

OECD-RIETI Special Session

Green Growth in Asia  
アジアにおけるグリーン成長

Handout



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# Green Growth in Japan: Future Prospects

OECD-RIETI “Green Growth in Asia”

May 15, 2015

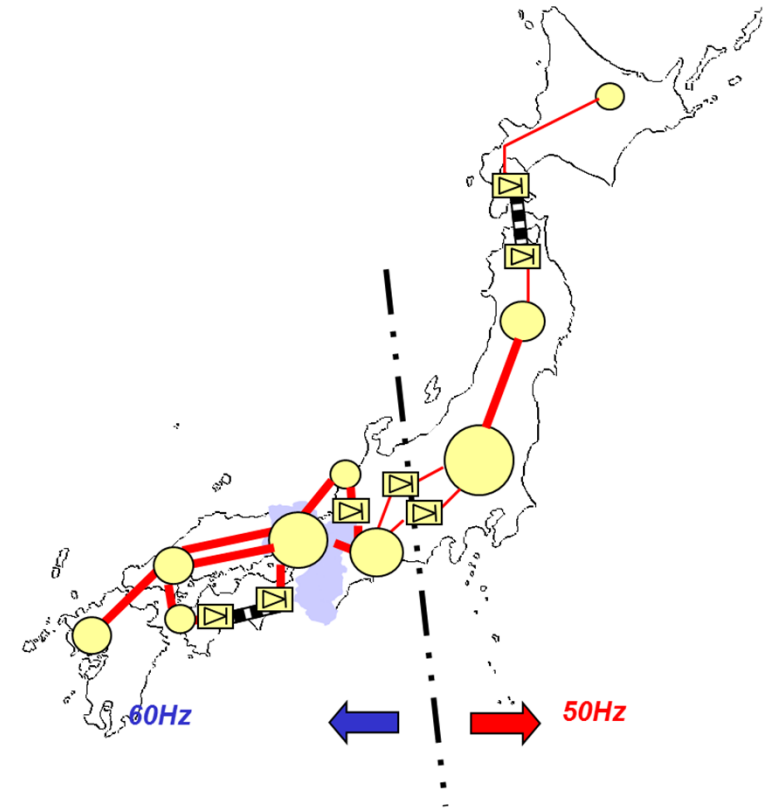
Hiroshi Ohashi

RIETI & the University of Tokyo

# Reflection on Great East Japan Earthquake and *Fukushima*

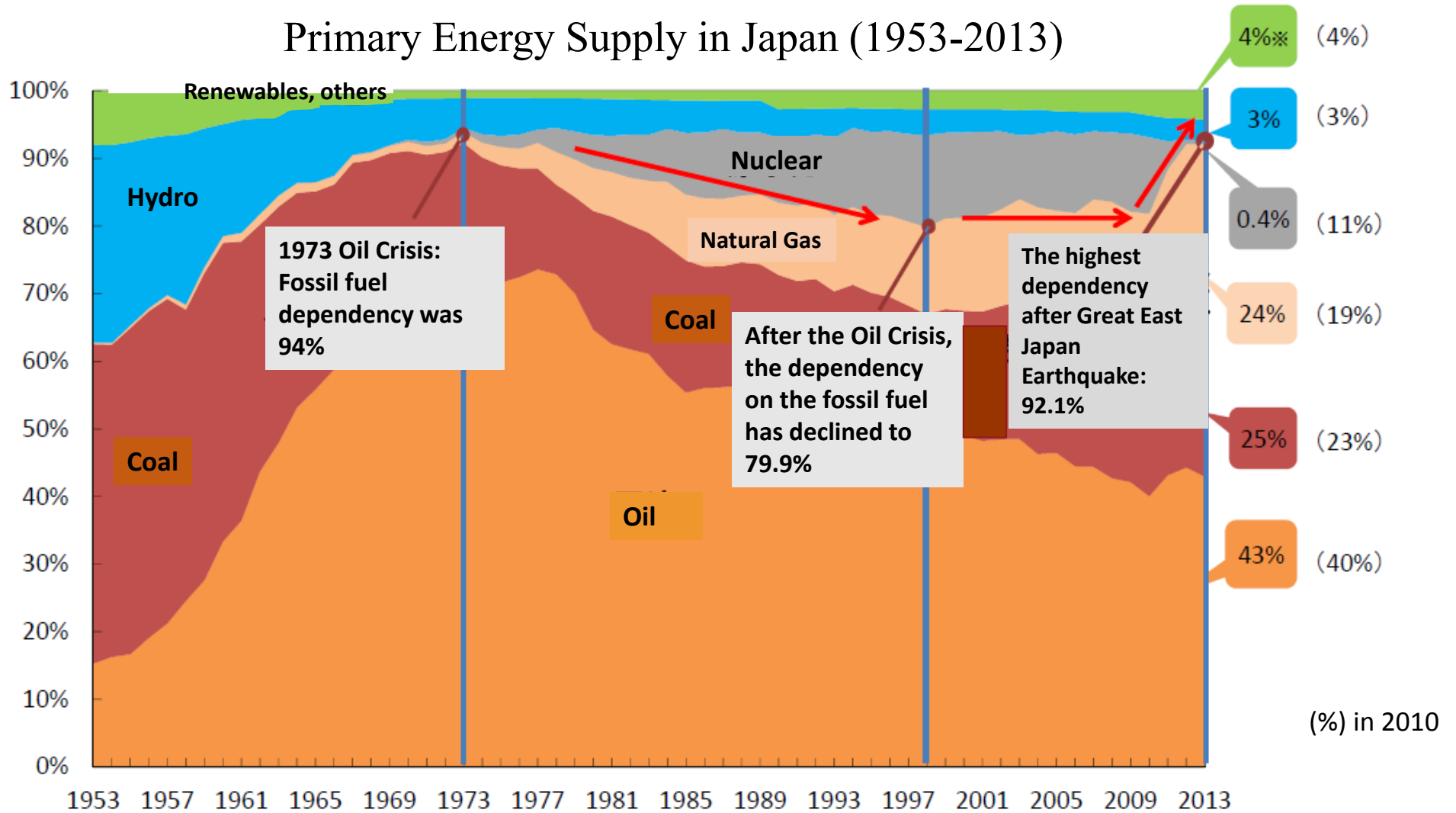
(Report of the Electricity System Reform Expert Subcommittee, Feb 2013)

1. Confidence in nuclear power.
2. Risk arising from the dependence on large-scale power sources.
3. Regional monopoly (i.e., the lack of system to transmit electricity beyond regions).
4. Inability for the households to choose retail electricity companies.
5. Need for renewable energy.



