

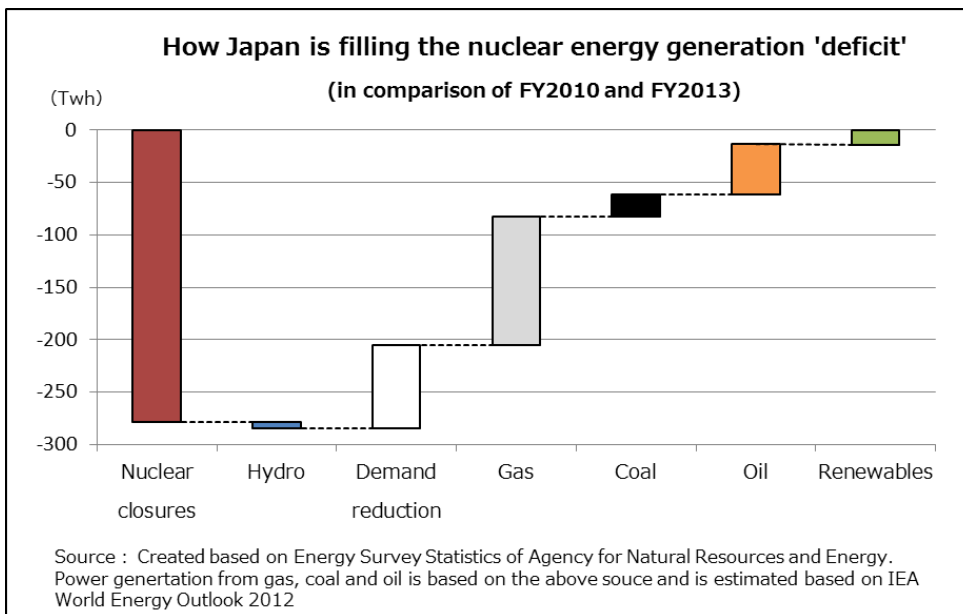
Nuclear Free Japan one year

Greenpeace Japan, September 2014

1.7 trillion yen, 13 nuclear reactors -- the power of energy efficiency

For one year no commercial nuclear reactors have operated in Japan. This nuclear energy 'deficit' has been filled by a combination of energy savings, both efficiency and conservation, and increased power generation primarily from natural gas, followed by coal and oil. According to Japan's Ministry for Economy Trade and Industry (METI), electricity generated by thermal power plants¹ increased by 190Twh (134%) to FY2013, compared with FY2010².

Electricity generation in total has declined by 78.9Twh in the same period as result of increased energy efficiency and conservation. This reduction in electricity demand represents a saving of 1.7 trillion yen, the equivalent cost of generation by imported fossil fuels. The reduction of 78.9Twh is the same amount of electricity that 13 nuclear reactors would generate in an entire year, which would sufficiently supply 22 million Japanese families. Japan's GDP is the third largest in the world, while declining by around 10% during the same period, however remains at it's 6th highest point since 1960 as of FY2013. Japanese GDP's highest ever point was recorded in FY2012³.



