

PARIS SCHOOL OF INTERNATIONAL AFFAIRS (PSIA)

Should South Korea let the United States dictate its civil nuclear energy policy?

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For the first time in four decades, South Korea and the United States are to renegotiate a deal that Seoul hopes will finally allow them to make their own fuel for the country's civil nuclear energy programme. The problem is that the technology South Korea needs would bring the country closer to developing nuclear weapons. And with heightened tension in the Korean peninsula, the timing couldn't be worse. The United States has signalled its reluctance to green-light the move, claiming that lifting a ban on nuclear fuel reprocessing would complicate its diplomatic efforts to persuade irascible states such as neighbouring North Korea and Iran to give up their nuclear programmes. But is that fair to South Korea?

Choices about national policy and governance are a sovereign right. But having once compromised this autonomy, South Korea is now entering a delicate struggle to regain control over its domestic energy policy. The East Asian tiger ceded control over its nuclear energy policy to the United States when it first signed a bilateral nuclear cooperation treaty in 1972, set to be renewed in 2014, that bans South Korea from enriching uranium and reprocessing spent nuclear fuel. That was the price the United States had asked in return for a transfer of material and technical expertise to help build the South's nuclear energy industry. Accepting the condition proposed by the United States was worth it at the time, but South Korea – by now the world's sixth-largest nuclear energy producer – is finding it painfully difficult to reverse the structure of authority in the relationship. Should the rising East Asian nation accommodate the United States' fears of international security or is it time for it to chart a new path of energy sovereignty?

Certain commentators have been quick to argue for maintaining the ban, claiming that rising tensions with North Korea are a factor in South Korea's increased interest in reprocessing nuclear fuel, since it provides the possibility of producing nuclear weapons. But this is hype. There is little evidence to suggest that South Korea's interest in advanced nuclear technology stems from anything else but growing energy security concerns and a certain appetite for doing business. South Korea currently imports 97 percent of its energy requirements¹ and steady economic growth has seen a corresponding increase in electricity consumption. Lacking fossil fuel reserves, South Korea needs its nuclear energy programme to expand if it realistically wants to achieve energy independence. Once a

¹ Seongho Sheen, "Nuclear Sovereignty versus Nuclear Security: Renewing the ROK-U.S. Atomic Energy Agreement," *The Korean Journal of Defense Analysis*, Vol. 23, No. 2, June 2011.

unilateral recipient of American help in civil nuclear engineering, South Korea now wants to minimise dependence on energy imports and to become 100 percent self-sufficient by 2012, with no residual intellectual property constraints.

To this end, President Lee Myung-bak has made nuclear power an important part of South Korea's National Strategy for Green Growth, arguing that nuclear energy would help the country achieve energy independence while mitigating carbon emissions.² South Korea harbours major nuclear power plans, such as building 27 more reactors to increase nuclear power's electricity generation from 31 percent³ to 60 percent by 2035.⁴ The country's ambitions are not limited to domestic energy concerns. In December 2009, South Korea won a \$20 billion deal to build four nuclear plants in the United Arab Emirates (UAE). Shortly thereafter, the Ministry of Knowledge Economy declared its aim to achieve exports of 80 nuclear power reactors worth \$400 billion by 2030. If successful, this would make South Korea the world's third largest supplier of such technology, behind the United States, France, and Russia.

These are big and somewhat daunting plans, but South Korea feels – fairly – that it has earned a legitimate right to use advanced nuclear technology. It has had a consistent track record of peaceful nuclear use, building international confidence over its intentions and capabilities. The United States' fears that reprocessing could lead to proliferation, yet it has allowed India to do so, although India has never signed the Non-Proliferation Treaty and has longstanding tensions with neighbouring Pakistan. South Korea is a signatory and has been a loyal ally to the United States who has never breached its side of the agreement, unlike unruly sister state North Korea. Also, South Korea has a demonstrated record of nuclear cooperation with the United States on pyro-processing technology. Indeed, there is enough evidence to back South Korea's commitment to reasserting itself as a reliable global actor in peaceful uses of nuclear power.

For the South Koreans, it is time to press for a renegotiation of the terms of the treaty for several reasons. Among the top six nuclear-power producing countries, South Korea is the only one without a closed fuel cycle thanks to its agreement with the United States. With no possibility of enriching uranium and reprocessing spent fuel either abroad or domestically, South Korea currently imports uranium, sends it abroad for enrichment, imports again to use it as fuel, then accumulates spent fuel in waste storage facilities. This is unsustainable for a multiplicity of reasons: the cost of uranium and subsequently its enrichment is increasing;⁵ current spent-fuel storage is approaching capacity by 2017;⁶

² According to *Korea's Future in Green Growth*, a 2009 report of the Presidential Committee on Green Growth, nuclear power expansion is one of ten major policy directions aimed at reducing the use of fossil fuels and improving energy independence.

