



## Japan's Nuclear Energy Debate: A Year After the Fukushima Nuclear Crisis

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### **Summary**

The massive earthquake and tsunami which triggered the Fukushima nuclear crisis on March 11, 2011 has shattered the Japanese people's faith in the safety of nuclear power generation. The Tokyo Electric Power Company (TEPCO) which manages the plant has stated that it was the unprecedented tsunami that caused the nuclear crisis. Therefore, in the immediate aftermath of the nuclear crisis the Japanese people were demanding to put in place additional safety measures to enable nuclear power plants withstand a future tsunami. However, the people's perception drastically changed when a section of nuclear experts contested TEPCO's claim and asserted that the nuclear plant was damaged by the quake even before the tsunami hit the plant. Another factor that has led to a major change in public perception was the findings that the Fukushima nuclear plant spewed a large amount of radioactive material, which would remain suspended in the atmosphere and could be hazardous for health. These factors have left a deep impact on the Japanese psyche, leading to a revival of anti-nuclearism in Japan. Japanese civil society has been demanding a phase out of the country's nuclear power generation programme. Amidst this debate, the government is mulling a new energy plan, which is likely to downsize the nuclear power programme and invest more in renewables.

## Introduction

In 1954, when Japan embarked on its nuclear power development programme, the slogan was “nuclear power is the only way for Japan to rise from the ashes.” Over the next few decades, nuclear energy certainly proved a boon for Japanese industry as it contributed 30 per cent of Japan's total energy needs. By 2009 Japan had constructed 54 nuclear reactors. Motivated by this success story, in 2010, Japan not only set an ambitious target to increase the share of nuclear energy up to 51 per cent in its energy matrix by 2030 by setting up 14 additional nuclear plants, but also adopted a “growth strategy” by selling nuclear technology to countries interested in setting up nuclear power plants. However, the massive earthquake and tsunami which triggered the Fukushima nuclear crisis on March 11, 2011 has shattered the Japanese people's faith in the safety of nuclear power generation. The new slogan in Japan today is: “we aim for a Japan with no nuclear power plants.”<sup>1</sup> A large number of Japanese re-iterated this commitment on the first anniversary of the March 11 disaster by holding countrywide anti-nuclear protests.<sup>2</sup>

As a result of this resurgence of anti-nuclearism post Fukushima, the nuclear reactors idled for regular inspections continue to remain off line. Only two out of 54 are operational today and these two will also stop operating for periodic safety checks in April 2012. The Japanese government is trying to convince the host communities to restart nuclear reactors but the latter have been reluctant because of public sentiments that remain largely opposed to restarting them. Against this backdrop, this Issue Brief analyses the impact of the Fukushima nuclear crisis on the Japanese psyche. The new Japanese debate to wean the country away from nuclear power generation stems out of this psyche. The Issue Brief also throws light on Japan's emerging energy policy.

## Radiation Scare post Fukushima Nuclear Crisis

The drastic change in Japanese thinking on hosting nuclear power plants could be attributed to the radiation scare which resulted from the meltdown of Fukushima No.1 nuclear power plant. With the radiation level in the environment from the embattled Fukushima nuclear reactors reaching hazardous levels, the government of Japan had evacuated people within a radius of 20 kilometers from the quake stricken nuclear plant and urged those living between a radius of 20 and 30 kilometers to vacate voluntarily. A year after the March 11 crisis, people have started returning to their homes but the 20 kilometer radius area around the Fukushima Daichi plant remains a “no-go zone” and will continue to be so for another 30 years because of radioactive contamination of soil.

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<sup>1</sup> This is the English translation of a full page advertisement that appeared in Japanese vernacular dailies including *Mainichi Shimbun* on February 11, 2012.

<sup>2</sup> “Antinuclear protests held across Japan on anniversary of disaster,” *Mainichi Shimbun*, March 12, 2012.

As a result, 110,000 people remain displaced and have been living in makeshift shelter or rented accommodation.

