

Workshop on South Korea as a Responsible Nuclear Supplier

Participating Scholars

Dr. Emma Belcher

Dr. Jor-shan Choi

Dr. Ferenc Dalnoki-Veress

Dr. Robert Gallucci

Dr. Alan Hanson

Mr. Mark Hibbs

Ms. Gretchen Hund

Dr. Jun Bong-Geun

Dr. Lee Jong-Ho

Dr. Lee Kun Jai

Dr. Steven Miller

Ms. Jane Nakano

Amb. Park Robyug

Dr. Seo Jong Tae

Dr. Shin Chang-Hoon

Ms. Sharon Squassoni

Dr. Yim Man-Sung

Dr. Yoo Ho Sik

ABOUT THE WORKSHOP | *Seoul, South Korea, February 18, 2013*

The Center for Strategic and International Studies and the Asan Institute for Policy Studies cohosted a workshop on “Korea as a Responsible Nuclear Supplier” on February 18, 2013, at the Asan Institute in Seoul. Experts from government, academia, nongovernmental organizations (NGOs), and industry participated under Chatham House rules. Discussion focused on the opportunities and challenges the Republic of Korea (ROK) will face as a new nuclear exporter. For the past 30 years, South Korea has worked hard to acquire the capabilities to build its own nuclear power reactors, and in 2009, the United Arab Emirates (UAE) chose a South Korean consortium led by KEPCO to build four APR-1400 reactors at Baraka. In light of these developments, the workshop sought to define the responsibilities that accompany nuclear supply and to explore how to carry out such responsibilities in practice.



PNNL's Gretchen Hund speaking on corporate responsibilities.

The discussion paper (Appendix A) suggested definitions of responsible nuclear supply. The workshop agenda (Appendix B) divided discussion into four main areas: capacity issues that the South Korean nuclear industry will experience at home; trends in international nuclear supply; building export capacity in Korea; and elements of responsible nuclear supply. These are discussed in turn below.

This meeting was the second in a series of three workshops on new nuclear suppliers held as part of the Sustainable Nuclear Futures Project of the Proliferation Prevention Program at CSIS. The Proliferation Prevention Program aims to develop new tools for slowing proliferation, identify next steps in arms control, and help illuminate the path toward a sustainable and safe nuclear future. The Sustainable Nuclear Futures Project was made possible by the generous support of the John D. and Catherine T. MacArthur Foundation.

The Asan Institute is an independent, nonpartisan think tank with the mandate to undertake policy-relevant research to foster domestic, regional, and international environments that are conducive to peace and stability on the Korean peninsula and Korean reunification.

Key Conclusions

- South Korea, as a relatively new nuclear supplier, has both an opportunity and a responsibility to show that it can export nuclear power safely and securely. The ROK-UAE deal for four AP-1400 reactors at Barakah will be important for setting norms.
- With ambitious goals for exports and domestic construction, South Korea's human resources will be strained for the next several years. Aging and retirement of the first-generation workforce will lead to long-term human resource and knowledge transfer problems.
- Unilateral, bilateral, multilateral, and vendor-level approaches are necessary for “responsible” nuclear supply. Those on the front line—suppliers—should take initiative.

BACKGROUND OF THE SOUTH KOREAN NUCLEAR EXPORT REGIME

Nuclear energy and the nuclear industry are among the most heavily regulated enterprises in the world. Domestic material control and accounting and international safeguards are in place to deter the diversion of nuclear energy materials, equipment, and technology to military uses. In addition to domestic regulations, export controls are enforced by countries and policies are harmonized among countries to ensure standards of behavior. In the case of South Korea, agencies such as the Korea Strategic Trade Institute (KOSTI) and the Korea Institute of Nuclear Nonproliferation and Control (KINAC) are responsible for dual-use and trigger list export control items. Until now, the Nuclear Safety and Security Commission (NSSC) had the final authority to approve or reject export license applications. According to the Presidential Transition Committee's plan, the NSSC will be moved to the jurisdiction of the Ministry of Science, ICT and Future Planning, reportedly because the NSSC was so isolated that no officials wanted to work there and because it was ineffective in enforcing safety regulation. Nuclear promotion is expected to be moved elsewhere under the Park Geun-hye administration's reshuffling of agencies.