Draining national wealth

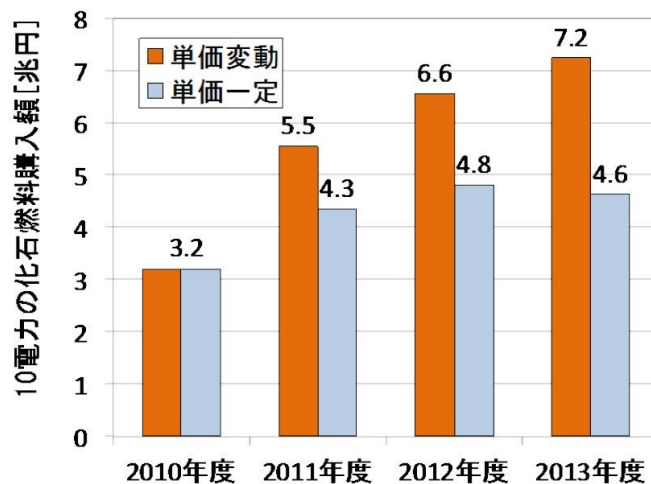
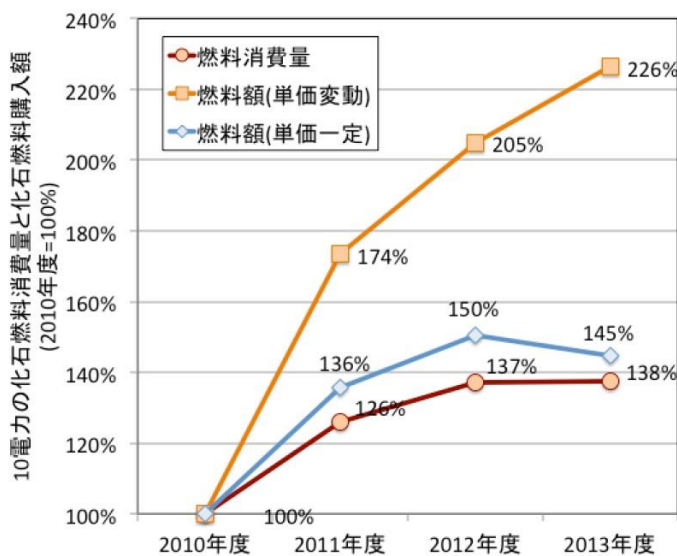
Between FY2010 and FY2013 Japan's ten utilities fossil fuel consumption amount increased by 1.4 times, and at a purchasing cost of 2.3 times more. In the same period, the fossil fuel purchasing costs of these electricity companies increased from 3.2 trillion yen to 7.2 trillion yen, sometimes described as a 4 trillion yen lost national wealth. ISEP (Institute of Sustainable Energy Policy) estimates⁴ that of the 4 trillion yen of lost national wealth 1.4 trillion yen was due to the shutdown of nuclear reactors, while the majority (2.6 trillion yen or 65%) was due to depreciation of the Japanese yen as well as increased oil prices in the global market.

Deliberate government policy has contributed to a decline of the yen by 14% since December 2012⁵. The major costs incurred by Japanese society are a direct consequence of a flawed energy policy based on promoting dependence on unsafe and unreliable nuclear power and fossil fuels, while under-investing in renewables and efficiency. The attempt by the government to maintain the same policy will only guarantee Japan's continued dependence on expensive fossil fuel imports, including the export of trillions of yen in national wealth, while also risking further severe nuclear accidents.

(Left) Fossil fuel purchasing cost and consumption amount of ten utilities (red: consumption amount / fossil fuel purchasing cost – orange: in fluctuating price/ -- blue: in flat price)

(Right) Fossil fuel purchasing cost of ten utilities (orange: in fluctuating price / blue: in flat price) unit in trillion yen

(Both graphs are created by ISEP)



What is the best answer to avoid draining national wealth?

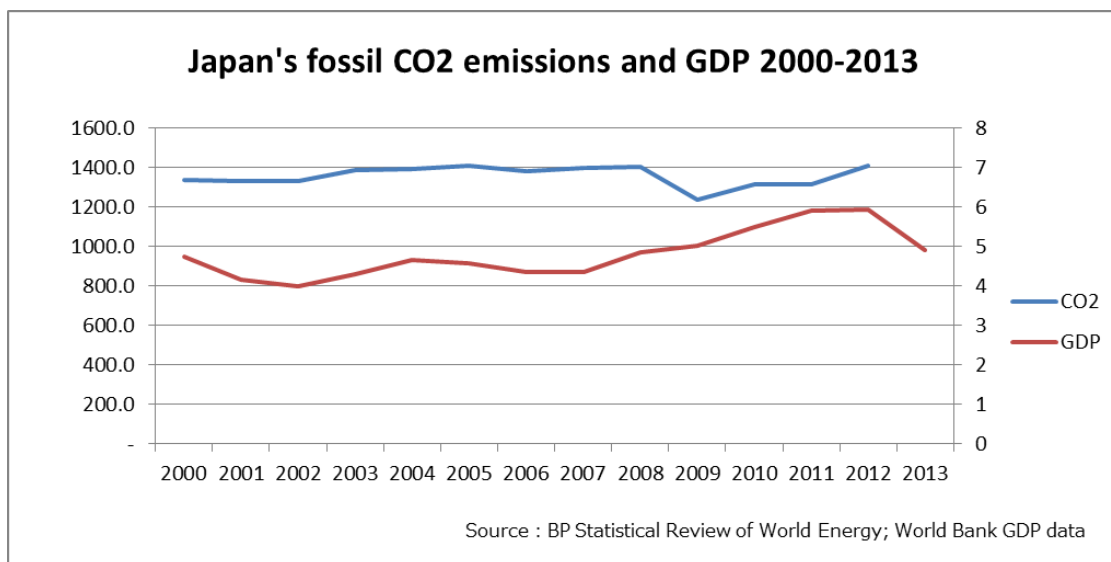
The table below describes a comparison of three electricity generation methods. The logical answer, if Japan wished to avoid draining its national wealth, would be the expansion of energy efficiency and renewable energy, rather than attempt to restart its nuclear program and to increase fossil fuelled electricity generation.