A series of reports and findings that the Fukushima nuclear plant spewed a large amount of radioactive material has also left a deep impact on the Japanese psyche. Video footage of a testimony before a Japanese Diet Committee by Tatsuhiko Kodama went viral online. On August 12, 2011 Kodama had testified that the embattled Fukushima nuclear plant released some 29.6 times more radioactive materials than the Hiroshima bombing. Kodama, head of Tokyo University's Radioisotope Centre, also stated that radiation from Fukushima will only decrease by one-tenth per year, which is about 100 times slower than radiation from the bomb.<sup>3</sup> Yet another report by the Japanese government's nuclear watchdog, Nuclear and Industrial Safety Agency, submitted to a Diet panel noted in August 2011 that the Fukushima No.1 nuclear plant emitted 15,000 terabecquerels of Cesium-137 which can linger for decades and can cause cancer.<sup>4</sup> A recent report by a team of researchers from the Metrological Research Institute of the Japanese Metrological Agency and the Central Research Institute of Electric Power Industry have concluded that radioactive Cesium released in the atmosphere from the plant was about 30,000 to 40,000 terabecquerels.<sup>5</sup> In contrast the 1986 Chernobyl accident had released 137,000 terabecquerels of radioactive cesium into the atmosphere. Thus, these studies suggest that Fukushima released far less radioactive materials as compared to previous nuclear accidents like Chernobyl. However, this did not allay the Japanese people's fear about radiation. To understand how the March 11 crisis impacted the common people's thinking about nuclear energy, let me quote what a reader wrote to the *Japan Times*:

"Looking at Tokyo Electric Power Co. workers struggling to solve what seem like unsolvable technical difficulties; damaged nuclear reactor emissions contaminating the air, land and sea; dairy people draining precious milk into a ditch; farmers unable to sell vegetables in the market; fishermen unable to sell their catch; and people who've had to evacuate from their homes, I firmly believe that the nuclear energy industry should be totally stopped."<sup>6</sup>

Another factor which has made the Japanese people cautious about restarting nuclear reactors was the assertion made by some scientists that major piping at the Fukushima

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<sup>3</sup> "Fukushima fallout said 30 times Hiroshima's," *The Japan Times*, August 24, 2011. The report notes that the video received three million hits.

<sup>4</sup> "Cesium release equal to 168 Hiroshima A-bomb," *The Japan Times*, August 28, 2011.

<sup>5</sup> "Cesium released from Fukushima possibly equals 20-30% of Chernobyl," *The Mainichi Daily*, March 1, 2012.

<sup>6</sup> Naoshi Koriyama, "Put the efforts into renewables," (Readers in Council), *The Japan Times*, May 22, 2011.

plant was damaged by the quake even before the tsunami hit the plant. But the Tokyo Electric Company (TEPCO) has been asserting that the direct cause of the disaster was “the larger than expected tsunami.”<sup>7</sup> After the accident a sizeable number of Japanese had accepted TEPCO’s argument and were optimistic about nuclear power generation if additional safety measures were implemented to stop the inundation of nuclear reactors from a tsunami. But their trust about nuclear reactor safety started eroding when members of the government appointed Hatamura Panel, which is assessing the causes of the nuclear meltdown at Fukushima plant, cast doubts on TEPCO’s claim. “The claim that tsunami alone caused the accident is nothing but a hypothesis,” noted *Asahi Shimbun* citing a panel member Hitoshi Yoshioka.<sup>8</sup> Quoting another member of the panel, the paper also reported that between six to eight members of the government panel have doubts about TEPCO’s claim. The Hatamura panel will submit a final report in mid- 2012. The panel wants to make an on site visit to assess TEPCO’s claim but finds it difficult to make one because of the high radiation level inside the plant.<sup>9</sup> Given the doubts raised by some members of the government panel about the current quake resistance standards, local governments are naturally reluctant to give their consent to restarting nuclear reactors. They want to wait till the final cause of the nuclear reactor’s meltdown is ascertained by the government panel. The people also remain opposed to restarting the idled reactors, as a study by the Earthquake Research Institute at the University of Tokyo has predicted that the probability of a major quake hitting the Tokyo area within four years remains very high.<sup>10</sup>

## Public Opinion and Increasing Nuclear Allergy

Public opinion on nuclear energy has also started shifting post Fukushima. An opinion poll conducted by the *Asahi Shimbun* in April 2011, a month after the Fukushima crisis, found that out of 1999 respondents 41 per cent wanted nuclear generation to be reduced or stopped. This figure was only 28 per cent when the daily conducted a similar poll on the issue earlier in 2007.<sup>11</sup> (See Table 1)

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<sup>7</sup> “Utility’s probe lays blame on tsunami,” *The Japan Times*, December 4, 2011. TEPCO authorities have been making similar statements even before the probe.

