

ISSUE BRIEF

Executive Summary

No. 2025-42(S)

Recommendations for South Korea's Nuclear Energy Use and Analysis of U.S. Sanction Laws

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2025-12-29

This Issue Brief outlines the key findings and recommendations regarding South Korea's nuclear energy use policy, specifically focusing on the legal risks associated with U.S. domestic laws following the November 14, 2025, Korea-U.S. Joint Fact Sheet.

1. Significant Progress and New Challenges

The Joint Fact Sheet marks a major advancement in bilateral nuclear cooperation, signaling a path toward **civilian uranium enrichment, spent fuel reprocessing**, and the introduction of **nuclear-powered submarines**. While this progress offers solutions to long-standing issues like fuel supply stability and spent fuel storage, it also introduces complex legal and diplomatic challenges.

A critical concern is the potential blurring of lines between the “**peaceful use**” (civilian) and “**military use**” (nuclear submarines) of nuclear energy. Any perceived violation of non-proliferation obligations—such as using U.S.-provided technology or materials for military fuel without explicit approval—could trigger severe, multi-layered U.S. sanctions, regardless of the strength of the political alliance.

2. Analysis of the Four Core U.S. Sanction Laws

The United States maintains a robust legal framework to penalize nuclear non-proliferation violations. These laws can act automatically and progressively, moving from sector-specific restrictions to total economic paralysis.

Law	Primary Impact	Specific Sanctions
Atomic Energy Act (AEA)	Immediate cessation of nuclear cooperation	Mandatory stop of nuclear exports (fuel, equipment, technology) and a “ Right of Return ” for all previously provided materials
Arms Export Control Act (AECA)	Mandatory military and financial sanctions	Termination of Foreign Military Sales (FMS), military financing, and commercial arms exports. US opposition to loans from international financial institutions (IMF, World Bank)
Foreign Assistance Act (FAA)	Termination of foreign aid	Specifically targets nuclear enrichment potential (Symington Amendment), cutting off economic and military assistance
International Emergency Economic Powers Act (IEEPA)	Comprehensive economic blockade	Asset freezing, exclusion from the U.S. dollar payment system (SWIFT), and secondary sanctions on third-party entities

The severity of potential sanctions varies, but the following are the major impacts of the sanction laws mentioned above.

- **AEA:** Since South Korea relies heavily on U.S. or U.S.-licensed fuel, a cessation of cooperation would likely result in the **shutdown of all domestic nuclear power plants**, devastating the national power grid.
- **AECA (Glenn Amendment):** This would effectively neutralize the Korea-U.S. Mutual Defense Treaty by halting the supply of parts and support for key weapon systems like **F-35 fighters and Aegis systems**.
- **IEEPA:** This is the highest level of sanction. By declaring a “national emergency,” the U.S. President can freeze all South Korean government and corporate assets in the United States and paralyze the country’s export-import economy by cutting off dollar transactions.

3. Key Risks and Observations

This piece highlights several specific areas where South Korea must exercise caution:

- **Self-Procurement of Fuel:** Internal discussions regarding the self-supply of fuel for nuclear submarines using U.S.-provided materials—even after a potential expiration of the current Korea-U.S. Nuclear Cooperation Agreement—would be a violation. Such actions would be viewed as a diversion of “peaceful use” materials to “military purposes,” triggering the AEA and other sanctions.
- **Technological Sovereignty vs. Compliance:** If negotiations with the United States stall, there may be internal pressure for independent development or seeking third-country technology. However, the U.S. controls nuclear exports through the **Nuclear Suppliers Group (NSG)**, making third-party fuel procurement without U.S. consent politically impossible and legally risky.
- **Recent Security Incidents:** South Korea’s inclusion on the U.S. Department of Energy’s “**Sensitive Country List (SCL)**” in 2025—partly due to a contractor’s attempt to carry reactor design software to Korea—has already created a cautious environment in Washington.

4. Policy Recommendations for the South Korean Government

To achieve the goals of uranium enrichment and nuclear submarine acquisition while avoiding catastrophic sanctions, the government should adopt a “**precautionary approach.**”

A. Strict Separation of Peaceful and Military Uses

The government must maintain and publicly affirm a clear distinction between the two tracks:

- **Peaceful Track:** Uranium enrichment and reprocessing should be handled strictly within the framework of the Korea-U.S. Nuclear Cooperation Agreement.
- **Military Track:** Introduction of nuclear-propelled submarines is a “non-proscribed military activity” under IAEA guidelines and should be pursued through separate legal tracks (such as utilizing AEA Section 91 exceptions) and distinct negotiations with the United States and IAEA.

B. Proactive International Diplomacy and Transparency

- **Engagement with the U.S. Congress:** Since Congress has the power to override Presidential waivers on sanctions, South Korea must expand its lobbying and

persuasion efforts to address non-proliferation concerns within the U.S. legislative branch.

- **Cooperation with the IAEA:** South Korea should initiate discussions with the IAEA as soon as possible to establish arrangements for the temporary exclusion of nuclear materials from safeguards for “non-proscribed military activities.”
- **Affirmation of Non-Proliferation:** Continuously declaring that North Korean denuclearization remains a core policy goal and publicizing compliance with current IAEA safeguards will help solidify international trust in South Korea's intentions.

C. Strategic Patience

While the desire to finalize the introduction of nuclear submarines for domestic political or defense reasons is understood, making premature statements about “independent fuel procurement” is counterproductive. The government must remain patient, ensuring all legal and international procedures are followed to maintain the procedural legitimacy of its nuclear program.

About the Author

Dr. Shim Sangmin is senior research fellow at the Asan Institute for Policy Studies. Prior to his current position he worked as professor (non-tenured) at the Graduate School of Green Growth and Sustainability at KAIST from 2023 to 2025, as research fellow at the Asan Institute for Policy Studies from 2022 to 2023, as visiting research fellow at the Sejong Institute from 2021 to 2022 and as assistant professor of international law at the Korea National Diplomatic Academy (KNDA) from 2016 to 2021. He also served as visiting scholar at the Environmental Law Institute (ELI), a private think-tank that conducts research on issues of international environmental law, from 2015 to 2016. Dr. Shim’s legal educational background includes a J.S.D. degree at Stanford University, which was awarded in 2015 with his dissertation entitled, “Structuring Climate Policy in the Korean Electricity Sector: Politics, Institutions and Mitigative Capacity-Building.” He also holds a J.S.M degree at the same university, and is a graduate of Seoul National University. (B.A. & M.A. in law) An expert on international environmental law and policy, Dr. Shim is especially interested in climate change law and policy. His academic interests extend to conventional international legal issues as well, such as peace and security in the United Nations system, law of the sea, nuclear non-proliferation, human rights in North Korea and state responsibility. He also covers a variety of non-traditional security issues – energy, environmental, economic and human security.

This article is an English Summary of Asan Issue Brief (2025-38).

(‘우리나라 원자력 이용에 대한 제언: 미국 제재법률에 대한 검토를 중심으로’)