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FALLING FROM GRACE: NUCLEAR ENERGY IN JAPAN POST-FUKUSHIMA

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Prior to the triple disaster of March 2011, Japan was perceived as one of the more well-prepared nations in the world in the area of disaster response. However, the earthquake, tsunami and most particularly the nuclear crisis in Fukushima demonstrated the limits of any disaster preparedness programme if not complemented by sufficient safety measures and foresight in governance. This NTS Alert examines the importance of effective nuclear energy governance systems by highlighting the implications for Japan's future and that of the East Asian region.



Members of the International Atomic Energy Agency (IAEA) fact-finding team visit the Fukushima Daiichi nuclear power plant on 27 May 2011 to examine the devastation wrought by the 11 March earthquake and tsunami.

Credit: Greg Webb / IAEA.

Threats to human security posed by the mismanagement of energy sources are also addressed in the October 2010 issues of the NTS Alert: **Issue 1** focuses on the coal mining industry, while **Issue 2** looks at offshore oil rigs.

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Introduction

Nuclear energy has played a significant role in Japan's economic development and energy policies: the country depends on nuclear energy for at least a third of its electricity. It has also been a significant factor in Japan's measures to mitigate climate change, insofar as it has served as an alternative to fossil fuels (which are associated with higher levels of carbon emissions). According to Japan's current Strategic Energy Plan (formerly termed the Basic Energy Plan) launched in March 2010, Japan aims to increase its dependence on alternative energy sources to 70 per cent, out of which 50 per cent would be from nuclear energy (Duffield and Woodall, 2011).

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- Consortium of NTS Studies in Asia Website
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All this changed, however, when the Great East Japan Earthquake struck on 11 March 2011. The earthquake triggered a tsunami, which in turn caused a nuclear crisis in Fukushima. Not only did the disasters cause an unprecedented level of damage and losses to an already ailing economy, it also affected the level of confidence felt towards the nuclear industry. It would seem that decades' worth of efforts to improve economic development and energy security had failed to take into account broader, non-traditional aspects of security for Japanese society. While Japan continues to work towards addressing these complex challenges, it is clear that governance issues related to the economy, energy resources and the environment cannot be addressed in silos. This NTS Alert therefore seeks to highlight Japan's evolving nuclear energy governance structure, particularly after the Fukushima nuclear crisis, and the challenges Japan may face in the future.

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Energy from a Non-Traditional Security (NTS) Perspective

Before delving into the weaknesses of Japan's nuclear energy governance structure pre-Fukushima, it is important to revisit the non-traditional security (NTS) perspective on energy security. Since the 1973 oil crisis, many countries and stakeholders have defined energy security as the means of handling disruption of oil supplies from producing countries (Yergin, 2006). This traditional understanding of energy security was dominant until emergent energy-related environmental and socioeconomic issues rose in prominence. To understand these latter issues, the concept of human security would be a useful starting point.

Unlike traditional definitions of security, which centre on the stability and the security of the state in terms of territory and military capabilities, human security highlights the perspectives of individuals and communities within the states. Human security plays an important part in human development, as highlighted by the late Dr Mahbub Ul Haq in the UN Development Programme's 1994 *Human Development Report*.

In the report, he defined human security as a broadening of the scope of global security to include seven threats: economic security, food security, health security, environmental security, personal security, community security and political security. While energy security does not feature explicitly in these categories, elements related to a non-traditional understanding of energy security can be found in categories such as economic, environmental and food security.

Moreover, in 2003, the UN Commission on Human Security further enhanced the concept of human security by highlighting two pillars – (1) the freedom from want; and (2) the freedom from fear. It is evident that energy security comes under the first pillar, given the constant need for energy despite its increasingly limited availability and the challenges related to ensuring the safety and sustainability of the various energy sources.

