Japan's Energy Security Post Fukushima

Young Pugwash Conference

Climate Change and Energy Policy/ Security

By: Stephen Kakouris

Centre for International Studies and Diplomacy

21st March, 2016

Case Study: Fukushima

The lack of resources in Japan put it in a position where its primary objective when it came to energy was to decrease dependency as much as possible [Vlado:2012]. Being the fifth largest consumer of energy in the world, it was not in best interest for Japan to be reliant on importation from its neighbors of which relations were insecure as well as oil producing countries in the Middle East [EIA:2008; Vivoda:2015]. Nuclear power gave Japan an opportunity to have a relatively stable energy trilemma for a country that lacked natural resources because it allowed the country to have a sense of energy independence. A quarter of Japan's energy mix was nuclear before Fukushima, giving it both resilient energy security in the event of importation disruptions as well as allowing it to be a world leader in environmental sustainability, it held the 13th index rank for energy trilemma stability [worldenergy.org:2011].

The unknown shock of the tsunami in 2011 hit Japan without any warning, not that a warning could have had any effect on such an unstoppable force of nature. When the wave destabilized the power plant in Fukushima, the entire energy system of Japan had to be reassessed

[Vivoda:2012; Vivoda:2015]. The initial repercussions of the shock had two main destabilizing effects on the Japanese energy security. The first, and most prominent was an anti-nuclear public opinion, essentially demonizing the most significant source of Japan's home grown energy mix. The degree of the impact of Fukushima made the Japanese people and government question the safety of nuclear power plants in a country that is located on an earthquake prone fault line. The second was a dramatic increase in the use of fossil fuels which lead to a crippling trade deficit that increased the importation of fossil fuels by 25.5% [Vivoda:2012]. On top of costs of rebuilding damaged infrastructure from such a devastating event, Japan desperately needed to increase its oil import to meet energy demand, increasing the price of electricity as well as further weakening the Japanese economy.

The lack of diversity in the energy mix was truly realized when the energy system was revaluated and the nuclear industry was not to be included in Japan's energy future. Commitments to exclude nuclear from Japan's energy mix has two threatening implications to its energy security. The first being that now it is now on a "path of dependence", as it is almost entirely dependent on fossil fuel imports [Vivoda:2012]. This puts Japan's energy security in the hands of external actors. Further more disputes over

key shipping routes in the South China contribute to Japan's energy insecurity as regional disputes have the potential to disrupt the continuity of fossil fuel imports [source+ add]. The second implication is that Japan will now significantly increase its carbon emission output in order to meet demand. The prevalence of nuclear power in Japan meant that a quarter of its energy mix came from a non-carbon energy source. Now that nuclear power generation has ceased in Japan, the country is moving away from the diversification of energy. This will Make it impossible to meet goals established at the Kyoto Protocol (which was created Japan), but also means that it can not realistically be a leader in the movement towards climate change policy.

Japan's energy plan's for the future of its energy security is diversification. In July 2015, the Japanese government finalized it's 2030 energy mix to compose of 22-24% renewables, 20-22% nuclear, 27% LNG, 26% coal and 3% oil [UNFCCC:2015]. These plans to developing renewable energy infrastructure will ideally bring Japan back to a position of energy independence, rather than solely relying on a volatile energy source. These developments have included the implementation of a feed-in-tariff system to incentivize renewable source incorporation, especially with mega-solar PV [worldenergy.org:2015]. The most important,

immediate action for Japan is to focus on energy efficiency. These steps demonstrate Japan's commitment to reduce vulnerability and increase resilience in its energy sector.

Japan is an example of how detrimental climate change can be to energy security. The effects of of the tsunami and Fukushima provided a wake up call, for the rest of the world. Similar to that experienced in the 1973 oil crisis. The message being: It does not matter how developed or "Westernized" the society is, natural disasters are the most dangerous threat to energy security. If scientific consensus is to be believed, global warming is likely to increase the frequency and severity with which events similar the the 2011 tsunami occur in the future [ICC:2012] . This crisis led to energy policy that achieved a complete shutdown of Japan's nuclear energy production, reestablishing energy dependence on the importation of fossil fuels in the immediate future [Vivoda:2015]. Japan's energy trilemma, now almost completely dependent of fossil fuel imports aside from 10% renewables, has been reduced to a Global Energy Security Index Rank of 32nd in the world in 2015. Japan demonstrates the consequences of not having a diversified energy mix.

The saving grace for Japan is that it is a developed country that bounced back from this disaster, relatively quickly. When an unexpected shock hit the energy industry, the countries energy sector was left extremely vulnerable. A positive aspect for Japan is that is a country that has other strong industry sectors that can help it correct its errors and eventually rehabilitate. The information on extreme weather event shows that there are greater numbers in fatalities and damage to infrastructure in poorer countries. Provided that there is a connection between climate change and the increase of natural disasters, developing countries are at far greater risk of threats to energy security and irremediable repercussions.

Bibliography

Hildyard, Nicholas. "'Creating Insecurities: The Consequences of EU Energy Policies,'" May 2011. http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/Creating%20Insecurities%20%20no%20pictures%20WEB.pdf.

Rühle, Michael. "NATO and Energy Security: From Philosophy to Implementation." *Journal of Transatlantic Studies*, 2012. http://www.tandfonline.com.ezproxy.soas.ac.uk/doi/pdf/10.1080/14794012.2012.734673.

.“NATO and Energy Security: From Philosophy to Implementation.” Accessed March 17, 2016. http://www.tandfonline.com.ezproxy.soas.ac.uk/doi/pdf/10.1080/14794012.2012.734673.

“The Biggest Cybersecurity Threat: The Energy Sector.” *Forbes*. Accessed March 17, 2016. http://www.forbes.com/sites/michaelkrancer/2015/11/04/the-biggest-cybersecurity-threat-the-energy-sector/.

“Ukraine Power Grid Attacks Continue but BlackEnergy Malware Ruled out.” Accessed March 17, 2016. http://www.v3.co.uk/v3-uk/news/2440469/ukraine-investigating-suspected-russian-cyber-attack-on-power-grid.

Yergin, Daniel. “Ensuring Energy Security.” *Foreign Affairs* 85, no. No.2 (April 2006): 69–82. http://www.un.org/ga/61/second/daniel_yergin_energysecurity.pdf.