

Below-the-Threshold Nuclear Development: The Nuclear Program in the UAE

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Background

The interest in nuclear energy on the west side of the Gulf was kindled by Iran's desire, beginning in the 1970s, to develop a nuclear program; the establishment of Iran's Atomic Energy Organization; and the start of construction of two nuclear reactors in Bushehr, which was later frozen once the revolution broke out. In May 1978, after several years of debate, Saudi Arabia, Kuwait, and Qatar signed an agreement to build a joint nuclear reactor, but the plan never came to fruition. Kuwait planned to build nuclear reactors on its own soil to generate electricity; this plan too was never realized. In those years, Saudi Arabia began monitoring seismic activity in the kingdom, an initial step in determining the most suitable locations for nuclear reactors. It seems that in addition to Iran's nuclear development, the motivations underlying these preliminary moves included Israel's and Iraq's nuclear efforts and the high oil prices at that time. The reasons none of these plans were executed are apparently linked to the Three Mile Island accident in Pennsylvania in March 1979, Israel's attack on the nuclear reactor in Iraq in 1981, and the drop in oil prices.

The renewed interest in nuclear development among the Gulf states was closely related to the momentum surrounding nuclear development in Iran; this was made explicit at the Gulf Cooperation Council summit in December 2006 in Riyadh. Since then, these nations have investigated the use of nuclear technologies for a range of applications with different rates of intensity and success. When it comes to international law and nonproliferation norms, all six states adhere to the directives of the International Atomic

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Energy Agency, and in recent years three of them – the UAE, Kuwait, and Bahrain – have also signed the IAEA Additional Protocol, allowing closer supervision of their nuclear activities.

The Arab Gulf states – Saudi Arabia, UAE, Kuwait, Qatar, Oman, and Bahrain – share an official policy that strives to keep the Middle East in general and the Gulf in particular free of weapons of mass destruction. But as early as 2004, they proposed a sub-region free of nuclear weapons in the Gulf.¹ This represented something of a turning point from their previous approach, which had emphasized a nuclear-free zone encompassing the entire Middle East, very similar to the Iranian-Egyptian initiative presented to the UN General Assembly in 1974.² Unofficial discussions on the issue were held, but the initiative failed because of disagreement between the Arab states and Iran, which had made its participation conditional on Israel dismantling its nuclear capabilities and US forces leaving the Gulf.

Given their desire to resolve the Iranian nuclear issue, the Gulf states presented a new initiative in 2007, which proposed that Iran become a member of the regional nuclear fuel bank in exchange for stopping its uranium enrichment program.³ Iran, however, announced it had no intention of stopping its enrichment activity. The failure of this initiative in tandem with the growing realization of Iran's power and resolve to continue developing its program played a role in the motivation of several Arab Gulf

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states to develop their own civilian nuclear programs, while stressing that this in no way contradicted their fundamental position on a nuclear-free zone. This stance reflects the oft-repeated saying that the states have a right to strive for nuclear technologies within the framework of IAEA supervision. This was also expressed in the most recent, semi-official Saudi initiative on behalf of a WMD-free Middle East.⁴

Although the declarations made by all six Gulf states link their renewed interest in nuclear development to a rising demand for sources of energy, it is difficult to doubt that a key motivation underlying the trend is the Iranian nuclear program. It is hardly a coincidence that Iran's resolve to continue its nuclear

program overlapped with the Gulf states' renewed efforts to develop an infrastructure and knowledge in the field. Similarly, the UAE's nuclear program – the most advanced among the Arab nations – is in large part a

response to Iran. Yet in addition, it may still serve as a desirable alternative model for civilian nuclear development for the entire Middle East.

Energy Needs, Prestige, and Regional Status

The UAE possesses the world's seventh largest oil reserves, with an estimated 100 billion barrels (with more than 90 percent of the federation's oil reserves located in Abu Dhabi).⁵ The low cost of producing oil and gas, the fact that energy is highly subsidized, the accelerated rate of development, and population growth have all contributed to very high rates of consumption of electricity. In fact, the UAE has one of the highest per capita consumption of energy in the world.⁶

