Overview of Renewable Energy in Japan

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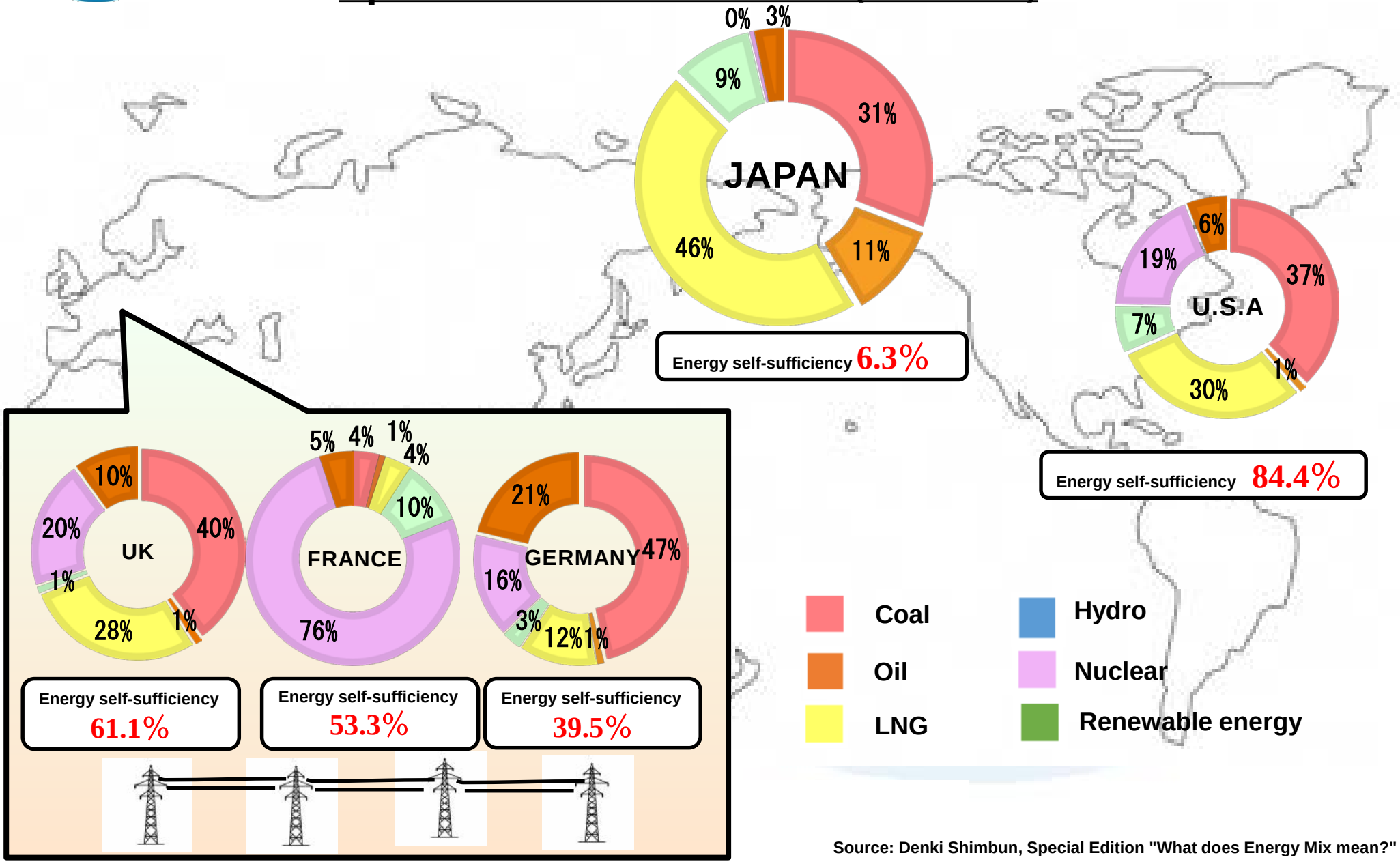
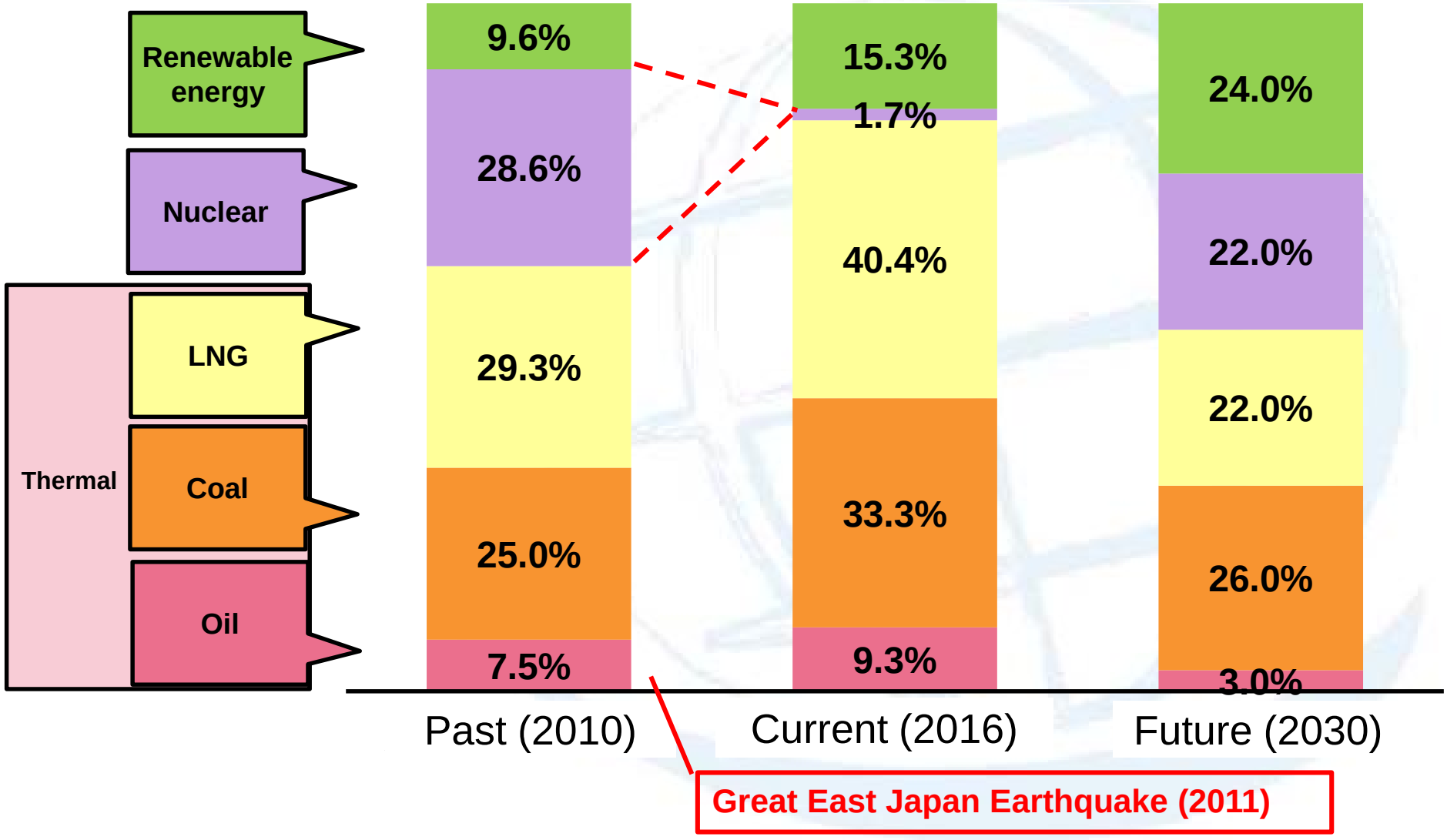
Energy self-sufficiency and power source make-up of different countries (As of 2012)