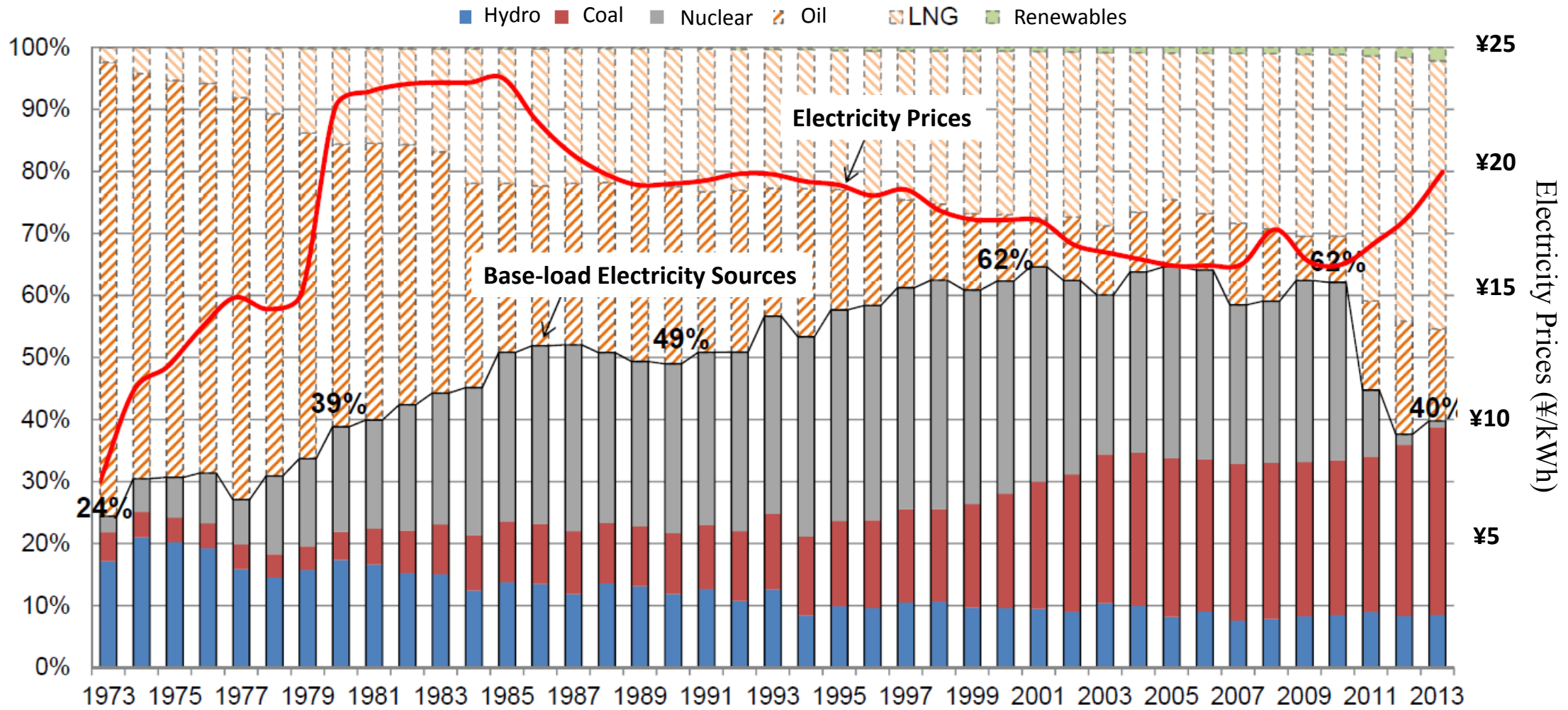
# Power Sources, Energy Independence, and Electricity Prices since 3.11