Although it has some of the largest oil reserves on the globe, the UAE is intent on varying its mix of energy sources, currently based entirely on fossil fuels (the UAE's high consumption of electricity has forced it to import gas from its neighbors).⁷ Aside from investing in solar energy development, the federation has allocated some \$40 billion to production of electricity from nuclear reactors. Once constructed, it is estimated that these reactors will add 5.6 GWs to the electric grid. The annual consumption of electricity in the nation is expected to climb to more than 40,000 MWs by 2020, reflecting a cumulative compound growth of roughly 9 percent since 2007.⁸

The importance of ensuring new energy sources in the UAE stems from the dramatic increase in the nation's consumption and the need for additional desalination plants, transportation development, and an accelerated infrastructure construction program. Yet despite the dramatic increase in electricity consumption, the rate of the UAE's investment in the production and development of energy sources remained static in 2005-2010. Furthermore, despite its investments in renewable energy, such as wind and solar power, it seems that renewable energy can provide only up to 7 percent of the nation's demand for electricity.⁹

Thus, given the high demand for electricity, the UAE has begun looking for energy sources that can meet its rapidly growing needs. Because a total elimination of the heavy subsidies on energy products is liable, under extreme conditions, to damage the federation's political stability, the regime prefers to export its gas and oil and use alternate energy sources to provide for its civilian electricity needs. To this end, in January 2009 the UAE signed a "123 agreement" for civilian nuclear cooperation with the United States, opening the door for activity by US and international companies in the federation. The same year, the UAE also signed the IAEA Additional

Protocol, which expands the supervisory regime, thereby signaling that it was serious about its intentions and committed to full transparency.¹⁰ One of the key paragraphs in the “123 agreement” bans plutonium processing and uranium enrichment. The existence of this paragraph, in addition to Abu Dhabi’s commitment to transparency and IAEA regulation, helped allay US concerns and secure Congressional approval. Those limitations on fuel cycle activities also helped the administration label the agreement the “gold standard” for similar agreements in the future.¹¹

One of the ways in which the agreement between the United States and the UAE was made possible was through the passage of the 2009 Federal Law Regarding the Peaceful Uses of Nuclear Energy. While creating the foundation for a local civilian nuclear development framework, the law also helped achieve official conformity with certain conditions stipulated by the “123 agreement,” e.g., the ban on any planning, development, or construction of an enrichment or processing facility on UAE soil. In January 2010, the Emirates’ Nuclear Energy Corporation announced that a consortium headed by South Korea’s Electric Power Corporation had won a \$20 billion contract to construct four APR1400-type reactors. After visiting the UAE in 2011, the IAEA noted that the nation’s nuclear program was progressing satisfactorily and was in compliance with IAEA guidelines, and that it could serve as a role model for other nations seeking to develop a civilian nuclear energy program.¹²

The “123 agreement” opened the door to international cooperation for the UAE. From 2010 until 2015, such agreements were signed with the United Kingdom, Australia, Finland, Canada, Argentina, Japan, Russia, and France, among others, focusing on the transfer of technology, experts, nuclear materials, and instruments. For example, in March 2010, Abu Dhabi co-founded, with the United States, an academic institution called the Gulf Nuclear Energy Infrastructure Institute to train regional manpower in fields relevant to nuclear research. Similarly, Australia, which has the largest uranium reserves in the world, agreed in July 2012 to provide the UAE with reactor fuel sufficient for the first 15 years of operation of the nuclear power plant.¹³

Unlike other nations for which the disaster in Fukushima provided a reason to cancel or suspend their programs, the UAE is forging ahead. Ironically, the cornerstone laying ceremony at the site selected for the nuclear reactors in Barakah, Abu Dhabi, took place on March 14, 2011, only three days after the accident in Japan. The construction of the first

reactor, Barakah 1, began in July 2012; on Barakah 2 in May 2013; on Barakah 3 in September 2014; and on Barakah 4 in September 2015. If there are no delays, the first reactor is expected to be joined to the electric grid in 2017 and the last in 2020.¹⁴