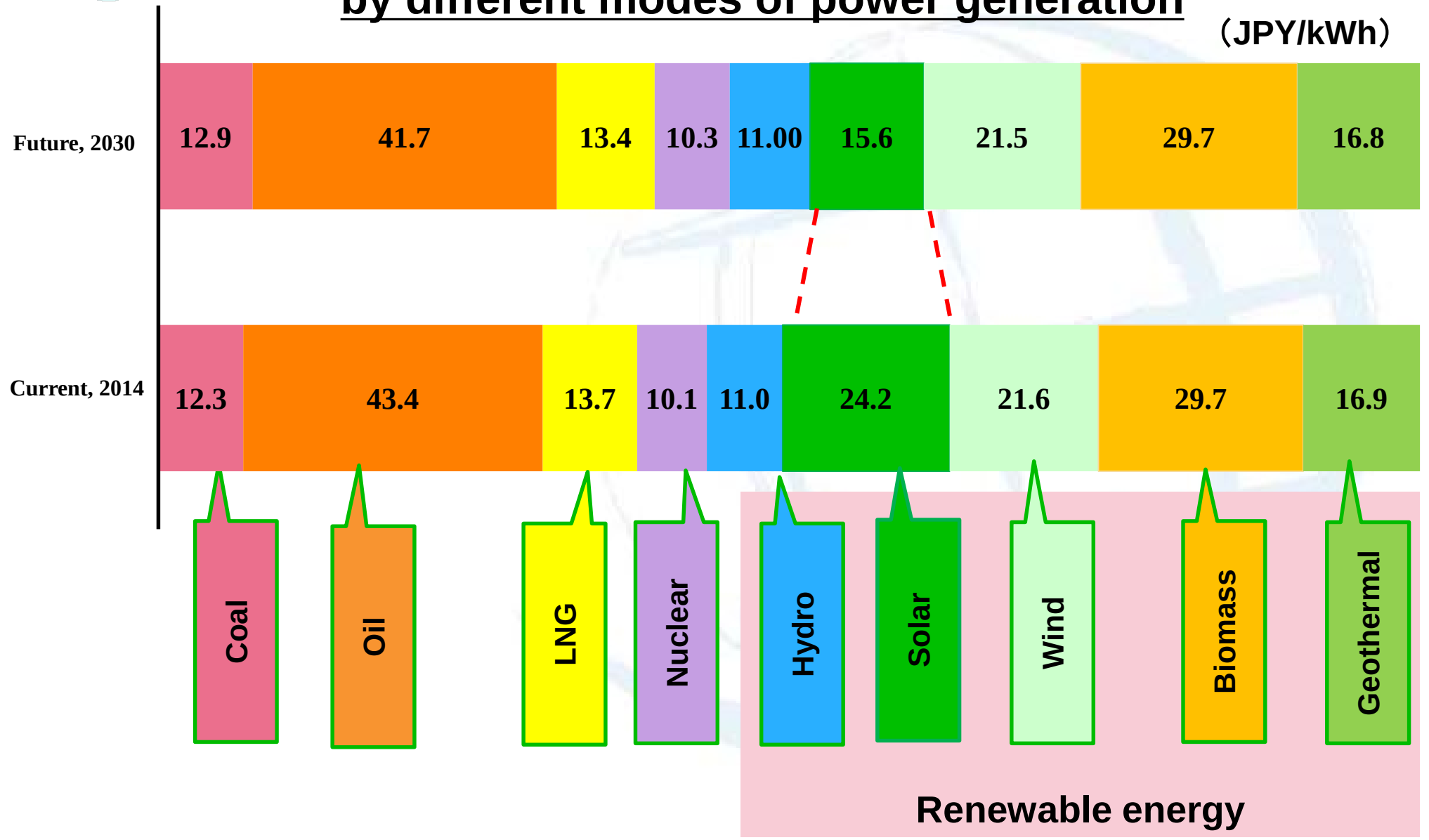
Source: Denki Shimbun, Special Edition "What does Energy Mix mean?"

