

Is it in Japan's interest to abandon nuclear power?

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(Introduction)

Following the worldwide shock caused by the Fukushima accident, some Western countries have switched their energy policies away from nuclear power while Japan, the site of this accident, has seen a growing push for denuclearization. Under pressure from this movement, Japan's nuclear power and related industries face an immediate crisis. Japan sits at a major crossroads, to put it mildly.

Japan is coping for the time being through power conservation efforts, but a full-scale break with nuclear power generation would have an enormous impact on Japan's energy policy. It would also have a significant bearing on Japan's international commitments vis-à-vis global warming, and would inevitably deal a fatal blow to Japan's economy and its people's quality of life.

Consequently, any discussion of denuclearization must be accompanied by dispassionate consideration of the pertinent issues from the perspective of Japan's national interest, including the quantitative potential of alternative energies to replace nuclear power over the short, medium and long term. It is dangerous to simply be swept along by the public mood. The broad connectedness of nuclear power means that the impact of denuclearization would be extensive, and it would be extremely difficult to make a return to nuclear power once it has been abandoned. I earnestly hope that this paper will be of some small help in assessing the best course of action.

(The importance of nuclear power for Japan)

Energy and food are core elements in Japan's economic activities and the lives of its citizens, and Japan has an extremely low rate of self-sufficiency in both. In particular, its energy self-sufficiency ratio is a mere 4%, one of the lowest among developed countries. In addition, Japan as an island country cannot access electric power transmissions from neighboring countries. Given these circumstances, nuclear power contributes greatly to Japan's energy security. Nuclear power is domestically produced for the most part, and Japan's energy self-sufficiency ratio inclusive of nuclear power is nearly 20%. At the same time, the remarkable economic development of emerging countries in Asia and elsewhere will likely spur a rapid rise in demand for fossil fuels, making nuclear power all the more important.

Another factor is the urgency of worldwide efforts to prevent global warming and the prominence of nuclear power as an energy source that does not produce CO₂ emissions. At the September 2009 UN Summit on Climate Change, (then) Prime Minister Hatoyama announced a medium-term target for 2020 of cutting CO₂ emissions by 25% from 1990 levels (a 30% reduction from 2005 levels). Although this was a conditional declaration, the figure took on a life of its own as a de facto promise to the international community. It was expected that nine additional nuclear reactors would need to be built and operated at a rate of 80% or higher to achieve this decrease.

(Japan's nuclear power crisis)

However, the Fukushima accident had major repercussions worldwide (nuclear accidents know no borders). Countries around the globe are in accord on strengthening nuclear power plant safety regulations both domestically and internationally and on insisting the IAEA should play a central role in this, but opinions vary on what to do about nuclear power generation itself. Many countries have adopted a posture of greater safety-consciousness as they continue their development of nuclear power facilities, while Germany, Italy and a few other Western countries have been pressured by public sentiment into steering away from nuclear power altogether.

Public sentiment against nuclear power has also gained momentum in Japan and, with some members of the media as well as certain politicians jumping on the bandwagon, nuclear power stands at a crossroads. Only 14 of Japan's 54 nuclear reactors are currently (as of August 23) in operation, and restarting the offline reactors upon completion of periodic inspections will be politically difficult. The worst-case scenario would be a shutdown of all nuclear power generation throughout Japan next March.

The Basic Energy Plan just recently approved (June 2010) by the Cabinet as well as the associated guidelines for actively promoting nuclear power have been scrapped, and the fate of nuclear power plant exports as part of Japan's New Growth Strategy has become uncertain. Vietnam, Turkey, Jordan and other countries considered potential export customers by Japan have sent positive signals regarding cooperation with Japan, while Japan's response has been less than optimal. The future of the nuclear power agreements with Russia, Vietnam, Jordan and South Korea submitted to the current session of the Diet for approval remains up in the air, and negotiations on nuclear power agreements with Turkey, Brazil and other countries have essentially been suspended. In all these instances, Japan has adopted an extremely passive posture toward nuclear power both at home and abroad.

(Could Japan survive without nuclear power?)

Could Japan manage after abandoning nuclear power?

Should nuclear power, which accounts for about 30% of Japan's overall electric power production, disappear, what would serve as a substitute? It would likely be fossil fuels in the short term, but this would lead to mounting import costs, more funds diverted to purchase emissions credits to

cover greater CO₂ emissions, and higher power generation costs. Forecasted rises in fossil fuel prices would only exacerbate the problem. Natural energy (wind power, solar power, geothermal power, biomass, etc.) could become available over the medium and long term and would seem at first glance a popular choice with the public. However, Japan has been one of the slowest among developed countries to pursue natural energy, which currently represents only about 1% of its total power generation, and efforts to develop natural energy sources should be undertaken in future. Nevertheless, natural energy is not without its own problems relating to the reliability of supply (for example, the average usage rate of solar power in Japan is about 12% and the annual usage rate for wind power is 26%), the difficulty of quantitative expansion, energy economy, and the quality of the power generated (including problems of system stability).

Accordingly, natural energy might be useful as a dispersed and supplementary power source but it is unreasonable to expect it to serve as the primary base-load source of electricity for a large-scale economy. Simply demanding that nuclear power be replaced by natural energy is pointless; instead, we need quantitative analyses, progress schedules and system designs. Unwarranted changes in energy policy and calls for such changes can only bring about major disruptions in our country's economic activities and the lives of its people, with ultimately fatal consequences for the Japanese economy.

What do proponents of denuclearization intend to do about the export of nuclear power plants, a matter relevant to Japan's international ties? What about the de facto international restrictions on CO₂ emissions put in place to prevent global warming? Will Japan back out and claim "force majeure"? All of these issues will affect the international community's trust in Japan.

Abandoning nuclear power would entail withdrawing from the "nuclear fuel cycle," one of resource-poor Japan's most important energy policies, implemented consistently since the earliest days of nuclear power generation. With the nuclear fuel cycle dependent on accumulated experience and trained personnel, any withdrawal would make it extremely difficult to restart the cycle. Very careful deliberations are needed to assess the wisdom of withdrawal.

(Conclusion)

As a former member of the Japan Atomic Energy Commission, I might appear to be serving my own interests here, but I believe that an objective look at Japan's geopolitical situation and the scale of its economy as well as quantitative assessments of the issues concerned will show that abandoning nuclear power is an unreasonable choice for Japan. Instead, I contend that the most practical measures for Japan to protect its national interests are to continue its use of nuclear power (expanding nuclear power if possible) while conducting thorough safety reviews, actively develop natural energy sources in parallel, and determine the best mix of all forms of energy. Denuclearization is not a path down which Japan should go.