# Primary Energy Supply in Japan (1953-2013)



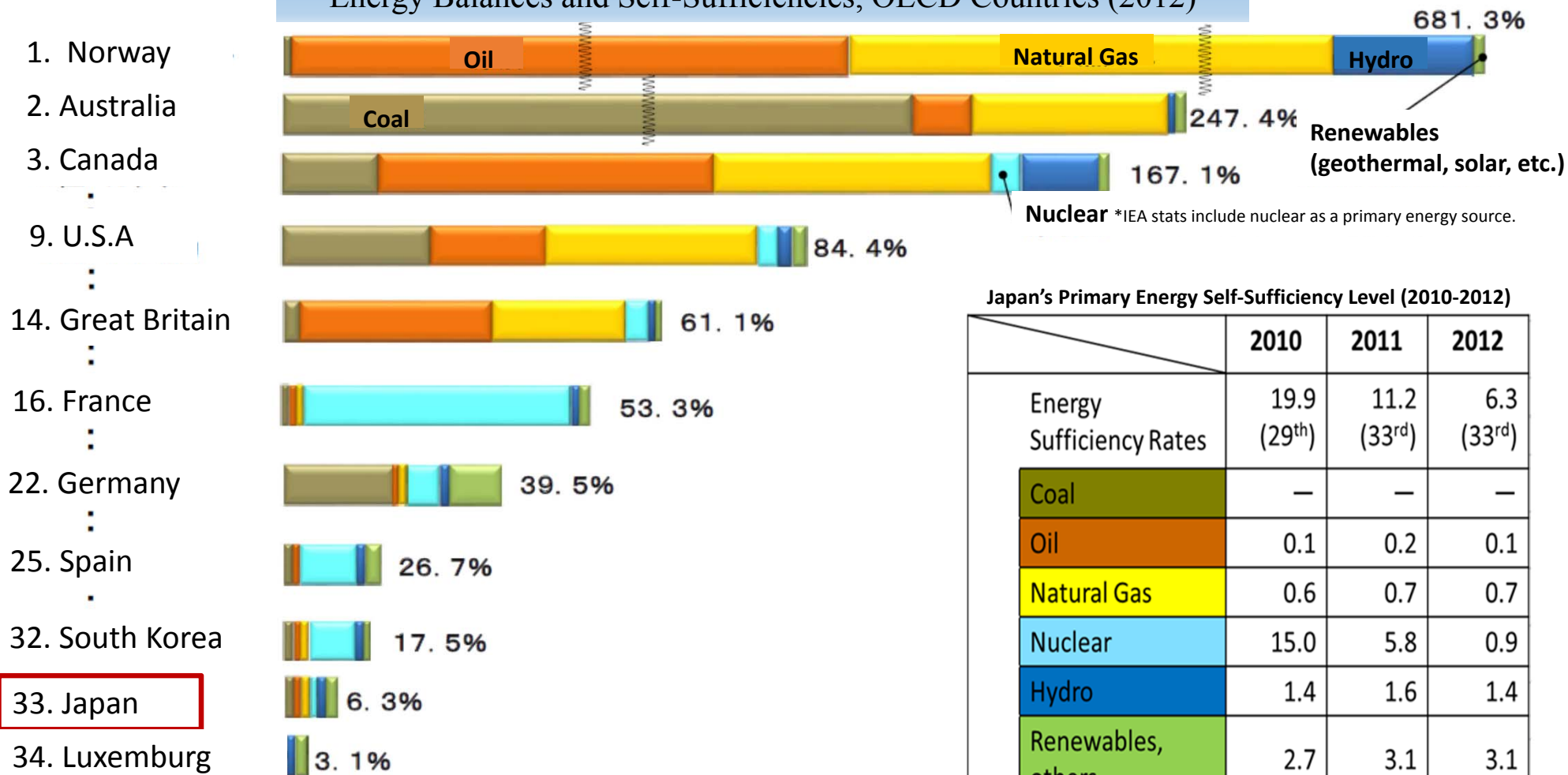
Sources: Total Energy Statistics and METI

\* Renewable energy include; solar power (0.1%), wind (0.2%), geothermal (0.1%) and biomass (3.6%)



Data Source: "Overview of Electric Power Development" Agency for Natural Resources and Energy. Electricity Tariffs include those from household and industrial demand. METI

## Energy Balances and Self-Sufficiencies, OECD Countries (2012)



Japan's Primary Energy Self-Sufficiency Level (2010-2012)

	2010	2011	2012
Energy Sufficiency Rates	19.9 (29 <sup>th</sup> )	11.2 (33 <sup>rd</sup> )	6.3 (33 <sup>rd</sup> )
Coal	—	—	—
Oil	0.1	0.2	0.1
Natural Gas	0.6	0.7	0.7
Nuclear	15.0	5.8	0.9
Hydro	1.4	1.6	1.4
Renewables, others	2.7	3.1	3.1

“—” shows minimal level.