	Renewables (solar, wind)	Nuclear (Uranium)	Fossil fuel (coal, oil, gas)
Fuel cost	Free	Pay	Pay
Fuel sustainability	Indefinite	Limited	Limited
Origin of fuel	Japan made	Imported	Imported
Direct waste from the fuel	Nil	Toxic for hundreds of thousands of years	Toxic ash & related

No rapid increase of CO2

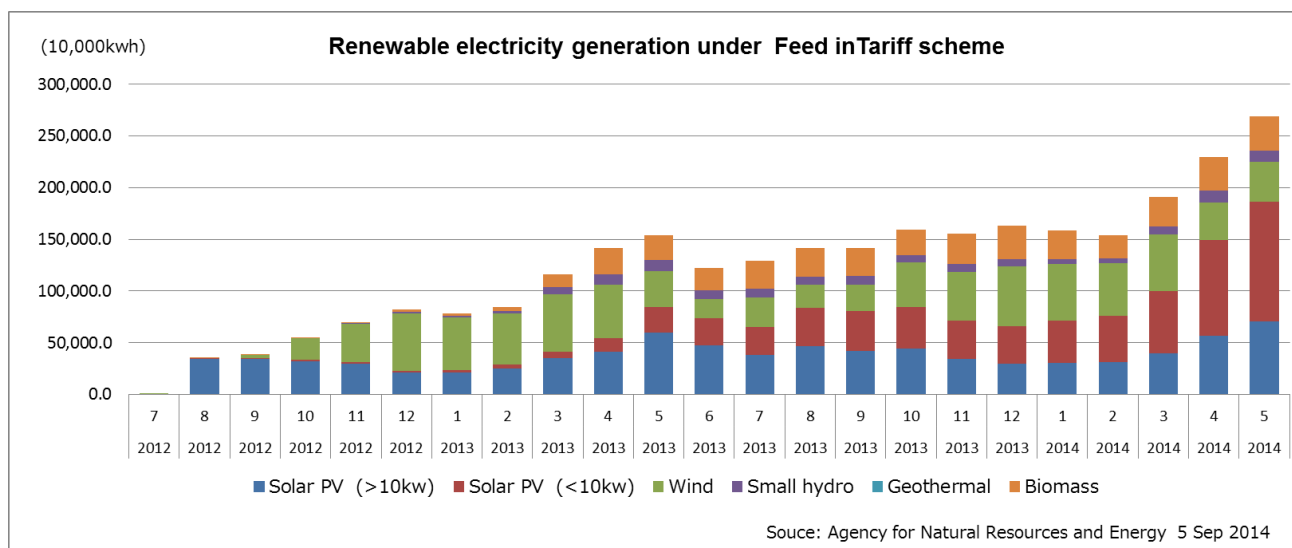
All in all, the country's rise in CO2 emissions after Fukushima has been surprisingly moderate – notably smaller than what might have been expected in proportion to the sudden loss of the world's third largest nuclear reactor fleet. Coal and oil consumption, while up from 2010 in 2012, were still below the levels

before the 2008 economic crisis. The CO2 emissions from Japan's energy sector – both pre and post-Fukushima disaster – have maintained the similar (unsustainable) growth trajectory that existed before the disaster. 2009 - 2010 saw an annual CO2 increase of approximately 7%, while 2010 – 2012 saw a less than 8% rise in CO2 emissions. In short, the post-Fukushima CO2 figures do not represent anything close to a sudden, drastic increase, but rather a continuation of emission trends that were already problematic, and partly reflect a bounce-back from the 2008 economic crisis.



