

Our agenda: – Reviewing energy policy –

**Executive Senior Fellow of The 21st Century
Public Policy Institute**

<http://www.21ppi.org/>

**Head of International Environmental
Economic Institute**

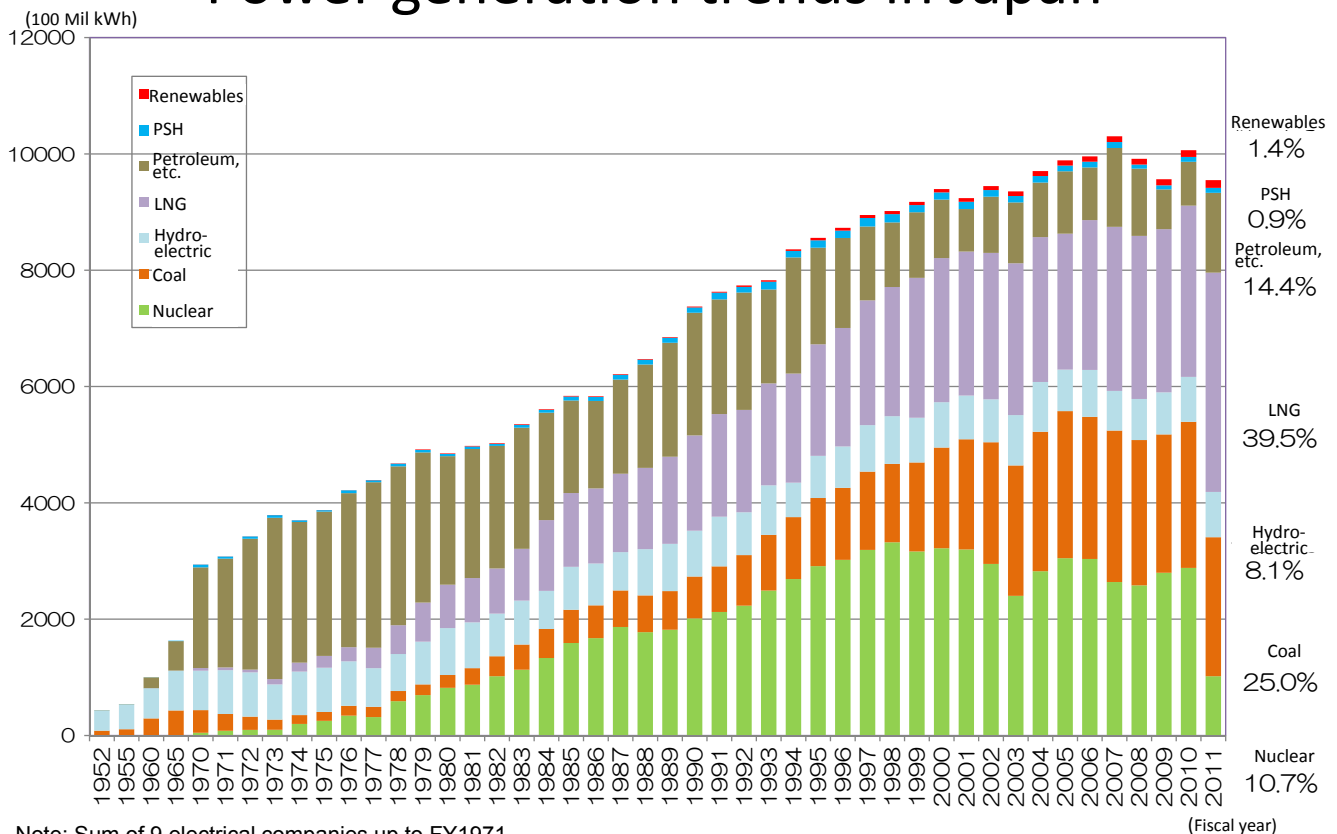
<http://ieei.or.jp/>

Akihiro SAWA

Twitter @sawaakihiro

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Power generation trends in Japan



Note: Sum of 9 electrical companies up to FY1971

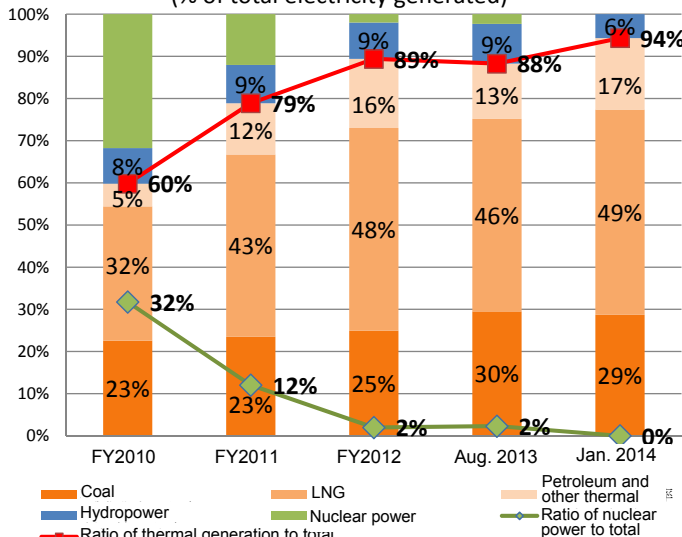
Compiled based on: Agency of Natural Resources and Energy "Overview of Electrical Power Sources" and "Overview of Electric Power Supply Plan"