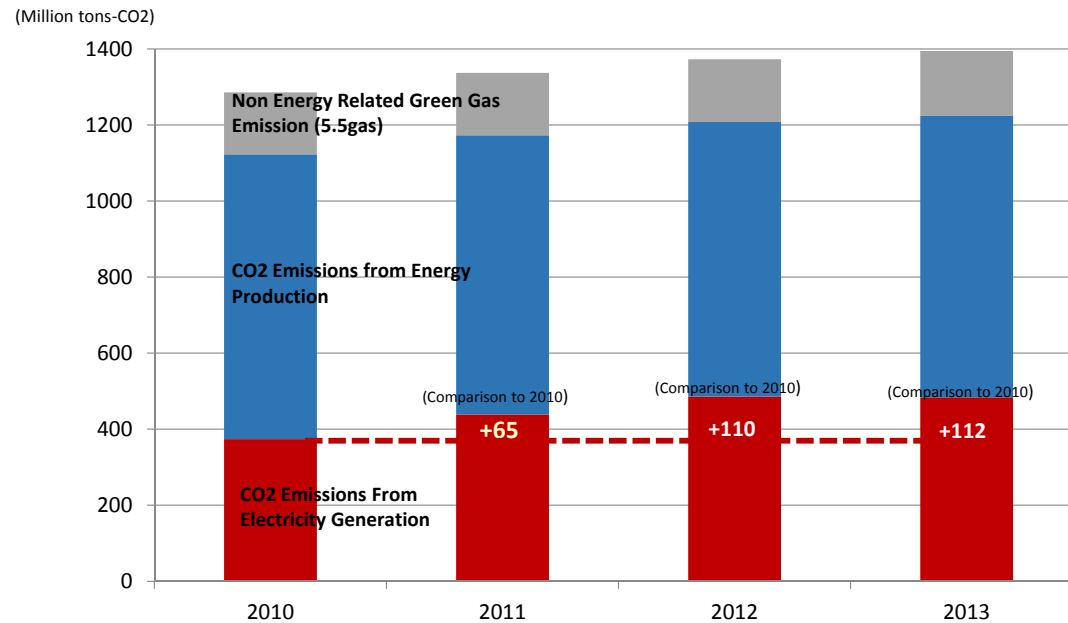
Source: IEA Energy Balance 2014, and METI

# Emissions

	2010	2011	2012	2013
Total Greenhouse Gas Emissions (million ton-CO <sub>2</sub> )	1,286	1,337	1,373	1,395
CO <sub>2</sub> Emissions From Electricity Generation * (million ton-CO <sub>2</sub> )	374	439	486	484
		+65 (Comparison to 2010)	+112 (Comparison to 2010)	+110 (Comparison to 2010)

\* Emission from general electric power companies.

\* 2013 figures are preliminary results.



Created from the following sources: Total Energy Statistics, Environment Action Program (The Federation of Electric Companies in Japan), The Greenhouse Gas Emission Statistics (Ministry of the Environment), and METI



