



Analysis

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Kazakhstan's Developing Non-Proliferation Goals, Opportunities, and Challenges

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Introduction

Kazakhstan has an admirable record of supporting nuclear and other nonproliferation initiatives. Upon gaining independence, Kazakhstan rapidly eliminated all the nuclear weapons and related infrastructure the new country inherited from the Soviet Union and joined the Nuclear Non-Proliferation Treaty (N.P.T.) as a non-nuclear weapons state. In 1991, the government closed the Soviet nuclear test site at Semipalatinsk, where the Soviet military had conducted almost 500 nuclear tests. The Soviet Union's collapse left more than 1,000 ballistic missiles and some 1,400 nuclear warheads on the territory of newly independent Kazakhstan. Working closely with Russia and the United States, Kazakhstan rapidly eliminated its nuclear arsenal and removed large amounts of fissile material to the United States. Kazakhstan has ratified the Comprehensive Nuclear Test Ban Treaty (C.T.B.T.) and has recently served as co-president with Japan of the Ninth Article XIV C.T.B.T. Conference. It also helped lead efforts to establish the Treaty on the Nuclear Weapon Free Zone in Central Asia, signed in 2006, symbolically in Semipalatinsk. Kazakhstan has contributed to chemical and biological nonproliferation efforts. Since then, Kazakhstan has supported many other non-proliferation initiatives, including a promising new nuclear fuel bank facility. In 2015, Kazakhstan signed an agreement with the International Atomic Energy Agency (I.A.E.A.) to host the Agency's Low-Enriched Uranium (L.E.U.) Bank. Due to operate from 2017 onward with uranium mined in Kazakhstan, the bank will supply L.E.U.—the basic ingredient for fabrication of nuclear fuel—to countries that develop civilian nuclear energy while meeting all non-proliferation requirements. The coming years should see greater Kazakh contributions to countering nuclear proliferation and enhancing nuclear security and safety.

Partnerships

Kazakhstan has constructed a robust network of W.M.D. partnerships in pursuit of its disarmament and nonproliferation goals. At the most recent nuclear security summit, for example, the leaders the United

States, Britain, and more than a dozen other governments affirmed that, “Kazakhstan has an exemplary record of contributing to nuclear nonproliferation and international peace.”¹

Kazakhstan has partnered with the I.A.E.A. to strengthen its national radiation protection infrastructure, especially for environmental monitoring.² The Kazakh government has negotiated a Comprehensive Safeguards Agreement with the I.A.E.A. This basic agreement, which came into force in 1994, permits the agency to monitor the country’s nuclear facilities. In addition, Kazakhstan has signed the I.A.E.A. Additional Protocol, which went into effect in 2007. It grants I.A.E.A. personnel the right to monitor a wider range of facilities and locations for possible nuclear activities than the standard safeguard agreement, which addresses only declared nuclear sites. Kazakhstan ratified the I.A.E.A.-sponsored 2005 Amendment to the Convention on the Physical Protection of Nuclear Material (C.P.P.N.M.).

Kazakhstan has become the world’s largest producer and exporter of natural uranium. Some 12 percent of the world’s uranium resources are located on its territory. Kazakhstan produced 41 percent of the world’s uranium in 2014. In addition to mining and exporting natural uranium, the country manufactures nuclear fuel pellets and the national nuclear corporation, KazAtomProm, wants to export more value-added products in the future, such as L.E.U. (3.5 percent enriched) reactor fuel, as well as re-launch the country’s domestic nuclear energy program.³

Nuclear nonproliferation has been a cornerstone of Kazakhstan’s partnership with the United States, which has provided Kazakhstan with financial and technical assistance to eliminate its nuclear warheads, weapons-grade fissile material, and supporting infrastructure. Soon after independence, through “Project Sapphire,” Kazakhstan and the United States cooperated to transfer more than 500 kilograms of highly enriched uranium (H.E.U.), stored in insecure conditions at the Soviet-built Ulba Metallurgical Plant in Ust-Kamenogorsk, at the eastern end of the country, to more secure storage at Oak Ridge, Tennessee.⁴ The United States agreed to purchase Kazakhstan’s nuclear material in exchange for some aid.⁵ In 2001, Kazakhstan partnered with the U.S.-based Nuclear Threat Initiative (N.T.I.) to implement a pilot project to downblend almost 3,000 kilograms of H.E.U. to L.E.U., rendering it not directly usable in nuclear weapons and providing a model for future projects, including a 2006 downblending project with the U.S. Department of Energy.⁶

¹ Joint Statement by the Leaders of Canada, China, Czech Republic, Finland, France, Germany, Hungary, Japan, Jordan, Kazakhstan, Norway, Philippines, South Korea, Spain, Sweden, UAE, UK and USA on the Low Enriched Uranium Bank in Kazakhstan, April 1, 2016, http://www.akorda.kz/en/events/international_community/foreign_visits/joint-statement-by-the-leaders-of-canada-china-czech-republic-finland-france-germany-hungary-japan-jordan-kazakhstan-norway-philippines-sout

² “Working to ensure nuclear security and promote global nuclear nonproliferation,” *Astana Times*, March 12, 2014, <http://www.astanatimes.com/2014/03/working-ensure-nuclear-security-promote-global-nuclear-nonproliferation/>.