Renewables – Up to 3 nuclear reactors and growing

Since the start of the Feed in Tariff (FIT) in July 2012, there has been a rapid increase in power generations from renewable energy nationwide. A total of 18.1Twh, which is equal to electricity sufficient to supply 5 million Japanese families for an entire year, was generated in FY2013 from renewable energy (excluding large hydroelectric)⁶. This is equivalent to the electricity that would have been generated by 3 nuclear reactors in one year. As a whole, 28.7Twh of electricity has been generated from solar, wind, geothermal, small hydroelectric, and biomass in Japan since the beginning of FIT to May 2014.



Power to the People - 530,000 micro power stations

In the 23 months from the beginning of FIT to May 2014, 680,000 new renewable power stations have started to operate Japan-wide. The majority of the total capacity of 10.4GW is decentralized power stations particularly small scale solar photovoltaic (PV) systems. These are less than 10kw solar panels, typically made for households, which accounts for 530,000 out of the 680,000 cases according to METI⁷. This means that every month 23,000 families in Japan have become micro solar power stations, turning from electricity consumers to producers of their own clean and safe electricity. These half a million micro solar power stations have generated 8.5Twh in the past 23 months - the equivalent of electricity from 1.4 nuclear reactors annually.

Conclusion

The idea that every commercial nuclear reactor in Japan would be shutdown for over a year would have been unimaginable before the Fukushima-Daiichi nuclear accident. Nonetheless the Great East Japan Earthquake, the Fukushima nuclear disaster, the introduction of the FIT and the people of Japan themselves have triggered a massive change. Now, on the 15th of September 2014, for the first time in nearly half a century Japan is free of nuclear electricity for an entire year. This rapid reduction in nuclear electricity generation is unique in the history of nuclear power. And significantly, it has caused no electricity blackouts.

Greenpeace issued its Energy [R]evolution scenario for Japan six months after the Fukushima disaster. It showed that the country could stop operating all its reactors in 2012 without creating blackouts. The scenario has become reality. The potential for solar PV installation predicted in the document has also been matched by actual developments. It goes on to demonstrate that Japan can gain 43% of its electricity from renewables by 2020.

The return of nuclear power by summer 2014 has not materialised with many unresolved safety, legal and political challenges ahead. Led by citizens, communities, and industry, Japan is moving forward to increase energy efficiency and renewable energy expansion. The government, however, is ignoring the lessons of Fukushima and attempting to delay the renewable revolution, trying to take the nation back to its dependence on dangerous and unreliable nuclear power. It's the wrong energy policy for the future of Japan, that policy should be based on energy efficiency and renewables. The government should be focusing its efforts on managing the ongoing nuclear disaster at Fukushima, supporting its victims, and abandon plans to restart nuclear reactors; set an aggressive national target for energy efficiency, renewables, and CO2 reduction.

Greenpeace stands together with the people of Japan demand that this historic one year of being nuclear free should be the beginning of a clean and safe energy future.

¹ Plants using gas, oil or coal for fuel

² Agency for Natural Resources and Energy, Energy Survey Statistics

³ World Bank GDP data <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/JP?display=graph>

⁴ Institute of Sustainable Energy Policy, briefing paper, 7 May 2014 <http://www.isep.or.jp/library/6330>

⁵ An example of such an indication, see <http://www.bloombergvew.com/articles/2014-02-24/that-s-enough-yen-depreciation>

⁶ Agency for Natural Resources and Energy, 5 September 2014 http://www.fit.go.jp/statistics/public_sp.html

⁷ Agency for Natural Resources and Energy, 5 September 2014 http://www.fit.go.jp/statistics/public_sp.html