Why would a nation sitting on top of some of the world's largest oil reserves need a nuclear energy program? This is a question Iran has long been asking. Answers given by the UAE include the need to reduce air pollution (the UAE has one of the highest per capita-to-pollution ratios in the world) and dependence on oil for electricity. Moreover, while one cannot ignore the desire to acquire alternate energy sources as a way to protect the nation's natural resources and preserve them for exports, one can also not ignore the national prestige attached to technological nuclear achievement. The population of the UAE seems overwhelmingly in favor of the nuclear energy policy, which was presented as a way of reducing dependence on fossil fuels, increasing the security of electricity supply, creating jobs, and reducing pollution. A poll conducted in the UAE in December 2012 revealed that 82 percent of the population supports nuclear energy and that 89 percent supports the construction of a nuclear plant in the country, an increase from the 66 and 67 percent, respectively, over a previous poll. Furthermore, 89 percent thought that nuclear energy for peaceful purposes is "critically important," "very important," or "important" for the nation.¹⁵

Finally, alongside considerations of energy policy and prestige, the seal of approval given to the Iranian nuclear program is also clearly a strong motivating element for its neighbors to work toward civilian nuclear technology as a way of reaching a kind of nuclear parity. In their view, they too can play the game. For some of the smallest nations – Qatar, Kuwait, Bahrain, and Oman – their financial, geographical, and/or political situation is such that an independent civilian nuclear program, to say nothing of a military one, is unrealistic; they may take part in joint GCC projects. At the same time, some declarations on nuclear development in the Gulf were meant to exert pressure on the United States to stop Iran.

Possible Obstacles and Risks

Despite the UAE's commitment to act with full transparency and the steps already taken to ensure this goal, there are still technological obstacles to a sustainable nuclear energy program and concerns about the proliferation of nuclear knowledge and materials. The chief concern is that in the past, Dubai served as a base of operations for the smuggling network operated

by Pakistani nuclear scientist A. Q. Khan; Dubai remains attractive to smugglers, including a slew of Iranian straw companies involved in the smuggling of banned materials. In addition, the speed with which the UAE is advancing to nuclear energy is alarming because its institutions are not yet sufficiently prepared to handle the issue and undertake rigorous inspections. The federal structure of the UAE makes it even more difficult to inspect dual use materials because each of the emirates has different customs laws, and coordination among them is faulty. The lifting of the sanctions against Iran could also make it difficult for the UAE to oversee Iranian activity in the field on UAE soil.

Despite all these issues, as well as concerns that the reactors in the UAE are constructed in a conflict-prone area and could become targets for terrorist attacks, the federation is succeeding in interesting foreign governments and companies in the project and is using its economic clout to offer experts from all over the world attractive terms of employment. A large part of the UAE's success lies in its financial sources, the lack of political or environmental opposition in the country, and the availability of uninhabited land suitable for nuclear plants. The project schedule is unprecedented: some 10 years from the announcement of the policy to when the first reactor is expected to start supplying electricity. But even if the UAE has solved fundamental problems of nuclear development, such as ensuring a long term supply of nuclear fuel, regulating treatment of spent fuel, and devising regulatory and policy solutions, and even if it is so far on schedule, other issues remain unresolved, including: problems of safety associated with this type of reactor in South Korea; the sharp decline in oil prices in the last year, liable to result in budgetary pressures on the

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nuclear program; adjustment of the reactors to the difficult climate conditions in the Gulf, including water temperature, sand storms, and the dust and heat, issues that have not been fully resolved to date; and, finally, the numerous different systems and experts from many countries involved in the program, all with different technology backgrounds and speaking different languages.¹⁶

At least in the short and mid terms, the UAE's nuclear energy program is irrelevant to the danger of a nuclear arms race in the Middle East. However, civilian nuclear programs can reduce costs and difficulties associated with military programs if and when security risks or

political motivations emerge. Should the UAE, at some point in the distant future, decide it must have military nuclear capabilities of its own as a way to defend itself, the civilian program already in existence – including the plants, technologies, materials, human capital, and accumulated expertise – can pave a relatively quick and easy way to nuclear arms. The international community has good tools to confront this danger, if only thanks to the UAE’s dependence – at least in the foreseeable future – on foreign sources for the construction of infrastructures and manpower. The UAE chose, at least initially, to attain its fuel from external sources and ship the spent fuel back to its country of origin. Nonetheless, economic constraints may result in nations exporting nuclear technologies being less than optimally careful in this area so as not to risk financial losses.

A Model for the Region?

