Regional Cooperation as a Potential Driver of Nuclear and Energy Security Improvements in Northeast Asia

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Energy security in general, nuclear energy in particular, and nuclear weapons proliferation are issues that are never far from the news in Northeast Asia (NEA), and recent months have been no exception. Negotiations continue on a new version of the existing US-ROK nuclear energy cooperation, which is set to expire in 2014. The ROK seeks an agreement that would allow it to expand its nuclear energy activities to include uranium enrichment and a form of spent fuel reprocessing, but recognize that the United States is unlikely to agree to those conditions. Revising the pact is crucial to the ROKs ambitions as a nuclear exporter. In Japan, policymakers and others have been grappling with the development of a new "energy basic plan" that may be a significant departure from the reliance on nuclear power and imports that characterized pre-Fukushima energy policy. Many details of the plan remain hazy and/or contradictory, however. In October, China released a "white paper" on its energy policy that emphasizes energy efficiency, clean energy, and pollution reduction, among other goals, along with continuing its massive program of nuclear power development, albeit with a stated emphasis on safety, incorporating the lessons of Fukushima. In November, Russian President Vladimir Putin announced a "rejuvenation" of government plans to develop the Russian Far East, plans in which new and expanded energy facilities and energy exports to other NEA nations feature prominently. Meanwhile, the nuclear weapons program of the Democratic People's Republic of Korea (DPRK) regularly surfaces as a news item, most recently and conspicuously in the form of the DPRK's December rocket launch, which was considered by many to be the functional equivalent of a long-range missile test. Concerns about the DPRK's nuclear weapons program affect the energy and nuclear policies of each of its neighbors, often in

complicated and interactive ways.

Reducing the threat of nuclear weapons in Northeast Asia will require not only securing nuclear weapons and related materials, but also addressing the security of the huge quantities of fissile materials contained in spent fuel from nuclear power reactors. The management of nuclear spent fuel is closely associated with energy security policy and issues in all NEA countries; the relationship between nuclear energy and energy security is particularly complex in the DPRK. Whether nuclear threat reduction occurs through formation, as has been suggested, of a Nuclear Weapons Free Zone (NWFZ) in NEA, or through other agreements, it will require attention and unprecedented regional coordination on both nuclear and conventional energy security issues.

Northeast Asia includes, in the Republic of Korea (ROK) and Japan, two of the world's nations most dependent on nuclear power. Most of the global growth of nuclear power use will occur in NEA, particularly in China. The ROK and Japan have accumulated thousands of tons of spent fuel containing plutonium (Pu) and other materials potentially usable in nuclear weapons; Japan's reprocessing program has accumulated more than 50 tons of separated Pu. The DPRK, Japan, and China are enriching uranium for use in nuclear reactors. Means to address co-mingled nuclear and energy security issues in NEA include cooperation on the "front-end" and "back-end" of the nuclear fuel cycle, on energy security issues in the DPRK, and on non-nuclear regional energy infrastructure. An overarching issue for each of the countries of the region, though to different degrees, is the still-emerging impact of the Fukushima accident on national nuclear energy policies.

Regional Cooperation on Nuclear Fuel Cycle Issues: "Front End", Technology, and Reprocessing

How fissile materials are managed and tracked—through storage, reprocessing, and/or final disposal—will have a significant impact on how NEA countries perceive the security of nuclear materials in the region. Nuclear energy fuel cycle issues related to potential nuclear weapons development and production in Japan and ROK must be addressed to the satisfaction of each, and ultimately, to the satisfaction of the DPRK. Arrangements could include collaborations on nuclear fuel enrichment, agreements on limitations on (or cessation of) Japanese reprocessing, with similar agreements on potential ROK "pyroprocessing" , both of which have traditional links to energy security policies in each nation. Both the ROK and Japanese reprocessing programs are likely seen by the DPRK as potential stepping stones to nuclear weapons development, so as long as those programs persist, at least without international monitoring, the DPRK may be reluctant to give up its weapons. Other nuclear fuel cycle cooperation options include shared "fuel banks", collaboration on nuclear equipment manufacturing/export, and agreements on a nuclear equipment vendor code of conduct.

Regional Cooperation on Nuclear Fuel Cycle Issues: "Back End", Spent Fuel Storage and Disposal

On the "back end" of the nuclear fuel cycle, the nations of Northeast Asia, whether limited to Japan and the Koreas or broadened to include China, the Russian Far East, Taiwan, and/or Mongolia, could collaborate on the siting and operation of centralized or dispersed intermediate spent fuel storage, and possibly spent fuel disposal, facilities. Regional facilities would be operated with international oversight to assure that no nuclear materials are being diverted. A cooperation possibility for the more distant future is to collaborate on the development/operation of permanent nuclear waste disposal facilities, including "deep borehole disposal" in which nuclear materials would be placed in holes drilled 3 to 5 km into stable rock strata.

DPRK Energy Insecurity and International Assistance Options

A key issue underlying the DPRK's nuclear weapons (and, at least nominally, its nuclear energy) programs has always been its own "energy insecurity"—its lack of key fuels and technologies with which to redevelop its economy in the post-Soviet era. Lack of fuels, particularly petroleum fuels, colors the DPRK's attitudes regarding nuclear weapons, which it sees as a deterrent to adversaries that have easy access to oil to fuel conventional weapons.