Japan's power source make-up — Past, current and future



Source: Denki Shimbun, Special Edition "Guidebook for Understanding Electricity"

Costs of generating 1 kWh of electricity in Japan by different modes of power generation

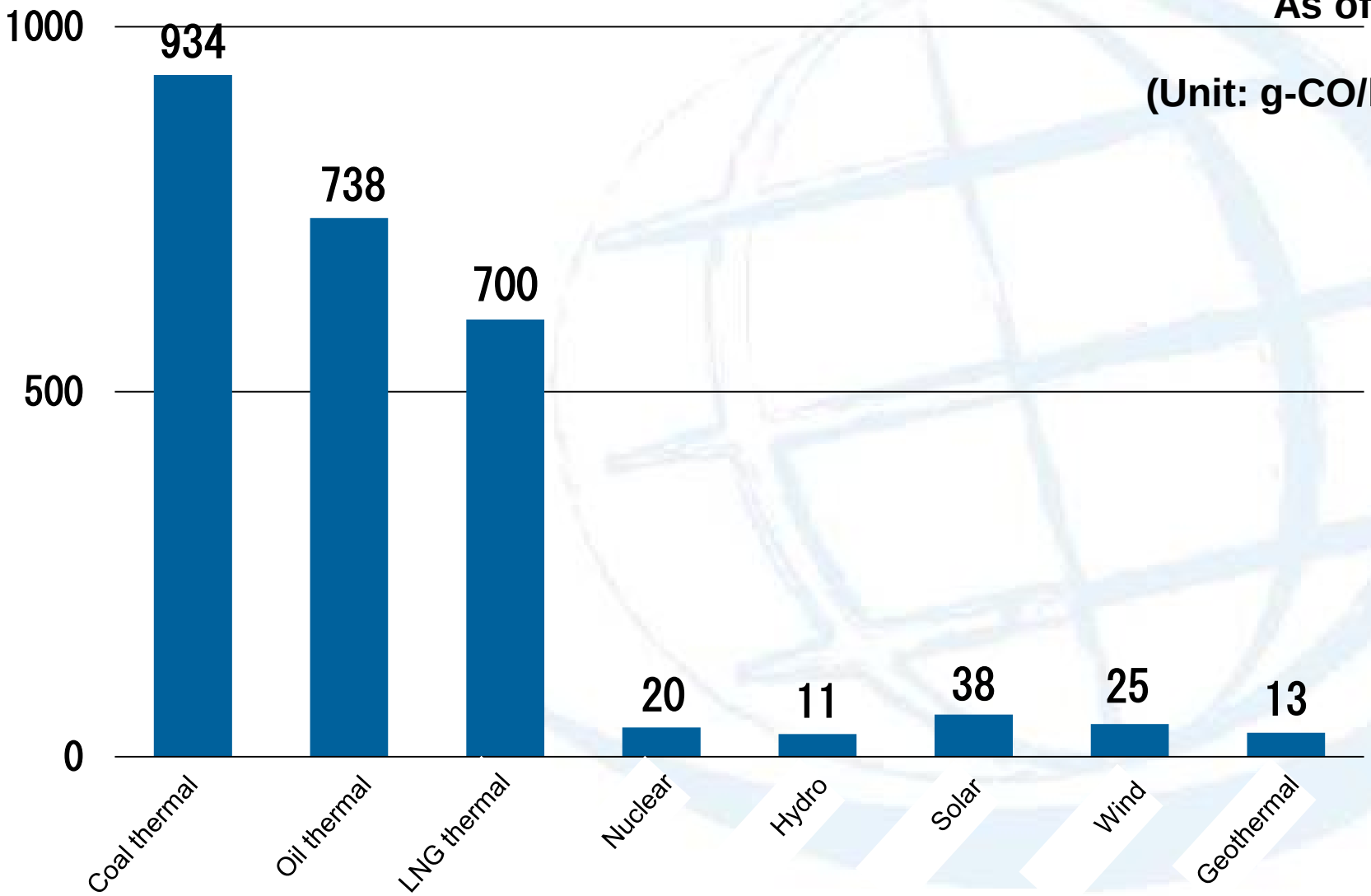


Source: Denki Shimbun, Special Edition "What does Energy Mix mean?"

