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KEDO: How multilateral cooperation helped an unprecedented North Korean project

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Abstract

In 1994, the United States and North Korea signed the Agreed Framework, in which Pyongyang promised to abandon its nuclear program in exchange for energy aid and improvement of relations with Washington. An international consortium led by the United States was created to implement the key provisions of the deal, including the delivery of two light water reactor (LWR) units. While multi-national efforts are common in commercial nuclear projects, the case of the Korean Peninsula Energy Development Organization (KEDO) was unique. KEDO's challenges ranged from the lack of diplomatic relations between its main members and North Korea, to the country's poor infrastructure. This paper examines KEDO's experience and concludes that cooperation among its member states—Japan, South Korea, the United States and others—helped ensure the project's financial and political feasibility, even if work did not proceed smoothly. While the construction of the LWRs was never completed due to larger political changes, KEDO's experience offers lessons for future nuclear projects that face similar hurdles.

Introduction

Following a dispute with the International Atomic Energy Agency (IAEA) over its past plutonium production, North Korea declared in 1993 that it was withdrawing from the Nuclear Nonproliferation Treaty (NPT). This touched off a prolonged crisis that threatened to escalate into military conflict in the spring of 1994. The crisis was resolved with the signing of the Agreed Framework in October of that year after a series of contentious talks between the United States and North Korea.¹

The Agreed Framework sought not only to end the North Korean nuclear program but also to fundamentally change the relationship between the United States and North Korea, which never established diplomatic ties following the Korean War. The central elements of the agreement included North Korea's commitment to shut down and eventually dismantle its graphite-moderated reactors, and to remain a party to the NPT. In exchange, the United States promised to provide North Korea with two light water reactor (LWR) units, compensate the country for the loss of energy production from its shutdown reactor with another form of energy while the LWRs were being constructed, and begin taking steps to improve relations with Pyongyang.²

The reason the United States agreed to provide North Korea with LWR units is because they are less proliferation-prone than graphite-moderated reactors. The nuclear waste that the LWRs produce is more difficult to divert to nuclear weapons compared to the material produced by their graphite-moderated counterparts. LWRs are also easier to safeguard compared to the graphite moderated reactors. An additional benefit for the United States was the fact that North Korea did not have the ability to make its own fuel rods for LWRs, and needed to depend on overseas suppliers.³

U.S. negotiators, however, immediately realized that the cost of the reactors, estimated at over \$4.6 billion, was more than the United States was willing to shoulder alone. KEDO was founded partly as a solution to these financing concerns.⁴ The U.S. negotiators insisted to their North Korean counterparts that the Agreed Framework make clear that an international consortium will be established to build the LWRs and ship alternative energy to North Korea.⁵

What did KEDO achieve, and did the multilateral cooperation embodied in KEDO help its mission? This paper first discusses KEDO's membership, mission, and challenges. It then lists the organization's achievements during its years of operation, including whether it served to promote nonproliferation norms. It then analyzes which aspects were helped or hindered by multilateral cooperation. Finally, the paper discusses some of the problems that were left unsolved at the time KEDO's work stopped due to larger political changes, and some lessons for other projects.

KEDO's members, mission and challenges

KEDO was officially founded in March 1995 in New York by Japan, South Korea and the United States, as an international organization under U.S. law.⁶ The organization's charter stipulated three main tasks: The first was to finance and construct two LWR units in North

Korea, the second was to provide North Korea with interim energy alternatives until the first of the reactors were completed, and the third was to carry out any other measures needed for the implementation of the Agreed Framework.⁷

Over the next two years, New Zealand, Australia, Canada, Indonesia, Chile, and Argentina joined the organization. The European Union joined in 1997 with representation on the Executive Board to reflect the size of its financial contribution to the project.⁸ By 2000, the number of member countries totaled 13.