As such, the international community's offerings of energy assistance will continue to be essential to convincing the DPRK to make and implement concessions regarding its nuclear weapons program. Key assistance options include improving the DPRK's coal mining infrastructure, rehabilitation of coal-fired power plants and boilers, rebuilding its electricity grid, development of small-scale renewable energy systems, rehabilitation of rural infrastructure, and particularly implementation of energy-efficiency measures. Tightly-monitored cooperation on the DPRK's nuclear energy program is also possible, benefiting the entire region by assuring that any DPRK nuclear energy development occurs with international oversight to confirm the safe handling and use of nuclear materials. In virtually all of these cases, assistance must start at a small scale, include extensive capacity- and trust-building activities, and include clear plans for follow-up.

Regional Cooperation on Non-nuclear Energy Infrastructure Development and Operation

Advanced investigation of regional electricity grid and gas supply interconnections, plus DPRK demand infrastructure development, provide opportunities to directly engage the DPRK with China, Russia, the ROK, and possibly Japan in projects of mutual economic/energy security interest. These projects are complex to develop, but establishing links between the energy sectors of the NEA nations can build confidence in regional agreements, with likely synergistic effects on nuclear threat reduction.

Fukushima as a Driver of Change in Nuclear Policy

In the political and social climate following the March 2011 Fukushima reactor accident, Japan's enthusiasm for nuclear power in general appears to be waning , and the accident has caused additional reflection on/examination of nuclear plans, and on nuclear safety, in the ROK and China as well. The images and lessons of the Fukushima accident, and related public concern regarding the nuclear fuel cycle, could serve as a means of bringing together the NEA nations to discuss collaborations and transparency arrangements on not only spent fuel storage and disposal, but reprocessing, nuclear plant design/retrofitting, and nuclear safety in general. These discussions would serve as a means to engage the DPRK on nuclear issues of concern to all regional players, and as such serve as a strong and necessary complement to nuclear weapons agreements.

References and Further Reading for "Regional Cooperation as a Potential Driver of Nuclear and Energy Security Improvements in Northeast Asia"

Nuclear weapons agreements:

Morton H. Halperin (2012), *Promoting Security in Northeast Asia: A New Approach*. Presented for discussion at workshop: "A New Approach to Security in Northeast Asia: Breaking the Gridlock", October 9-10, 2012, Washington, DC.

Nuclear fuel cycle cooperation and agreements:

David von Hippel, Peter Hayes, Jungmin Kang, and Tadahiro Katsuta, “Future Regional Nuclear Fuel Cycle Cooperation in East Asia: Energy Security Costs and Benefits”, *Energy Policy*, Volume 39, Issue 11, November 2011, Pages 6867–6881, Asian Energy Security Special Section.

Miles A. Pomper (2012), “How to unsnag US-South Korea nuclear negotiations”, *Bulletin of the Atomic Scientists*, dated 25 September 2012.

DPRK energy sector assistance

Peter Hayes, David von Hippel, and Scott Bruce (2011), “The DPRK Energy Sector: Current Status and Future Engagement Options”. *The Korean Journal of Defense Analysis,* Vol. 23, No. 2, June 2011, 159–173.

von Hippel, D., and P. Hayes (2010), *Engaging the DPRK Enrichment and Small LWR Program: What Would it Take?*, Nautilus Institute Special Report, dated December 23, 2010.

Siegfried S. Hecker (2010), *A Return Trip to North Korea’s Yongbyon Nuclear Complex*. NAPSNet Special Report, dated November 22, 2010.

Regional energy infrastructure:

David von Hippel, Ruslan Gulidov, Victor Kalashnikov, and Peter Hayes (2011), “Northeast Asia regional energy infrastructure proposals”, *Energy Policy*, Volume 39, Issue 11, November 2011, Pages 6855–6866, Asian Energy Security Special Section.

Rianovosti (2013), “Putin Ready to Revive Russia’s Far East Mega Plan”, dated 29 November, 2012.

The Fukushima accident as a driver of energy policy:

David von Hippel and Kae Takase (2011), *The Path from Fukushima: Short and Medium-term Impacts of the Reactor Damage Caused by the Japan Earthquake and Tsunami on Japan’s Electricity Systems*, Nautilus Report, April, 2011.

James Goodby and Markku Heiskanen (2011), *The Fukushima Disaster Opens New Prospects for Cooperation in Northeast Asia*, Nautilus Institute Policy Forum, 2011-06-28.

Junko Edahiro (2012), “Japan's Strategic Energy Plan under Review after 2011 Nuclear Disaster”, *Japan for Sustainability Newsletter* No.114 (February 2012).

Peter Hayes (2011), “Fukushima’s Implications for Korea’s Nuclear Dilemmas”, *Hanbando Focus,* Institute of Far Eastern Studies, Kyungnam University, May 5, 2011, pp. 21-27.

Andrew DeWit, "Japan’s Energy Policy at a Crossroads: A Renewable Energy Future?" *The Asia-Pacific Journal*, Vol 10, Issue 38 No. 4, September 17, 2012.

Xinghua.com, “Full Text: China's Energy Policy 2012”, dated October 24, 2012.

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