The reorganization under the new ROK administration raises questions about the consistency of ROK nuclear regulatory agencies and the predictability of the regulatory regime. Efforts apparently are underway to maintain the independence of the regulatory agency under the new administration. Even in a perfect regime, some gaps are likely to remain, whether in safety, security, safeguards, or even independence of domestic regulation. In addition, the drive to continually reduce the risks of nuclear energy requires continual readjustments to technical and political developments.

The 2011 Fukushima accident prompted thinking about the limits of sovereignty and "business as usual" approaches and raised questions generally about the governance of nuclear energy. Individual countries have examined their own implementation of safety and security standards, but industry groups and the International Atomic Energy Agency (IAEA) are also thinking about how to improve implementation and/or raise standards. This suggests that efforts to strengthen governance need to target all levels of the supply chain—industry/vendors, importing states, governments, intra-government relationships, and international organizations.

Where does South Korea fit in? From the time that utilities first switched on electricity from the Kori-1 nuclear power plant in 1978, South Korea has worked hard at developing its own nuclear technology and manufacturing capabilities to increase the domestic content of its nuclear power plants. It is an advanced nuclear technology state, but a relative newcomer to



Workshop on Korea as a Responsible Nuclear Supplier, Seoul, South Korea, February 18, 2013.

the nuclear export market. With plans to export more than 80 nuclear power plants through 2030, South Korea is positioning itself to be the world's third-largest nuclear supplier, aiming to capture some 20 percent of the market. With these plans, South Korea could set the stage for responsible nuclear supply. Particularly in a post-Fukushima environment, there is an incentive for South Korea to be seen by potential customers as a responsible supplier with the highest attention to standards of safety and security, with a focus on controlling goods throughout the supply chain.

CAPACITY ISSUES FOR DOMESTIC KOREAN NUCLEAR INDUSTRY

Participants in the workshop began by exploring the capacity issues for domestic new build in South Korea. The Long-Term National Energy Plan of the ROK establishes a goal of 59 percent of total electricity generation for nuclear energy (equal to 40 total reactors) by 2030. At the same time, the contract that the KEPCO consortium won in 2009 to build four APR-1400 nuclear power reactors in the UAE will place increasing demands on Korean nuclear vendors. Korean industry had been building two nuclear power plants per year; this has doubled to four per year with the UAE contract. By 2015, human resource demand for the UAE project will reach roughly 11,000 personnel. Current plans are to train personnel and then rotate them from domestic projects to foreign projects as needed. This is just the beginning of the human resource draw for UAE projects, however, since the first contract is only for four reactors, and the UAE anticipates building ten reactors in total.

Moreover, Korea's nuclear industry is currently at a turning point. The aging and retirement of the first-generation workforce will lead to long-term human resource and knowledge transfer problems, especially since the younger generation is, anecdotally, avoiding the nuclear industry. While the Fukushima accident lowered the demand for nuclear power, it also lowered the youth's interest in nuclear careers. To counteract these trends, several programs have been implemented to train nuclear workers, such as the KEPCO International Nuclear Graduate School (KINGS), and also to attract new talent to the nuclear field.

Human capacity issues loom large for the ROK. Even before the UAE deal, industrial companies were already having difficulty meeting capacity. Also, recent scandals involving spare parts have diminished public acceptance of nuclear energy, which could affect the current ROK five-year energy plan under revision and government support for addressing human resource issues.

