

Issue Brief

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Time to Act Quickly on the Bold Lee/Trump Nuclear Technology Agreements

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fuel cycle technology to South Korea

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A South Korean scholar recently told me that President Lee Jae-myung's enthusiastic support for transformative nuclear technology agreements with the United States represents a "Nixon goes to China" moment.

What he meant was that, just as Richard Nixon—the lifelong anti-communist—made the landmark decision in 1972 to dramatically shift U.S. policy and normalize relations with Beijing, President Lee, a progressive leader, has broken with traditional left-leaning positions by striking major strategic deals with the U.S. to build nuclear-powered attack submarines (SSNs) and to cooperate on uranium enrichment and the peaceful reprocessing of nuclear fuel.

Lee's move was bold not only because it defied South Korea's vocal anti-nuclear lobby, but also because it risked complicating his goal of improving relations with North Korea.

President Lee Jae-myung also has built a pragmatic, transactional, and productive relationship with the Trump administration that surprised many critics. Despite ongoing frictions over tariffs and defense burden-sharing, the two sides have significantly deepened cooperation in defense, advanced nuclear technology, and regional security.

The personal rapport between Trump and Lee was evident during Lee's visit to the White House in August 2025 and their productive summit on the sidelines of the APEC meeting in Gyeongju in October 2025.

President Trump also held a constructive meeting with Prime Minister Kim Min-seok in Washington in March 2026. That session helped advance South Korea's \$350 billion investment commitment in the United States, maintained momentum on the bilateral trade agreement, and included useful discussions on the possibility of Trump re-engaging with North Korean leader Kim Jong Un.

President Lee's push to elevate South Korea's nuclear capabilities came at a critical time. In December 2025, North Korean leader Kim Jong Un inspected the completed hull of an 8,700-ton "nuclear-powered strategic guided-missile submarine" at a shipyard, hailing it as a major step in Pyongyang's naval nuclear program.

The Lee-Trump nuclear agreements were a long-overdue recognition of a strategic reality: in an era of nuclear-armed adversaries on the Korean Peninsula and a rapidly modernizing Chinese navy, South Korea cannot deter aggression with diesel-electric submarines alone.

For decades, Seoul has operated some of the world's most sophisticated conventional submarines. South Korea's KSS-III-class subs are quiet, heavily armed with vertical-launch cruise and ballistic missiles, and equipped with advanced air-independent propulsion. They represent a remarkable indigenous achievement. South Korea has offered to sell a version of the KSS-III submarine, the KSS-CPS, to Canada.

However, diesel-electric submarines have significant limitations. Range and time at sea are limited by their diesel fuel. These subs must periodically surface to recharge their batteries, limiting their time submerged to days or weeks at best. In the shallow, confined waters around the Korean Peninsula—and in any broader Indo-Pacific contingency—the KSS-III subs are vulnerable to detection and cannot sustain the persistent, high-speed patrols required for naval deterrence today.

South Korean nuclear-powered submarines can change that equation. An SSN can remain submerged for months, travel at sustained high speeds, and operate across vast distances without fuel constraints. For South Korea, this capability is a necessity. North Korea's growing fleet of ballistic-missile submarines already threatens to complicate Seoul's defense planning. Beijing's expanding submarine force, designed to project power far beyond the first island chain, poses an even larger challenge.

The good news is that South Korea is more than ready for this ambitious leap into nuclear-powered submarines. Its renowned “Big Three” shipbuilders—HD Hyundai Heavy Industries, Samsung Heavy Industries, and Hanwha Ocean—stand among the world's top-tier shipbuilding giants. Collectively, they command a dominant position in high-value, technologically advanced vessels, including LNG carriers, offshore platforms, and sophisticated naval platforms.

These companies already design and construct world-class conventional submarines, most notably the KSS-III, and have invested heavily in US shipyards. This includes Hanwha Ocean's acquisition of the historic Philly Shipyard in Philadelphia and is committing billions of dollars—including a \$5 billion modernization program—to dramatically expand its capacity.

Transferring US naval nuclear propulsion technology would help bring South Korea's already advanced shipbuilding industry to the next level.

However, building and sustaining a nuclear submarine fleet requires far more than hulls and reactors. South Korea must gain access to the full nuclear fuel cycle: the ability to enrich uranium to produce nuclear fuel and to reprocess spent fuel rods into advanced nuclear fuel. Without this, both its submarine program and civilian nuclear industry would remain dependent on foreign suppliers.

Access to the full nuclear fuel cycle would also be a boon to South Korea's broader civilian nuclear ambitions. South Korea relies on nuclear power for about 30 percent of its electricity. It is also a leading producer of advanced nuclear reactors. Granting South Korea access to enrichment and reprocessing would boost its efforts in next-generation nuclear power technology, such as the production of high-assay low-enriched uranium (HALEU) and advanced nuclear fuel needed for Small Modular Reactors (SMRs) and new reactor designs.

