



May 2018

# Nuclear Energy and Proliferation in the Middle East

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*The James Martin Center for Nonproliferation Studies, the National Defense University, and the Institute for National Security Studies held a two-day nonproliferation dialogue in Israel, April 29–30, 2018. The purpose of the dialogue was to exchange views on evolving threat perceptions, perceived gaps in goals, priorities, and policies, and identify further opportunities for deepening US–Israel cooperation in countering the proliferation of WMD and related threats. The following policy memo is based on the author’s presentation delivered during the dialogue.*

**M**ore countries have pursued a nuclear weapon capability in the Middle East than in any other region. They include Egypt, Iraq, Libya, Syria, and Iran.

Leaving aside Israel, none has succeeded in acquiring nuclear weapons—at least so far. But growing regional interest in nuclear energy programs could increase the risks of nuclear proliferation.

According to statements by regional leaders since 2006, more than 18 Middle East states have declared their intention to pursue nuclear energy programs. For most of these countries, the expressions of intent have been aspirational and unrealistic. But for several of them, plans to build nuclear power reactors are more concrete.

- Iran already operates a Russian-built reactor at Bushehr and construction of two more Russian reactors is now underway.

**Growing regional interest in nuclear energy programs could increase the risks of nuclear proliferation. But this is far from inevitable, and there are strategies the United States and its allies can employ to prevent further proliferation.**

- South Korea’s project to build four power reactors in the United Arab Emirates (UAE) is on schedule and, reportedly, under budget.
- Saudi Arabia is now considering bids for the construction of two power reactors, the initial stage of an ambitious plan to build 16 large reactors in the next few decades.
- Egypt, Turkey, and Jordan have all signed deals with Russia for the construction of power reactors.

Regional proponents of nuclear power offer a variety of justifications. Energy-importing countries cite the need for energy security. Producers of oil and natural gas want to free up more of those resources for export. And water desalination is a region-wide motivation. One can raise legitimate questions about the energy choices of Middle East countries on economic or technical grounds. But persuading these countries to forgo nuclear energy programs altogether is highly unlikely, either because they are convinced of the economic and technical merits of their programs; because their programs are a source of national pride and a symbol of their advancing status; or because they have ulterior motives—in particular, to use their programs as an enabler and cover for a latent or actual nuclear weapons program.

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Iran's interest in nuclear weapons was not the only reason that it embarked on a nuclear power program. But it was a critical, and probably the primary, reason. Today, Iran's nuclear program, especially its enrichment capability, is the principal motivator for further proliferation in the Middle East. As long as the 2015 Joint Comprehensive Plan of Action (JCPOA)'s nuclear restrictions are in force and implemented scrupulously, Iran will not have the capability to produce nuclear weapons. But once those restrictions lapse—either because they expire after 10 and 15 years under the terms of the JCPOA or because the JCPOA itself is terminated much sooner—Iran will be able to realize its stated objective of an industrial-scale enrichment program. This would give it the ability—should it decide to run the risks of breaking out of its obligations under the JCPOA and the Treaty on the Non-Proliferation of Nuclear Weapons—to produce enough highly enriched uranium for a nuclear bomb in a matter of weeks.

This prospect of Iran becoming a threshold nuclear-weapon state has motivated Saudi Crown Prince Mohammad bin Salman to declare publicly that, if Tehran acquires nuclear weapons, the Kingdom will follow suit as soon as possible. And it is why Saudi Arabia, in negotiations with the United States on a bilateral civil nuclear cooperation agreement, has refused to accept the so-called gold standard, a legally binding obligation not to pursue enrichment or reprocessing.

In the Middle East, only the UAE has accepted the gold standard. Other regional countries with plans for nuclear power reactors, such as Egypt, Turkey, and Jordan, can be expected to resist a ban on enrichment and reprocessing, either because they are unwilling to surrender what they consider to be their sovereign right to pursue civil nuclear technologies of their choosing; because they genuinely believe fuel cycle technologies could make an important contribution to their energy goals; or because they want to keep open a future option to pursue nuclear weapons.

The current Middle East nuclear landscape includes a potentially large-scale Iranian fissile-material production capability, a Saudi

determination to match Iran, plans in several other countries for nuclear power programs, and the unwillingness of most regional states to renounce enrichment or reprocessing capabilities. These nuclear developments take place in the context of a Middle East consumed by heightened tensions, sharp political rivalries, and ongoing—even escalating—military conflicts.

Prominent Israelis have maintained that, under these circumstances, the spread of fuel cycle capabilities throughout the region is virtually inevitable and will ultimately result in the proliferation of latent or actual nuclear weapons capabilities. However, a nuclear “chain reaction” is neither pre-determined or inevitable.

First, other than in Iran, the UAE, and Saudi Arabia, it is uncertain whether current nuclear energy plans will actually materialize. In varying degrees, Egypt, Turkey, and Jordan face major challenges in pursuing and sustaining nuclear energy programs: financial constraints, low levels of human and technological infrastructure, unsteady government commitments to nuclear power, inadequate electrical grids, competing lower-cost sources of energy, and so on.