Nuclear safety is a prerequisite for success both at home and abroad. As Korea's nuclear program has advanced, so has nuclear safety regulation. When the Atomic Energy Board was created in 1958 and the Korea Atomic Energy Research Institute (KAERI) was established in 1959, regulation initially targeted only industrial safety, aiming to protect workers from radiation. By the end of the late 1960s, the construction of the Kori-1 reactor increased demands for domestic nuclear safety regulation, which was still at a fledgling stage. South Korea's early nuclear power reactors were purchased from abroad (the United States, France, Canada) and therefore complied with foreign regulations. As South Korea began building its own nuclear power plants (e.g., Yonggwang 3 & 4), domestic regulations expanded to meet Korean needs. Safety regulations were further strengthened with the amendment of the Atomic Energy Act in 1982 and the establishment of the Nuclear Safety Center, which would later become the Korea Institute of Nuclear Safety (KINS) in 1989. Incidents steadily decreased over time. The Korea Electric Power Industry Codes (KEPIC), developed in 1975, were revised several times and eventually were broadly accepted, as demonstrated by the UAE deal.

The panelists at CSIS compared Korea's challenges with those facing the U.S. nuclear industry. While there have been many license renewals approved in the United States, those renewals do not guarantee that those power plants will continue operating, as demonstrated by the closure of the Kewaunee nuclear power plant. The case for new U.S. nuclear has been fairly difficult despite government involvement. Nothing short of a carbon emissions tax will make new nuclear power plants competitive with shale gas. Financing is a particularly significant hurdle in the United States. With regard to small modular reactor (SMR) development, capital costs estimates are extremely speculative, although SMRs could possibly be a boon to the industry. The long hiatus in domestic construction has also lowered the availability of skilled labor in construction.

During discussion, participants asked whether recent statements by ROK officials on exporting 80 reactors by 2030 were realistic. Given limited Korean resources, participants speculated about the ROK's unique supply advantages. Several experts noted the importance of "human power" through education and the fact that the ROK itself, as an "electricity island," has to rely on nuclear power for its survival. Another expert pointed out that while the ROK has the requisite infrastructure industries to be a successful exporter, exporting 80

nuclear power plants is "outrageous." One participant suggested that South Korea could use the steam generator replacement market in the United States to expand the versatility of ROK nuclear export capabilities.

The final part of the discussion drew comparisons between the ROK-UAE deal and the U.S.-ROK nuclear relationship in the 1970s. The UAE's safety framework is supported by exchanges with the ROK, a relationship that is somewhat similar to that of the ROK and the United States in the 1970s. However, the UAE is a wealthier country with a much smaller population, so the nature of work and safety culture may be vastly different than in the ROK. Also, the security clearance process in the UAE is tougher than in the ROK, so workers from adjacent countries may not easily be able to work in the UAE. Given these circumstances, KINS and Korea Hydro and Nuclear Power (KHNP) emphasize their responsibilities in ensuring a safe turnover as part of the "build-to-transfer" plan after five years of foreign operation.

TRENDS IN INTERNATIONAL NUCLEAR SUPPLY

Participants discussed the prospects for a "nuclear renaissance" and, in particular, emerging markets for nuclear energy. Natural gas for many countries will be the primary impediment to growth in nuclear power, particularly since many unconventional sources remain untapped globally. However, experts did not rule out that the pace and scope of unconventional natural gas production in the United States can be constrained by environmental or regulatory issues, for example, a delay in addressing surface water management challenges. Such an accident could create a backlash to the natural gas industry. In other regions, like Europe, moving away from nuclear power toward gas could have adverse consequences. For example, Europe could once again become dependent on Russia for gas, with all the potential for politically motivated supply disruptions. Both Finland and Saudi Arabia could become prominent emerging markets for nuclear power.