Russia did not join KEDO, despite its interest in nuclear developments in North Korea. While U.S. chief negotiator Robert Gallucci appears to have preferred to build Russian LWRs in North Korea as part of the KEDO project, that idea was deemed infeasible due to Japan's fears of having the Russian reactors constructed nearby so soon after the Chernobyl incident and due to South Korea's strong desire to provide the reactors.⁹ Russia also initially reacted negatively to the Agreed Framework, claiming that it created a bad precedent.¹⁰ Russia later hinted that it wanted a seat on KEDO's Executive Board, but that notion was rejected by KEDO, as Moscow was unwilling to provide significant funds for the project.¹¹ In contrast, China was generally supportive of the Agreed Framework, but Beijing did not play an active role in KEDO, saying that it could be more useful by staying outside of the organization.¹²

KEDO faced unique challenges. While multinational projects are common for commercial nuclear projects, the complexities involved were unusual because KEDO's founding members had historically hostile relations with North Korea.¹³ Neither Japan, South Korea, nor the United States had diplomatic relations with the North. This meant that in addition to the normal constraints that such a project may face, KEDO had additional concerns, ranging from the security of its employees working on North Korean soil to the larger political landscape impacting its operations.

The LWR project was also different from normal civilian nuclear cooperation projects, as the reactors were to be constructed in exchange for North Korean nonproliferation commitments. While a few countries had given up their nuclear weapons programs in exchange for economic assistance and improved relations with the West, this was a rare case that involved an exchange of a set of proliferation-prone reactors for more proliferation-resistant ones.¹⁴

North Korea also lacked the technical experience, skill, and infrastructure to construct and operate the South Korean reactors. For example, the North Korean regulatory authorities lacked the expertise to provide oversight for the LWR project, and the North Korean grid was not capable of handling the large electric load from the plants.¹⁵ The reactors were also North Korea's first multibillion-dollar, Western-style construction project.¹⁶

What did KEDO achieve?

Due to the unique conditions noted above, KEDO had few precedents to rely on. One of KEDO's first major achievements was the conclusion in December 1995 of the Supply Agreement, which detailed how the LWR project would be carried out and how work was to be divided between

KEDO and North Korea. The agreement was concluded nine months after the date that the Agreed Framework parties agreed to make “best efforts” to conclude it,¹⁷ reflecting the general delay in the implementation of the Framework.

Based on this agreement, KEDO and North Korea also negotiated eight protocols that were needed for implementing the project.¹⁸ The lack of diplomatic relations between North Korea and the original KEDO founders complicated this process. For example, in order to allow KEDO personnel—mainly Americans, Japanese and South Koreans—to visit the North Korean construction site, the parties agreed that the employees should use KEDO identification cards that served the same function as passports.¹⁹ The protocol on transportation allowed goods to be shipped from South Korea to North Korea by designated points on land, sea and air, but not through the demilitarized zone between the two Koreas.²⁰

According to the Supply Agreement, KEDO was in charge of preparing the construction site in Kumho, on North Korea’s northeast coast. The rural site had originally been chosen for LWRs that the Soviet Union promised North Korea in the mid 1980s but were never built. It still lacked the necessary infrastructure, etc.²¹ KEDO put in the infrastructure needed to support both the construction of the reactors and the thousands of its staff who worked there. This meant removing four million cubic meters of rock and soil from a mountain to create a foundation for the nuclear reactors, and building a port, roads, housing, and a medical facility, among other things.²² In August 2002, a ceremony was held to mark the pouring of concrete for the first LWR unit.²³

KEDO’s work implementing the Agreed Framework helped promote nuclear nonproliferation norms, although the gains were reversed when the project ended. The International Atomic Energy Agency began monitoring the freeze of North Korea’s five nuclear facilities a month after the October 1994 signing of the Agreed Framework. While largely symbolic, the IAEA also resumed in March 1996 ad hoc and routine inspections at small nuclear facilities that were not subject to the freeze.²⁴ Had the project moved forward, North Korea would have had to come into full compliance with its safeguards agreement with the IAEA and solved the issue of its past plutonium production before the LWRs were completed.²⁵

How multilateral cooperation helped the project

The largest benefit of the multinational approach embodied in KEDO was that it made the project financially feasible. With the United States unwilling to pay for the project by itself, additional financing was a necessity. South Korea offered to fund 70 percent of the estimated \$4.6 billion needed for the two LWR units, and Japan agreed to pay 116.5 billion yen, or about \$1 billion at the time.²⁶ This still left a shortfall in funding, but it was hoped that other countries would step up. The Supply Agreement was written in such a way that North Korea was required to repay KEDO the cost to build the reactors over a 20-year term without interest, starting after the units were completed.²⁷ Some KEDO members thought that repayment was unlikely.²⁸