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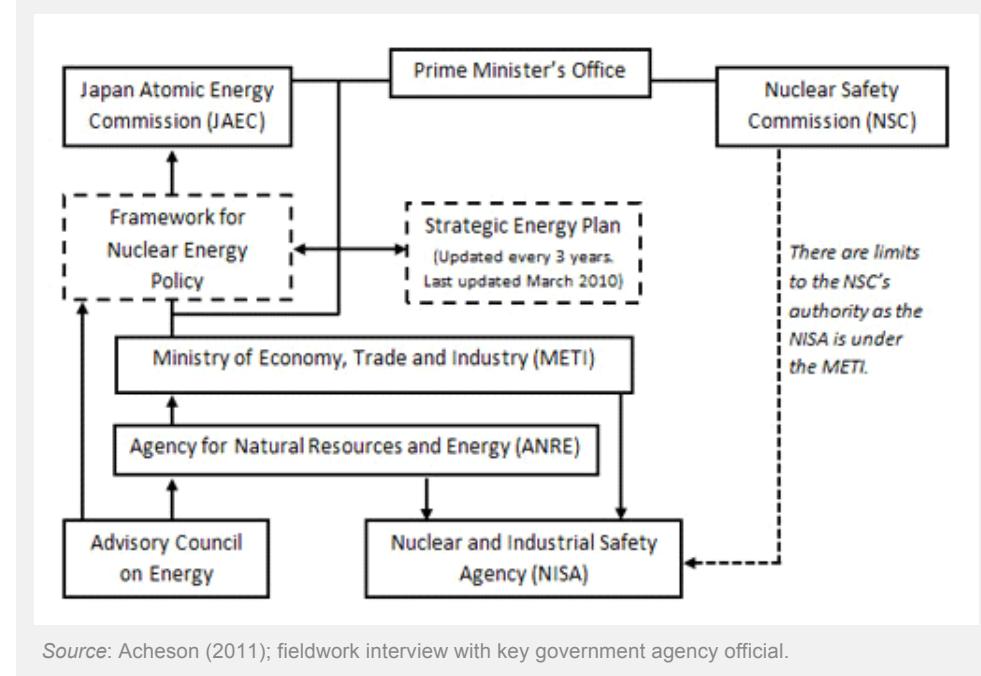
Weaknesses in Japan's Nuclear Energy Governance

Japan's energy policies have given little credence to the non-traditional energy security paradigm. This is somewhat ironic as Japan has been a strong advocate of human security. A dominant reason is the way its governance structures and policies developed. Nuclear energy in Japan had its beginnings in 1954, as an offshoot of US President Dwight D. Eisenhower's 'Atoms for Peace' campaign. Nuclear energy was thus a means of rebuilding Japan after World War II. Japan's nuclear energy industry progressively expanded over the decades as a way of reducing Japan's dependency on fossil-fuel imports – particularly for its domestic consumption. However, its use of nuclear energy in the pre-Fukushima period was still considered minimal as Japan's overall energy dependency on fossil-fuel imports was as high as 90 per cent (RSIS Centre for NTS Studies, 2010:8), a state of affairs which gave Japanese policymakers the impetus to further grow Japan's nuclear energy capacity. With such emphasis on nuclear energy's role in the economic growth and development of Japan, it is no wonder that nuclear energy was (and still is) administered under the Ministry of Economy, Trade and Industry (METI) (as seen in Figure 1).

By governing nuclear energy under the

Figure 1: Japan's nuclear energy governance structure (pre-Fukushima).

auspices of the METI and primarily in relation to Japan's economic development, it would have been in the government's interest to reduce anti-nuclear assertions as such sentiments would have prevented Japan's ability to rebuild its economy. The muting of anti-nuclear voices is compounded by a culture of secrecy (Japanese Fears, 2007). In particular, the strong alliances between government and business interests in the nuclear energy sector had reduced the level of transparency in the management of the industry, allowing nuclear power plant operators to occasionally circumvent safety procedures, and government officials to find loopholes within the processes of the Nuclear and Industrial Safety



Source: Acheson (2011); fieldwork interview with key government agency official.

Agency (NISA), the regulatory body for nuclear energy. These arrangements made it easier for government officials to marginalise anti-nuclear groups such as the Citizen's Nuclear Information Centre, which has been lobbying against the use of nuclear energy since its inception in 1975.