No discussion of nuclear energy is complete without considering the impact of the Fukushima accident. While it is still early to tease out all the implications, a few conclusions can be drawn. Although some countries have backed away from nuclear energy (e.g., Germany, Belgium, Taiwan, Switzerland), most are implementing their previous plans, albeit a little more slowly. Fukushima placed greater focus on beyond-design-basis threats, the connection between safety and security, the management of spent fuel pools, and international assistance during accidents. Growth in nuclear power is most likely to be seen in developing countries, rather than developed countries.

On the supplier side, competition has intensified and industry has become more consolidated. Although there are six major vendors, the two historically major suppliers—the United



CSIS's Jane Nakano speaking on international trends in nuclear energy.

States and France—have weakened significantly for different reasons. In the United States, the competitive disadvantage of nuclear energy against unconventional gas resources has created little enthusiasm and political support for nuclear energy. In France, continuing problems in new construction at home and abroad (Flamanville and Olkiluoto), as well as a few poor business choices, have diminished AREVA's competitiveness. In contrast, Russia has signed several contracts for multiple nuclear power plants, at times with creative structuring. Russia has signed one agreement with Turkey that uses a “build, own, and operate” model, and its agreements with Iran and Vietnam use a “cradle-to-grave” model. Nonetheless, it is too soon to tell whether these approaches will be profitable or sustainable.

Among other suppliers, Japan faces hurdles in declining public commitment after Fukushima and internal competition among suppliers. For the ROK, the grey area is primarily financing issues and industry capacity. China has limited technologies to offer and no experience with customer confidence in its products. India is experiencing lower public support for nuclear and could lack some legitimacy as a supplier since it is not in the Nuclear Suppliers Group. Also, India lacks nuclear liability provisions.

Lastly, experts debated the impact of small modular reactor commercialization on the international market. SMRs have been a high policy priority for the United States, which could continue under Dr. Ernest Moniz as a possible new secretary of energy, but many uncertainties remain regarding design and security. Competition in that field is broad, and the United States may not have the edge on innovation.

BUILDING EXPORT CAPACITY IN KOREA

In recent years, the ROK has concluded 26 nuclear cooperation agreements (27 if the agreement with Finland is included, although it has not yet entered into force). The ROK is also party to multiple nuclear export control regimes, and while it is not party to any international convention on nuclear damages, such

provisions are incorporated into domestic ROK laws. Potential technologies for export could include the OPR-1000, the APR-1400, the SMART reactor, and DUPIC technology. The panelists pointed out that, though the ROK is already a successful nuclear supplier, it is a relatively new nuclear exporter. The UAE deal has placed KEPCO in the spotlight, with observers questioning whether the project can be completed successfully.

Success was defined as the plant being built on schedule, on budget, with no litigation or safety violations, and with sufficient transparency. While KEPCO is a signatory to the Principles of Conduct for Nuclear Power Plant Exporters, one panelist noted that such principles can and should be strengthened to improve the integrity of procurement. In particular, principles should create more demanding obligations on suppliers, especially with regard to implementation of a system of accounting and control of nuclear materials and ethical commitments. One expert noted that in the drafting of the principles, some companies resisted wording that they perceived as too strong, but that it was considered better to have them “inside” the principles rather than alienating them.

One panelist suggested that achieving success as a nuclear exporter will require not cutting corners on safety or quality in order to achieve market advantage, not preempting competitive procurements, and not selling to countries that are clearly not ready to undertake the responsibility of operating a nuclear power plant.

Participants also discussed the importance of organizational culture. Regulatory bodies, such as the Nuclear Regulatory Commission (NRC), are limited in their ability to stop all fraud; the promotion of safety and security culture is crucial. Relevant documents such as the Principles of Conduct are also limited in their ability to prevent all violations. Participants discussed and dismissed the potential for an international treaty on these principles. However, they noted that industry could take the initiative to do what cannot be done politically.