The more immediate problem confronting KEDO was raising the funds to provide the 500,000 tons of heavy fuel oil (HFO) that were to be shipped to North Korea annually while the reactors

were being constructed. The United States took the lead in the fundraising effort, but it consistently faced difficulties. Raising funds domestically became particularly challenging after the Republican Party, which was largely hostile to the Agreed Framework, gained control of both houses of Congress in the 1994 midterm elections. Secretary of State Warren Christopher said in Congressional testimony in January 1995 that he expected the annual cost of the project for the United States to be “in the range of \$20 to \$30 million,”²⁹ a vastly underestimated sum. Facing domestic problems, the United States invited the European Union (EU) to join KEDO as part of an effort to ensure funding for the HFO shipment. The EU was given representation on the KEDO Executive Board in exchange for its contribution of \$15 million a year for five years. But even with additional contributions from non-Executive Board members, the funds for the HFO still fell short.³⁰ As such, HFO delivery to North Korea was often late. To prevent further delays, Japan provided funds for an account that could be used to finance the HFO delivery, under the condition that the money be replenished at the earliest possibility.³¹ Yet even then, HFO shipments lagged.

Another benefit of the multinational approach was that it helped some member countries win the domestic support necessary to secure their contributions to the LWR construction and HFO shipments. In selling the deal to members of the U.S. Congress, Clinton administration officials argued that Japan and South Korea were contributing the lion’s share of the cost of the project and that the two allies were sufficiently committed to the agreement.³² The Japanese Foreign Ministry made a similar argument in its domestic process. It believed that wider participation in KEDO would help strengthen its case for Japan shouldering part of the cost for the LWR project.³³ South Korea was the outlier in the equation. Because it was providing the largest share of the funds for LWR construction it wanted a smaller and concentrated decision-making structure.³⁴

There were other political benefits to KEDO’s structure. For instance, the EU’s participation raised awareness of the North Korean issue in a region where it was not a priority.³⁵ Another important benefit was the fact that the structure also played into broader U.S. political goals to encourage interaction between North Korea and South Korea.³⁶ North Korea at first resisted South Korea’s inclusion in any part of the Agreed Framework process. Indeed, North Korea initially rejected accepting South Korean origin reactors for the project. Once the North agreed to have the reactors supplied by the South, they insisted on calling the reactors “American” because of the origin of the technology. Meanwhile, the South Korean’s wanted the reactors to be referred to as “Korean” reactors. The impasse was settled when the two sides agreed to a technical description of the type of reactor that was to be built.³⁷

Once KEDO began its operations, however, the inclusion of South Korea became a useful vehicle for regular contact between the two Koreas on all levels. Choi Young Jin, KEDO’s first South Korean deputy executive director, called the arrangement “a camouflaged inter-Korean dialogue.”³⁸ These contacts included interactions at the reactor construction site in Kumho, where North Koreans interacted daily with workers from South’s Korea Electric Power Corporation (KEPCO), which won the contract to provide the LWR units.³⁹ The interactions not only promoted understanding between the two groups, but also exposed the North Koreans to modern technology and methods of managing such a technical project.⁴⁰

KEDO's multilateral structure also helped when disputes arose between parties. One way was by giving the organization more options for working around a potentially disruptive situation. For example, when North Korea withdrew its workers from the project demanding more pay in 2001, KEDO hired mostly ethnic Korean workers from Uzbekistan, a KEDO member, to take their place. While this move proved more expensive than giving the North Koreans the pay raises that they were demanding, some KEDO members thought it was an important opportunity to show the North Koreans that they were not going to give in to what they viewed as unreasonable North Korean demands.⁴¹

More generally, interaction between KEDO members and their North Korean counterparts reduced potential misperceptions and at times prevented disruptive problems from exacerbating. A South Korean KEDO member, for example, recalls a time when negotiations were deadlocked due to North Korea's demand that KEDO's ships turn off their communication and navigation systems when entering a North Korean port. A North Korean delegate explained to him on the side that work was underway to overcome strong military objections, and asked for some time. The issue was resolved in a following meeting as the North Korean indicated.⁴²

What did not work well

Despite the benefits of the multinational approach embodied by KEDO, it also raised some challenges that hindered the project's success. One was the impact of historical enmity and politics outside of the project interfering with the process. In one example, work was delayed because Japanese officials objected to the use of the label "East Sea" in an environmental report for the project, insisting that it be changed to "Sea of Japan," which is what Tokyo calls the body of water surrounded by Japan, Sakhalin, and the Asian mainland.⁴³ The references to "East Sea" were ultimately changed to "Sea" in the report.⁴⁴