# Green Growth

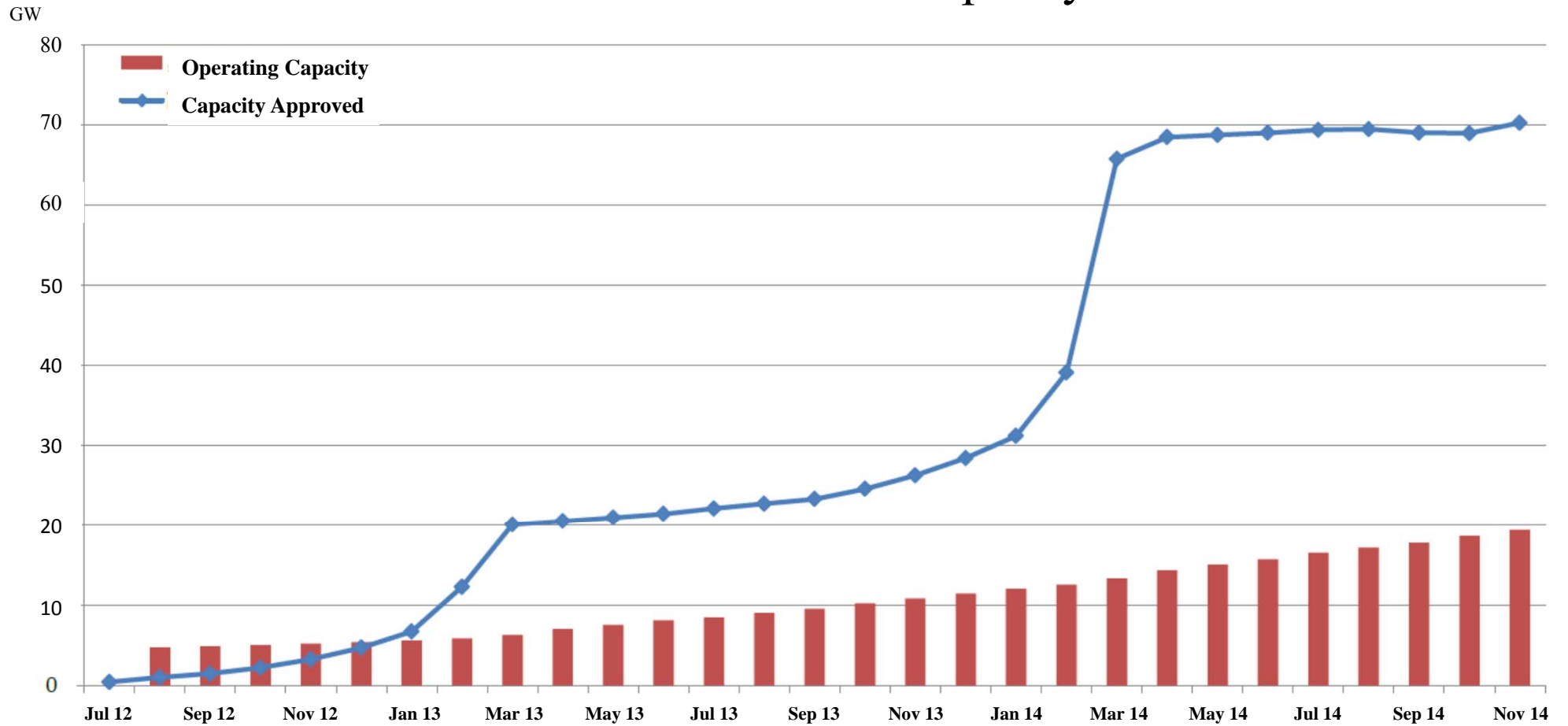
# Renewable Energy Sources (as of April 2015)

	Pre-FIT (~June 2012)	Post-FIT (Jul 2012 ~Nov 2014)	
	Total Operating Capacity*	Total Operating Capacity	Total Capacity Approved
Solar PV (residential)	4.7 GW	2.80 GW	3.34 GW
Solar PV (non-residential)	0.9 GW	11.76 GW	66.88 GW
Wind	2.6 GW	0.22 GW	1.43 GW
Mid- to Small-sized Hydraulic	9.6 GW	33 MW	340 MW
Biomass	2.3 GW	0.122 GW	1.48 GW
Geothermal	0.5 GW	1 MW	10 MW
<b>Total</b>	<b>20.6 GW</b>	<b>14.931 GW</b>	<b>73.49 GW</b>

\* Values are approximate.