³ “Uranium and Nuclear Power in Kazakhstan,” World Nuclear Association, January 2016, <http://www.world-nuclear.org/information-library/country-profiles/countries-g-n/kazakhstan.aspx>

⁴ John A. Tirpak, “Project Sapphire,” *Air Force Magazine*, August 16, 2008, <http://www.airforcemag.com/MagazineArchive/Pages/1995/August%201995/0895sapphire.aspx>

⁵ Michael R. Gordon, “Months of Delicate Talks in Kazakhstan Atom Deal,” *The New York Times*, November 24, 1994, <http://www.nytimes.com/1994/11/24/world/months-of-delicate-talks-in-kazakhstan-atom-deal.html>

⁶ “Working to Ensure Nuclear Security and Promote Global Nuclear Nonproliferation,” *Astana Times*, March 12, 2014, <http://www.astanatimes.com/2014/03/working-ensure-nuclear-security-promote-global-nuclear-nonproliferation/>

Nuclear cooperation has continued under the Obama administration. The Second Line of Defense Program, sponsored by the U.S. Department of Energy (D.O.E.) and its National Nuclear Security Administration (N.N.S.A.), has partnered with Kazakhstan's Customs Control Committee since 2006 to bolster nuclear security efforts at airports, border crossings, and ports. Kazakhstan is also partnering with the D.O.E. and N.N.S.A. to implement effective response measures in case of a nuclear or radiological accident or attack. The D.O.E. is helping Kazakhstan establish a Material Protection, Control, and Accountability training center at the Institute of Nuclear Physics near Almaty.⁷ The D.O.E. and the I.A.E.A. are also funding a project to help KazAtomProm better account for and control its raw uranium.⁸

In May 2009, Kazakhstan partnered with the United States and Russia to transfer additional dangerous nuclear material to a more secure location. Together with the I.A.E.A., they transported almost 74 kilograms of H.E.U., sufficient to construct several nuclear weapons, located in Kazakhstan to Russia.⁹ In 2010, Kazakhstan and the United States completed closing Kazakhstan's BN-350 reactor in Aktau, securing the weapons-grade spent fuel it had produced (with sufficient separated plutonium to manufacture 775 nuclear weapons), and then transported the spent fuel more than 3,000 kilometers to secure storage sites in eastern Kazakhstan.¹⁰ On December 1, 2011, the Kazakhstan Ministry of Industry and New Technologies and the N.N.S.A. signed a cooperation agreement in the field of nonproliferation, nuclear security, and radiation safety.¹¹ Through this agreement, the two governments are collaborating to bolster security at Kazakhstan's nuclear material facilities. For example, U.S. trainers are helping Kazakhstan strengthen its State System of Accounting and Control. In 2012, Kazakhstan joined with Russia and the United States to secure more than a dozen bombs worth of weapons-grade plutonium from its Degelen Mountain.¹² The D.O.E. and N.N.S.A. conducted a joint exercise with several Kazakh agencies in 2013 to train first responders.¹³ Two Kazakh institutes, the Institute of Nuclear Physics and the Institute of Atomic Energy, are cooperating with Russia and the United States to convert Kazakhstan's three remaining reactors from H.E.U. to L.E.U. fuel. The remaining H.E.U. at these three facilities—85kg in total—will be shipped to Russia for disposal.¹⁴ The United States has also assisted

⁷ "Country Reports on Terrorism 2010," U.S. Department of State, last modified August 18, 2011, <http://www.state.gov/j/ct/rls/crt/2010/index.htm>

⁸ "Fact Sheet: U.S.-Kazakhstan Cooperative Activities on Nuclear Security," The White House, March 2, 2014, <http://www.whitehouse.gov/the-press-office/2014/03/25/fact-sheet-us-kazakhstan-cooperative-activities-nuclear-security>.

⁹ "N.N.S.A. Announces Removal of More than 73 Kilograms of Highly Enriched Uranium from Kazakhstan," National Nuclear Security Administration, May 19, 2009, <http://www.nnsa.energy.gov/mediaroom/pressreleases/05.19.09>

¹⁰ Robert O. Blake, Jr. Assistant Secretary, Bureau of South and Central Asian Affairs, "Testimony before the House Foreign Affairs Committee, Subcommittee on Europe and Eurasia", U.S. Department of State, March 10, 2011, <http://www.state.gov/p/sca/rls/rmks/2011/158199.htm>

¹¹ "Kazakhstan and U.S. Expand Nuclear Security Cooperation," Nuclear Threat Initiative, April 26, 2012, <http://www.nti.org/analysis/articles/kazakhstan-and-us-expand-nuclear-security-cooperation/>

¹² "2014 Nuclear Security Summit Q&A, Graham Allison and Gary Samore Discuss Summit Significance and Goals," Belfer Center for Science and International Affairs, Harvard Kennedy School, March 20, 2014, [http://belfercenter.ksg.harvard.edu/publication/24027/2014_nuclear_security_summit_qa.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%253A+belfer%252Fasia+\(Belfer+Center+for+Science+and+International+Affairs+-+Asia\)](http://belfercenter.ksg.harvard.edu/publication/24027/2014_nuclear_security_summit_qa.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%253A+belfer%252Fasia+(Belfer+Center+for+Science+and+International+Affairs+-+Asia))