CO2 emissions for every 1kWh generated in Japan by different modes of power generation

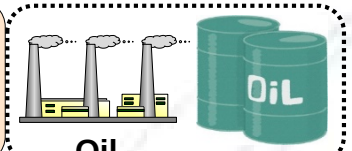
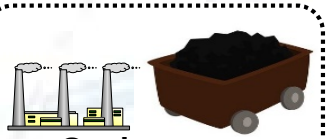
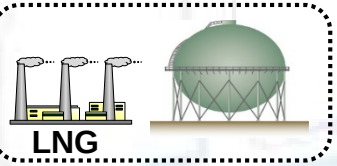
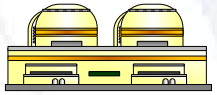
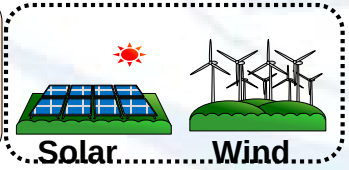
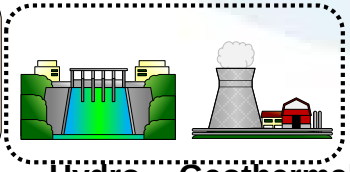
As of 2010

(Unit: g-CO/kWh)



Source: Denki Shimbun, Special Edition "What does Energy Mix mean?"

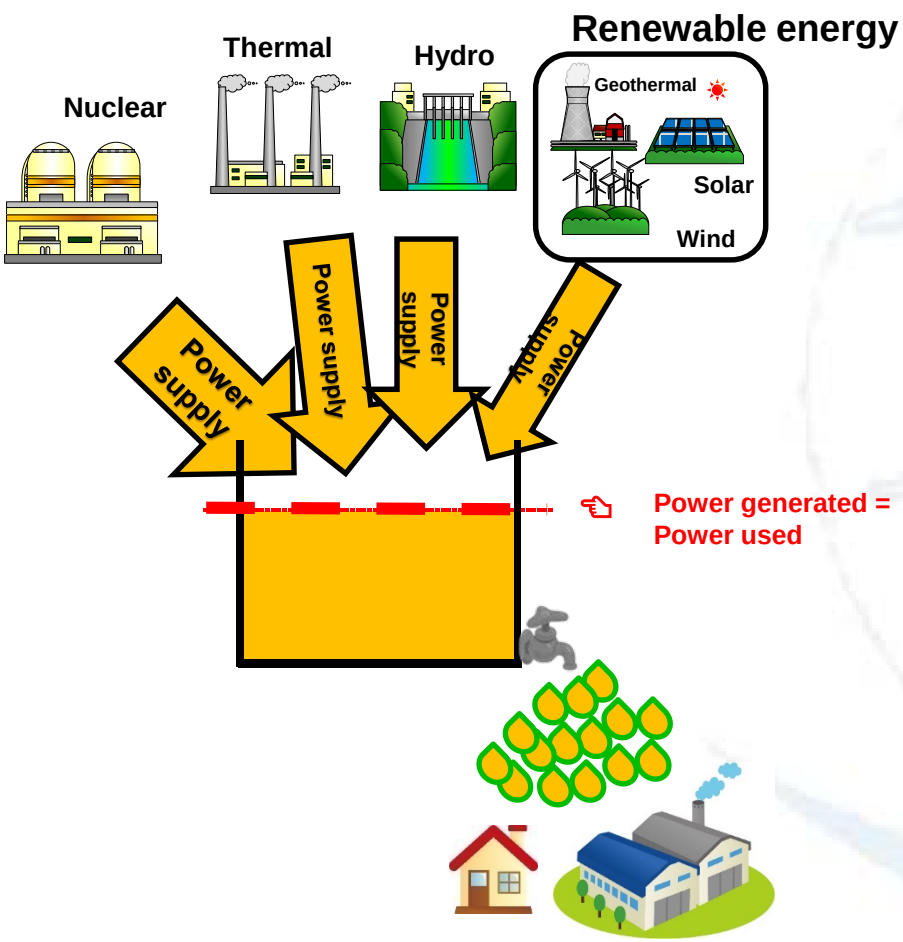
Key Point [1] The advantages and disadvantages of different modes of power generation

Advantages		Disadvantages
	Thermal	
◎Fuel is liquid and therefore easy to transport and store.	 Oil	✖Volatile prices. Production is concentrated in the middle east. ✖ Emits large amounts of CO2 when generating power.
◎Cheaper than oil or LNG. ◎Available globally and supply is consistent.	 Coal	✖Emits large amounts of CO2 when generating power. ✖ Ashes are left over after generating power.
◎Available globally and supply is consistent. ◎Best power generating efficiency among all thermal fuels.	 LNG	✖Emits CO2 when generating power, albeit in smaller amounts than from oil. ✖ Volatile prices. Cannot be stockpiled for long periods of time.
	Nuclear	
◎Only small amounts of fuel needed to generate large amounts of power inexpensively. ◎No CO2 emissions when generating power.		✖Consequences from accidents are severe. ✖ Requires stringent management of radioactive material.
	Renewable energy	
◎Requires no fuel. ◎No CO2 emissions when generating power.	 Solar Wind	✖ Is affected by weather and other natural conditions, resulting in inconsistent power generation. ✖ Unable to generate power in large amounts.
◎ Requires no fuel. ◎No CO2 emissions when generating power.	 Hydro Geothermal	✖Only being developed in a small number of regions. ✖ Requires long development lead times, and developable areas are limited.