³ See Annex: Figure 1.

⁴ The Ministry of Education, Science & Technology's third comprehensive nuclear energy development plan for 2007-11 projected that South Korea should develop its nuclear industry into one of the top five in the world, with 60% of electricity from nuclear by 2035.

⁵ See Annex: Figure 2.

⁶ Park, Pomper and Scheinman (2010): "Spent fuel from Korea's four CANDU (Canada deuterium uranium) reactors is now in interim dry cask storage at a reactor site in Wolsong, but this facility will be full by 2017."

and South Koreans have expressed strong opposition to permanent waste storage sites in such a densely populated country.⁷ Domestic reprocessing is a logical recourse to reduce waste and secure fuel for more energy while maintaining similar levels of carbon output at more competitive prices.

This is not merely a question of domestic interests. World primary energy demand for nuclear is projected to increase by 2035 given Current, New Policies and 450 Scenarios.⁸ Some experts argue that by 2050, a large increase of the world nuclear industry is needed not only for the production of electricity but also to complement the oil industry, by providing it with necessary CO₂-emissions-free heat and hydrogen.⁹ With South Korea's growing technological capabilities in nuclear power, it is well-positioned to become a global player in energy supply. On top of the UAE contract, South Korea has agreed to provide a small research reactor to Jordan and is planning to engage in other nuclear projects in Indonesia, Thailand, Vietnam, the Philippines, India, Poland, Kazakhstan, and Morocco. As such, South Korea's energy sovereignty is desirable not only for its domestic needs but also for rising global energy demand. Policy intervention by United States is not only collaring South Korean ambitions, it is subverting global supply and demand.

But the heart of this debate goes beyond energy policy. Reprocessing spent nuclear fuel would be greatly advantageous for South Korea, but it is not vital to achieve its goals. It is about South Korea reclaiming autonomy over its domestic energy policy and becoming an equal negotiating partner. It is about defending Westphalian sovereignty. Yet it does not have to be a zero-sum game – South Korea still has much to gain from maintaining positive relations with the United States. In the renegotiations, Seoul could offer self-imposed conditions, obviously the most important being a pledge to never develop nuclear weapons. Even if talks with the United States throw domestic reprocessing out of the question, South Korea could still negotiate for the right to construct a reprocessing plant in South Korea but have it placed under multinational control. An alternative is to negotiate for the right to engage in offshore reprocessing, such as in France, but this is notoriously expensive due to transport costs,¹⁰ and would only create more dependence.

The renegotiation is a test of the two countries' alliance, and a chance for South Korea to demonstrate that it is not merely an instrument of American foreign policy. There are those that argue South Korea freely entered this agreement and can choose to terminate it, but this "take it or leave it" attitude only demonstrates how little bargaining power the South Koreans have. Freedom to terminate a contract is neither true freedom, nor a true

⁷ Park, Pomper and Scheinman (2010): "Public opposition to nuclear waste disposal has meant that only one country (Finland) is on track to open a permanent repository for the most dangerous nuclear waste. However, public opposition to nuclear waste disposal sites in South Korea has been more vociferous and long-standing than in many other countries, leading on one occasion to rioting. This has led Seoul to regularly unveil and then scrap proposed new sites for disposing of this material and to reach a compromise earlier this decade on disposing of lower-level wastes that may have made even more intractable the problem of permanent disposal of high-level wastes."

⁸ See Annex: Figure 3.

⁹ A Reappraisal of Energy Supply and Demand in 2050. P.R. Bauquis. *La Revue de l'énergie*, No. 509. September 1999.

¹⁰ World Nuclear Association: "KHNP (Korea Hydro & Nuclear Power Co., Ltd.) has considered offshore reprocessing to be too expensive, and recent figures based on Japanese contracts with Areva in France support this view, largely due to transport costs."

expression of sovereign power. Bilateral arrangements have often contained invitations that violate the Westphalian model of state sovereignty by explicitly detailing instructions for domestic policy. To this end, the United States has long capitalised on its dominant position to secure contractual arrangements that allows it to engage in domestic policy intervention. In this case, it is not difficult to see how the United States' values and preferences are eroding the South Korea's sovereign right to dictate its own civil nuclear energy programme. Historically, the extent to which the principles of sovereignty are transgressed depend on the relative bargaining power of the states involved. With South Korea's rise alongside other emerging Asian economies, it is increasingly possible for the country to renegotiate the terms. And perhaps it is time to test those waters.