¹³ "Fact Sheet: U.S. - Kazakhstan Cooperative Activities in Nuclear Security," The White House, March 25, 2014, <http://www.whitehouse.gov/the-press-office/2014/03/25/fact-sheet-us-kazakhstan-cooperative-activities-nuclear-security>

¹⁴ *Ibid.*

Kazakhstan in transporting ten metric tons of H.E.U. and three metric tons of plutonium from Kazakhstan's BN-350 facility to a secure facility in northeastern Kazakhstan.¹⁵

On October 3, 2012, Secretary of State Hillary Clinton praised what she described as Kazakhstan's role as a global leader and Washington's strategic partner in nuclear non-proliferation, disarmament and security.¹⁶ At the 2014 Nuclear Security Summit, the two countries confirmed their shared commitment to nuclear security. In a joint statement, presidents Barack Obama and Nursultan Nazarbayev stated that their two governments would continue to collaborate on securing the former Semipalatinsk test site; preventing illicit trafficking of nuclear and radiological materials; converting Kazakhstan's remaining H.E.U. reactors to L.E.U. fuel; supporting Kazakhstan's bid to host the I.A.E.A. L.E.U. Bank; establishing a Regional Nuclear Security Center; and strengthening Kazakhstan's nuclear emergency response capabilities.¹⁷ The United States is also partnering with Kazakhstan to build a Nuclear Security Training Center that would improve the country with the ability to secure and safeguard its nuclear facilities. The Center will offer a curriculum that will train participants in countering nuclear smuggling and other nuclear security measures.¹⁸

Enhancing Nuclear Security

Complementing its cooperation with the I.A.E.A. and the United States, Kazakhstan has joined the most important international export control regimes working to decrease the risks that transferred items could be misused for making nuclear weapons or their means of delivery. These include the Nuclear Suppliers Group, the Zangger Committee, the Proliferation Security Initiative, and The Hague Code of Conduct against Ballistic Missile Proliferation. Kazakhstan is seeking to join the Missile Technology Control Regime, the Wassenaar Arrangement, and the Australia Group.¹⁹ These export control bodies seek to monitor the transfer of conventional military and dual-use technologies that have military as well as civilian applications. Kazakhstan's export control lists already includes almost all the items covered by these organizations, but the country wants the status and influence that would come with full membership in these bodies.²⁰

Kazakhstan has played a prominent role in the global efforts to prevent nuclear terrorism. The country remains on the front line against nuclear smuggling. On April 23, 2014, the Karaganda regional court sentenced four individuals in the country's nuclear industry to prison after they were found guilty of illegal possession and distribution of radioactive materials. They allegedly participated in a nuclear

¹⁵ *Ibid.*

¹⁶ "Hillary Clinton Thanked Kazakhstan for Working With I.A.E.A. on Creation of Nuclear Fuel Bank," *Tengri News*, October 8, 2012, http://en.tengrinews.kz/politics_sub/Hillary-Clinton-thanked-Kazakhstan-for-working-with-I.A.E.A.-on-creation-of-nuclear-13518/.

¹⁷ "Joint Statement by President Obama and President Nazarbayev of Kazakhstan on Cooperation in the Sphere of Nonproliferation and Strengthening Nuclear Security," State Department's Bureau of International Information Program, March 25, 2014, <http://iipdigital.usembassy.gov/st/english/texttrans/2014/03/20140325296847.html#axzz2xeGEDztk>

¹⁸ "Fact Sheet: U.S. – Kazakhstan Cooperative Activities in Nuclear Security." The White House, last modified March 2, 2014, <http://www.whitehouse.gov/the-press-office/2014/03/25/fact-sheet-us-kazakhstan-cooperative-activities-nuclear-security>

¹⁹ "Security Council Statement Reaffirms Concern over Weapons of Mass Destruction as It Marks 10 Years since Adopting Landmark Non-proliferation Text," United Nations, last modified May 7, 2014, <http://www.un.org/News/Press/docs/2014/sc11382.doc.htm>

²⁰ Interview with Kazakh official, February 2012.

trafficking ring that attempted to sell cesium-137—a radioactive element that is formed through nuclear fission of uranium-235 and other fissionable isotopes. It is used in the medical field, but terrorists can place it inside a bomb, creating a radiological dispersal device. If detonated in a populated area, they could cause mass panic and economic losses. Countering ‘dirty bombs’ was a major theme at this March’s Nuclear Security Summit in The Hague. One of the defendants stole the cesium container in 1991 from the Zhezhgan mining factory and kept it concealed for years at his workplace, but in June 2013 he transferred the cesium to three unemployed people in the area and asked them to help sell it.²¹ Fortunately, the National Security Committee learned of the network and had one of its agents pretend to buy the material for \$250,000. The Committee then arrested the four would-be traffickers.²²