Source: METI

# Solar Power: Total Capacity



Source: METI

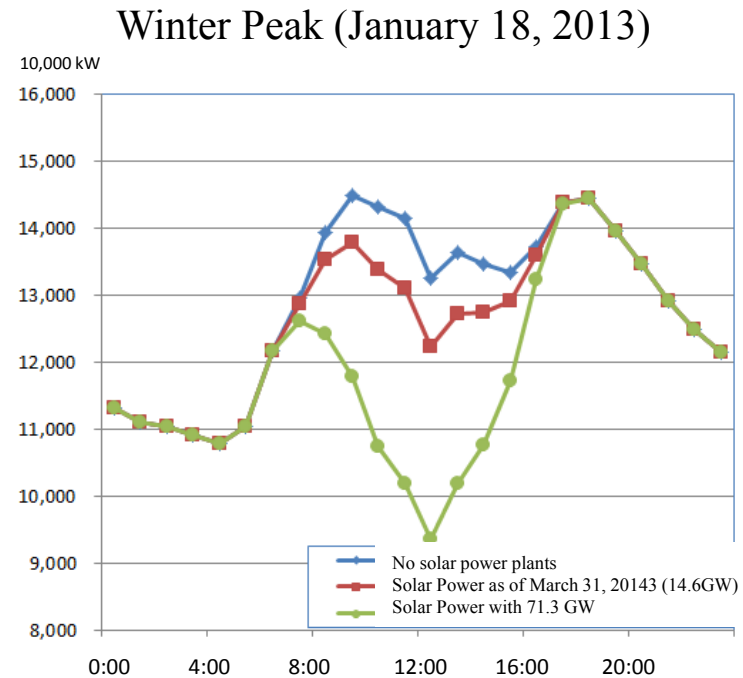
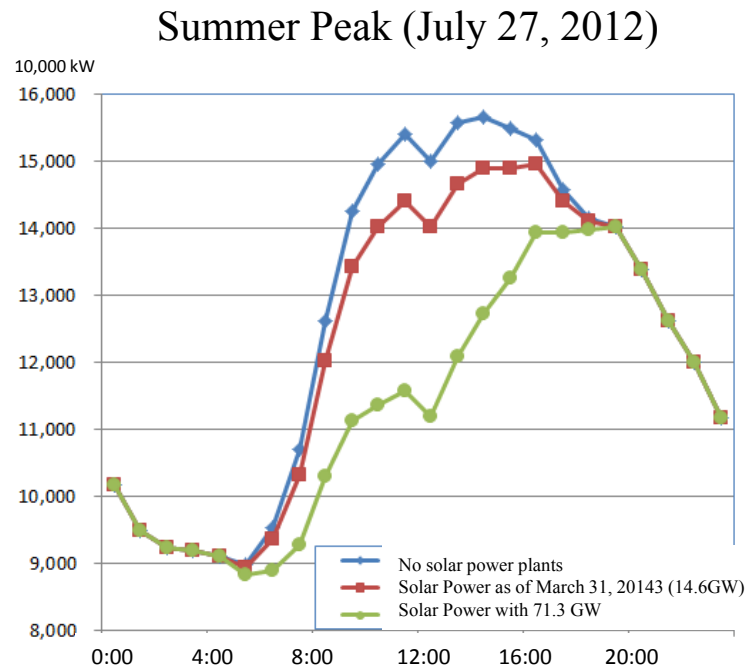
# Solar Power

(cited from Basic Energy Plan, 2014)

- Small and medium-scale solar power reduces the burden on main grids and it can be used as an emergency power source.
- Generation cost of solar power is high, and power output is unstable. Therefore, further technological innovation is necessary.
- In the mid- to long-term, cost reduction is expected to promote the introduction of solar power based on its position as an energy source which complements peaking demand in daytime hours in the distributed energy system.