ROLES AND RESPONSIBILITIES OF NEW NUCLEAR SUPPLIERS

One panelist sought to define “responsible” nuclear supply and its policy implications. “Responsible” nuclear supply was broadly defined as not increasing the risks of radiation, which could occur through a nuclear explosive, a radiological dispersal device, or an accident, particularly where developing countries aspire to nuclear energy. Approaches at the vendor, unilateral/bilateral, and multilateral/international levels are necessary for improved nuclear governance. Eventually, effective nuclear governance will require fuel cycle limitations on enrichment and reprocessing technologies.

The speaker highlighted voluntary actions for dual-use exporters, and Oerlikon's sharing of information with the German government. At the unilateral/bilateral level, ratification of the Additional Protocol for nuclear cooperation agreements and as a condition for supply in the Nuclear Suppliers Group were highlighted as potential strengthening measures. Governments also need to harmonize their nuclear cooperation agreements, especially regarding enrichment and reprocessing capabilities and services. Finally, on the multilateral level, multinational approaches, such as the ROK's investment in the Georges Besse II enrichment plant, should be encouraged.

Another panelist showed how corporate sustainability could be an important model for achieving nonproliferation objectives and for establishing trust with stakeholders. More and more companies and investors are aligning with responsible investment, as demonstrated by growth in the Principles for Responsible Investment. One case study in corporate sustainability was the Cement Sustainability Initiative, in which cement manufacturers reduced their CO2 emissions before regulations were imposed on them. For nuclear power, this model would apply not only to reactors, but also to dual-use items. The whole supply chain, including banking, needs to be taken into account. Seven steps were emphasized for success, including establishing a nonproliferation code of conduct, sharing suspicious trade requests, incorporating industry feedback in export-control rulemaking, and companies acknowledging noncompliance. KEPCO does have a corporate responsibility code, but it does not mention nonproliferation. Incentives for taking additional steps include lower insurance rates, time and money savings, a leveled playing field for illegitimate orders, and meeting ethical obligations.

One supplier responsibility is ensuring that the recipient country is capable of providing safety and security. A second responsibility centers on fuel cycle capabilities and the ability to restrict proliferation of sensitive nuclear technologies. Companies are on the front line and should take the initiative.

Participants debated the terms of the UAE-ROK cooperation agreement, which allows the UAE to enrich Korean-origin uranium up to 20 percent even though the UAE is legally bound not to enrich uranium domestically. One participant suggested that this provision was left in the agreement because the ROK needed reciprocal rights in the event that it moves forward with uranium enrichment. The ROK's 123 agreements with other countries reflect a diverse array of policies with regard to enrichment and reprocessing. According to one participant, this difference goes to the very heart of whether the ROK is defending its nonproliferation commitments.



Discussion of corporate sustainability as a model for achieving nonproliferation objectives.

Other participants disagreed, noting that enrichment and reprocessing are not restricted under the Nuclear Non-Proliferation Treaty (NPT). One of the panelists suggested that since the UAE and Jordan reactor contracts, KEPCO has taken a leadership role in mobilizing its subcontractors to participate in a strong export control regime. KOSTI, which supports the Ministry of Knowledge Economy (MKE), and KINAC, which supports the NSSC, all work closely in ensuring a safe export regime. One participant suggested the ROK designate an organization to act as a clearinghouse for information related to exports. Such an organization would share violations, rejections, and improve implementation practices. All vendors need to acknowledge the potential for countries without nuclear power programs to be used as routes for transit. Such countries need their own export control management programs. Global social corporate responsibility should be an objective, given that South Korea is now emerging as a global nuclear supplier. In addition, it would be useful to find consensus on a practical and procedural definition of "effective" export control. Finally, the question of nuclear trade between non-NPT members needs to be better addressed.