These government-business alliances, however, outlasted their usefulness in the wake of the Fukushima incident. The lags in the government's response to the disaster were scrutinised and its relations with the Tokyo Electric Power Company (TEPCO) severely criticised. To give the government the benefit of the doubt, the extent of the triple disasters – earthquake, tsunami and then nuclear crisis – was a great challenge to the resources available and the degree of communications needed from various agencies. However, while Japanese officials struggled to come to a clear understanding of the situation, the delays in providing the public with information led to greater unease and an increasing lack of trust in the government's ability to handle the situation. The lags in disseminating public information coupled with the lack of a balanced playing field for the anti-nuclear bloc in Japan in the past also exacerbated the tendency for public debates to be led by emotional or irrational expressions, particularly in the immediate aftermath of the nuclear crisis. The Fukushima incident provided the ideal ammunition for the anti-nuclear lobby in Japan to take issue with the nuclear industry. However, while such heated debates may have highlighted the diversity of perspectives on nuclear energy in Japan, coming to an agreement on the best concrete ways forward has been less easily achieved.

Another weakness in Japan's nuclear governance pre-Fukushima was that long-term risks were not adequately reflected in its nuclear energy safety plans, due to cost factors. Specifically, tsunamis were not fully factored into the planning of the Fukushima nuclear power plant because the data available to planners at the time indicated that the probability of a tsunami was very low. Hence, energy planners thought it more practical to divert funds to other more probable risks.

It is also likely that there was little motivation to consider further improvements given Japan's ability to withstand the numerous earthquakes that had struck over the years. The fact that an incident such as a nuclear leak at the Kashiwazaki-Kariwa nuclear power plant following an earthquake in 2007 was efficiently dealt with would have reassured nuclear planners of the ability of Japan's nuclear systems to handle any problems that might arise. Moreover, critics have noted that subsuming a regulatory body such as the NISA under the METI could have compromised the transparency of the checks on Japan's nuclear power plants.

However, as seen from the Fukushima incident, it was not the earthquake but rather the ensuing tsunami that caused the disruption of the operations of the backup safety systems (Sample, 2011). Various Japanese technical experts have noted that had safety standards incorporated the possibility of tsunamis, such as simply positioning the generator higher and away from the shore, the nuclear crisis could have been averted (Sinha, 2011; Squassoni, 2011).

The inability to ensure a set of nuclear safety standards that incorporates comprehensive long-term planning can result in costs beyond the energy sector. In addition to socioeconomic and environmental damage, poor nuclear safety standards have resulted in issues of food security arising from the exposure of agricultural produce to radiation (JAIF, 2011c). Not only does this affect domestic consumption, it has also reduced international exports, thereby further hurting Japan's ailing economy.

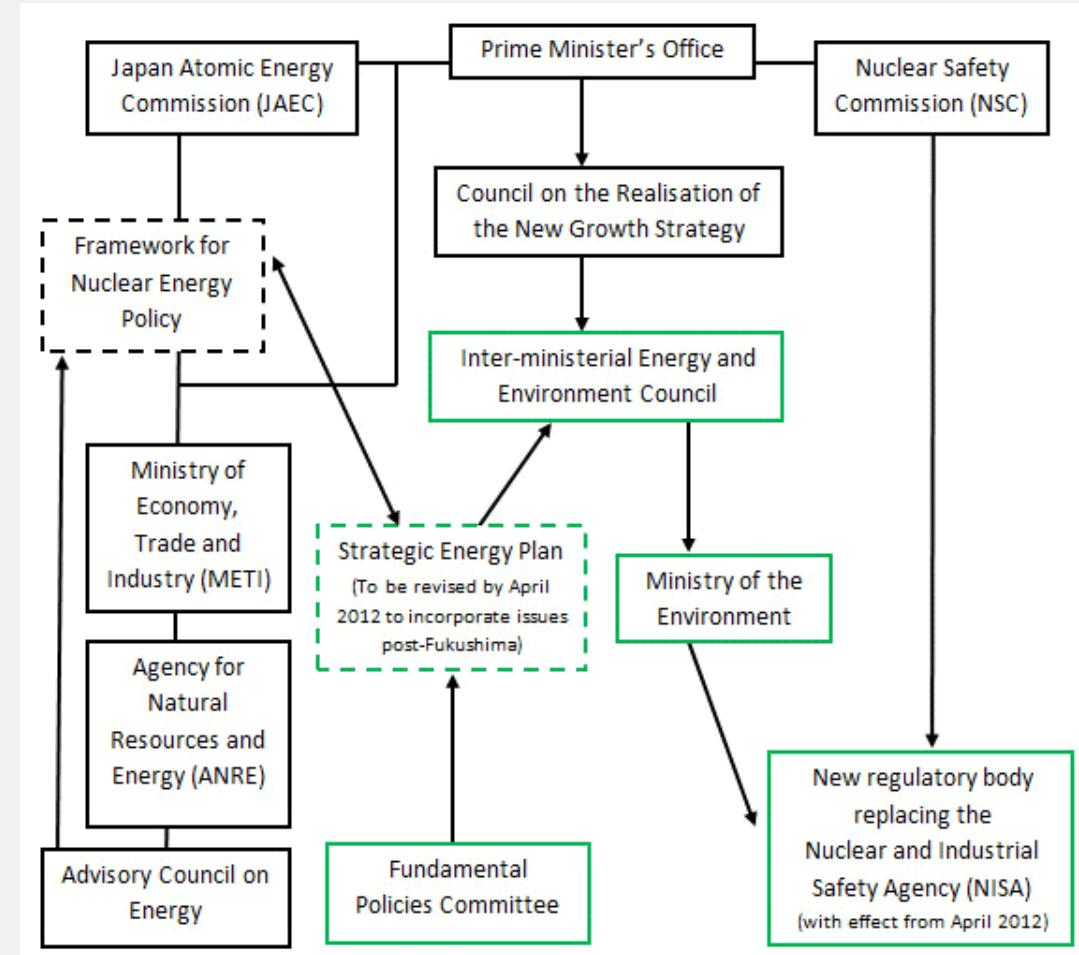
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Post-Fukushima Changes in Japan's Nuclear Energy Governance