Source: White Paper on Energy 2013 2

Energy Supply-Demand Trends

- No nuclear power plants in operation => approx. 30% of electricity supply lost
- Despite increased use of renewable energy supported by the FIT program launched in July 2013, not yet enough to accommodate all demand. Therefore, nuclear power replaced by thermal power.
- Due to replacement by thermal power, fuel costs in 2013 **estimated** to have increased by approx. 3.6 trillion yen (equivalent to approx. 20% of current expenses. Trade deficit was 8.2 trillion yen in FY2012)
- Potential fuel price surges triggered by tensions in the Strait of Hormuz will cause further increases in electricity rates.

Changes in electricity portfolio of electric power operators (retail & wholesale) after the Great East Japan Earthquake (% of total electricity generated)



Source: compiled from Electric Power Statistics and interviews with electric power operators

Increased fuel costs due to stoppage of nuclear power plants

Power source	Fuel prices for power generation		Impact on costs (estimate)	
	FY2012	FY2013	FY2012	FY2013 (*)
Nuclear	1 yen/kWh	1 yen/kWh	-0.3 Tril yen	-0.3 Tril yen
Coal	4 yen/kWh	4 yen/kWh	+0.1 Tril yen	+0.1 Tril yen
LNG	11 yen/kWh	13 yen/kWh	+1.4 Tril yen	+1.7 Tril yen
Petroleum	16 yen/kWh	18 yen/kWh	+1.9 Tril yen	+2.1 Tril yen
Total	—	—	+3.1 Tril yen	+3.6 Tril yen

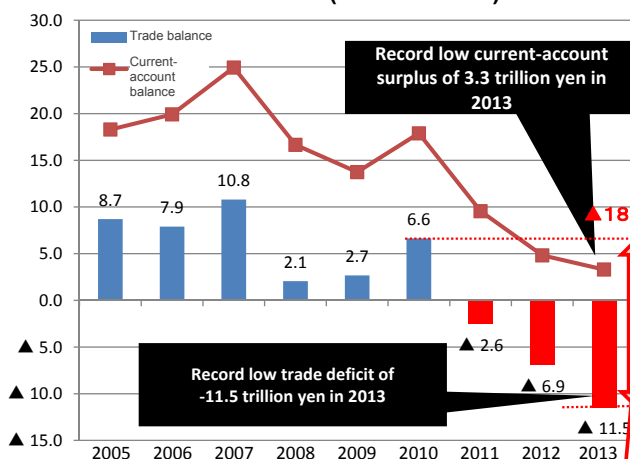
※Fuel costs for FY2013 represented by average costs for April – Aug., assuming that all nuclear power plants will continue to be shut down from Sept. through Dec..

Source: material compiled by METI

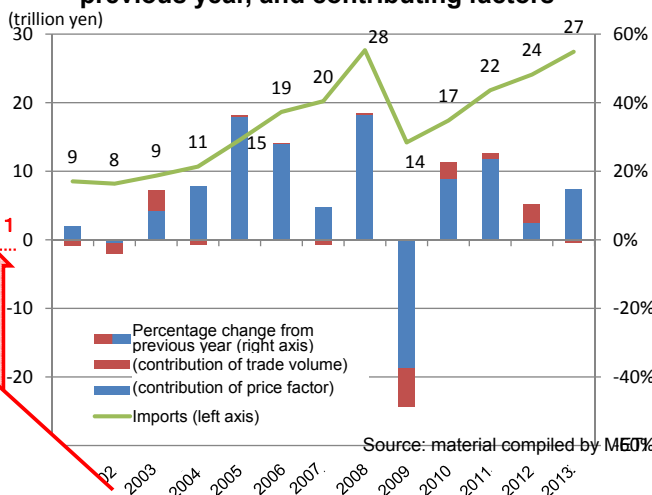
Increased fuel procurement costs and adverse effects on trade balance

- In 2011, Japan suffered a trade deficit due for the first time in 31 year, due to increasing fuel procurement costs. In 2013, it posted a record trade deficit of 11.5 trillion yen. (Second worst record of 6.9 trillion yen posted in 2012 .)
- Growth in imports owes mainly to increased oil and LNG imports. Growing trend of mineral fuels imports are a result of higher import prices and larger import volume. In particular, import growth from 2012 to 2013 owes mainly to increased import prices, affected by a weaker yen.

