in September 2017 in Vladivostok.)

3. Future cooperation

- In December 2016, when Russian President Mr. Putin visited Japan, two countries signed 23 energy-related, public/private memoranda of cooperation and other outcome documents (80 when all fields are combined). Furthermore, when Prime Minister Mr. Abe visited Russia in April and September 2017, Japan and Russia signed three (29 in total) and eight (56 in total) outcome documents, respectively. To substantiate the individual items of cooperation that two countries agreed, the Council and each working group are now taking necessary measures.

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Promoting cooperation with Russia on energy (2)

Three working groups under the Japan-Russia Energy Initiative Council

●Hydro carbon (oil, natural gas, and coal)

Sophistication of upstream oil and gas, LNG projects, and the related plants; Construction and technological development of petrochemical plants; Cooperation toward the development and expansion of gas and LNG markets; Cooperation toward coal purchase.

●Energy conservation & renewable energy

Promoting the introduction of wind power generation and cogeneration (local production, technical demonstration); Promoting technical exchanges to create opportunities for energy conservation analysis and projects.

●Nuclear power

Nuclear power related activities in areas where cooperation between Japan and Russia makes sense, such as the decommissioning of the reactors at the Fukushima Daiichi Nuclear Power Station and the associated basic research, and other types of cooperative basic research.



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