

INTRODUCTION

Alternative East Asian Nuclear Futures

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The 13 chapters contained in this book's two volumes were prompted by a single inquiry in 2012 from the MacArthur Foundation. Was there any way, I was asked, to further clarify the economic and nonproliferation downsides if further production of civilian plutonium proceeded in East Asia? My initial reply was no. So much already had been done.

But the more I thought about it, two things that had yet to be attempted emerged. The first was any serious analysis of just how bad things could get militarily if Japan and South Korea acquired nuclear weapons and North Korea and Mainland China ramped up their own production of such arms. Such nuclear proliferation had long been assumed to be undesirable but nobody had specified how such proliferation might play out militarily. Second, no serious consideration had yet been given to how East Asia might be able to prosper economically *without* a massive buildup of civilian nuclear power. Since each of the key nations in East Asia—China, the Koreas, and Japan—all would likely exploit their civilian nuclear energy infrastructure to acquire their first bombs or to make more, such inattention seemed odd.

What followed was encouragement from foundation staff; development of a proposal; funding from The MacArthur Foundation, The Carnegie Corporation, the Scaife Foundation, and The Smith Richardson Foundation; and more than four years of work. First,

I commissioned the very best regional security experts I could find to develop scenarios for Japan and South Korea acquiring nuclear weapons and for North Korea and China significantly ramping up their production and development of nuclear arms. These scenarios specified what each of these countries might do if they acquired a nuclear arsenal or expanded their existing stockpiles over the next 20 years.

Second, the authors presented these studies to leading Chinese, Russian, South Korean, Japanese, and American security and energy officials and experts at a series of workshops. The aim of these meetings was to get the participants' views on how real or worrisome the military scenarios might be. All of the military nuclear projections exploited civilian nuclear infrastructure to make nuclear weapons. Finally, to balance these dark nuclear projections, I commissioned a number of energy experts from East Asia and the United States to evaluate peaceful alternative civilian energy futures for East Asia that would rely on less nuclear power through 2035.

Privately, I was told that the project was doomed. No one of interest, I was told, would agree to participate. If they did, they wouldn't say anything of interest. And if they did, the participants wouldn't get along. Just the opposite occurred. Senior officials from each country did come; they all were candid; and the gatherings were surprisingly collegial.

In 2012, the project's first premise—that Japan and South Korea might use their civilian nuclear infrastructure to acquire nuclear weapons and that North Korea and China would perfect much more robust nuclear forces of their own—seemed fantastic. The prevailing wisdom was that Japanese or South Korean acquisition of nuclear weapons was unthinkable. It was not in their interest. Severe trade sanctions would be imposed upon them for violating the Nuclear Nonproliferation Treaty (NPT). Worse, such proliferation would weaken essential security ties with the United States. As for China and North Korea, most experts believed that neither would need nor want many nuclear weapons.

The project's second premise—that East Asia could meet its energy and environmental requirements without a large number of new reactors was also considered unlikely. At the time, most experts were arguing just the opposite, that the economies of Japan, South Korea, Mainland China, and Taiwan would falter without a massive build out or restart of planned nuclear power plants.

Accepted as wisdom six years ago, today none of these views seem particularly persuasive.

Today, our East Asian Allies are increasingly interested in developing nuclear weapons options.¹ In response to North Korea's nuclear saber-rattling, more than a few former and current officials both in South Korea and Japan—including former defense ministers and the leaders of the ruling and opposition parties—have come out in support of acquiring nuclear arms or a nuclear weapons option. Mostly, their enthusiasm for nuclear options has been driven by fear. On the other hand, some of this bravado is reasoned: In specific, it is no longer clear, if it ever was, that South Korea or Japan would suffer economically if they withdrew from the NPT. Consider India: Since 2011 it's been able to enjoy all of the civilian nuclear trade privileges of a member state of the Nuclear Supplier Group (NSG) despite being a nuclear-armed non-NPT state. This suggests other countries can acquire nuclear weapons, be outside of the NPT, and still skirt nuclear trade sanctions as well. Why wouldn't Washington be as forgiving of Seoul and Tokyo as it has been of New Delhi? Did Israel's, the UK's or France's acquisition