Source: Denki Shimbun, Special Edition "What does Energy Mix mean?"

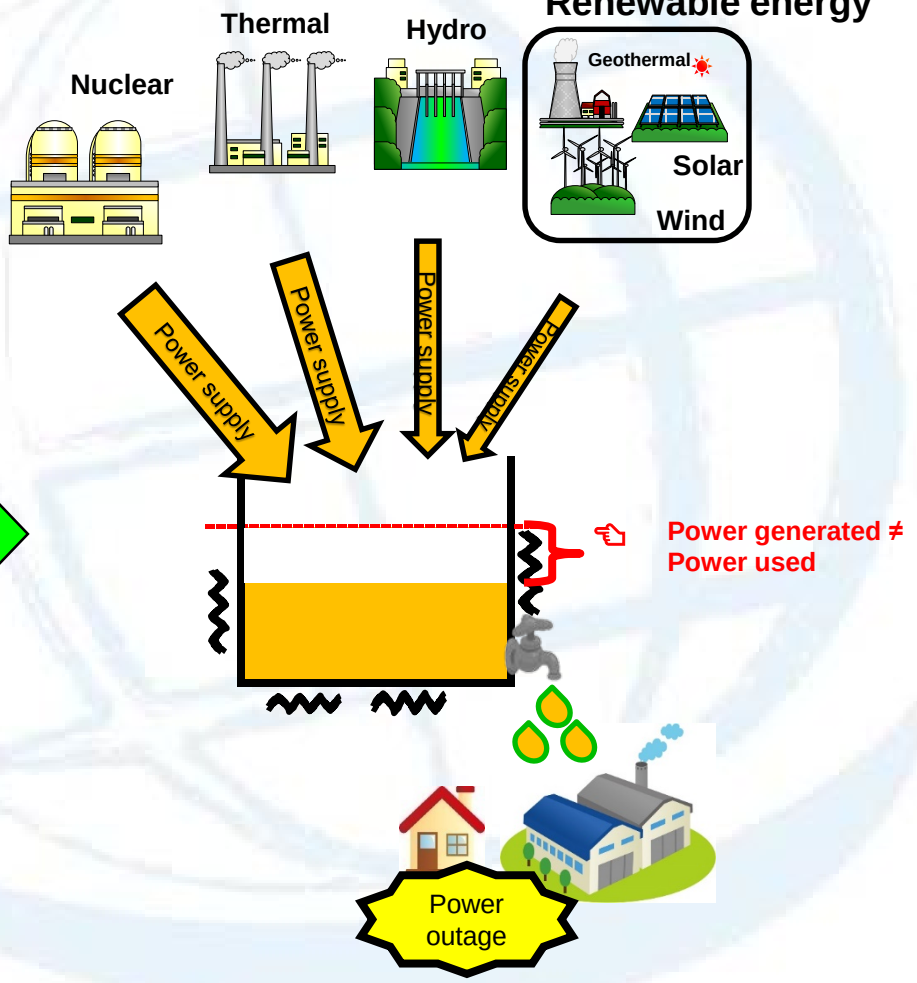
Key Point [2] Equalizing the amount of power generated and used

Amount of power generated (power generated)



Amount of power used (power consumed)

Amount of power generated (power generated)



Amount of power used (power consumed)

Source: Denki Shimbun, Special Edition "What does Energy Mix mean?"

Key Point [3] Four perspectives for choosing modes of power generation

Energy security
This is about providing users with a supply of power that they are able to use in the amounts that they need, when they need it, with few power outages.

Economy
This is about lowering the cost of power as much as possible so as not to seriously affect household finances or other economic activities.