The rationale behind the “123 agreement” between the United States and the UAE was to set a binding precedent that would apply to all countries seeking to build civilian nuclear infrastructures on their soil. However, since the signing of the agreement, it seems that other nations have become less inclined to accept similar terms. The United States, which does not want to lose markets to competitors, has also distanced itself from the precedent it wanted to establish, instead preferring to adopt a case-by-case policy. Other than the possible danger this change poses to the agreement already signed with the UAE, the policy is liable to allow other nations to operate a nuclear fuel cycle on their soil. Over time, applying limitations selectively not only fails to ensure that those nations will buy their facilities and knowledge from the United States but almost certainly damages the NPT regime, if only because of the role the United States has played and the bilateral agreements it has signed to stop nuclear proliferation.

While the UAE remains bound to limits on operating a nuclear fuel cycle on its soil, the United States has significantly changed its approach since the agreement was signed in 2009 and weakened the threshold conditions for receiving nuclear approval, as reflected in the agreement it signed with Vietnam, which set the so-called “silver standard.” In May 2014, Washington and Hanoi, which plans on building seven reactors in the country, signed a “123 agreement” that

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did not include an explicit commitment on Hanoi's part not to process plutonium or enrich uranium. Despite the pressure on Congress to enforce the gold standard on future nuclear agreements, it seems that the current administration insists on judging each case on its own merits.¹⁷ Similarly, in April 2015, the United States signed a nuclear cooperation agreement with South Korea, which already operates 24 nuclear reactors, designed to replace the prior agreement that banned Seoul from enriching uranium and processing plutonium. This agreement erodes the gold standard set in the agreement with the UAE and allows South Korea, in consultation with the United States, to engage in certain aspects of plutonium production and uranium enrichment.¹⁸

This trend not only reflects an erosion of the level set in the agreement with the UAE, but in the case of South Korea, affects a nation that exports nuclear knowledge and materials to the Middle East, representing a potential proliferation risk.¹⁹ Two major elements are responsible for the administration's curtailed position: one, the pressure exerted on the administration by the US nuclear industry not to lose potential clients

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to competitors; two, the administration's complex relationship with nations seeking to develop nuclear infrastructures on their soil, such that other interests, including economic, might affect progress toward nuclear cooperation agreements if operating under a lower threshold than that set in the agreement with the UAE.

Conclusion

The UAE has made a convincing case for the feasibility of nuclear projects for civilian ends: the increasing demand for energy, reduced dependence on polluting fuels, and more oil available for exports. In terms of nuclear proliferation, the federation does not pose a significant danger in the foreseeable future; the danger of a regional nuclear arms race is, at least for now, unrelated to the development of a nuclear program based on the model adopted by the UAE. In

the more distant future, however, the UAE's nuclear program could have additional strategic significance, because it would force its enemies to waste energy on guessing whether or not nuclear arms were within UAE reach.

The nuclear agreement between Iran and the P5+1 set a new standard for the region. It is therefore not inconceivable that the Iranian precedent will encourage other Middle East nations to develop a nuclear program just below the nuclear threshold. Experts posit that the first of these nations would be Saudi Arabia, which believes it has the resources needed to close the gap with Iran should it become necessary to do so. Despite US efforts to calm the Saudis, the latter have not given up their “right” to enrich uranium on their soil. Senior Saudi officials are now asking for the same conditions Iran achieved in its agreement. More recently, amid fears of an atomic arms race in the Middle East, UAE’s ambassador to the US told Ed Royce, Chairman of the House Foreign Affairs Committee, that the UAE might also seek the right to enrich uranium, a right that Iran has asserted under the recently signed nuclear deal, and that his country no longer felt bound by its previous nuclear agreement with the US.²⁰

It is doubtful if the singular case of the UAE can serve as a model for future nuclear development. The agreements signed more recently by the United States, as well as the public demands voiced by Saudi Arabia and others nations about their right to enrich uranium on their soil, are indications of this. Progress in the UAE’s nuclear project will give the federation enhanced regional status, not only compared to Iran but also compared to its other neighbors, as the first Arab nation to join the nuclear club. Other Arab nations lacking the resources and international support enjoyed by the federation will find it difficult to develop a program with the same rate and systematic approach the UAE has achieved. Finally, although nuclear development in Iran was an essential factor in motivating the UAE to start its own program, other factors just as important, if not more so, were also involved. Even if Iran keeps its part of the agreement and rolls back some of its nuclear capabilities, energy security and national prestige will remain on the table as powerful motivators for the UAE to continue and further develop its nuclear program.

Notes

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