1. See, e.g., Michelle Ye Hee Lee, "More than ever, South Koreans want their own nuclear weapons," *The Washington Post*, September 13, 2017, available from <https://www.washingtonpost.com/amhtml/news/worldviews/wp/2017/09/13/most-south-koreans-dont-think-the-north-will-start-a-war-but-they-still-want-their-own-nuclear-weapons/>; Jake Adelstein, "Is Japan about to Hit Its Nuclear Tipping Point?" *The Daily Beast*, February 15, 2018, available from <https://www.thedailybeast.com/is-japan-about-to-hit-its-nuclear-tipping-point>; and David E. Sanger, Chloe Sang-Hun, and Motoko Rich, "North Korea Rouses Neighbors to Reconsider Nuclear Weapons," *The New York Times*, October 28, 2017, available from <https://www.nytimes.com/2017/10/28/world/asia/north-korea-nuclear-weapons-japan-south-korea.html>.

of nuclear arms terminate security ties with Washington? Presumably, officials both in Seoul and Tokyo know the answers as well as those in Washington. If not, they need only reflect on the North Korean case: It withdrew from the NPT in 2002 and suffered no specific sanctions at all.

As for the weapons ambitions of China and North Korea, they too no longer look to be so limited. China, faced with both Russian and American nuclear arsenal revitalization programs and a perceived increased willingness to threaten use, has announced that it will need to increase and upgrade its stockpile as well.² North Korea, meanwhile, has shown no restraint at all. It not only seems intent on increasing the number of nuclear weapons in its arsenal (now projected to grow to more than 100 by 2030), but to test and deploy sea and ground-based missiles of nearly all sorts. It remains to be seen how what they've built might be used as leverage for political and economic concessions during negotiations with the United States.

This, then, brings us to the further growth of nuclear power in East Asia. Today, nuclear power's expansion in Asia is in retreat. Taiwan plans to go nonnuclear by 2025; South Korea by 2030. The Japanese government is eager to restart as many as possible of the 54 reactors it had online before the Fukushima accident shut them down. As of this writing, however, Japan has only eight online and many are slated to be shuttered.³ The big question is whether and to what extent Japan will further adapt its electrical system to allow non-nuclear alternatives a greater role in the country's electrical power mix. Finally, Mainland China, once projected to have 200 gigawatts of electrical capacity on line by 2030, is encountering difficulties and now may be lucky to have a bit less than 100 gigawatts on line

2. See "China must expand nuclear arsenal in response to Trump: Global Times," *Strait Times*, January 24, 2017, available from <https://www.straitstimes.com/asia/east-asia/china-must-expand-nuclear-arsenal-in-response-to-trump-global-times>.

3. See Reuters Staff, "Table-Japan nuclear reactor operations: Kyushu shuts Sendai No. 2," *Reuters*, April 23, 2018, available from <https://af.reuters.com/article/commoditiesNews/idAFL3N1S02UE>.

by then.⁴

Nor have economies in East Asia suffered significantly because of this nuclear slowdown. China's economy continues to grow, albeit at a somewhat slower rate as its economy matures. Japan, South Korea, and Taiwan all have sustained positive growth since 2012. Meanwhile, increases in electrical demand in each of these economies have slowed. Certainly, projections that East Asian economies would tank without a ramp up in nuclear power have yet to materialize. Meanwhile, the price of liquefied natural gas, which has been used to help substitute for nuclear power, has fallen roughly 60% since 2012.

Much of this volume's commissioned research predicted these trends. These chapters are worth reading if only to understand what premises the authors used to reach their conclusions. North Korea is interested not in deterring its adversaries, but in coercing them and in driving U.S. forces out of the region. The outcome of its negotiations with the United States remains to be seen but it appears that Pyongyang will do so as a nuclear-armed equal. China, meanwhile, may have no choice but to expand its nuclear arsenal as it develops modern forces that demand the integration of warheads with missile delivery systems (submarines and road-mobile missiles) that are increasingly autonomous. Beijing also must deal eventually with a Russia that it will have difficulty trusting, or at least a Russia that is unwilling to trust Beijing.

Natural gas prices increasingly will be less local and instead reflect global market trends, which will be almost entirely independent of oil prices. Such globalized natural gas is likely to remain plentiful and affordable, at least for several decades.⁵ Nuclear power from

4. See Steve Kidd, "Nuclear in China—why the slowdown?" *Nuclear Engineering International*, August 10, 2017, available from <http://www.neimagazine.com/opinion/opinionnuclear-in-china-why-the-slowdown-5896525/>.

5. For a thorough update on the likely glut of natural gas in East Asia, see Melanie Hart, Luke Bassett, and Blaine Johnson, "Do Not Fall for the Hype on U.S.-China Natural Gas Trade," Center for American Progress, April 18,

large reactors and nuclear recycling costs and construction times are high and unlikely to fall. By contrast, electrical demand growth, the cost of renewables, natural gas-fired electricity, and electrical grid storage are falling and are likely to continue to do so. Meanwhile, improving grid transmission systems and developing more agile and experimental electrical pricing systems can help to reduce demand and encourage more economical forms of electrical generation. All of these developments corroborate the key finding in most of the chapters that follow.