Another was the difference in the countries' political approach and culture. For instance, while many of the American members of KEDO were contractors employed for the duration of the project, the Japanese and South Korean governments sent representatives from their various ministries for a limited-time assignment. This meant that a unified sense of mission was only achieved after much effort.⁴⁵

Differing technical standards among KEDO countries also sometimes held up progress. For instance, Japan hesitated to approve additional funding for the LWR construction when an American industrial organization asked for the project to meet U.S. construction standards for concrete anchors.⁴⁶ Tokyo's unwillingness had little to do with the LWR project in North Korea. Instead, it had everything to do with its desire to avoid setting a precedent for its own construction standards at home.⁴⁷

How did KEDO deal with its problems?

KEDO opened a small office in Kumho manned by Americans, Japan and South Koreans to maintain a working relationship with North Korea at the reactor construction site and to deal

with any disagreements or disputes.⁴⁸ The KEDO office in Kumho (KOK) provided consular protection for KEDO workers, had diplomatic interactions with the North Korean authorities, informed KEDO headquarters in New York of the situation on the ground, and maintained some technical oversight over the project.⁴⁹ For example, KOK dealt with a case in which a South Korean truck driver hit a North Korean on the construction site and had to be repatriated. When a North Korean sought asylum in the KEDO compound at the construction site, he was quietly turned away by KEDO's unarmed security forces.⁵⁰

KEDO also worked to bring cohesion to its multi-national staff working at its New York headquarters. It enhanced communication among the staff, including at informal social gatherings and joint lunches. These activities were eventually stopped when they became unnecessary.⁵¹

What remained unresolved?

The LWR project lost its momentum after U.S. President George W. Bush came into office in 2001 with skepticism about the Agreed Framework. Work on the LWR units and the HFO shipments were gradually terminated after the United States confronted North Korea about its pursuit of a covert highly enriched uranium program in 2002. KEDO formally ended its operations in 2006.

Even had the project moved forward, it would have faced numerous challenges. One was the question of North Korea's past nuclear activities. The Agreed Framework stipulated that North Korea come into full compliance with its IAEA safeguards agreement before key nuclear components of the LWRs were to be installed in Kumho. This meant that North Korea would have had to revisit the discrepancies that the IAEA found in the country's declaration on past plutonium production, which was the origin of the nuclear crisis that led to the Agreed Framework.

The project to construct the LWRs also had some outstanding technical problems. One issue concerned the North Korean electrical grid. North Korea's outdated electrical grid would not have been able to handle the electricity generated by one LWR unit, let alone two.⁵² None of the KEDO members wanted to assist North Korea with upgrading its electrical grid, which would have cost more than a billion dollars.⁵³ In addition, the North Koreans didn't have an off-site power system for the operation of the LWR units,⁵⁴ without which it couldn't power coolant pumps in the case of a reactor shutdown.

Another sizeable challenge was negotiating a U.S.-North Korean nuclear cooperation agreement. The North needed such an agreement because major components of the reactors were based on U.S. technology, even if they were provided to North Korea by the South.⁵⁵ Questions about nuclear liability also remained unsolved. Should an accident occur at the reactors, would North Korea be able to make payments for damages? The lack of a liability regime was a particular concern for the companies providing components to the project.⁵⁶

Conclusion

The conclusion and implementation of the Agreed Framework would have been a difficult task regardless of who the United States partnered with. The relationship between the U.S. and North Korean governments was hostile going back decades, and the North lacked the infrastructure, skills, and experience to deal with the construction of large-scale nuclear reactors. Yet, the partnership between the United States, Japan, and South Korea—and the eventual inclusion of 10 other states—helped to address some of the largest problems associated by the Framework and laid the foundation for broader cooperation with the North in a way that would have been infeasible if the United States alone would have tried to fulfill its terms.

Despite its challenges, KEDO negotiated a supply agreement and eight protocols that were necessary for the LWR project, and built the necessary infrastructure in Kumho to support the construction of the reactors. KEDO also divided the financial cost of implementing the agreement in a way that enabled sustained domestic buy-in in the participating states. It also facilitated regular interaction between North and South Korea, including at the Kumho construction site. While conflicts did arise within KEDO, they never reached a point where they threatened the project.