<sup>8</sup> “Panel doubts TEPCO claim tsunami caused nuke accident,” *The Asahi Shimbun*, December 6, 2011, available online at <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201112060052>, accessed on December 8, 2011.

<sup>9</sup> Ibid.

<sup>10</sup> “New ‘Big One’ forecast: four years,” *The Japan Times*, January 24, 2012.

<sup>11</sup> “Poll: 41% want nuclear power generation reduced or stopped,” *The Asahi Shimbun*, April 19, 2011, available online at <http://www.asahi.com/english/TKY201104180129.html>, accessed on April 21, 2011.

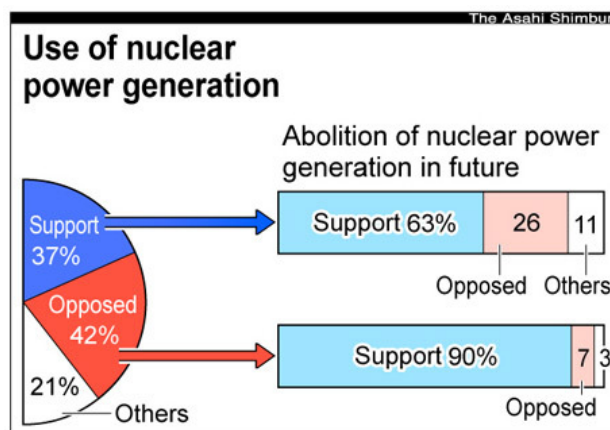
**Table 1**

**Q. What should be the future of Japan’s nuclear power generation?<sup>12</sup>**

Nuclear power generation should be increased	5% (13)
Nuclear power generation should continue as it is	51% (53)
Nuclear power generation should be decreased	30% (21)
Nuclear power generation should end	11% (7)

(Figures in parenthesis indicate responses to the 2007 survey.)

Further, a poll conducted in June 2011 by the *Asahi Shimbun* suggested that there has been a gradual shift in Japanese public opinion towards abolishing nuclear power generation. Among the 1980 respondents to the opinion poll, “74% supported abolishing nuclear power after a phase out period, compared with 14% opposed.”<sup>13</sup> The drastic shift from 41 per cent to 74 per cent in favour of abolishing nuclear power plants may be a result of the growing radiation scare in Japanese society. The survey found that 37 per cent respondents supported nuclear power generation, while 42 per cent were opposed. Even among those who support nuclear power generation, more than 60 per cent support phasing out nuclear power generation and abolishing it at a later date.<sup>14</sup> (see the graph below.)



(Source: The Asahi Shimbun)<sup>15</sup>

<sup>12</sup> The *Asahi Shimbun* opinion poll available online at <http://www.mansfieldfdn.org/backup/polls/2011/poll-11-04.htm>, accessed on March 8, 2012.

<sup>13</sup> “74% of voters back dumping nuclear power,” *The Asahi Shimbun* June 15, 2011, available online at <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201106141154>, accessed on 16, 2012.

<sup>14</sup> Ibid.

<sup>15</sup> *The Asahi Shimbun*, June 14, 2011, available online at <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201106141154>, accessed on June 15, 2011.

Another poll conducted by the *Mainichi Shimbun* in August 2011 also showed a similar trend. It suggested that “74% of respondents expressed support for a gradual cutback on nuclear power plants in Japan, while only 11 percent demanded an immediate halt to nuclear energy.”<sup>16</sup> Earlier the *Mainichi Shimbun* had conducted a specific survey to assess the opinion of mayors of disaster hit areas of Fukushima, Iwate, and Miyagi. In this survey conducted on March 8, 2011, it was found that 60 per cent of the mayors of 42 municipalities in the three disaster hit prefectures wanted nuclear power stations abolished. The opposition was particularly high in Fukushima which hosts the crippled nuclear plant. 12 out of 15 mayors said that nuclear plants should be decommissioned.<sup>17</sup>

### Resurgence of Anti-Nuclear Activism

The Fukushima crisis has also triggered the revival of anti-nuclear activities in Japan. Almost 60,000 protesters participated in an anti-nuclear rally in Tokyo's Meiji Park on September 19<sup>18</sup> – the biggest ever demonstration after the Vietnam War – demanding the scrapping of all nuclear reactors in Japan. In addition, there have been hundreds of sporadic protests ever since the March 11 crisis demanding the scrapping of nuclear reactors.