Some of the volume's research, though, has yet to be vindicated. The encouragement of market-driven competitions among energy types in the production of electricity has only begun in Japan, China, and South Korea on a small scale. It is likely to change over the next two decades. Nor has there been any significant commerce in electricity between East Asian states. Both developments, if they should occur, however, could dramatically increase the supply of electrical power and reduce requirements for ever more generating stations.

What does this research then suggest to keep East Asia more peaceful? Three things. First, whatever the merits of nuclear power's expansion might be in East Asia, deferring the commercial use of plutonium-based fuels and the further expansion of uranium enrichment capacity makes both security and economic sense. Neither of these activities have any positive return on investment and increase the technical ability for China, Korea, and Japan to either ramp up their existing nuclear numbers or breakout to build an ever large batch of bombs.

Second, energy pricing, investment, and regulatory reforms in China, Taiwan, South Korea, and Japan that rely more on market signals than on central planning would help determine the appropriate level of nuclear power needed. The uncertainties regarding what the optimal types and mixes of new and existing forms of electrical generation, storage, and distribution systems might be as significant. How,

2018, available from <https://www.americanprogress.org/issues/security/reports/2018/04/18/449807/not-fall-hype-u-s-china-natural-gas-trade/>.

if at all, these new systems might relate to the transport sector and industrial and commercial heating and cooling markets is also unclear and will remain so for the next 20 to 40 years. Trying to pick which technologies will be the clear winners without heavy reliance on market signals is a prescription for regret.

Third, tying nonproliferation to efforts to strengthen American-Japanese and American-Korean relations is required now more than before. The need to pursue serious long-term planning toward this end cannot be emphasized enough. Such planning needs to go beyond conventional and nuclear military war gaming to deter, defend, and counter possible North Korean provocations. The United States and its allies need to work with Seoul to understand what might reduce its “need” or incentives to go nuclear. These drivers of South Korean interest in going nuclear are not just military in character. They also are social, historical, economic, and diplomatic and can be identified and mitigated. Certainly, reacting to their expression as crises may unfold is far less leveraged.

My center has already made efforts to act on all three recommendations. First, as part of a follow-on grant by the MacArthur Foundation, the Nonproliferation Policy Education Center (NPEC) made a number of trips to visit with senior officials in Seoul, Tokyo, and Beijing and explored the idea of these countries adopting a policy of deferring their plans to recycle plutonium-based fuels commercially. As a result of these exchanges, I worked with members of the State Department’s International Security Advisory Board to get all of its members to back a U.S.-led initiative to encourage a commercial plutonium pause in East Asia. Unfortunately, this board’s unanimous support came late in the Obama Administration’s second term. Action was not taken.

With the election in 2016, President Donald Trump appointed Rex Tillerson as Secretary of State and he was briefed on the desirability of pushing a commercial plutonium pause in East Asia. Mr. Mike Pompeo has just been installed as Tillerson’s replacement. It is unclear if he has yet been briefed on the idea but it is clear that if

the stated goal of North Korean denuclearization is to be achieved, it may require nuclear restraint on both the plutonium recycling and uranium enrichment not just in North Korea but in neighboring states as well. Time will tell if this idea is given a chance or not.

Second, NPEC is currently conducting a two-year project to assess nonnuclear alternatives to the further expansion of nuclear power systems both in the Middle East and in Mainland China and Taiwan. The key here is to compare the costs of different energy systems both economically and environmentally. The initial research (see David Von Hippel's Appendix in Vol. II) suggests that China's nuclear power program, which is growing faster than any other nation's, may no longer be increasing quite so quickly. Nor is it clear that it will grow anywhere nearly as large as originally planned. At the moment it is unclear if South Korea's plans to go nonnuclear by 2030 and Taiwan's plans to do so by 2025 will be the model for the region or if nuclear power will continue to expand. Much will depend on how things unfold on the Mainland.

NPEC's most recent studies may help. They are aimed at encouraging the U.S. government to do its own more detailed analyses of its own as called for by Title V of the Nuclear Nonproliferation Act of 1978. They also are being shared with key officials in East Asia.

Finally, NPEC has begun collaborating with the National Defense University's Center for the Study of Weapons of Mass Destruction and its Program for Emerging Leaders to set up a long-term analysis and planning program in support of the U.S. government's current policy of preventing South Korea and Japan from acquiring nuclear weapons. This program has just begun. It remains to be seen if the project's products will attain policy traction.