ANNEX

Figure 1:

Table 12.1 • Key nuclear power statistics by region, end-2010

	Operational reactors	Installed gross capacity (GW)	Average fleet age (years)	Share of total generation	Reactors under construction
OECD	343	326	27	21%	12
United States	104	106	31	19%	1
France	58	66	25	75%	1
Japan	54	49	25	27%	2
Germany	17	21	28	23%	0
Korea	21	19	17	31%	5
Canada	18	13	26	15%	0
United Kingdom	19	11	29	16%	0
Other	52	40	28	24%	3
Non-OECD	98	68	21	4%	55
Russia	32	24	28	15%	11
Ukraine	15	14	22	48%	2
China	13	11	8	2%	28
India	19	5	17	3%	6
Other	19	14	24	9%	8
World	441	393*	26	13%	67

*393 GW of gross capacity is equivalent to 374 GW of net capacity.

Sources: International Atomic Energy Agency Power Reactor Information System; IEA databases.

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Figure 2:

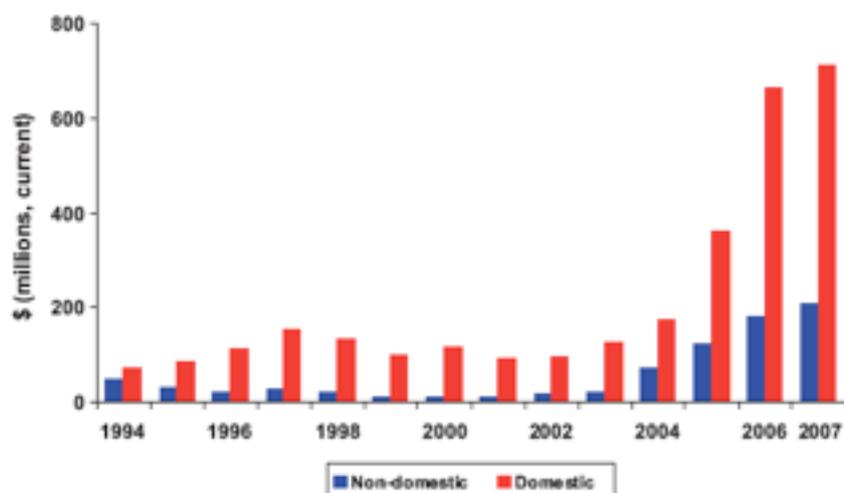
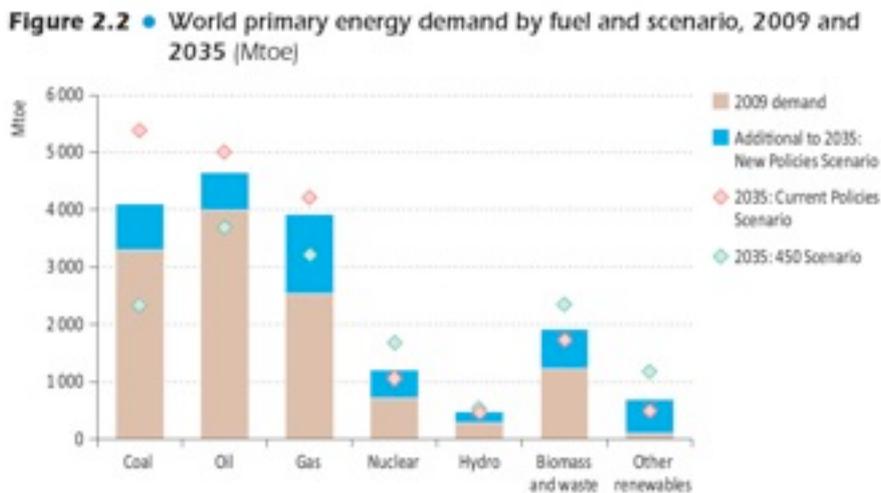


FIG. A-3. Trends in reported uranium exploration and development expenditures. Values for 2007 are estimates.

Driven by increases in the uranium spot price, uranium exploration and development increased significantly in 2005 and 2006 and are expected to increase further in 2007 (see Fig. A-3). This increase has occurred both in countries that have explored and developed uranium deposits in the past and in many countries new to uranium exploration.

Source: Giacomo Luciani, *Politics and Economics of International Energy*, Lecture 12, Slide 26. 2011.

Figure 3:



Source: Giacomo Luciani, *Politics and Economics of International Energy*, Lecture 12, Slide 13. 2011.