Moreover, providing South Korea with access to the full nuclear fuel cycle is not only a strategic imperative but also a matter of basic fairness and logic.

South Korea operates one of the world's most advanced civilian nuclear industries. Yet it cannot enrich uranium to make nuclear fuel rods or reprocess spent fuel and must import all of its nuclear fuel.

Making this much worse, not only does South Korea import about a third of its nuclear fuel from Russia, US sanctions against Russia in response to the war in Ukraine will force it to stop

buying nuclear fuel from Russia in 2028. This means South Korea's nuclear industry is facing nuclear fuel shortages and much higher fuel costs in just two years.

None of this makes any sense. Although South Korea is the fifth largest operator of nuclear power plants, after the U.S., China, Russia, and France, it is the only one entirely dependent on overseas suppliers for its enriched uranium because it lacks the domestic capability to enrich uranium.

And another astonishing fact: several other non-nuclear weapon states—including Japan, the Netherlands, Germany, Brazil, and Argentina—already possess uranium enrichment and fuel rod reprocessing capabilities under IAEA safeguards. Meanwhile, North Korea has secretly developed both technologies in flagrant violation of international law.

It therefore is both illogical and counterproductive to withhold full nuclear fuel cycle rights from a model NPT member and steadfast US ally like South Korea while granting or tolerating them for so many other nations.

Access to the full nuclear fuel cycle also would allow Seoul to sharply reduce its growing spent fuel stockpiles, extract vastly more energy from existing uranium resources, cut waste volumes by up to 90 percent through closed-fuel-cycle technologies like pyroprocessing to recycle spent fuel rods to produce new advanced nuclear fuels for next-generation reactors.

The Korea Atomic Energy Research Institute (KAERI) has been actively developing advanced nuclear fuel reprocessing technologies—primarily pyroprocessing—for nearly three decades, with serious R&D efforts underway since 1997. The goal has long been to recycle spent fuel from conventional reactors into new,

high-performance metallic fuels suitable for next-generation fast reactors, while also dramatically reducing the volume and long-term toxicity of nuclear waste.

The recent Lee-Trump nuclear agreements mark a major breakthrough in this effort. For the first time, the United States has explicitly expressed support for South Korea's pursuit of peaceful spent fuel reprocessing alongside domestic uranium enrichment. This effectively removes the longstanding legal and diplomatic barriers that previously restricted South Korea's fuel-cycle ambitions.

As a result, KAERI's program can now transition from the R&D phase to engineering-scale demonstration and eventual commercial-scale implementation in the 2030s. This paves the way for South Korea to build facilities such as an advanced pyroprocessing plant linked to next generation sodium-cooled fast reactors.

Although the new US-South Korea nuclear agreements support these advances in South Korea's nuclear power program, some revisions still need to be made to the US-South Korea "123 agreement" on the sharing of peaceful nuclear technology.

Transferring US naval nuclear propulsion technology would be an improvement on Australia's AUKUS agreement, which focuses on building new submarines from scratch. By contrast, under the US-South Korea submarine agreement, Seoul can quickly and cost-effectively build a nuclear-powered variant of its proven KSS-III design. Joint production or technology-sharing arrangements also would strengthen America's own submarine industry, which is years behind in production and maintenance.

During his recent trip to Seoul, Democratic Congressman Ami Bera acknowledged why the U.S./South Korea submarine

agreement is vital to US national security when he said, “Korean shipbuilding is far ahead of where U.S. shipbuilding is, and we need Korean companies to help revitalize American shipbuilding.”

Naturally, critics have raised nonproliferation concerns. These concerns are unwarranted. South Korea is a model member of the Nuclear Nonproliferation Treaty (NPT). North Korea, by contrast, has blatantly violated its nuclear treaty obligations, has constructed an estimated 50 nuclear weapons, and is now reportedly building nuclear-powered submarines. Denying South Korea the nuclear technology it needs to defend itself while North Korea races ahead is not responsible nonproliferation; it would be strategic malpractice.

An AUKUS-style framework with updates to the US–South Korea 123 agreement is the best way forward to provide Seoul with critical nuclear technology while ensuring safety, security, and non-proliferation standards.

South Korea has the industrial capability, the strategic need, and the alliance commitment to make this new nuclear technology cooperation work. The US has taken the first step. The only remaining question is speed. The Trump administration, in consultation with Congress, should expeditiously provide South Korea with the full suite of naval nuclear technology, reactor design support, fuel-cycle cooperation, and pathways for advanced reactors, including SMRs.

In the face of growing threats from China and North Korea, a comprehensive U.S.–South Korea nuclear partnership is one of the most effective ways to deter conflict and promote peace, security, and prosperity in the Indo-Pacific.

Only Richard Nixon could go to China in 1972. Perhaps only Lee Jae-myung could go to Donald Trump in 2025 and secure the historic nuclear propulsion and fuel-cycle agreements that will give South Korea its first nuclear-powered submarines and dramatically elevate its nuclear industry.

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