As most states in the Middle East have expressed an interest in or are already developing nuclear power, regional cooperation can be an important tool to build nuclear confidence and allay proliferation concerns. This article will investigate how Israel could fit into a nuclear energy development paradigm consisting of regional approaches to the nuclear fuel cycle.

In addition, it will argue that early progress in collaborative efforts can help to create momentum for the envisioned 2012 conference on developing a zone free of weapons of mass destruction (WMD) in the Middle East.

Countries in the Middle East have cited a range of reasons for their resurgent or new interest in developing nuclear power, including the need to diversify energy sources and to meet increasing electricity demands. There are concerns that the interest is driven at least partly by Iran’s nuclear advances and suspicions that it may have a military dimension. Although nuclear power advancement in the Middle East can be viewed a priori with concern from a proliferation perspective, it could offer an opportunity for a net nonproliferation gain if technological development progresses down the right path of transparency and collaboration. The equation is straightforward. If these budding programs in the Middle East develop as completely separate national programs, mistrust is bound to increase. If they develop more in parallel with each other—with collaboration on such elements as information exchanges, transparency of plans, safety and security issues, and, potentially, fuel cycle activities—there is a real chance that nuclear development can serve instead as a tool to increase trust and confidence, feeding into a wider security-building agenda in the region.

Although nuclear cooperation has been a sensitive topic throughout the atomic era, it is particularly difficult to envision such ventures in the Middle East, with its chronically unstable political-security situation. Recent evidence suggests, however, that crossing the traditional Arab-Israeli divide is possible even in the nuclear area.

Access to Nuclear Technology

Israel is among the countries in the region that have expressed a renewed interest in nuclear energy. National Infrastructures Minister Uzi Landau used the opportunity of a civilian nuclear power conference in Paris in March to reiterate the country’s interest in developing nuclear power. For the past 40 years, Israel has seen nuclear energy as an integral goal in its energy planning, but it has not yet introduced nuclear power into its energy mix. The Web site of the Israel Atomic Energy Commission (IAEC) says that Israel decided in the 1970s that “an option to produce electricity using nuclear reactors should be prepared and maintained.” The Israel Electric Corporation (IEC) concluded in the 1980s that a site in the northern Negev desert near the town of Shivta would be suitable for a nuclear power plant. In his Paris speech, Landau confirmed that the Shivta site is still being maintained from a scientific and technical infrastructure point of view. The current plan is to have a two-unit nuclear power plant with a generation capacity of 1,200-1,500 megawatts operational by 2020.

Israel considers itself an “energy island” because it is not connected to the grids of any of its neighbors and must import all its energy sources. From these imported sources, Israel produces
around 13,000 megawatts of electricity, a figure that is expected to double by 2020. Without an indigenous nuclear power program, Israel will need either to continue relying on energy imports or seek alternative routes to nuclear power, such as regional collaboration. Israel’s energy situation provides an incentive for the country to seek a long-term regional nuclear deal in which it progressively increases the transparency of its nuclear activities in return for integration with neighbors on energy projects, a win-win situation for all countries in the region. Although Israel would not be interested in becoming dependent on any one source of energy imports, it is open to buying electricity generated from, for example, a Jordanian nuclear power plant. Creating grid connections between Israel and neighboring Arab states would be a good peace project and open the door for further technological collaboration in the energy area. The initiation of talks on such grid connections could be plausible in the next couple of years and be a suitable precursor to other energy-related cooperative efforts.

The main constraint on Israel’s nuclear power development has been its exclusion from foreign assistance because it is not a signatory of the nuclear Nonproliferation Treaty (NPT). Because the Nuclear Suppliers Group (NSG) in 2008 granted India an exemption from the requirement of full-scope safeguards—meaning that all the country’s nuclear facilities would be open to International Atomic Energy Agency (IAEA) inspectors—as a condition for trade, Israel has been lobbying for the group to draw up a list of objective trade criteria for non-NPT states. The NSG has been engaging Israel for the past few years, but the group has received Israeli proposals with lukewarm interest. In May 2009, NSG Chairman Viktor Elbling led a delegation to Israel to discuss export controls and Israel’s relationship with the NSG.

Some, including former IAEA Director-General Mohamed ElBaradei, have argued that India’s NSG exception amounts to a nonproliferation gain because it draws the country into the regime. Nevertheless, it is difficult to imagine that further erosion of nuclear export controls, by granting Israel similar rights, will benefit nonproliferation. In fact, as the world sees a rising interest in nuclear power, the NSG should play an increasingly important role in anticipation of expanded nuclear trade. Unfortunately, the group has not been able to agree on strengthened guidelines on transfers of enrichment and reprocessing technologies. To regain credibility lost with the India exemption, the NSG must agree on tighter rules related to these technologies and refrain from further exemptions.