The staff of the Nuclear Threat Initiative, with input from a panel of outside experts, have developed a Nuclear Materials Security Index to measure the risks of the potential theft of weapons-usable nuclear materials—highly enriched uranium, separated plutonium, and plutonium in fresh mixed oxide fuel. According to the most recent (2016) edition, the Index ranks Kazakhstan with a perfect score regarding its Control and Accounting Procedures; International Legal Commitments; Voluntary Commitments; Domestic Commitments and Capacity; Domestic Nuclear Materials Security Legislation; Safeguards Adherence and Compliance; and the nature of its Independent Regulatory Agency. The country scores near the global average regarding its Security and Control Measures; Insider Threat Prevention; Physical Security During Transport; International Assurances; Domestic Commitments and Capacity; UNSCR 1540 Implementation; Political Stability; and presence of Group(s) Interested in Illicitly Acquiring Materials. Finally, Kazakhstan ranks below average concerning only its large Quantities of Nuclear Materials, Cybersecurity, Effective Governance, and Pervasiveness of Corruption.²³

The Nuclear Security Summits

Kazakhstan has participated in the biannual nuclear security summits, whose goals include promoting the safe use of nuclear energy, augmenting the I.A.E.A.’s role and authority in nuclear safety and security, adopting stronger measures to secure radiological sources that terrorists can use in “dirty bombs,” and encouraging commercial nuclear power producers to stop using highly enriched uranium.

A highpoint of the 2012 summit in Seoul was the Kazakh-Russian-U.S. initiative to enhance the security of the former Semipalatinsk nuclear test site. Although the site was closed in 1991, scavengers were collecting some of the radioactive materials at the site. The secret trilateral effort to clean and secure the site was launched in 2004 and was completed in 2012. The announcement was a major element in the effort, supported by the United States and other countries, to showcase Kazakhstan as a model non-proliferation actor whose policies should be followed by Iran and other countries with nuclear-related

²¹ “Mining Engineer Caught In The Attempt To Sell Radioactive Cesium,” *Interfax-Kazakhstan*, accessed March 28, 2016, http://www.interfax.kz/?lang=eng&int_id=expert_opinions&news_id=6564

²² “Kazakh Court Sentences Four to Jail for Attempted Cesium Sale,” the Nuclear Threat Initiative, last modified April 23, 2014, <http://www.nti.org/gsn/article/kazakhstan-court-sentences-men-attempted-cesium-sale/?mgs1=41bffCqz6Y>

²³ The Nuclear Threat Initiative, *The 2016 N.T.I. Nuclear Security Index: Theft and Sabotage* (Washington: the Nuclear Threat Initiative, 2016), p. 79, March 28, 2016, http://ntiindex.org/wp-content/uploads/2016/03/N.T.I._2016-Index_022516.pdf

production capabilities. At the summit, President Obama praised “the outstanding leadership of President Nazarbayev and the people of Kazakhstan” for their contributions to global nuclear materials security.²⁴

At the 2014 summit at The Hague, Nazarbayev called for a variety of measures to strengthen nuclear security: strengthening the authority and the role of the I.A.E.A.; increasing nuclear transparency; bolstering negative security guarantees; legally binding nuclear safety standards; adopting uniform measures for rapidly responding to nuclear accidents; and, eventually, complete nuclear disarmament.²⁵ Of the 53 states participating at the 2014 summit, 33 countries, including Kazakhstan, pledged enhanced cooperation on nuclear security through such means as submitting themselves to periodic peer reviews of their nuclear security procedures.²⁶ In his summit speech, Nazarbayev proposed creating an international office at the United Nations to monitor how the five nuclear weapons states fulfill their security guarantees to countries that abandon nuclear weapons and join regional nuclear-weapons-free zones.²⁷ Nazarbayev also warned against Ukrainian politicians who want to restore their country’s nuclear weapons status, calling them “irresponsible.”²⁸

From March 30 to April 1, 2016, Nazarbayev joined other world leaders in Washington for the fourth and likely final Nuclear Security Summit. The delegates studied how to further fortify the world against nuclear terrorism. In addition to contributing to all the main summit achievements, the governments of Kazakhstan and the United States “confirmed a shared commitment to implementing practical measures to strengthen the nuclear nonproliferation regime and enhance nuclear security” even beyond the summit.²⁹

During the summit, U.S. leaders paid tribute to Kazakhstan’s record on de-nuclearization. Indeed, nuclear disarmament and nonproliferation have been cornerstones of Kazakhstan’s partnership with Washington since independence.

Managing Regional Non-Proliferation Challenges

Kazakhstan contributed to the successful outcome of the torturous negotiations between Iran and the five members of the P5+1—the United States, Russia, China, France, Britain, and Germany. Almaty hosted several rounds of talks between Iran and the P5+1 group, and Kazakhstan’s leaders regularly urged the

²⁴ “2012 News Bulletin No.14,” April 2, 2012, Embassy of the Republic of Kazakhstan, http://www.kazakhembus.com/archived_article/2012-news-bulletin-no-14 (accessible, but cannot find object)

²⁵ Nursultan Nazarbayev, “Prepared Extended Remarks by President of the Republic of Kazakhstan Nursultan Nazarbayev at the first plenary session of the Nuclear Security Summit,” March 24, 2014, The Hague, The Netherlands.

