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Prospects for Enhanced U.S.-Saudi Nuclear Energy Cooperation

Overview

U.S. companies have provided proposals to Saudi authorities in relation to a planned tender for nuclear reactor construction in Saudi Arabia. The kingdom’s nuclear energy program remains nascent, and, in recent years, the Saudi government has entered into agreements concerning possible civil nuclear cooperation with several countries (Table 1). In July 2017 the Saudi cabinet approved a National Project for Atomic Energy, including plans to build large and small nuclear reactors for electricity production and desalination amid a larger effort to diversify the Saudi economy and expand the use of renewable energy. Saudi authorities expressed hopes of signing contracts for reactor construction in 2018, but did not do so. Depending on its nature and extent, future U.S.-Saudi nuclear cooperation may require executive branch authorizations and/or congressional approval of bilateral agreements. Saudi plans also are fueling debate in Congress over regional nuclear proliferation and security dynamics.

Saudi Arabia holds 16% of the world’s proven reserves of crude oil, has the world’s fourth-largest reserves of natural gas, and is the largest oil consumer in the Middle East, with oil consumption for electricity generation projected to increase. Oil and natural gas generate 40% and nearly 60% of the kingdom’s electricity, respectively. The Saudi Ministry of Energy, Industry, and Mineral Resources and the King Abdullah City for Atomic and Renewable Energy agency (KA CARE) are considering proposals for the construction of two reactors to generate 2.9 GWe of electricity.

U.S.-Saudi Nuclear Cooperation

In 2008, the United States and Saudi Arabia signed a Memorandum of Understanding (MOU), which stated the countries’ intentions to cooperate on nuclear activities in the fields of medicine, industry, and electricity production. Previous Administrations had explored a civil nuclear energy agreement with Saudi Arabia. U.S.-Saudi negotiations remain open but reportedly have stalled.

U.S. Nuclear Cooperation Requirements

Section 123 of the Atomic Energy Act of 1954, as amended (AEA, 22 U.S.C. 2011 et seq.), requires nuclear cooperation agreements for significant nuclear cooperation with foreign governments. Such cooperation includes the transfer of certain U.S.-origin nuclear material subject to licensing for commercial, medical, and industrial purposes; the export of reactors and critical reactor components; and other commodities under Nuclear Regulatory Commission export licensing authority.

So-called “123 agreements” must include the terms, conditions, duration, nature, and scope of cooperation, as

well as meet several nonproliferation criteria. The President must make a written determination “that the performance of the proposed agreement will promote and will not constitute an unreasonable risk to, the common defense and security.” The AEA requires Congress to review a 123 agreement for two time periods totaling 90 days of continuous session. If the President has not exempted the agreement from any requirements of Section 123(a), it becomes effective at the end of the second period, unless, during that time, Congress adopts a joint resolution disapproving the agreement and the resolution becomes law.

Table 1. Saudi Nuclear Cooperation Developments

March 2015	Argentine-Saudi joint nuclear R&D venture agreed. Saudi-South Korean mutual nuclear cooperation agreements signed, including an MOU on building two small reactors for Saudi water desalination.
June 2015	KA CARE signs a nuclear energy cooperation agreement with state-owned Rosatom of Russia. Agreements signed with France on cooperation, including EPR reactor feasibility studies.
January 2016	Saudi Arabia and China memorandum of understanding signed regarding cooperation in the possible future construction of a high-temperature gas-cooled reactor (HTGR) in the kingdom.
October 2016	Saudi Arabia and Kazakhstan sign a nuclear cooperation agreement focused on nuclear fuel.
March-August 2017	Agreement signed for Chinese-Saudi feasibility study of HTGR construction in Saudi Arabia. China National Nuclear Corporation (CNNC) and the Saudi Geological Survey sign agreements on cooperation on uranium exploration.
December 2017	Russia’s Rosatom and KA CARE sign implementing agreement related to small and medium reactors, personnel and fuel management.
November 2018	KA CARE signs contract with WorleyParsons to provide project management consultancy services for the National Project for Atomic Energy.
January 2019	KA CARE announces it has received reactor bid proposals from entities in the United States, Russia, France, South Korea, and China.
April 2019	Argentina’s IAEA Envoy said “Saudi Arabia will have to move to a full scope comprehensive safeguards agreement with subsidiary arrangements” before an Argentinian-designed research reactor is fueled.
January 2020	Saudi Arabia and South Korea amend pre-project engineering contract for planned small reactors.

Source: Official statements and media reports.

The Department of Energy (DOE) in 2017 expeditiously granted a “Part 810 authorization” (per 10 C.F.R. 810) for U.S. companies to engage in discussions, including marketing, with the Saudi government regarding its civil nuclear program. Section 57(b)(2) of the AEA allows for limited cooperation related to the “development or production of any special nuclear material outside of the United States” if that activity has been authorized by the Secretary of Energy following a determination that it “will not be inimical to the interest of the United States.” A 123 agreement is not necessary for such authorizations, which mostly involve unclassified nuclear technology transfer and services, such as nuclear reactor designs, nuclear facility operational information and training, and nuclear fuel fabrication. Part 810 authorizations are not subject to congressional review. A March 2019 DOE press statement confirmed that the Administration has approved seven 810 authorizations related to Saudi Arabia.