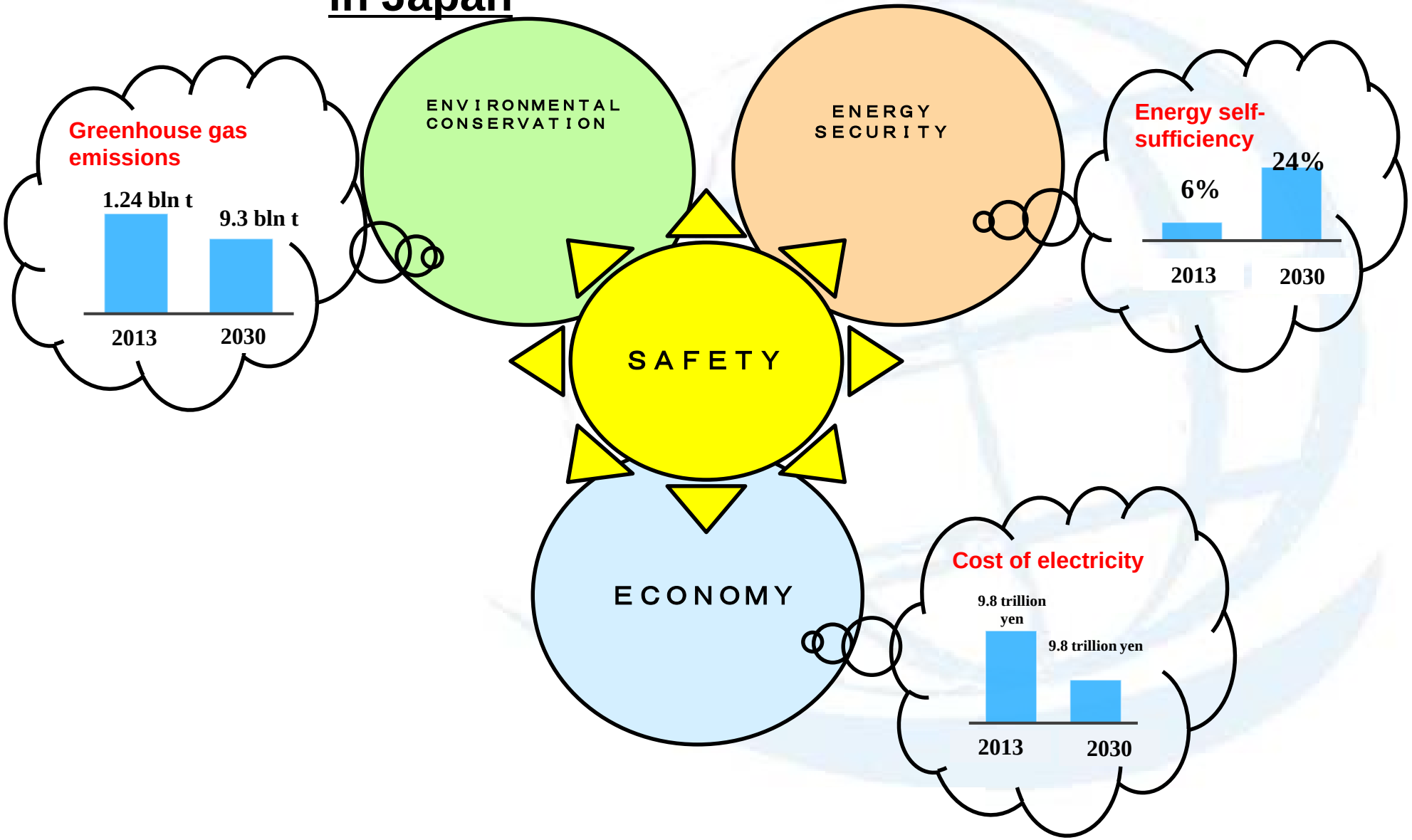
Environmental conservation
This is about controlling CO2 emissions as we protect our natural environment into the future.

Safety

This is a critical factor in generating and transmitting electricity. Regardless of the mode of power generation we choose, it is absolutely essential that we protect our facilities from accidents and natural disasters.

Source: Denki Shimbun, Special Edition "What does Energy Mix mean?"

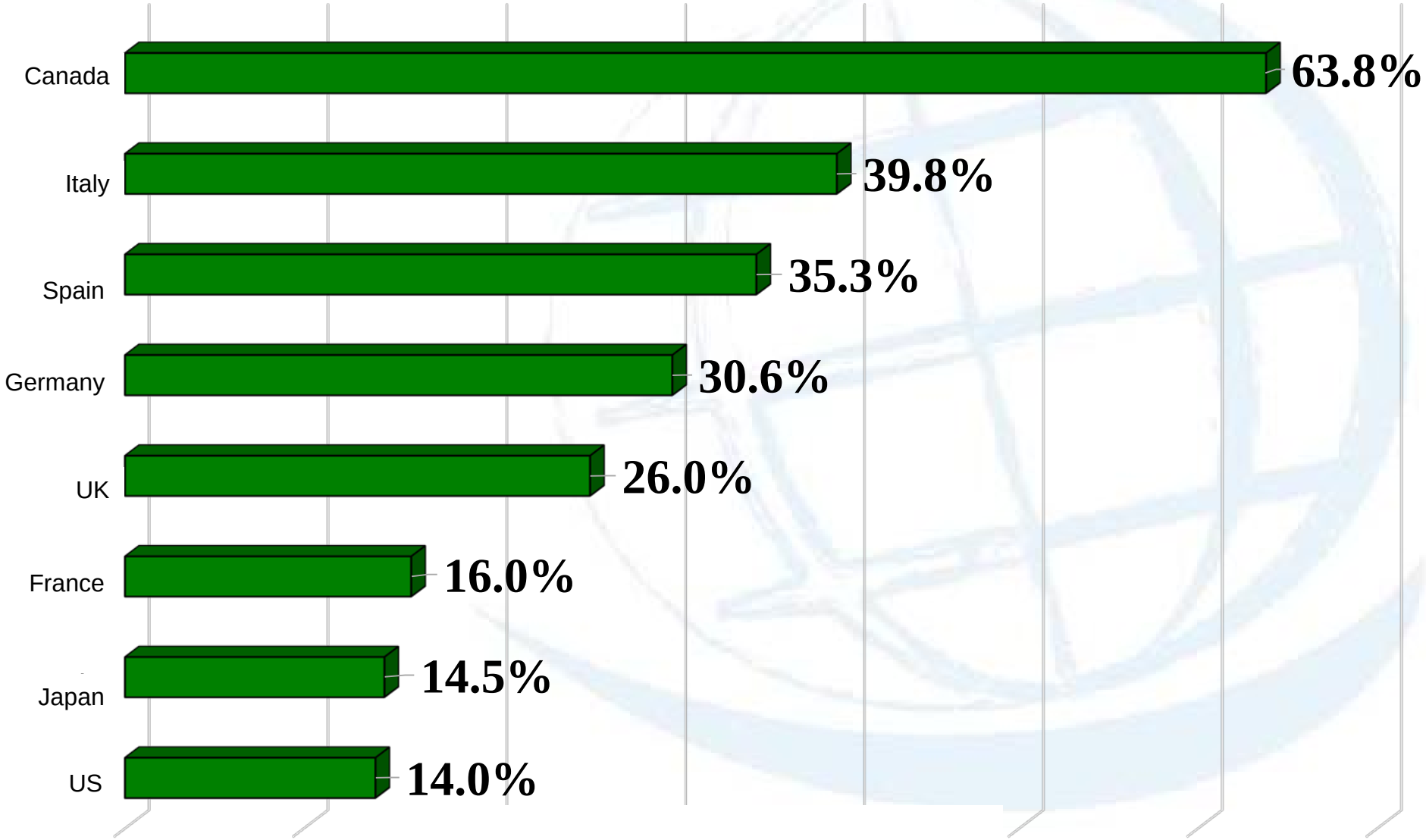
"Basic Plan" for envisioning the future of energy in Japan