²⁶ “Two Thirds NSS Countries: From Guidelines to Law,” 2014 Nuclear Security Summit, last modified March 25, 2014, <https://www.nss2014.com/en/news/two-thirds-nss-countries-from-guidelines-to-law>

²⁷ “Remarks by President of the Republic of Kazakhstan Nursultan Nazarbayev At the first plenary session of the Nuclear Security Summit The Hague, the Netherlands,” Embassy of the Republic of Kazakhstan to Canada, March 24, 2014, <http://kazembassy.ca/news-and-events/remarks-by-president-of-of-kazakhstan-nursultan-nazarbayev/>

²⁸ *Ibid.*

²⁹ “Joint Announcement of the United States and Republic of Kazakhstan Cooperation in the Sphere of Nonproliferation and Nuclear Security,” Office of the White House, March 31, 2016, <https://www.whitehouse.gov/the-press-office/2016/03/31/joint-announcement-united-states-and-republic-kazakhstan-cooperation>.

parties to resolve their differences through peaceful negotiations. They do not object to Iran's pursuing an internationally monitored civil nuclear energy program, as permitted under the N.P.T. Nevertheless, they oppose any Iranian effort to acquire nuclear weapons. In November 2011, Nazarbayev cited I.A.E.A. concerns about some hidden dimensions to Iran's nuclear program to argue, "That's why it is necessary to continue negotiations and request Iran to let the I.A.E.A. inspectors see all the facilities, so that they can prove to the whole world that Iran is indeed working peacefully."³⁰ The Kazakhs also encouraged Iran to follow Kazakhstan's model of complete abstention from nuclear weapons activities. In March 2012, Nazarbayev published an op-ed in *The New York Times* on "What Iran Can Learn From Kazakhstan." Recalling how Kazakhstan has prospered since renouncing the nuclear weapons capabilities it inherited from the Soviet Union, the author wrote that, "Kazakhstan has used its close diplomatic relations with our neighbor across the Caspian Sea to urge Tehran to learn from our example."³¹

Kazakhstan has regularly denounced the tests of nuclear weapons and long-range ballistic missiles by North Korea and urged Pyongyang to rejoin the Six-Party Talks seeking to eliminate all nuclear weapons in North Korea in return for security, economic, and other benefits. For example, after North Korea conducted its fourth nuclear weapons test on January 6, 2016, Kazakhstan's foreign ministry immediately issued a statement strongly condemning the test, adding that the Pyongyang's "actions seriously undermined the international community's efforts along the path of nuclear disarmament and strengthening the non-proliferation regime and global security in general."³² In 2014, South Korean President Geun-Hye Park echoed the sentiments of other leaders and said that North Korea should follow Kazakhstan's example in pursuing economic development rather than nuclear weapons.³³

The Nuclear Fuel Bank

Kazakhstan is the world's biggest producer and exporter of natural uranium, giving it a major role in the global nuclear energy sector. But Kazakhstan wants to use its uranium wealth to support global fuel supply mechanisms that promote the safe and secure use of nuclear energy.

Toward this end, in 2015, Kazakhstan signed an agreement with the I.A.E.A. to host the Agency's Low-Enriched Uranium (L.E.U.) Reserve in Kazakhstan. This step follows the country's joining Armenia, Russia, and Ukraine in establishing the world's first international Uranium Enrichment Center, intended to supply guaranteed uranium enrichment services for country's pursuing civilian nuclear energy programs.

³⁰ "Kazakhstan President Against Military Actions Towards Iran," *Tengri News*, November 21, 2011, http://en.tengrinews.kz/politics_sub/Kazakhstan-President-against-military-actions-towards-Iran-5729/

³¹ Nursultan Nazarbayev, "What Iran Can Learn From Kazakhstan," *The New York Times*, March 25, 2012, http://www.nytimes.com/2012/03/26/opinion/what-iran-can-learn-from-kazakhstan.html?_r=0

³² "Astana Condemns North Korea's Nuclear Test," *Astana Times*, January 13, 2016, <http://astanatimes.com/2016/01/astana-condemns-north-koreas-nuclear-test/>

³³ "President Park urges North Korea to take lesson from Kazakhstan's nuclear arms hand-over," *Arirang News*, June 19, 2014, http://www.arirang.co.kr/News/News_View.asp?nseq=164162

This repository would provide L.E.U. fuel from an I.A.E.A.-owned and controlled stockpile to countries pursuing peaceful nuclear energy programs without the economic and environmental costs of manufacturing their own nuclear fuel through uranium enrichment, which can be misused to make nuclear weapons. Distinguishing between peaceful and military nuclear weapons programs is a perennial challenge for the international community, since the pursuit of the same capabilities contribute to both goals. Proponents of a fuel bank had originally hoped it might provide Iran with a substitute to having its own enrichment facilities. Although this is no longer considered likely, the bank might still divert other states from such an expensive and proliferation-risky path.