WRAP-UP OF THE WORKSHOP

Participants wrapped up discussions by comparing the workshops on new nuclear supply in New Delhi and in Seoul. Clearly, India is in the initial stages of considering nuclear exports, and its role in the nuclear nonproliferation regime is just beginning to be defined. While India has about the same number of nuclear power reactors as Korea, nuclear energy only provides about 3.7 percent of India's electricity requirements. Several other key differences are important: the relative lack of foreign technology in India, the lack of connections between India's nuclear industry and the U.S. nuclear industry, and the lack of a close alliance, such as in the case of the United States and South Korea. India is not yet poised to become a major vendor, whereas Korea is already pursuing this path.



CSIS's Sharon Squassoni speaking on defining a responsible nuclear supply.

The next workshop in China is likely to cover somewhat different ground, particularly because the U.S.-China relationship is significantly different from the close relationship between the United States and the ROK. It will provide a good opportunity to continue defining nuclear supplier responsibilities. ■

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CSIS PROLIFERATION PREVENTION PROGRAM

Sharon Squassoni | Director and Senior Fellow

Thomas C. Moore | Deputy Director and Senior Fellow

Cindy Vestergaard | Visiting Fellow

Robert Kim | Research Assistant

Jacob Greenberg | Intern

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ASAN NUCLEAR POLICY AND TECHNOLOGY CENTER

SHIN Chang-Hoon | Director

PARK Jiyoung | Deputy Director

CHOI Yunhwa | Program Officer

KIM Do Hyun | Program Officer

APPENDIX A

South Korea as a Responsible Nuclear Supplier Discussion Paper for February 18, 2013, Workshop Cohosted by Asan Institute and CSIS, Seoul, South Korea

This paper defines responsible nuclear supply, identifies the need for it, and describes approaches the Korean government and suppliers might take to support responsible nuclear supply. It is meant as a starting point for discussions during the February 18 workshop.

INTRODUCTION

Nuclear energy and the nuclear industry are among the most heavily regulated enterprises in the world. In addition to domestic regulations, export controls are enforced by countries and policies are harmonized among countries to ensure standards of behavior. Yet, some gaps are always likely to remain, whether in safety, security, safeguards, or even independence of regulation. In addition, the drive to continually reduce the risks of nuclear energy requires continual readjustments to technical and political developments.

The 2011 Fukushima accident prompted thinking about the limits of sovereignty and “business as usual” approaches. It also raised questions across the board about governance of nuclear energy. Individual countries have examined their own implementation of safety and security standards, but industry groups and the IAEA are also thinking about how to improve implementation and/or raise standards. This suggests that efforts to strengthen governance need to target all levels of the supply chain—industry/vendors, importing states, governments, intra-government relationships, and international organizations. Such efforts combined together will help shape nuclear energy to reduce risks.

RESPONSIBLE NUCLEAR SUPPLY AND NUCLEAR GOVERNANCE

There is no widely accepted definition of responsible nuclear supply. The term “nuclear governance” has been increasingly used in academic and NGO circles to describe behaviors in nuclear safety and security in the wake of Fukushima but generally has not been applied to nuclear supply. The Nuclear Suppliers Group (NSG), which coordinates nuclear supply policies among the currently 47 member states, has been the forum in which supplier states shape the contours of responsible nuclear supply, primarily with respect to nonproliferation. As a member of the Nuclear Suppliers Group since 1995, South Korea has been adhering to the voluntary guidelines for close to two decades.

Adherence to NSG policies is one element of responsible nuclear supply. To encompass a broader set of objectives than just nonproliferation (to the benefit of nuclear energy), one could define responsible nuclear supply as behavior that does not increase the risks of release of radiation to the environment, people, or society. A radiation release could come from a nuclear explosive, a radiological dispersal device, or an accident. The elements of responsible nuclear supply would encompass nuclear nonproliferation, security, and safety (or, the so-called three “S”s).

THE NEED FOR RESPONSIBLE NUCLEAR SUPPLY

Long-term sustainability of nuclear energy will require improved nuclear safety and security and approaches to the fuel cycle that limit growth in weapons-usable nuclear material. Reducing risks from the fuel cycle will need to focus not just on the front end as is fashionable, but use incentives from the back end (disposal of nuclear waste) to encourage states to avoid acquiring sensitive nuclear technologies like enrichment and reprocessing. This cannot be done by a single country or a single vendor, but will require a broad-based collaborative effort.