Various anti-nuclear groups, which had earlier accepted the peaceful use of nuclear energy, have changed their stance on nuclear power generation following the Fukushima crisis. For instance, *Nihon Hidankyo* (Japan Confederation of A- and H-bomb Sufferers Organisations) has urged the government to not only drop the plan to build new nuclear power plants but also to decommission existing nuclear power plants one by one. *Gensuikin* (Japan Congress against Atomic and Hydrogen Bombs) has also called for the phasing out of nuclear power generation. *Gensuikyō* (Japan Council against Atomic and Hydrogen Bombs) has also adopted a similar stance.<sup>19</sup> *Rengo* (The Japanese Trade Union Confederation), Japan's largest labour organisation, has also decided to pursue a society that will eventually stop relying on nuclear power. This is a departure from its earlier policy of supporting the construction of new nuclear power plants.<sup>20</sup>

An NGO, *Sayonara Nuclear Power Plants*, which emerged following the Fukushima nuclear meltdown, has collected signatures in Tokyo and Osaka. It has petitioned these two metropolitan governments to hold a referendum to seek the people's opinion on hosting

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<sup>16</sup> “74 percent favor gradual reduction of nuclear power plant: Mainichi poll,” *Mainichi Shimbun*, August 22, 2011.

<sup>17</sup> “Nearly 60 percent of mayors in disaster-hit areas want nuclear power stations abolished,” *Mainichi Shimbun*, March 8, 2012.

<sup>18</sup> “Mass turn out to protest nuclear power,” *The Japan Times*, September 20, 2011.

<sup>19</sup> “Old and new nuclear perils,” (Editorial), *The Japan Times*, August 6, 2011.

<sup>20</sup> “Rengo takes an anti-nuclear stance,” *The Japan Times*, October 12, 2011.



nuclear power plants and has been calling upon them to withdraw their stakes from the TEPCO and Kansai Electric Power Company (KEPCO). The Tokyo metropolitan government has major shareholding in TEPCO which runs the embattled Fukushima nuclear power plant, while the Osaka government has shareholding in KEPCO. Following the submission of signatures demanding a referendum in both the metropolises, *Sayonara Nuclear Power Plants* took out a full page advertisement in Japanese newspapers with the slogan “We aim for a Japan with no nuclear power plants.” Given the reluctance of these metropolitan governments to hold a referendum, the group has started lobbying municipal representatives in the hope of garnering two thirds support for bringing an ordinance for the referendum. Various eminent personalities in Japan including Nobel laureate in literature, Kenazabu Oe, have lent their active support for the movement to abandon nuclear energy.

### The Media and the Nuclear Energy Debate

Like the civil society groups, the Japanese media has also been proactive in unleashing a sustained campaign to wean the country away from nuclear power generation. Almost all the major dailies except the *Yomiuri Shimbun* have called for the gradual abolition of nuclear power plants and switching to renewable energy sources. The *Japan Times*, The *Mainichi Shimbun* and the *Asahi Shimbun*, all have written editorials on the issue of the fallout of the Fukushima crisis almost on a weekly basis and have urged the government to do away with nuclear power generation. The *Asahi Shimbun* came out with a series of five editorials in July 2011 enunciating its position on a phased withdrawal of nuclear reactors. One of its editorials stated:

“...nuclear power generation has never become a major political issue in this country. The Fukushima disaster, however, has provoked calls for reconsidering the nuclear energy policy within the Japanese political community. We hope the government will hammer out and announce a detailed and reliable road map for the nuclear phase-out by the next general election.”<sup>21</sup>

And it concluded that “the basic principle for phasing out nuclear power generation should be shutting down old reactors that have reached the end of their planned life span without building new ones.”<sup>22</sup> Since then the daily has reiterated this position in subsequent editorials as well.

The *Mainichi Shimbun* has also called upon the government to rethink its energy policy. The daily editorialized that “events that have occurred since the March 11 Great East Japan Earthquake have reminded us of the reality Japan faces – another powerful

<sup>21</sup> “Seeking a society without nuclear power generation: Nuclear phase out roadmap needed soon,” (Editorial), The *Asahi Shimbun*, July 15, 2011. available online at <http://www.asahi.com/english/TKY201107140328.html> accessed on July 16, 2011.