Kazakhstan's Minister of Energy signed the agreement on April 27, 2015, regarding agreed definitions, mutual rights and obligations, financial issues, tax exemption, and other conditions.³⁴ On June 11, the I.A.E.A. Board of Governors approved the agreement to establish a reserve of up to 90 tons of L.E.U. at the Ulba plant in the city of Oskemen as well as a related nuclear fuel transit agreement through Russian territory. The reserve is scheduled to start operations in 2017 and will be owned and held by the I.A.E.A., which will also prescribe safety standards, protocols and regulations.³⁵

The L.E.U. bank is intended to be a resource of last resort for interested parties, to be utilized in the event of major supply disruption or significant non-access to the commercial market, in order to assure both reliability and predictability, and is not supposed to interfere with existing, state-to-state transactions for nuclear fuel and energy products.³⁶ The facility will hold a maximum reserve capacity of 90 metric tons of L.E.U., a total the I.A.E.A. says is sufficient to provide power to a major city for up to three years.³⁷

Astana will assume responsibility for the daily operating costs of the plant, while the I.A.E.A. will pay for the purchase and delivery of all associated equipment, technical resources, and uranium stockpiles.³⁸ Reflecting the international flavor of its ownership body, the nuclear fuel bank is to be funded by voluntary donations separate from the regular I.A.E.A. budget. The I.A.E.A. has lined up \$150 million in contributions from several parties, enough to keep the bank in operation for at least a decade.³⁹ The U.S.-based Nuclear Threat Initiative funded one-third of the \$150-million I.A.E.A. fuel bank. Another third came from the U.S. government, while the European Union, Kuwait, the United Arab Emirates, Norway and Kazakhstan contributed as well.⁴⁰

³⁴ "Kazakhstan signs I.A.E.A. 'fuel bank' agreement," World Nuclear News, May 15, 2015, <http://www.world-nuclear-news.org/UF-Kazakhstan-signs-I.A.E.A.-fuel-bank-agreement-14051502.html>; and "I.A.E.A. approves 'fuel bank' agreements," World Nuclear News, June 12, 2015, <http://www.world-nuclear-news.org/UF-I.A.E.A.-approves-fuel-bank-agreements-1206157.html>

³⁵ Alexander Nitzsche, "I.A.E.A. Moves Ahead on Establishing Low Enriched Uranium Bank in Kazakhstan," *International Atomic Energy Agency*, June 11, 2015, <https://www.iaea.org/newscenter/news/iaea-moves-ahead-establishing-low-enriched-uranium-bank-kazakhstan>

³⁶ Our Work, "The I.A.E.A. L.E.U. Bank," *I.A.E.A. News*, March 10, 2016, <https://www.iaea.org/ourwork>

³⁷ Alexander Nitzsche, "I.A.E.A. Moves Ahead on Establishing Low Enriched Uranium Bank in Kazakhstan," *International Atomic Energy Agency*, June 11, 2015, <https://www.iaea.org/newscenter/news/iaea-moves-ahead-establishing-low-enriched-uranium-bank-kazakhstan>

³⁸ Catherine Putz, "Kazakhstan Banks on Nuclear Power," *The Diplomat*, June 3, 2015, <http://thediplomat.com/2015/06/kazakhstan-banks-on-nuclear-power/>

³⁹ Alexander Nitzsche, "I.A.E.A. Moves Ahead on Establishing Low Enriched Uranium Bank in Kazakhstan," *International Atomic Energy Agency*, last modified June 11, 2015, <https://www.iaea.org/newscenter/news/iaea-moves-ahead-establishing-low-enriched-uranium-bank-kazakhstan>

⁴⁰ Miklos Gaspar, "I.A.E.A. and Kazakhstan Sign Agreement to Establish Low Enriched Uranium Bank," I.A.E.A., August 27, 2015, <https://www.iaea.org/newscenter/news/iaea-and-kazakhstan-sign-agreement-establish-low-enriched-uranium-bank>

Kazakhstan is a prime location for a nuclear fuel bank given its long history with nuclear power; its secure geographic location; its adherence to virtually all major, relevant international non-proliferation treaties, protocols, and agreements; and its large uranium deposits and exports. Kazakhstan has long pursued a balanced and non-confrontational foreign policy that tries to engage the United States, Russia, China, the European Union, and other countries active in Central Asia.

Opposing Biological and Chemical Weapons

The Soviet Union researched biological and chemical weapons using production and testing facilities on Kazakhstan's territory. The main facilities for biological weapons research included the Vozrozhdeniye Island Open-Air Test Site in the Aral Sea (half of which is located on the territory of Uzbekistan), the Scientific Experimental and Production Base in Stepnogorsk (then the world's largest anthrax production and weaponization facility), the Scientific Research Agricultural Institute in Gvardeyskiy, and the Anti-Plague Scientific Research Institute in Almaty (since renamed the Kazakhstan Scientific Center for Quarantine and Zoonotic Infections). Diseases tested at these facilities include anthrax, plague, smallpox, botulinum toxin, and Q-fever.⁴¹ The Soviet Union was building a major chemical weapons complex in the city of Pavlodar in northern Kazakhstan. As was usually the case with such plants, the Pavlodar facility was a dual-use facility with its civilian operations serving as a cover for the military production.⁴² The plan was to construct five weapons-related facilities: a plant for phosphorous trichloride (PCl₃) production; a building to make other precursor chemicals; a facility to make lethal chemical agents; a building designed to make weapons; and a laboratory to test these weapons on animals. Many of these facilities were never completed before President Michael Gorbachev ended the Soviet chemical weapons program in 1987.⁴³ A Pavlodar facility did manufacture precursor ("bulk") chemicals for expected use in weapons production—specifically phosphorus trichloride and phosphorus pentasulfide. These are precursors for the production of nerve agents. The Soviet Union was producing a new generation of binary nerve agents (code-name 'Novichok' or "Newcomer") that were many times more potent than common existing nerve agents and harder to detect.