One of Japan's greatest disasters in recent history, the Fukushima nuclear crisis precipitated the political will to address the abovementioned weaknesses in Japan's nuclear energy governance system. The impetus for political action was further strengthened by the concerns of communities and local governments in close proximity to Fukushima; they denounced the operation of nuclear plants in their vicinity in view of the lack of transparent safety standards in Japan's nuclear industry. Transparency is also of significance because many of the nuclear reactors in Japan are at least 20 years old and are up for testing as to whether they can continue operating or should be decommissioned.

The Japanese government has initiated an overhaul of nuclear energy governance in the country which addresses some of the weaknesses identified in the previous section and the concerns raised by its citizens (see Figure 2). First, the restructuring seeks to reduce the METI's dominance over nuclear energy issues and increase the level of transparency and oversight. An inter-ministerial Energy and Environment Council has thus been established under the Prime Minister's office to coordinate energy- and environment-related activities and enhance consultation across ministries. Moreover, it is proposed that the Environment Ministry will oversee the implementation of Japan's nuclear energy policies with effect from April 2012. To add further salt to the wound for the METI, an independent body will replace the NISA which had been criticised for its entrenched ties to business interests. Such ties, it was suggested, had led to delays in its responses to the Fukushima nuclear crisis (Regulatory Shake-up, 2011).

Figure 2: Nuclear energy governance structure (post-Fukushima).



Source: Acheson (2011); fieldwork interview with key government agency official.

Second, the overhaul is intended to increase the level of consultation with the various stakeholders in Japan. For instance, a new Fundamental Policies Committee was created to revise the existing Strategic Energy Plan. The revisions would need to take into account the implications of the Fukushima nuclear crisis in order to formulate an optimum balance for Japan's energy mix, both for the medium and long term, in light of the diminishing supply of nuclear energy and the structural reforms in the power sector (JAIF, 2011b). The Fundamental Policies Committee – composed of technical experts, private sector executives and representatives of consumer and labour organisations who are largely cautious of the use of nuclear energy – is scheduled to meet about twice a month and to issue the revised plan the following summer in coordination with the ministerial-level Energy and Environment Council. Such developments build on the decisions made by the Council in late July 2011 on reducing dependence on nuclear energy while enhancing its safety (JAIF, 2011a).

Third, the changed governance structure will address other energy- and environment-related concerns, such as the shortfall in energy supply. The supply deficit over the summer had been addressed from two directions – supply and demand.

On the supply side, Japan sought to diversify its energy mix, replacing nuclear energy with liquefied natural gas (LNG). Similar to other countries, Japan's LNG supply comes mainly from Qatar, Australia and Indonesia. Some experts have commented that Russia may be an

option for LNG in the future (Russia to Increase, 2011). Shale gas from North America is another alternative (Koyama, 2011). In addition to this, Japan has announced that it would seek to conduct test drilling for deep-sea energy sources off the coast of Japan as well as Alaska (RPT-Japan, 2011). These new sources of energy will require an array of strong safety standards, technical expertise and transparency in processes to avoid accidents due to mismanagement, such as the 2010 oil spill off the Gulf of Mexico. As such, consultation with the Ministry of Environment would be crucial in evaluating the feasibility of such projects.