Source: Denki Shimbun, Special Edition "Guidebook for Understanding Electricity"

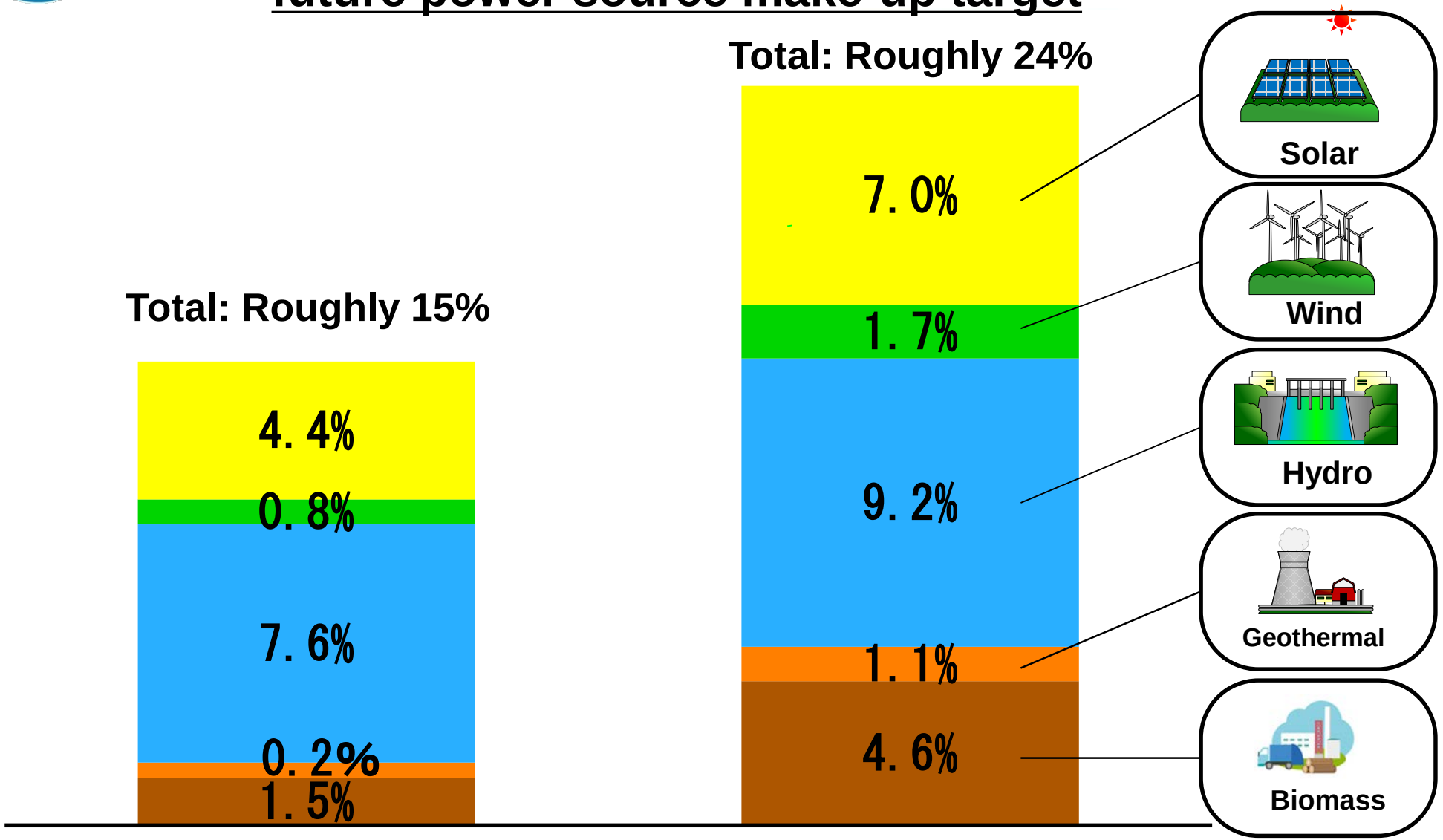
Percentage of renewable energy deployment in different countries