Trade balance and current-account balance trends (annual basis)



Mineral fuel imports, percentage change from previous year, and contributing factors



Source: material compiled by METI

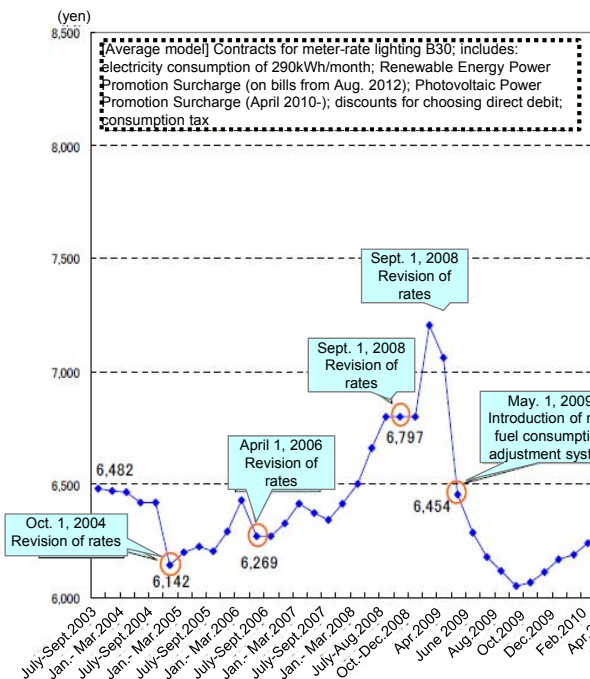
[Source] Trade balance: Trade Statistics (MOFA)
 ※[total exports] – [total imports]
 Current account-balance: Balance of Payments statistics (BoJ)

Dramatically worsening trade balance - 18.1 trillion yen drop between 2010 and 2013
 • Total imports: +20.5 trillion yen (+33.7%); total exports: 2.4 trillion yen (+3.5%); rapid increase by +10.0 trillion yen (+57.5%) in mineral fuels

[Source] compiled from Trade Statistics (MOFA)
 Note: Contributing factors were determined by first calculating the ratio attributable to trade volume change based on the percentage change of the import volume index relevant to the previous year as given in the Trade Statistics, and then calculating the price factor by subtracting the ratio attributable to trade volume from the percentage change of imports compared to the previous year.

Increasing electricity rate trends

TEPCO's "average model" electricity rate changes in the recent decade



Average model electricity rates before and after the Great East Japan Earthquake

(yen)

Electric power company	Jan. 2011	June 2014	Rate of increase
Hokkaido	6,177	7,404	19.9%
Tohoku	6,289	7,915	25.9%
Tokyo	6,257	8,567	36.9%
Chubu	6,500	8,252	27.0%
Hokuriku	6,310	7,167	13.6%
Kansai	6,403	8,190	27.9%
Chugoku	6,734	8,036	19.3%
Shikoku	6,581	7,857	19.4%
Kyushu	6,241	7,609	21.9%
Okinawa	7,270	8,558	17.7%

Electricity consumption (kWh/month)
Hokkaido 260; Tohoku 280; Tokyo 290; Other300

Application period: 5

Strategic Energy Plan Basic policy regarding measures concerning energy supply and demand

(2) Position of each energy source

1) Renewable energy (solar, wind geothermal, hydro, biomass, biofuels)

Faces various challenges in terms of stable supply and cost, but is a promising, multi-characteristic and important energy source which can contribute to energy security as it can be domestically produced with low carbon emissions. Accelerated introduction to the furthest extent possible across three years, followed by continued active promotion. Hence, establishment of Related Ministers' Cabinet meeting on Renewable Energy for enhanced government initiatives and promotion of policy coordination among concerned

Geothermal and hydropower will play the role of base load power.

Given instability of supply volume of solar and wind power, must be combine with load-following power sources, such as LNG and petroleum.

2) Nuclear power:

Important base load power contributing to the stability of energy supply-demand structure, on the major premise of ensuring its safety, due to its superiority in providing stable energy supply and efficiency, low and stable operational costs and low greenhouse gas emissions during operation. Dependency on nuclear power generation will be lowered to the extent possible by saving energy and introducing renewable energy as well as improving the efficiency of thermal power generation. Under this policy, will **fully examine the volume of electricity to be secured through nuclear power** taking Japan's energy constraints into account and from the viewpoint of stable supply, cost reduction, global warming, and maintaining nuclear technologies and human resources (required to ensure safety).

3) Coal: Re-evaluated as important base load power for its stability and economic efficiency, to be utilized, reducing environmental load through the deployment of highly-efficient coal-fired thermal power generation technology.

4) Natural gas: Given its central role as load following power, expected to have an expanded role in the future.

5) Petroleum: Bears important role as a resource/material supporting the transportation and household sectors, while serving a certain role as peaking power. Important energy source to be continually utilized.

6) LP gas: Can be used as load following power. Clean and distributed gaseous energy source, useful in both normal times and in emergency situations.

Source: METI Strategic Energy Plan (April 2014) 6