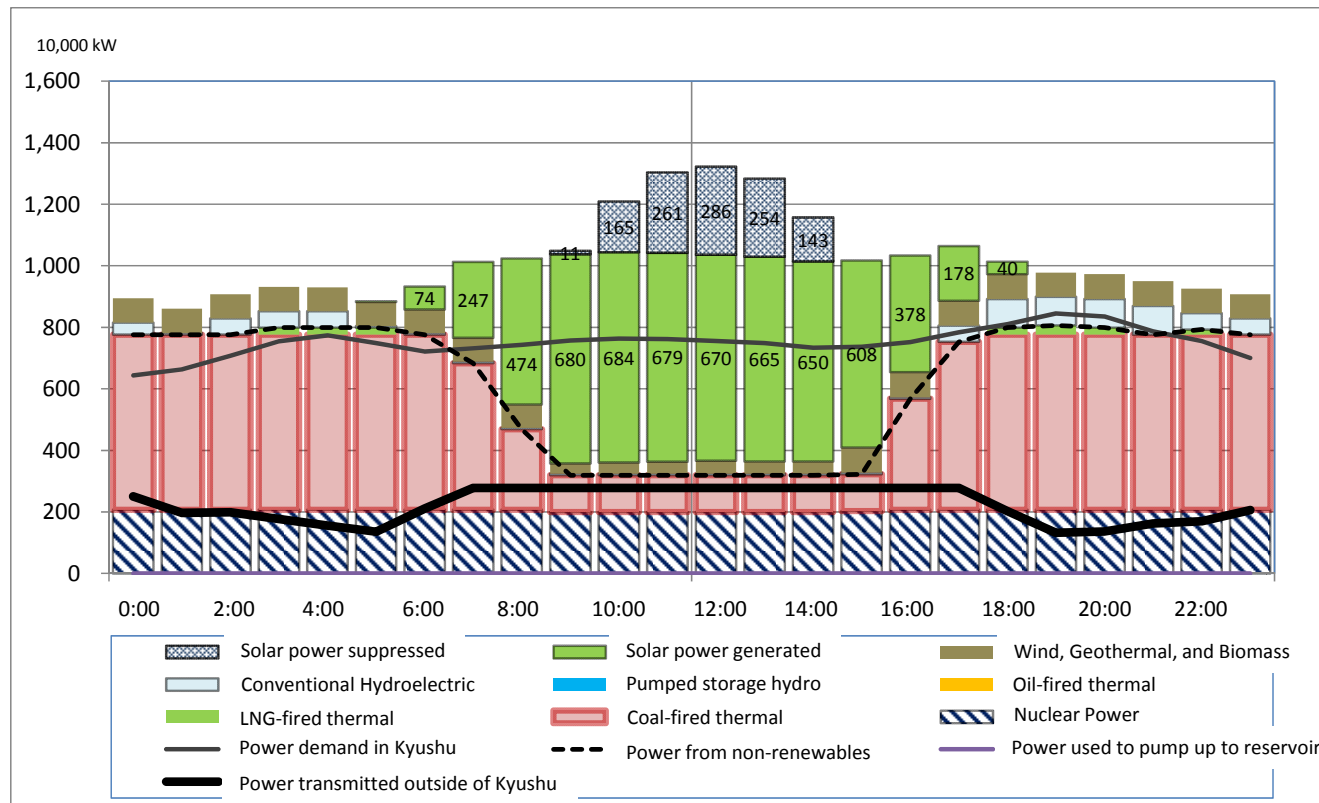
→ Both merits and drawbacks exist in the promotion of solar power. Simulation analyses would be very helpful in policy making when quantifying the tradeoff.

# Simulation Study 1: Effects of Penetration for Solar Energy on Load



Summary is available at RIETI (<http://www.rieti.go.jp/en/papers/contribution/ohashi/08.html>)

# Simulation Study 2: “Mothballing”



Summary is available at RIETI ([http://www.rieti.go.jp/en/columns/a01\\_0418.html](http://www.rieti.go.jp/en/columns/a01_0418.html))

# Green Growth: future prospect

- Basic Viewpoint of the Energy Policy
  - Energy Security, Economic Efficiency, Environment, and Safety (3E+S)
- A long-term supply-demand forecast
  - (“Energy Mix in 2030,” released in April 28, 2015)
  - aims at 24.3 % of energy self-sufficiency
  - reduces energy costs by 5 % (compared with 2013)
  - reduces CO2 emission by 26.0% (compared with 2013)
- To do so, promote “stable” renewables (including geothermal, hydro, and biomass)
- Require drastic innovation to reduce installation costs for solar and wind powers
- Need credible studies to obtain an in-depth understanding as to how green growth leads to job creation and economic growth.
  - short-run stimulus effect of green energy investment, relative to other stimulus policies;
  - the quality of the jobs created in the long run; or
  - the ability of governments to make strategic investments that lead a sustainable growth sector. Etc..

Thanks for your attention