Where does this leave Israel as far as partaking in a regional arrangement when it does not have access to nuclear technology? Israel developed its nuclear infrastructure with foreign assistance but prior to the establishment of the NPT and the NSG. It is maintaining its current nuclear activities with limited access to the international nuclear market as controlled by the NSG. An ardent nonproliferation argument would hold that Israel should not even reap the benefit of nuclear energy indirectly, such as by buying nuclear-generated electricity from neighboring states, because of its status as an NPT holdout. Fred McGoldrick, a former U.S. Department of State official, said in March that although an arrangement under which a Jordanian reactor was supplying electricity to Israel “technically” would “probably not violate the NSG guidelines...it would not be faithful to their intent.”

Israel has not breached any nonproliferation commitments because it has not signed the NPT. Most of its nuclear research and development occurred before 1968, when the treaty was opened for signature. Because of its relationship to and dependence on the United States, it could not be transparent about its nuclear activities and thus not be one of the open and accepted nuclear powers of the 1960s. Israel had promised the United States not to be the first to introduce nuclear weapons in the Middle East and did not want to defy its protector. The result was a “don’t ask, don’t tell” policy between the two allies that kept Israel’s program secret. The question is whether it is a net nonproliferation gain to keep Israel outside cooperative activities or whether encouraging and including Israel in potential regional efforts would be better in order to increase trust and confidence that nuclear activities have a peaceful intent. Israel must be integrated into the nonproliferation regime, and one approach could be the establishment of cooperative nuclear activities in the region. Although some supplier states may be opposed on political grounds to seeing Israel benefit indirectly from nuclear energy, for example in the case of the Jordanian nuclear power plant, it is unlikely that this will prevent nuclear trade and the construction of nuclear plants in states neighboring Israel.
Compared to many other countries in the Middle East, Israel has a clear position on multilateral nuclear approaches. According to one Israeli government source, the country has developed a set of prerequisites that it thinks should govern regional nuclear development.\[8\]

- States must forgo sensitive fuel-cycle facilities, such as uranium-enrichment and spent fuel reprocessing plants. Israel categorizes fuel fabrication plants as sensitive as well.\[9\] Although limiting enrichment and reprocessing technologies is a powerful nonproliferation measure, it goes to the heart of the problem of nuclear haves versus have-nots and infringement of NPT rights.\[10\] A more pragmatic approach would be to establish multilaterally owned and operated plants in the region.

- States must have an additional protocol to their IAEA safeguards agreements in place. This presents several problems because Israel itself currently would not live up to this criterion. Another stumbling block regarding additional protocols is that Egypt has said it will not sign one unless Israel joins the NPT as a non-nuclear-weapon state.\[11\]

- Nuclear fuel supply to the region should be based on lifetime contracts and follow so-called leasing and take-back arrangements. A just-in-time refueling regime can be a powerful confidence-building measure because it aims to deliver fresh fuel right before a reactor needs refueling and return spent fuel to the supplier country as soon as possible, preferably within a year after the spent fuel has been taken out of the reactor.

- A stable regulatory system is needed in each state embarking on a nuclear program. The United Arab Emirates and possibly Jordan are seen in Israel as being on the right track in this respect.

According to the Israeli source, Israel regards multilateral nuclear approaches as having merit, especially in light of its position that no country in the region should have a closed national nuclear fuel cycle. For Israel, the key questions to address are host-country selection and eligibility criteria for such an arrangement, the source said. Pointing to experiences in Iran and North Korea, where years of sanctions have not resolved proliferation concerns after detection of clandestine facilities, he said Israel is skeptical of the effectiveness of IAEA safeguards enforcement.\[12\]

Regarding current efforts to create a system of assured nuclear fuel supply, for example through supplier state-sponsored guarantees, and the establishment of international fuel banks to provide low-enriched uranium if supply were disrupted for political reasons, Israeli officials fall in line with the majority viewpoint that these types of assurances, if not part of a comprehensive effort to internationalize the nuclear fuel cycle, amount to creating a solution for a problem that does not exist. In other words, current supply mechanisms based on market forces work and do not need fixing.\[13\]

According to Israeli officials, current nuclear energy planning includes looking into how the national program could feed into efforts to internationalize the fuel cycle. The IEC and IAEA signed an agreement in March 2010 calling for a survey of long-term nuclear energy strategy, including international aspects, to be conducted by a joint task force consisting of all relevant government offices. Although the focus of international cooperation would be on states with developed fuel cycles, such as some EU countries, Japan, and the United States, one government official said the survey would presumably address potential regional approaches as well.\[14\]