In addition, Russia's ability to follow through on its reactor deals with those countries is questionable. It has offered generous financing. But with low oil prices and sanctions, its economy is hurting and it is unclear whether Moscow can deliver on its financial promises. The Russian nuclear industry is also overstretched. It has committed to building 19 reactors in 14 countries. But it is having a hard time meeting even domestic construction commitments. If Russian projects in the Middle East go forward at all, they will be plagued by long delays and escalating costs.

Second, even if the nuclear energy plans of Middle East countries go forward, it would be a challenge for them to acquire enrichment or reprocessing capabilities. Given insufficient technical expertise and nuclear infrastructure, their ability to develop fuel cycle technologies and build fuel cycle facilities indigenously is very limited. This is especially the case in

Saudi Arabia, whose nuclear program is starting from scratch.

To pursue fuel cycle programs, these countries would need significant foreign assistance, but that would be hard to obtain. In 2011, the Nuclear Suppliers Group (NSG) adopted a restrictive guideline on the transfer of enrichment and reprocessing equipment and technology. No NSG members are currently making such transfers to non-nuclear-weapon states, and it is very unlikely they would do so in the future.

Middle East states seeking enrichment or reprocessing capabilities would have to look to technology holders outside the NSG or to NSG members with weak export controls. Their efforts to acquire fuel cycle technologies from such sources would almost surely be covert and illicit. Imports of equipment, materials, and technology, as well as their construction of fuel cycle facilities, would have to go undetected, which would be a significant challenge.

Pakistan was a key source of enrichment technology for Libya, North Korea, and Iran. But the A.Q. Khan network has been eradicated, and the Pakistani government has taken a conscientious approach to controlling nuclear-related exports as well as controlling current and retired Pakistani nuclear scientists.

NSG member China once sold intermediate-range ballistic missiles to Saudi Arabia, and its export control system has weaknesses. However, it is highly unlikely the Chinese government will agree to assist a Saudi fuel cycle program, especially as Beijing seeks to strengthen its relations with Iran.

While North Korea sent some uranium hexafluoride to Libya and tried to build a plutonium-production reactor in Syria, there is no evidence that it has transferred enrichment or reprocessing technology. Moreover, United Nations Security Council resolutions have put its illicit supply network under greater pressure and its exports are subject to increased scrutiny.

Of course, illicit foreign assistance to fuel cycle programs in the Middle East cannot be ruled out

altogether. But the likelihood of such assistance, especially undetected for a long time, is less than is commonly understood.

For many years, rumors circulated that Pakistan had committed to help Saudi Arabia acquire nuclear weapons, perhaps by supplying the weapons themselves or the fissile material to build them. But senior Pakistani and Saudi officials deny that such an understanding exists. If it did once exist, it was probably a vague, unwritten assurance between a former Pakistani leader and a former Saudi king. The Saudis can hardly count on such an assurance today—with Pakistani authorities seeking to put the A.Q. Khan affair behind them, Islamabad pursuing a good relationship with Iran, and Pakistan having denied the Saudi request that it participate in the Kingdom's campaign in Yemen. If the Saudis do have a currently applicable commitment from Pakistan, it is probably nothing more than a general assurance that, in the event the Kingdom is threatened or attacked, Pakistan would take steps to support its friend.

So, in my view, it's overly pessimistic to assume that the Middle East is inevitably headed toward a competition in fuel cycle capabilities or nuclear weapons. Still, we should do whatever we can to make such competitions less likely. Here are some suggestions:

First, the United States and its partners should press Iran not to build a large-scale enrichment capability. Instead, Iran should be encouraged to maintain a limited enrichment program capable of only producing enough fuel for its research reactors. And it should be required to import the enriched fuel needed to run its power reactors.

Russian and US interests are aligned on this topic. Russia has a strong commercial interest in a limited Iranian enrichment program, and wants to continue selling Iran the enriched fuel needed to operate the existing and future power reactors Moscow hopes to build in Iran. For economic reasons, Russia does not want Iran to have the capacity to produce its own power reactor fuel. The United States should work with Russia and its other partners to gain Iranian acceptance of such an arrangement.

They should use the leverage at their disposal, including Iran's continuing need for fabricated power reactor fuel. They will probably also need to offer incentives, such as a further relaxation of remaining sanctions.

Getting Iran to limit its future enrichment program will depend significantly on preservation of the JCPOA. If the United States withdraws from the JCPOA while Iran is in compliance, it will be hard to mobilize the international support, including from the Russians, that will be required to get Tehran to abandon its plans for an industrial-scale enrichment program.