<sup>22</sup> Ibid.

earthquake could occur anytime and anywhere, and we have no way to predict it." Against this backdrop, it noted that "the government has no choice but to seriously consider whether quake-prone Japan can coexist with nuclear power stations, take prompt countermeasures and drastically change its nuclear energy policy."<sup>23</sup> More recently, it asked the government to "say good bye to nuclear power", stating that "the illusion of nuclear power safety has been torn out by root. The Fukushima nuclear disaster that followed the great waves of March 11 last year made sure of that."<sup>24</sup>

The *Japan Times* has also been at the forefront in highlighting the safety aspects of nuclear reactors post Fukushima crisis. It has also been calling the government to "cut the nuclear cord". The daily was at the forefront in hailing Kan's idea of "turning Japan into a society that does not have to rely on nuclear power", even though other dailies lamented the lack of specifics in Kan's idea. *Japan Times* opined that Kan's "idea as a long-term goal is reasonable in view of the fact that the accidents at Tokyo Electric Power Co.'s Fukushima No. 1 nuclear power plants have underlined the inherent difficulty in ensuring the safety of nuclear power stations in this earthquake-prone country."<sup>25</sup> It also came out against the government's plan to restart the idle nuclear reactors after they pass a "stress test" – an assessment whether the reactors can withstand earthquake and tsunami. Further, it urged the people to remain vigilant against the government's stress test, stating that "the government must be watched closely because it may use the stress test results to justify restarting nuclear power stations without fully disclosing all relevant information." For, "the greatest problem with Japan's stress tests is that they are being carried out before the causes of and lessons from the Fukushima nuclear crisis are clearly known."<sup>26</sup>

The *Yomiuri Shimbun* has been the lone media organisation which has continuously batted for nuclear power plants. In its editorials it has been urging the government not to get carried away by "the emotional opposition to the nuclear power." It has also been advocating the need to restart nuclear reactors without any delay.<sup>27</sup> But at the same time it has also urged the government to enhance nuclear power plant safety following Fukushima. In an editorial it advised that "to secure electricity in a stable manner, Japan must improve its nuclear technology and enhance power-plant safety to continue utilizing nuclear power. Therefore, the government must avoid taking a 'no nuclear power plants' stance in its new energy strategy."<sup>28</sup> But the drastic shift in public opinion towards nuclear power (mentioned above) suggests that the *Yomiuri's* argument has few takers.

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<sup>23</sup> "Japan should change energy policy following nuclear power plants crisis," (Editorial), *The Mainichi Shimbun*, April 16, 2011.

<sup>24</sup> "Time to say goodbye to nuclear power," (editorial), *The Mainichi Shimbun*, March 7, 2012.

<sup>25</sup> "Cutting the nuclear cord," *The Japan Times*, July 15, 2011.

<sup>26</sup> "Question over stress test," (Editorial), *The Japan Times*, February 7, 2012.

<sup>27</sup> "Restarting nuclear reactors must not be delayed," *The Yomiuri Shimbun*, January 19, 2012.

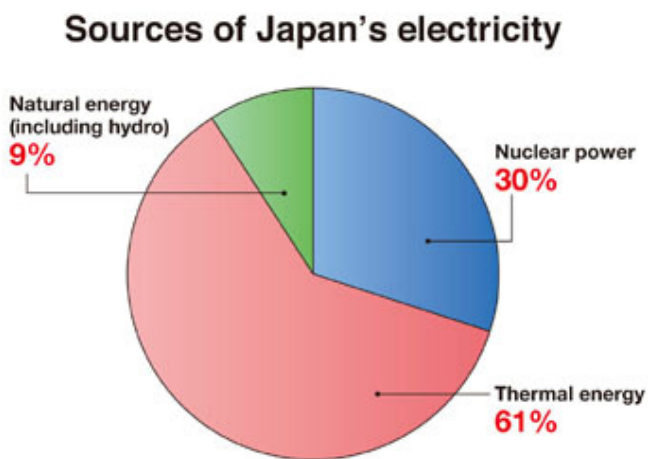
<sup>28</sup> "Nuclear power must be part of Japan's energy future," *The Yomiuri Shimbun*, March 14, 2012.