### Signs of Cooperation

In general, Israeli officials say their country is open to regional cooperation, especially with neighbors Egypt and Jordan, with which it has peace agreements. Due to the current regional political situation, however, cooperation among these three countries would be very difficult, even if there were a desire for it. A case in point is the Israeli-Jordanian relationship, which unofficially is quite good, despite a more critical tone publicly.\[15\] In the nuclear area, cooperation is taking place, but it is low key. Officials from the two countries are mainly discussing Jordan’s planned reactor at Aqaba on the Red Sea near the Israeli-Jordanian border. Although the full extent of the talks is unknown, Israel is providing assistance in terms of site selection, nuclear safety and security issues, and seismic data.
from its Geophysical Institute.[16]

Israeli news media reported in March on talks between Landau and Jean-Louis Borloo, France’s minister of environment and energy, on joint nuclear projects involving France, Israel, and Jordan.[17] Jordan, however, distanced itself from this public discussion, with Jordan Atomic Energy Commission Chairman Khaled Toukan stating that it is “too early to speak of regional cooperation with Israel before resolving the Palestinian issue and the Arab-Israeli conflict.”[18] The episode nonetheless can be seen as representing a trial balloon and an indication from Israel’s side that it is open to regional nuclear cooperation.

Further evidence of the regional willingness to cooperate in the nuclear field is the Jordan-based SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East) project. SESAME is the region’s first major scientific research center and aims to be “an international scientific and technological centre of excellence open to all qualified scientists from the Middle East and elsewhere.”[19] The project centers around a synchrotron radiation source, a gift from Germany. Activities are planned in fields such as molecular environmental science, micro-electromechanical devices, x-ray imaging, materials characterization, and clinical medical applications. Current SESAME members are Bahrain, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Turkey, and the Palestinian Authority.

When considering regional nuclear cooperation in the Middle East, Israel could offer expertise in a number of areas with its long-standing experience in the field. Indeed, it is already assisting Jordan with siting-related issues at Aqaba, as discussed above. Such assistance can be expanded to other countries, such as Egypt. Information exchanges in areas such as nuclear safety and security would be another good starting point for nuclear confidence building. Israel could offer a great deal in the area of education, in particular because it is currently setting up new nuclear engineering and physics courses to maintain its nuclear knowledge base. The Soreq Nuclear Research Center has acquired a new particle accelerator to replace its 50-year-old research reactor. The accelerator is a joint project with the Weizmann Institute, the Israel Academy of Science, and the Hebrew University of Jerusalem. Language does not necessarily pose a problem. For example, the Weizmann Institute offers all relevant graduate courses in English with open attendance.

Looking to the Future

What would a multilateral approach to the nuclear fuel cycle in the Middle East look like? Setting aside political constraints for a moment, one could imagine a network of regional nuclear facilities servicing the region with nuclear energy. In a best-case scenario, for a regional approach to the fuel cycle in the Middle East to be credible and acceptable, there should be no enrichment and reprocessing facilities. The first hurdle with this scenario is Iran’s expanding enrichment program, which Tehran is not likely simply to dismantle in the foreseeable future. One solution would be to internationalize Iran’s enrichment facilities, as has been proposed in principle by Iran. In a letter to the UN Security Council in June 2008, Iran’s permanent representative to the United Nations, Mohammad Khazaee, proposed, as part of a package for constructive negotiations over the nuclear impasse, consideration of “establishing enrichment and nuclear fuel production consortiums in different parts of the world—including Iran.”[20] Geoffrey Forden and John Thomson of MIT have proposed a detailed and compelling plan for how to internationalize Iran’s enrichment facility at Natanz.[21] According to Forden and Thomson, the enrichment technology should be “black-boxed,” which would impede access to sensitive know-how. It also should be multilaterally owned and controlled and placed under stringent safeguards, they said.

Another problem with “outlawing” enrichment technologies in the Middle East or any region is the strong objection from developing countries that see this as another infringement of their NPT rights to nuclear technology. A fairer approach would be to establish a global network of multilaterally owned and operated plants. This was envisioned in a 2005 IAEA Expert Group report on multilateral nuclear approaches, which said that, first, nationally owned plants should preferably be internationalized, followed by the establishment of “in particular regional” multilateral nuclear approaches for new fuel-cycle facilities, including enrichment plants.[22]

Jordan and Turkey are good candidates to host front-end fuel-cycle facilities, such as those for
conversion and fuel fabrication, to form a regional fuel-production arrangement. Jordan, with its newfound uranium reserves, could be a main contributor of uranium, and Turkey has expressed interest in the past in hosting a regional fuel production center. In general, nuclear power plants may be more troublesome from administrative, political, and technical points of view. Power plants are large, expensive and politically sensitive projects often subject to substantial delays and cost overruns, which could be difficult to manage between several states. Also, the host of the plant would have the technical advantage of being able to cut electricity supply to its co-owners when it wants to. Nuclear plants are preferably national ventures with assistance from, or even run by, established international vendor consortiums.