ELEMENTS OF AN APPROACH

In an era of greater corporate responsibility and greater attention globally to governance, it is worth considering whether governments and industry can do more both separately and together. Often, industry leaders are vigilant about complying with existing legal obligations but do not feel compelled to volunteer information or actions beyond that. Government officials may find themselves in a similar position, obligated to meet the requirements of the law but with few incentives

for doing more than that. States that are seeking to deploy nuclear energy for the first time may have fledgling systems of control that have gaps. As new suppliers and new recipients populate the nuclear energy landscape, the potential for widening gaps in governance could require more flexible, creative approaches.

On the vendor level, engagement in discussions about codes of conduct can be helpful (e.g., Nuclear Power Plant Exporters' Principles of Conduct). Sharing corporate risk assessments with a national government could also help inform government officials engaged in negotiating nuclear cooperation agreements as well as export licensing procedures. Efforts at self-regulation to improve compliance even beyond what is nationally required (e.g., Oerlikon Leybold Vacuum and others as documented in "Broadening Industry Governance to Include Nonproliferation")¹ may be another avenue to explore. After negative press about diverted exports, some companies may find incentives to go beyond what is minimally required in national regulations. At the top, encouraging suppliers down the vendor's supply chain to adopt similar policies can widen compliance.

At the government level, transparency about export licensing and terms of nuclear cooperation agreements, particularly between governments, could be another element in a framework of responsible nuclear supply. Some of this is done already in the Nuclear Suppliers Group, but some is not. And although the NSG has not been able to agree on making an Additional Protocol a condition of supply, some suppliers require it. In the absence of NSG agreement, suppliers could slowly build the norm of such a requirement. Another area for discussion would be consent rights for enrichment and reprocessing. Greater uniformity among supplier conditions could help support broader nonproliferation objectives.

WHAT CAN SOUTH KOREA DO?

South Korea is an advanced nuclear technology state, but a relative newcomer to the nuclear export market. With plans to export more than 80 nuclear power plants through 2030, South Korea is positioning itself to be the world's third-largest nuclear supplier, aiming to capture some 20 percent of the market. With these plans, South Korea could set the stage for responsible nuclear supply. Particularly in a post-Fukushima environment, there is an incentive for South Korea to be seen by potential customers as a responsible supplier with the highest attention to standards of safety and security and with a focus to control goods throughout the supply chain.

Korean vendors could consult with other major vendors on general approaches to risk assessment (being careful not to violate antitrust prohibitions) in supplying nuclear power plants to countries that do not currently have them. KEPCO, which is a participant in the Nuclear Power Plant Exporters' Principles of Conduct, could help promote the adoption of similar principles for its subcontractors. If it does not do so already, KEPCO could work closely with government officials in sharing its own risk assessments and/or information about rejected export requests or suspicious end-users. Korean vendors could analyze gaps they perceive in implementation of regulations (whether safety, security, or nonproliferation/export controls) and consider where self-regulation might provide a benefit for them.

At the government level, sharing information about export licensing and nuclear cooperation agreements with other governments could help promote a better understanding of gaps in policies between states. Approaches for integrating nuclear safety, security, and nonproliferation standards in nuclear supply could be shared with the IAEA or at the governmental level. Strengthening liability protections, training, and infrastructure development in new nuclear states could be one area for collaboration between government and industry as they look forward to exporting nuclear power plants to states that are acquiring nuclear power for the first time. Industry input on training done by Korea's Center of Excellence on nuclear security, for example, could be helpful.

QUESTIONS FOR DISCUSSION

How will the future organization of regulatory agencies affect Korean exporting, if at all?
Has there been a learning curve in export licensing for the UAE deal?