Proliferation, Fuel, and Policy Choices

Analysts have examined Saudi nuclear plans and proposals for decades in light of the kingdom’s economic profile, energy resources, and security dilemmas. Saudi state policy underscores that the kingdom’s nuclear energy pursuits are limited to peaceful purposes, but senior officials, including Crown Prince Mohammed bin Salman, also have stated in 2018 that if Iran pursues or obtains a nuclear weapon, then the kingdom also would work to do so.

The most proliferation-sensitive nuclear technology is the capability to produce fuel for nuclear reactors, by either enriching uranium or reprocessing spent nuclear fuel to obtain plutonium. Both highly enriched uranium and plutonium can be used as fuel in some types of nuclear reactors but also are used as fissile material in nuclear weapons. Consequently, enrichment and reprocessing facilities frequently generate concern that ostensibly peaceful facilities may aid nuclear weapons programs. Conversely, a program without such facilities generally poses little proliferation risk, but may pose security and/or environmental risks. KA CARE is considering low-enriched uranium fuel for reactors in Saudi Arabia.

The 2008 U.S.-Saudi MOU, which is a statement of intent and is not legally binding, described the Saudi government’s intent “to rely on existing international markets for nuclear fuel services as an alternative to the pursuit of enrichment and reprocessing.” However, KA CARE has said that it may use indigenous uranium resources for fuel, and, in September 2019, Saudi Energy Minister Prince Abd al Aziz bin Salman Al Saud said, “even if we scale up [nuclear power] ... we want to go to the full cycle, to producing the uranium, enriching the uranium, using the uranium.” In August 2020, Saudi authorities denied press reports citing unnamed Western officials that claimed Saudi Arabia with China’s help built a facility for milling uranium oxide ore. Such a facility would not violate Saudi Arabia’s nonproliferation commitments but would require declaration. Other press reporting described a separate possible undeclared site.

Saudi Arabia is a state-party to the nuclear Nonproliferation Treaty (NPT), and its nuclear facilities, including any Saudi enrichment or reprocessing facilities, would be required to be under International Atomic Energy Agency (IAEA)

safeguards. Other international mechanisms are designed to restrict the spread of sensitive nuclear technology including enrichment technology. IAEA officials completed a nuclear infrastructure review in Saudi Arabia in 2018 and issued a final report in January 2019. In March 2019, IAEA Director General Yukiya Amano said, “We’re encouraging all countries to conclude and implement an additional protocol and that includes Saudi Arabia.” IAEA safeguards present a significant hurdle to the development of nuclear weapons.

The U.S.-UAE Nuclear Cooperation Precedent

A commitment to forgo enrichment or reprocessing is not required for 123 agreements. Still, some 123 agreements contain provisions designed to discourage national enrichment and reprocessing programs in the Middle East. The 123 agreement reached in 2009 with the United Arab Emirates (UAE) provides the United States the right to terminate nuclear cooperation with that country if it “possesses sensitive nuclear facilities within its territory or otherwise engages in activities within its territory relating to enrichment of uranium or reprocessing of nuclear fuel.” An Agreed Minute to that agreement states that its terms “shall be no less favorable in scope and effect than those which may be accorded” to other countries in the Middle East. The minute also explains that, if the U.S. government concludes a more-favorable agreement with another regional government, the United States will, at the UAE’s request, consult with the UAE “regarding the possibility of amending” the agreement with equally favorable terms.

Saudi officials have not forsworn uranium enrichment and fuel reprocessing or publicly stated they are willing to accept UAE-style restrictions as part of a 123 agreement. In February 2018, then-Foreign Minister Adel Al Jubeir said “we want to have the same rights as other countries,” a presumed reference to Iran. In May 2018, Secretary of State Michael Pompeo said in Senate testimony, “we want a gold-standard Section 123 Agreement from [the Saudis], which would not permit them to enrich.” The State Department said in an August 2020 press statement that the United States would “attach great importance” to continued Saudi compliance with the NPT and seeks an agreement “with strong nonproliferation protections that will enable Saudi and U.S. nuclear industries to cooperate.” Congress prohibited the use of FY2020 funds for Export-Import Bank support for nuclear exports to Saudi Arabia until the kingdom has a 123 agreement in effect that commits to renouncing uranium enrichment and reprocessing and has signed an Additional Protocol with the IAEA (Section 7041[h] of Division G, P.L. 116-94).

General Security Concerns

Threats to the security of critical Saudi infrastructure may raise concerns about the security of Saudi nuclear facilities. The U.S. government cites threats from terrorist groups and hostile regional actors, including missile and rocket attacks from Yemen. U.S. officials attributed a major 2019 missile and drone attack on Saudi infrastructure to Iran. U.S.-Saudi security cooperation mechanisms are robust and remain focused on mitigating these threats and others.

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