As of 2016



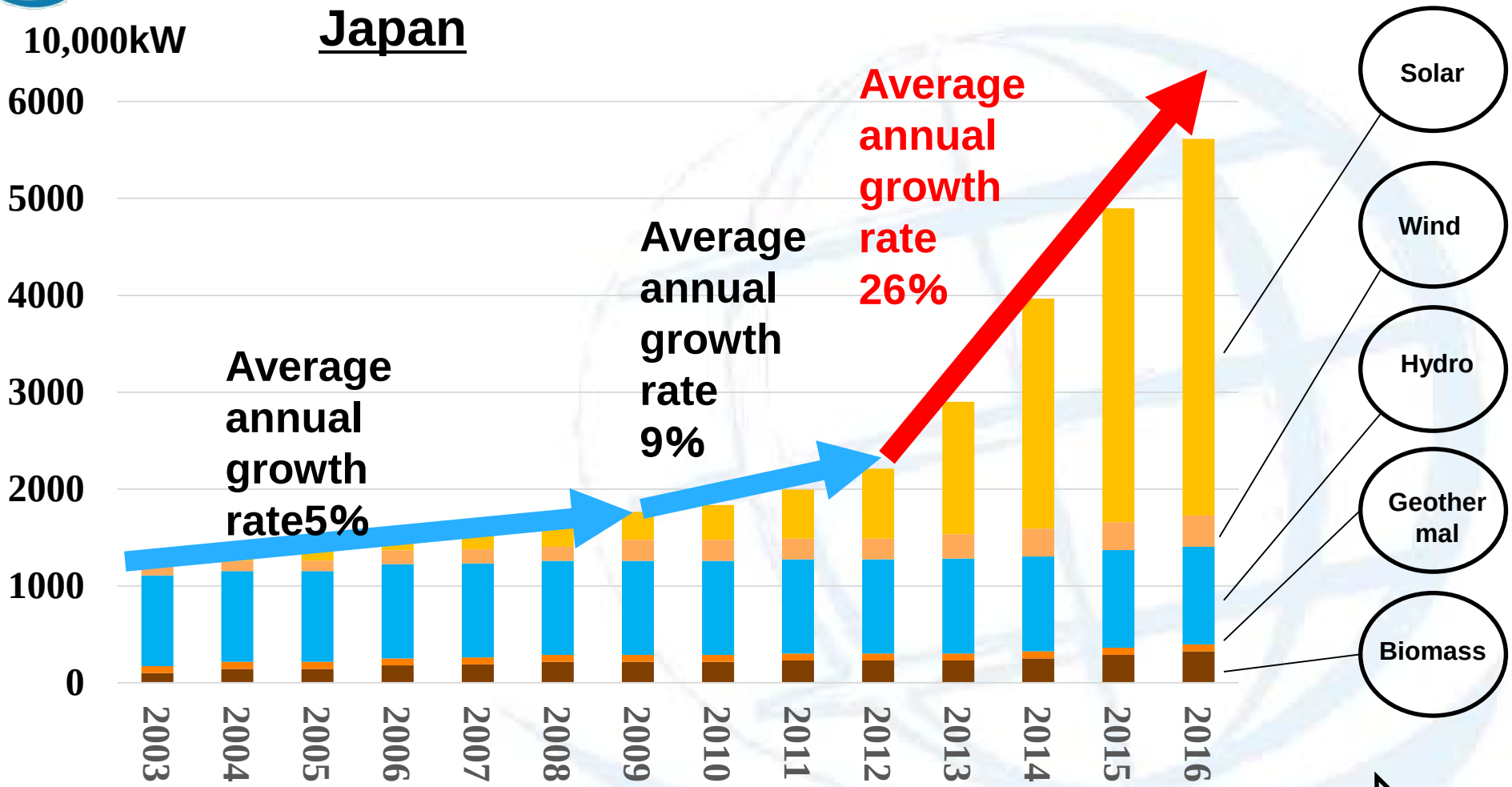
Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Current state of renewable energies in Japan, and future power source make-up target



Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Growing deployment of renewable energies in Japan



Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Information on different renewable energies in Japan

Solar

Wind

Hydro

Geothermal

Biomass

Wave-power

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Solar power generation

Example of installation on home rooftops

Example of large-scale installation

Example of installation on body of water

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Wind power generation

Example of installation in mountain areas

Example of installation at sea

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Hydro power generation

Example of installation using agricultural water channel

Example of installation using a dam

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Biomass power generation

Example of facility that uses woodchips produced in the lumber sawing process

Example of facility that uses wood pellets and palm kernel shells

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Geothermal power generation

Example of facility in a special district of a national park

Example of facility in a hot spring resort that uses geothermal steam to drive turbines

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

Wave-power generation

Example of a wave-power generation installation

Source: Agency for Natural Resources and Energy; Ministry of Economy, Trade and Industry

THANK YOU

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