Would KEDO have worked better had it included more countries, particularly regional powers China and Russia? KEDO would certainly have welcomed more financial contributions, and there would likely have been benefits to including countries that have diplomatic relations and embassies in North Korea. But given the challenges KEDO faced as the United States worked with its allies, it is also easy to imagine the problems that would have had to be overcome had China or Russia played a role in the organization.

Given the unique political environment in North Korea, KEDO's experience is not necessarily transferable to other cases where multilateral nuclear energy cooperation is being considered. However, it does demonstrate the range of potential benefits that could derive from such cooperation--from ensuring financing and addressing domestic political concerns.

About the author

Naoko Aoki is a Ph.D. student specializing in International Security and Economic Policy. Her dissertation explores the impact of domestic politics on international security cooperation, using U.S. implementation of two denuclearization agreements with North Korea as case studies. Her research attempts to better understand the conditions under which security cooperation agreements could be implemented. Her other research interests include nuclear and missile programs as well as cybersecurity in the Asia-Pacific region. She was formerly with Kyodo News, Japan's largest news agency, covering Japanese domestic politics and economic policy in Tokyo before serving as Kyodo's Beijing correspondent from 2004 to 2009. She holds an M.A. from The Johns Hopkins University, Paul H. Nitze School of Advanced International Studies (SAIS) and a B.A. from Sophia University in Tokyo, Japan.

¹ For history on the North Korean nuclear crisis and the signing for the Agreed Framework, see, for example, Wit, Joel S., Daniel B. Poneman, and Robert L. Gallucci. *Going Critical: The First North Korean Nuclear Crisis*. Washington, D.C: Brookings Institution Press. 2004.

² Korean Peninsula Energy Development Organization (KEDO). “Agreed Framework.” Accessed July 18. <http://www.kedo.org/pdfs/AgreedFramework.pdf>

³ Wit, Poneman and Gallucci, “Going Critical,” 54.

⁴ American Ambassador Thomas Hubbard says he was the first to come up with the idea in a meeting then U.S. Ambassador to South Korea James Laney and Robert Gallucci, chief U.S. negotiator for North Korea, in Charles Kartman, Robert Carlin and Joel Wit, “A History of KEDO 1994-2006,” Center for International Security and Cooperation Stanford University (June 2012) 15. Accessed on July 18, 2017. https://cisac.fsi.stanford.edu/sites/default/files/A_History_of_KEDO-1.pdf

⁵ Kartman, Carlin and Wit, “A History of KEDO,” 11.

⁶ Kartman, Carlin and Wit, “A History of KEDO,” 80.

⁷ KEDO. “Agreement on the Establishment of the Korean Peninsula Energy Development Organization.” Accessed on July 18, 2017. <http://www.kedo.org/pdfs/EstablishmentKEDO.pdf>

⁸ KEDO. “Member Nations.” Accessed on July 18, 2017. http://www.kedo.org/au_members.asp

⁹ Kartman, Carlin and Wit, “A History of KEDO,” 15-17.

¹⁰ Wit, Poneman and Gallucci, “Going Critical,” 343.

¹¹ Kartman, Carlin and Wit, “A History of KEDO,” 53.

¹² Kim, Samuel S. “The Changing Role of China on the Korean Peninsula.” *International Journal of Korean Studies* (Fall/Winter 2004): 83.

¹³ For example, the United Arab Emirates accepted a bid in 2009 by a consortium of South Korean and American companies for a \$20.4 million contract to build four nuclear reactors in the country. The reactors are due for completion in 2020. World Nuclear Association. “Nuclear Power in the United Arab Emirates.” (Updated May 2017). <http://world-nuclear.org/information-library/country-profiles/countries-t-z/united-arab-emirates.aspx>

¹⁴ For example, the former Soviet Republics of Belarus, Kazakhstan Ukraine, and more recently Iran and Libya, gave up or imposed limits on their nuclear weapons programs in exchange for economic incentives and/or improved relations with the West. For the former Soviet Republics, see Christoph Bluth, *The Nuclear Challenge: U.S.-Russian Strategic Relations after the Cold War* (Aldershot, U.K.: Ashgate, 2000).

¹⁵ Choi, Crom and Mulligan, “KEDO’s LWR Project,” 1075.

¹⁶ Wit, “Viewpoint: The Korean Peninsula Energy Development Organization: Achievements and Challenges,” *The Nonproliferation Review* (Winter 2009), 62-63.