Kazakhstan signed the Chemical Weapons Convention (C.W.C.) in January 1993 and ratified it in March 2000. The government enacted its Law on Export Controls of Weapons, Military Technology, and Dual-Use Goods in June 1996, which was updated in 2000. This legislation provides the legal base for the establishment of export controls on chemical weapons and other weapons-related related material. Following independence, the government worked with Russia, Europe, the United States, and other countries and international institutions to eliminate or secure these materials (e.g., by upgrading safety and security measures) and converting some plants to exclusively non-military use. This conversion proved more difficult than expected due to problems in making them commercially viable

⁴¹ "Kazakhstan Biological Overview," Nuclear Threat Initiative, March 2008, http://www.nti.org/e_research/profiles/Kazakhstan/Biological/index.html.

⁴² "Kazakhstan-Chemical," Nuclear Threat Initiative, February 2013, <http://www.nti.org/country-profiles/kazakhstan/chemical/>.

⁴³ Gulbarshyn Bozeheyeva, "The Pavlodar Chemical Weapons Plant in Kazakhstan: History and Legacy," *The Nonproliferation Review* (Summer 2000), pp. 136-145.

entities in the midst of the meltdown of the country's Soviet-era economy and the protracted transition to a more mixed one.

Furthermore, Kazakhstan acceded to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. During the late 1990s, the governments of Kazakhstan and Uzbekistan permitted U.S. scientists and intelligence experts to survey the vast stocks of biological weapons that the Soviets had buried on Vozrozhdeniye Island.⁴⁴ In January 2008, Kazakhstan allowed a team of U.S. scientists to remove Soviet-era samples of bubonic and pneumonic plague to the U.S. Centers for Disease Control and Prevention in Fort Collins, Colorado. Kazakh and U.S. scientists have undertaken joint research to develop means to prevent and cure these plague strains and other disease threats.⁴⁵ Kazakhstan and the United States jointly constructed a Central Reference Laboratory in Almaty as a research facility for regional diseases such as anthrax, plague, and cholera.⁴⁶

Looking Ahead

Turning to the future, the Kazakhstani-U.S. nonproliferation partnership should now focus on constructing a sustainable nuclear security and arms control architecture, ensuring that Iran and North Korea meet their nonproliferation obligations, and promoting the safe and secure use of nuclear energy in Eurasia and beyond.

Kazakhstani officials and experts argue that the only way to guarantee long-term nuclear security is through comprehensive nuclear disarmament. In the interim, they have called for ending all nuclear weapons testing through universal C.T.B.T. ratification, establishing more nuclear-weapons-free zones, and strengthening security guarantees for countries that renounce nuclear weapons.⁴⁷ They have castigated the nuclear weapons states for not making greater progress in disarmament and for not adequately fulfilling their security assurances to countries like Ukraine and Kazakhstan that eliminated their own arsenals.⁴⁸ Despite Kazakhstan's warm official relations with all the nuclear weapons states, the country's independent ability to secure these objectives is modest given the much greater impact of other factors on national nuclear weapons' decisions.

Kazakhstan's plans to rapidly expand its national nuclear industry could present proliferation challenges. Popular opposition to renewed domestic nuclear energy production persists due to the catastrophic health and environmental consequences inflicted on the local population from activities at the former

⁴⁴ Judith Miller, "Poison Island," *New York Times*, June 2, 1999, <http://query.nytimes.com/gst/fullpage.html?res=9507E1D81030F931A35755C0A96F958260>.

⁴⁵ Office of Senator Richard G. Lugar, "Lugar Offers Repeal of Jackson-Vanik for Kazakhstan," Press Release, January 29, 2008, <http://lugar.senate.gov/press/record.cfm?id=291402>.