The debate in the Japanese press has certainly played a role in keeping the memory and fall out of the Fukushima nuclear crisis alive and this could also be one factor that has contributed to the Japanese people’s revulsion towards nuclear power.

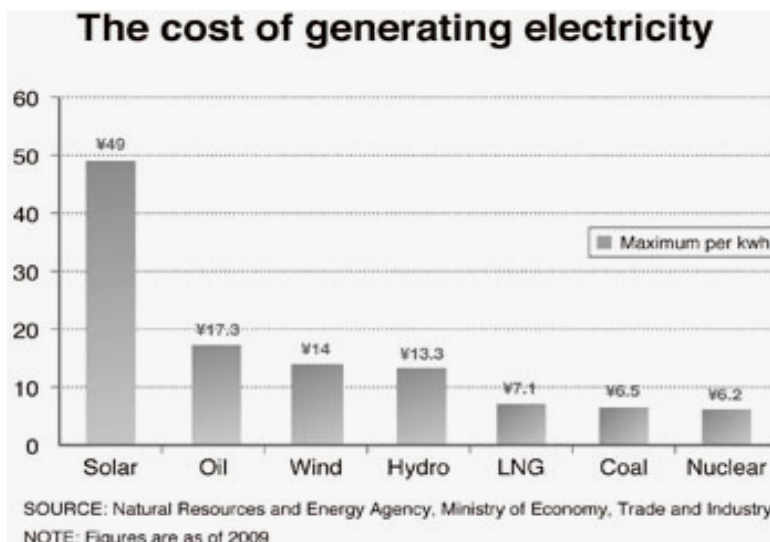
### Japan’s Energy scenario

Amidst public concern about nuclear power plants, the Japanese government has taken some measures to lower the country’s dependence on nuclear power. However, Japan would find it difficult to replace nuclear energy in the short term. Statistics shows that before the Fukushima crisis, nuclear energy constituted 30 per cent of Japan’s total energy, thermal had a 61 per cent share and the remaining nine per cent rest came from renewable sources. (See figure below).



SOURCES: Natural Resources and Energy Agency, Federation of Electric Power Companies  
NOTE: Figures are as of 2009

The reason behind Japan’s aggressive push for nuclear power generation was its cost effectiveness. As per Japanese government statistics, nuclear power costs only Yen 6.2 per kilowatt-hour, compared with Yen 49/kwh for solar, Yen 14/kwh for large wind farms, and yen 13.3 for hydro plants.



SOURCE: Natural Resources and Energy Agency, Ministry of Economy, Trade and Industry  
NOTE: Figures are as of 2009

Despite the fact that generating energy from sources other than nuclear is costlier, former Prime Minister Naoto Kan announced last year that he will lower “the nation’s dependence on nuclear power in stages and try to achieve a society that can function without nuclear power in the future.”<sup>29</sup> Before stepping down from the prime ministership, Kan successfully promulgated a law under which it would be mandatory for utility companies to purchase power generated by renewable sources. He also introduced a stringent “stress test” – a safety assessment for nuclear reactors under suspension.<sup>30</sup> Kan’s 2011 policy pronouncement was a complete turn around from the policy that he had adopted only a year earlier. In 2010, his cabinet had adopted a Basic Energy Plan which talked about establishing 14 additional nuclear plants in the country and increasing the percentage of nuclear energy in the overall energy matrix up to 53 per cent.<sup>31</sup> But in the wake of the Fukushima crisis the government appointed a committee to review Japan’s Basic Energy Plan. After detailed deliberations, the advisory committee on energy and resources made the following observations in December 2011:

“The Basic Energy Plan that was formulated in June of 2010 establishes that Japan will depend on nuclear power for more than half of its power generation in 2030. However, this supply structure must be fundamentally revised in the aftermath of the recent disaster and nuclear accident.”<sup>32</sup>

The Committee then gave the following basic directions to the government:

- 1) Fundamental reinforcement of energy and **electricity conservation** measures by considering reform of user behavior and social infrastructure;
- 2) Accelerated **development and use of renewable energies** to the maximum degree possible;
- 3) **Effective utilisation of fossil fuels** (i.e., environmentally friendly use of fossil fuels), beginning with a shift to natural gas, while giving maximum consideration to environmental burden; and
- 4) **Reduce dependency on nuclear power** wherever possible.<sup>33</sup> (emphasis added)

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<sup>29</sup> “Kan wants to phase out N-power,” *The Yomiuri Shimbun*, July 14, 2011.