¹⁷ KEDO. “Agreed Framework.”

¹⁸ KEDO. “Agreements and Protocols.” Accessed on July 18, 2017. http://www.kedo.org/ap_main.asp

¹⁹ KEDO. “Protocol between the Korean Peninsula Energy Development Organization and the Government of the Democratic People’s Republic of Korea on the Judicial Status, Privileges and Immunities and Consular Protection of KEDO in the Democratic People’s Republic of Korea.” Accessed on July 18, 2017. <http://www.kedo.org/pdfs/ProtocolPrivImmun.pdf>

²⁰ KEDO. “Protocol between the Korean Peninsula Energy Development Organization and the Government of the Democratic People’s Republic of Korea on Transportation for the Implementation of the Light-Water Project” and Lucy F. Reed. “Political Dissonance and Personal Harmony: Negotiating with North Korea and Iran.” *Proceedings* 105 (2011): 111–21.

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²² Kartman, Carlin and Wit, “A History of KEDO,” 73-74.

²³ Kerr, Paul. “KEDO Pours Concrete for North Korean Nuclear Reactor,” Arms Control Association. (September 2002) Accessed on July 18, 2017. https://www.armscontrol.org/act/2002_09/kedo_sept02

²⁴ International Atomic Energy Agency, Implementation of the Agreement between the Agency and the Democratic People’s Republic of Korea for the Application of Safeguards in Connection with the Treaty

on the Non-Proliferation of Nuclear Weapons,“ Accessed on September 4, 2017.

<https://www.iaea.org/About/Policy/GC/GC41/Documents/gc41-17.html>

²⁵ KEDO. “Agreed Framework.”

²⁶ Choi, Crom and Mulligan, “KEDO’s LWR Project,” 1074.

²⁷ KEDO. “Agreed Framework.”

²⁸ Comments by Japanese Ambassador Terusuka Terada in Kartman, Carlin and Wit, “A History of KEDO,” 67.

²⁹ United States. Congress. Senate. Committee on Foreign Relations. *North Korea Nuclear Agreement : Hearings before the Committee on Foreign Relations, United States Senate, One Hundred Fourth Congress, First Session, January 24 and 25, 1995*. S. Hrg. ; 104-125; United States. 104-125. Congress. Senate. S. Hrg. ; Washington : U.S. G.P.O. ;, 1995. <http://hdl.loc.gov/loc.law/lcconghear.00034039914>, 37,

³⁰ Kartman, Carlin and Wit, “A History of KEDO,” 61.

³¹ Ibid.

³² Author’s interview with former Secretary of State William Perry on June 13, 2017. Secretary Perry said he used the multilateral cooperation as part of his explanation to obtain funds for the HFO, although there was no way to measure whether that helped obtain them.

³³ Wit, Poneman and Gallucci, “Going Critical,” 347-348.

³⁴ Ibid, 348-349.

³⁵ Interview with KEDO’s former special advisor Aloysius O’Neill on June 26, 2017.

³⁶ Wit, “Viewpoint,” 62.

³⁷ Wit, Poneman, Gallucci, “Going Critical,” 360-368.

³⁸ Wit, “Viewpoint,” 62.

³⁹ Choi, Crom and Mulligan, “KEDO’s LWR Project,” 1071.

⁴⁰ The Stanley Foundation. “What Did We Learn from KEDO?” September 2006.

<http://www.stanleyfoundation.org/publications/pdb/KEDO07pdb.pdf>

⁴¹ Kartman, Carlin and Wit, “A History of KEDO,” 102.

⁴² Ibid. 43.

⁴³ Ibid. 108-109.

⁴⁴ Ibid.

⁴⁵ Kartman, Carlin and Wit, “A History of KEDO,” 24-26.

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Ibid, 74.

⁴⁹ Ibid, 75.

⁵⁰ Ibid.

⁵¹ Interview with Aloysius O’Neill on June 26, 2017.

⁵² Kartman, Carlin and Wit, “A History of KEDO,” 36.

⁵³ Ibid.

⁵⁴ Choi, Crom and Mulligan, “KEDO’s LWR Project,” 1075.

⁵⁵ Wit, “Viewpoint,” 69.

⁵⁶ Kartman, Carlin and Wit, “A History of KEDO,” 96-105.