Second, the United States should discourage Saudi Arabia from pursuing enrichment or reprocessing capabilities. Israeli Prime Minister Binyamin Netanyahu told the US Senate Foreign Relations Committee that the United States should insist on the gold standard in negotiating a civil nuclear agreement with Saudi Arabia—that is, a legally binding ban on any fuel cycle activities in the Kingdom. But Riyadh will surely continue to reject the gold standard. With other nuclear suppliers eager to cooperate with Saudi Arabia, the United States simply does not have the leverage to get the Kingdom to forswear enrichment and reprocessing completely and forever.

If the Trump administration insists on the gold standard, there will be no US–Saudi civil nuclear agreement. And consequently, there will be no US controls on future Saudi fuel cycle programs.

South Korea is most likely to win the bid for the first two Saudi reactors, largely on the basis of its success next door in the UAE. But South Korea's civil nuclear agreement with Saudi Arabia allows the Kingdom to enrich uranium up to 20 percent without even obtaining South Korean consent. Other potential nuclear suppliers, including Russia and China, would be even more permissive as far as fuel cycle capabilities are concerned.

The Trump administration should not insist on the gold standard with Saudi Arabia. But it should use whatever leverage it has to press for the

strongest and most long-lasting constraints on Saudi fuel cycle activities. In particular, it should insist on:

- A ban on enrichment and reprocessing activities in the Kingdom for around 20 years;
- A bilateral fuel supply commission that would give Washington a window into Saudi capabilities and intentions and an opportunity to influence Saudi fuel cycle choices; and
- Saudi adherence to the International Atomic Energy Agency (IAEA) Additional Protocol.

Such an agreement would not be a complete adoption of the gold standard. But it would put effective and long-term constraints on Saudi fuel cycle activities—and a much better constraint than would exist in the absence of a US–Saudi agreement. A pragmatic approach along these lines should guide the US approach to future negotiations on US civil nuclear agreements, including on an agreement with Jordan and on renewing the existing agreements with Egypt by 2021 and with Turkey by 2023.

Third, the United States should seek an informal agreement or understanding among a small group of key nuclear supplier governments on the need to adopt more rigorous common policies toward nuclear cooperation with Middle East countries. Such common policies might include:

- Going beyond the NSG guideline by banning any transfer of fuel cycle equipment or technology to a fuel cycle program under national control;
- Requiring a recipient to get the supplier's prior consent before enriching or reprocessing any material provided by the supplier or produced in a reactor provided by the supplier;
- Requiring a recipient to adhere to the Additional Protocol as a condition of nuclear supply;
- Providing other supplier governments and the IAEA additional information about nuclear-related transfers to the region, including all nuclear-related dual-use transfers; and

- Requiring the removal of all spent reactor fuel from the territory of recipient states or, at a minimum, giving supplier governments the right to insist on such removal.

Such common policies would be impossible to adopt by consensus in the NSG. But perhaps an informal approach among a select group of nuclear suppliers would have a greater chance of success.

Fourth, the United States and other like-minded governments should reach out to potential sources of illicit fuel cycle transfers and impress on them the importance of not contributing to fuel cycle programs in any way. In that connection:

- Pakistan needs to be pressed to practice post-A.Q. Khan vigilance, especially with respect to Saudi Arabia;
- China should be urged to enforce its export controls more effectively; and
- The international community should continue, through Security Council resolutions, to impede North Korea's illicit networks.

Fifth, efforts should be made to strengthen the ability to detect illicit procurement efforts and covert fuel cycle capabilities. US and other national intelligence agencies need to sustain and even increase capabilities to monitor proliferation-related development in Iran and elsewhere in the region. In addition, the United States and partner governments should explore the possibility of incorporating key monitoring and verification provisions of the JCPOA into routine safeguards practices as applied elsewhere in the Middle East and in the global nonproliferation regime.

Sixth, the United States and like-minded states should explore the potential contribution of regional or sub-regional arrangements to reduce the risk of fuel-cycle competition in the Middle East:

- A ban on reprocessing in the Gulf region might be feasible, given the current lack of interest in reprocessing in Iran and other Gulf countries.

- States of the region might agree to ship all spent reactor fuel out of the country.
- They might also agree that all new research and power reactors would be light-water-moderated and would use fuel enriched to below 5 percent, and
- A regional arrangement to guarantee reliable access to enriched fuel supplies—one that did not involve access to fuel cycle technology by regional states—could reduce incentives for indigenous fuel cycle capabilities in the region.

Finally, a strong and sustained US military presence in the Middle East could play an important role in reducing the likelihood of a regional competition in latent or actual nuclear weapons capabilities. Such a continuing US presence could help counter aggressive Iranian regional activities and could reduce incentives for Saudi Arabia and other Sunni governments to pursue hedging nuclear strategies.

In conclusion, despite concerns about the future of the JCPOA and Iranian intentions—and despite increased regional interest in nuclear energy and reluctance to forgo fuel cycle facilities—the proliferation of latent or actual nuclear weapons capabilities in the Middle East is far from inevitable. My prediction is that 10 and 20 years from now, there will still be only one nuclear-armed state in the Middle East.

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