On the demand side, one measure implemented over the past summer was a government power-saving order to reduce consumption of electricity in buildings and households. The promotion of energy efficiency, particularly during the summer season, would also require coordinated action with the Ministry of Environment.

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The Future of Nuclear Energy in Japan and Beyond

While these developments are progressive steps towards reducing dependency on nuclear energy and enhancing safety measures, there are several challenges that lie ahead, as Japan's revisions to its energy policies are still a work in progress. Thus, first, there is still a need to manage economic activity amid reduced energy supply. While the power-saving order during the summer had resulted in savings for households and offices, experts recently noted that the industrial sector had experienced a fall in output (Okubo Says, 2011). In light of this, Japan is considering increasing peak-time rates next summer (No Summer, 2011).

Second, while there has been a political restructuring of nuclear energy governance, it is still not totally clear who truly wields authority in the structure. The proposed substantial transfer of power from the METI to the Environment Ministry for instance will no doubt experience several teething problems, given the interest of the nuclear industry in its own survival. As such there will be increased tension between those regulating the nuclear industry and those that are being regulated.

Third, while there is growing engagement with technical experts and non-governmental organisations, reconciling their views will likely be a long process. This is because there remain distinct gaps in the perspectives of the various stakeholders. It is likely that while technical experts such as geologists may have a greater say in issues, they may to some extent continue to be overridden by the constraints imposed by economic objectives and the short-term political interests of some government officials.

These constraints could also mean that Japan will find greater difficulty in contributing effectively at the international level. For instance, Japan has asserted that it does not wish to extend its commitments under the Kyoto Protocol beyond 2012 (Japan Turns, 2010). It is likely that that will remain unchanged as Japan is increasingly turning back to fossil fuels. Moreover, adopting renewable forms of energy would be increasingly tedious for Japan's ailing economy. Post-tsunami reconstruction costs estimated at USD250 billion are likely to increase Japan's public debt to an all-time high of USD13.5 trillion (Ishiguro, 2011; Japan's Public Debt, 2011).

Finally, while Japan has not been as vigorous as before in promoting nuclear energy abroad, it has however extended assistance when asked by several Southeast Asian neighbours. Japanese nuclear officials have been providing training for Vietnam's power operations for 15 years, and they have shared their technical expertise with Indonesia. Although its nuclear industry has been heavily criticised for its lack of transparency, Japan benefits from the awareness among Southeast Asian countries that it possesses high-quality nuclear technology. Southeast Asian countries are thus still considering the nuclear option even after the Fukushima nuclear crisis. Indonesia, for instance, has indicated that it will continue to develop nuclear energy on Bangka island near Sumatra, though on a delayed schedule; it will only commence construction in 2022 to allow for sufficient time to incorporate more effective nuclear technology and safety measures (Indonesia's Nuclear Plans, 2011). As such, while the use of nuclear energy has suffered a blow in Japan, the prospects for nuclear energy at the global level would likely remain positive.

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Conclusion

While Japan's energy policy will only be finalised after the revised Strategic Energy Plan is published in 2012, it is highly likely that Japan's energy mix will depend much less on nuclear energy. Southeast Asian countries that are still committed to pursuing nuclear energy should seriously reflect on Japan's responses to the Fukushima crisis. For instance, while Vietnam and Indonesia continue to engage Japan for training and technical assistance, it is vital that they are equally sensitised to the need for increased transparency in governance structures to avoid negative consequences.

The latter emphasis, however, may not necessarily need to come from Japanese officials themselves (as they are perhaps less willing to comment on their government's mistakes). Rather, members of the Track 2 and Track 3 community can fill this gap by constantly engaging actively with regional neighbours and providing sound and accurate information on the progress of Japan's energy policies, in order to improve national policies and regional energy frameworks. There has been increasing emphasis on the role of ASEAN Plus Three (APT) in enhancing regional cooperation and addressing energy security concerns. Responses to Fukushima must be discussed frankly among

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