1. Gretchen Hund, A. Seward, "Broadening Industry Governance to Include Nonproliferation," Pacific Northwest National Laboratory Report, PNNL-17521, November 11, 2008, p. 2 and others, http://www.pnl.gov/main/publications/external/technical_reports/PNNL-17521.pdf.

APPENDIX B

Workshop on Korea as a Responsible Nuclear Supplier Agenda Monday, February 18, 2013 Asan Institute for Policy Studies

8:45 Check-in and Breakfast

9:00 Welcoming Remarks by the Asan Institute and CSIS Cohosts

Shin Chang-Hoon, Director and Research Fellow, Nuclear Policy and Technology Center, Asan Institute for Policy Studies

Sharon Squassoni, Director and Senior Fellow, Proliferation Prevention Program, CSIS

9:30 Panel One: Capacity Issues for Domestic Korean Nuclear Industry

This panel will address key opportunities and challenges for South Korean domestic nuclear industry, including government regulation, financing, supply chain issues, and development of human resources (training, education, safety, security cultures).

Moderator: **Mark Hibbs**, Senior Associate, Nuclear Policy Program, CEIP

Speakers: **Lee Jong-Ho**, Vice President, Technology Policy & Planning Department, KHNP
Lee Kun Jai, Professor Emeritus, Department of Nuclear and Quantum Engineering, KAIST

11:15 Break

11:30 Panel Two: Trends in International Nuclear Supply

This panel will cover the structure of international supply markets, demand for nuclear construction post-Fukushima, and opportunities and challenges for new suppliers.

Moderator: **Seo Jong Tae**, Senior VP & Project Manager, NSSS Domestic Business Group & Shin-Kori 3&4 Project, KEPCO E&C

Speakers: **Jane Nakano**, Fellow, Energy and National Security Program, CSIS
Yim Man-Sung, Professor, Department of Nuclear and Quantum Engineering, KAIST

1:00 Lunch

Speaker: **Ambassador Park Robyug**, Ministry of Foreign Affairs and Trade, Republic of Korea

2:00 Panel Three: Building Export Capacity in Korea

This panel will address considerations for Korean nuclear suppliers with respect to exporting, to include government support, supply chain, nuclear cooperation agreements, export controls, and liability protection.

Moderator: **Shin Chang-Hoon**, Director and Research Fellow, Nuclear Policy and Technology Center, Asan Institute for Policy Studies

Speaker: **Alan Hanson**, Executive Director, International Nuclear Leadership Program, MIT

APPENDIX B (CONT.)

3:15 Break

3:30 Panel Four: Roles and Responsibilities of New Nuclear Suppliers

This panel will address NSG Guidelines, IAEA assistance to states considering new nuclear supply, fuel cycle considerations, and nonproliferation.

Moderator: [Steven Miller](#), Director, International Security Program, and Coprincipal Investigator, Project on Managing the Atom, Belfer Center, Harvard University

Speakers: [Sharon Squassoni](#), Director and Senior Fellow, Proliferation Prevention Program, CSIS
[Gretchen Hund](#), Senior Scientist and Leader of the Policy and Analysis Team in the Global Security Technology & Policy Group, PNNL
[Jun Bong-Geun](#), Director-General and Professor, Department of National Security and Unification Studies, KDNA
[Yoo Ho Sik](#), Director, Nuclear Strategic Division, KINAC

5:15 Break

5:30 Closing Remarks

[Shin Chang-Hoon](#), Director and Research Fellow, Nuclear Policy and Technology Center, Asan Institute for Policy Studies

[Sharon Squassoni](#), Director and Senior Fellow, Proliferation Prevention Program, CSIS

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1800 K STREET, NW WASHINGTON, DC 20006
202.887.0200 | WWW.CSIS.ORG

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1-176 Shinmunro 2-Ga, Jongno-Gu, Seoul, 110-062, Korea
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