<sup>30</sup> Hiroshi Ohashi, “Think hard about renewable energy,” *The Association of Japanese Institutes of Strategic Studies*, Tokyo, available online at [http://www.jiia.or.jp/en\\_commentary/201110/07-1.html](http://www.jiia.or.jp/en_commentary/201110/07-1.html), accessed on March 2, 2012.

<sup>31</sup> “Kan wants to phase out N-power,” n. 29.

<sup>32</sup> Ministry of Trade Economy and Industry, Government of Japan, “Major discussion points toward the establishment of a new Basic Energy Plan for Japan,” *Advisory Committee on Energy and Natural Resources*, December 20, 2011, available online at [http://www.enecho.meti.go.jp/info/committee/kihonmondai/ikenbosyu/ronten\\_eng.pdf](http://www.enecho.meti.go.jp/info/committee/kihonmondai/ikenbosyu/ronten_eng.pdf), accessed on March 8, 2012.

<sup>33</sup> Ibid.

Based on these recommendations, the Japanese government is expected to announce a new energy policy in June 2012. Given the fact that the Japanese government had put emphasis on increasing the share of nuclear energy in the 2010 energy plan, the new policy is likely to constitute a major departure from previous policy.

Even as Japan's central government is mulling over a new energy plan, regional governments have already taken initiatives to promote renewables in place of nuclear energy. In Wakayama prefecture, the mayor of Hidaka municipal town who had been advocating that "the age of nuclear power is over" has abandoned the plan of hosting a nuclear power plant. Instead, the local government has signed a project with Eurus Energy Holdings Corp, the largest wind farm company in Japan, to build a wind power station in Hidaka. The project is likely to take off in 2014 and would generate 2,000 to 2,300 kilowatts electricity to supply enough power to 10,000 houses.<sup>34</sup>

On the occasion of the first anniversary of the Fukushima crisis, Fukushima governor Yuhei Sato issued a declaration calling for the abandonment of nuclear power plants and replacing them with renewable energy sources. "Fukushima aims to create a society that enjoys sustainable development by promoting renewable energy and not depending on nuclear power," read the "Fukushima Declaration" signed by the governor. Further, the declaration added that "We will call for all nuclear power stations in the prefecture to be shut down so that an accident like this never happens again."<sup>35</sup>

Private players have also shown an interest in Japan's renewable energy sector following the Fukushima nuclear crisis. Softbank has signed a Memorandum of understanding with 35 prefectures to generate energy from solar panels. The new enterprise claims that it can generate 20 per cent of Japan's overall electricity from solar energy by 2020. The critics of solar energy, however, say that solar would not be a viable option for Japan, since enormous space is required for installing solar panels. In response, Softbank's President Masayoshi Son has stated that Softbank will use 400,000 hectares of land that remain uncultivated in Japan.<sup>36</sup>

Geo-thermal is another resource which could fill the vacuum if nuclear reactors are phased out. Experts believe that Japan can tap 23.5 gigawatts of geothermal energy, equivalent to energy generated by 20 nuclear power plants. As per the Japanese government estimates,

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<sup>34</sup> "Wind power station planned in place of nuclear plant in Wakayama town," *Mainichi Shimbun*, January 31, 2012.

<sup>35</sup> "The Fukushima Declaration," available online at [http://www.pref.fukushima.jp/311ffc/the\\_fukushima\\_declaration2012.pdf](http://www.pref.fukushima.jp/311ffc/the_fukushima_declaration2012.pdf), accessed on March 16, 2012.

<sup>36</sup> "Interview: Masayoshi Son off on new quest to raise green profile," *The Asahi Shimbun*, September 1, 2011, available online at <http://ajw.asahi.com/article/0311disaster/opinion/AJ201109017388>, accessed on September 3, 2011.

geo-thermal power costs between yen 12 to 20 per kilowatt hour. Japan at present has 18 geo-thermal power plants.<sup>37</sup>

Certainly, the energy generated from non-nuclear means will cost the Japanese more. But the majority of Japanese will not mind an increase in electricity costs if the country increases the percentage of renewable energy. An *Asahi Shimbun* survey found that 65 per cent want renewable energy generation to be increased "even though electricity fees are raised"<sup>38</sup>

