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Iran's Path to Nuclear Peace

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Stanford, Calif. — As Iranian and Western diplomats continue to negotiate over Iran's nuclear program, the details will matter more and more. Obstinance and obfuscation will return the two sides to deadlock. But there is hope for the long term if Iran and America are willing to break with the past.

Iran has very little to show for its 50 years of nuclear pursuit. It has only one commercial reactor ready for electricity production at Bushehr that was supplied by Russia without Iran learning much about the technologies needed for the manufacturing and construction of reactors. The country also has an aging 1960s-era American-supplied research reactor on its last legs of medical isotope production.

The heavy-water reactor Iran is building at Arak, ostensibly for medical isotope production, remains a major hurdle in negotiations. The current reactor design appears much better suited for producing bomb-grade plutonium than for civilian uses — and if producing plutonium were the goal, it would take several years for such production.

Iran's pride and joy, its uranium centrifuge program, can enrich in one year as much uranium as the European consortium, Urenco, can produce in about five hours. A ten-fold increase in Iran's centrifuge capacity would be required to enrich enough uranium fuel for its Bushehr reactor alone. And no matter how many more centrifuges Iran installs, it can never become self-sufficient because it does not possess adequate uranium ore reserves for a large-scale nuclear energy program. It could purchase enrichment services on the global marketplace just as it would have to buy the natural uranium to feed into the centrifuges.

All Iran has today is the capacity to produce small amounts of reactor fuel or, if it decides to, one or two bomb's worth of highly enriched uranium per year

(which it would then need to weaponize).

Meanwhile, the direct costs of its nuclear pursuit have been enormous. And the indirect costs to the nation of keeping the nuclear weapons option open, in terms of political and scientific isolation plus economic sanctions, are staggering. If Iran's endgame really is a civilian nuclear power program, it will require a fundamentally different approach.

The best economic option for Tehran would simply be to get out of the nuclear fuel-cycle business altogether, but this is unlikely given Iran's insistence on its sovereign right to nuclear energy.

A second option would be to settle for a modest nuclear electricity program relying on the Bushehr reactor and construction of one or two more Russian-built reactors. Iran could maintain the current arrangement with Russia — that is, have Moscow supply the nuclear fuel and take back the spent fuel. Iran could then simply forgo all indigenous nuclear power development, including enrichment and the final disposal of spent fuel. It would not be doing so under pressure, but rather acting in its own best interest.

If Iran insists on a large and mostly indigenous nuclear electricity program, it can succeed only through international cooperation, not isolation. Like South Korea and Japan, Iran can never become fully independent because it lacks large indigenous uranium resources. It takes decades for countries without an established industrial and regulatory nuclear infrastructure to produce large amounts of nuclear electricity and requires close cooperation with established nuclear suppliers.

The lesson for Iran, based on other nations' experiences, is that it should concentrate on developing the capability to fabricate reactor fuel elements and reactor components, and learning how to build nuclear power plants. Japan and South Korea became leading global reactor vendors by doing so. This could constitute a pragmatic and honorable choice. Domestic enrichment would be abandoned because it isn't economical. And Iran would forgo the reprocessing of spent fuel because it isn't cost effective.

Such a solution offers the best opportunities for technical and industrial development with greatest economic gain and least danger of proliferation.

For the Arak reactor, Iran can still make technical changes that would reduce the proliferation risk and agree to send spent fuel out of the country to eliminate concerns about plutonium production.

A radical but even better solution would be to cooperate with other countries that sell and build reactors and tailor the design for medical and research applications in order to limit fears of proliferation. Such reactors are typically operated as international facilities. One is being constructed by South Korea in Jordan and an Argentine-built reactor has operated in Australia for the past six years. Such an arrangement would bring Iran into a cooperative relationship with the International Atomic Energy Agency instead of a confrontational one and integrate, rather than isolate, its nuclear program.

Sixty years after President Dwight D. Eisenhower announced the Atoms for Peace program, one lesson is clear: Civilian nuclear programs flourish only through cooperation and openness. Secrecy and isolation are typically signs of a nuclear weapons program.

If Iran accepts these pragmatic approaches to nuclear energy, it can resolve the nuclear stalemate in a manner that serves its people well and is acceptable to the international community.

Appropriately timed sanctions relief could then convince Tehran to implement the Additional Protocol of the Nuclear Nonproliferation Treaty, which would provide the unprecedented transparency required to demonstrate the peaceful nature of its program.

A successful nuclear deal would also provide an enormous boost for beleaguered global nonproliferation efforts and possibly lead to a productive American-Iranian relationship that could deal with the many complex security problems impeding stability in the Middle East.

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