⁴⁶ "Pentagon not developing biological weapons in Kazakhstan," *Tengri News*, January 23, 2014, http://en.tengrinews.kz/politics_sub/Pentagon-not-developing-biological-weapons-in-Kazakhstan-25364/

⁴⁷ "Remarks by President of the Republic of Kazakhstan Nursultan Nazarbayev At the first plenary session of the Nuclear Security Summit The Hague, the Netherlands," March 24, 2014, <http://kazembassy.ca/news-and-events/remarks-by-president-of-of-kazakhstan-nursultan-nazarbayev/>

⁴⁸ *Ibid.*

nuclear test site in Semipalatinsk.⁴⁹ The government has adopted the necessary laws and regulations to create a legal framework for nuclear materials security export controls. However, the new parliament and law enforcement authorities need to follow presidential direction and ensure strong application of all measures, including anti-corruption legislation, in the nuclear sector given that ‘insider threats’ typically remain a major problem for all national nuclear security programs.⁵⁰

Earlier problems with senior nuclear industry managers have aroused concerns that corrupt officials might undermine environmental regulations and provide opportunities for criminals or terrorists to acquire nuclear materials or technologies.⁵¹ Although these arrests appear to have resulted from construction kickbacks and related domestic developments, the Kazakh authorities and their international partners will need to guard against the illegal sale of nuclear materials, technology, or other assistance to states of proliferation concern or to terrorist or criminal organizations. The government should review and if necessary augment its safety and security measures and take other steps to reassure people that Kazakhstan’s nuclear energy program will not contribute to nuclear proliferation or accidents. The government and national nuclear industry remain committed to expanding the country’s domestic use of nuclear energy. However, it is possible that the low global demand for nuclear products due to depressed global oil and gas prices, and the resulting decline in the revenue available for national nuclear programs, will slow down the pace of Kazakhstan’s national nuclear development, which would address many of these concerns.

In addition, the United States and other countries can help Kazakhstan strengthen its export controls, anti-corruption, and other insider protection measures, nuclear training and education activities, border and cyber security, physical protection systems, and consequence management capabilities. Kazakhstan’s expanding biological, chemical, and nuclear dual-use capabilities, civilian space launch industry, and conventional arms exports means that it will become increasingly imprudent to exclude the country from export control bodies such as the Missile Technology Control Regime, the Wassenaar Arrangement, and the Australia Group.⁵² Additional support is also needed to address residual safety and security issues at the Semipalatinsk test site; although the tunnels have been sealed, scavenging of radioactive materials continues and the costs of comprehensively restoring the entire region (including the contaminated soil) remain enormous and clearly beyond the means of the local or national authorities. There is some local concern that the E.U., a strong non-proliferation player, is willing to fund studies to identify problems, but not programs to address them.

⁴⁹ Gulnoza Saidazimova, “Kazakhstan: Government Pushing Nuclear Power Despite Public Fears,” *EurasiaNet*, February 25, 2006, <http://www.eurasianet.org/departments/civilsociety/articles/pp022506.shtml>.

⁵⁰ Scott Parish and Tamara Robinson, “Efforts to Strengthen Export Controls and Combat Illicit Trafficking and Brain Drain,” *The Nonproliferation Review* (Spring 2010), pp. 112-124, <http://cns.miis.edu/npr/pdfs/parish71.pdf>.

⁵¹ Bruce Pannier, “Kazakh Atomic Kingpin Suddenly Radioactive,” *RFERL*, May 27, 2009, http://www.rferl.org/content/Kazakh_Atomic_Kingpin_Suddenly_Radioactive/1740290.html

⁵² “Kairat Abdrakhmanov, statement before the UN Security Council SC/11382,” United Nations, May 7, 2014, <http://www.un.org/News/Press/docs/2014/sc11382.doc.html>.

Kazakhstan will also need to revise and probably strengthen its national laws and regulations as the country's biological and chemistry industries continue to develop. If Kazakhstan succeeds in developing biotechnology and nanotechnology, these new capabilities could present even more serious proliferation challenges, since they could be used to create new forms of deadly biotoxins and miniaturized W.M.D. delivery systems. Central Asia has been highly penetrated by narcotics traffickers who convey Afghan-made opium products through several routes that traverse the region as they move illegal drugs to China, Russia, and Europe. These could easily serve as transportation routes for W.M.D. materials. The deterioration in Afghanistan's security could worsen this problem, since neither of the two main multinational security institutions active in Central Asia—the Shanghai Cooperation Organization and the Collective Security Treaty Organization—have made countering W.M.D. trafficking a priority. It is especially important that the national governments and private sector actors developing new scientific and technological industries in these regions receive adequate technical and financial assistance to upgrade their safety and security procedures.

Finally, the pioneering I.A.E.A. fuel bank will need further domestic and international support to succeed. At home, the new government and parliament need to finalize and approve the Kazakh-language version of the agreement. The Ministry of Energy and the I.A.E.A. also need to finalize their plan of action for ensuring the bank's safety and security. For example, it appears they will need to build a new facility at Ulba that can withstand a higher level of seismic shock than the existing structure, which was designed to resist a lower-level earthquake than the possible 7.2 magnitude event that the group of experts think could conceivably occur. The 2011 earthquake-triggered nuclear disaster in Japan is a sound lesson that it is better to be safe than sorry when addressing these risks. Further ahead, Kazakhstan and the international community need to decide whether the facility should engage in more activities besides storing L.E.U. fuel, such as possibly enriching uranium.⁵³

Assertions and opinions in this Commentary are solely those of the above-mentioned author and do not necessarily reflect the views of the Middle East Institute, which expressly does not take positions on Middle East policy.

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⁵³ Interviews with Kazakh officials and experts, Astana, March 2016.