### The Pro-Nuclear Power Lobby

However, public support in Japan to wean the country away from nuclear power generation is not uniform. Municipalities hosting nuclear power plants receive huge amounts of money in subsidies, which entice them not to scrap nuclear power plants. Recently, the Genkai town of Saga prefecture agreed to restart two suspended nuclear reactors because of the town's heavy dependence on money associated with nuclear power plants. The *Mainichi Shimbun* has reported that the town received a total of 26.5 billion yen in subsidies between 1975 and 2010. It will be short of budget if it were to decide to downsize the number of nuclear power plants.<sup>39</sup>

Two local elections held in Hokkaido and Yamaguchi prefectures after the March 11 nuclear crisis have in fact gone in favour of pro-nuclear mayors. In both these elections the hosting of nuclear reactors was one of the issues during the campaign.<sup>40</sup> This suggests that there are some constituencies in Japan which still wish to continue hosting nuclear reactors. Japanese business lobbies including the Nippon Keidanren have also been calling upon the government to re-start nuclear reactors which have passed the "stress test".

Among the politicians, former Minister of Economy Trade and Industry, Banri Kaieda, has pledged support for nuclear energy.<sup>41</sup> Another heavy-weight from the DPJ, Yoshito Sengoku, has also said on various occasions that "Japan will stick to nuclear power as a national energy policy."<sup>42</sup> Japanese Prime Minister Yoshihiko Noda has also changed his stance in favour of nuclear power generation. While he was in the race for the Prime

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<sup>37</sup> "Geo-thermal trove lies mostly untapped despite energy crisis," *The Japan Times*, September 27, 2011.

<sup>38</sup> "74% of voters back dumping nuclear power," n. 13.

<sup>39</sup> "Town agrees to restart of Genkai nuclear reactors due to dependence on Subsidies," *Mainichi Shimbun*, July 5, 2011.

<sup>40</sup> "Pronuke Kaminoseki mayor returned," *The Japan Times*, September 16, 2011; also see "Pronuclear Iwanai mayor re-elected," *The Japan Times*, October 4, 2011.

<sup>41</sup> "Despite crisis, nuclear to remain core energy source: Kaieda," *The Japan Times*, June 15 2011.

<sup>42</sup> "Nukes only way to go: Sengoku," *The Japan Times*, May 9, 2011.

Minister's post, Noda had sided with those who sought to lessen Japan's dependence on nuclear energy. This stance enabled him to defeat the pro-nuclear Banri Kieda during the presidential election of the DPJ. However, Noda has changed his stance after becoming prime minister and has stated that "the idea of 'no nuclear reactors' may exist as a dream of an individual person. But it is not so easy for the government to make a society based on that idea."<sup>43</sup> Nevertheless, he is treading cautiously given popular opposition to restarting nuclear reactors.

## Conclusion

Even though many of its nuclear reactors had been shut down, Japan faced a power shortage of only one per cent during the winter of 2011.<sup>44</sup> This is mainly because the Japanese people adhered to energy consumption guidelines issued by the government. However, with all nuclear reactors slated to be shut down by April 2012, Japan is likely to face a power shortage of around nine to 10 per cent.<sup>45</sup> Keeping that in mind, Prime Minister Noda has expedited efforts to convince local governments to restart some of the nuclear reactors which have passed the "stress test". However, the local governments have not given their consent yet. If this deadlock between the central and regional governments over the restarting of nuclear reactors persists, Japan may have to cope with power shortages until its other energy generation sources come online. Further, Japan's nuclear power programme itself is under a cloud, given that the basic direction given by government's Advisory Committee on Energy suggests that Japan will downsize its nuclear programme and will invest more in renewables. The direction that Japan takes will become clear only when the new Basic Energy Plan is announced in mid-2012.

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<sup>43</sup> "Noda's flip-flop on nuclear power points to naked ambition," *The Asahi Simbun*, September 27, 2011, available at <http://www.asahi.com/english/TKY201109260246.html>, accessed on September 28, 2011.

<sup>44</sup> Cabinet Office Statistics on estimated Supply-Demand Gap, quoted in "Keidanren Growth Strategy 2011: Accelerating Growth Strategy through Private-Sector Dynamism," *Keidanren*, September 16, 2011, p. 3, available online at <http://www.keidanren.or.jp/english/policy/2011/089.pdf> accessed on March 21, 2012.

<sup>45</sup> *Ibid.*