For the back end of the fuel cycle, a blanket nonreprocessing rule is preferable. The proliferation concerns associated with spent fuel reprocessing and plutonium extraction far outweigh the potential benefits from a so-called closed fuel-cycle arrangement. Although uranium enrichment (the other proliferation-sensitive process) is needed for fueling most reactors in the world, reprocessing is not necessary for electricity generation. Effective and transparent spent fuel disposition approaches should be established whereby the nuclear material is, for example, vitrified and stored in regional or international nuclear waste stations under multilateral control and monitoring.

The main nonproliferation benefit of the regional approach described above is that multilateral control, ownership, and operation will instill trust that the facilities are not used for nonpeaceful purposes. A breakout scenario in which the host country diverts uranium for a weapons program is much less likely if the facility is managed and staffed by people from several countries. It could also be argued that a multilateral approach means that a region needs fewer facilities than if each country develops the necessary production centers. This is attractive from a safeguards perspective because fewer sites would require IAEA monitoring. In addition, multinational ventures make economic sense due to economies of scale. It would be much less costly for a state to join a regional center than embark on developing a national facility.

On the negative side, as the 2005 IAEA Expert Group report on multilateral nuclear approaches pointed out, an internationally staffed enrichment facility could mean broader access to know-how and thus represent a proliferation risk. However, if the facility is black-boxed, the spread of sensitive information would be restricted to a minimum.

**Spillover Effect**

If regional cooperative efforts in nuclear energy start to take off within the next few years, they could possibly open the door for more constructive discussions on other security-related issues. One opportunity to test this hypothesis will be the envisioned 2012 conference on developing a WMD-free zone in the Middle East.

The final document of the 2010 NPT Review Conference calls for all states in the Middle East to participate in a conference in 2012 on a regional WMD-free zone. For the first time, the action formally sets the stage for moving ahead concretely to implement the 1995 NPT Review Conference Resolution on the Middle East. But the road ahead before a conference in 2012 can be realized will be long and bumpy, with the main task being to persuade Israel actually to participate. One significant task will be to navigate through the diplomatic minefield of international proliferation forums, trying to avoid singling Israel out. Another challenge will be carrying out the regional confidence building that is needed for earnest negotiations on a WMD-free zone to take place. The changing nuclear landscape in the Middle East offers an opportunity to do that.

Volumes have been written on the preconditions for the creation of a Middle East WMD-free zone, and the Arab-Israeli conflict clearly lies at the heart of the difficulties in moving forward. Countless attempts have been made to kick-start negotiations on a WMD-free zone, but as a comprehensive UN study concluded in 2004, “The Middle East seems no closer to realizing the aims of a WMD-free zone] than it was thirty years ago nor is the region any safer.”

The United States will play a key role not only in persuading Israel to participate in talks about a Middle East WMD-free zone, but also in providing a security environment necessary for Israel to consider signing such a treaty. In recent months, media reports citing unnamed Israeli officials have
suggested that the United States has provided “unequivocal guarantees...for the State of Israel’s preservation of strategic and deterring abilities,” as one of them put it.[26] Although public statements have not gone that far, at a July 6 joint press conference with Israeli Prime Minister Benjamin Netanyahu, President Barack Obama, referring to discussions at the NPT review conference, said that “the United States will never ask Israel to take any steps that would undermine their security interests.” This statement signals U.S. willingness to work with Israel to meet its security needs in a way that allows it to participate in earnest discussions on a Middle East WMD-free zone. Another area in which the United States, as well as France, can be constructive is encouraging nuclear trade with Israel conditioned on Israel’s signature on and adherence to a treaty establishing a verifiable WMD-free zone in the Middle East and signature on an NPT-like agreement. There is little prospect of Israel signing the NPT as a non-nuclear-weapon state in the foreseeable future, but Israel could consider signing a separate document as proposed by nonproliferation experts Avner Cohen and Thomas Graham Jr. Cohen and Graham proposed in 2004 that India, Israel, and Pakistan—the three countries that have never signed the NPT—could sign a free-standing protocol allowing them to keep their current programs but inhibiting further development. The agreement would call for cooperation with export controls, ban nuclear testing, and set a timeline phasing out fissile material production.[27]

It seems clear that if collaborative regional efforts in nuclear energy gain momentum within the next few years, a positive climate surrounding nuclear security issues in general will start to emerge. This would not only benefit the general peace process in the region, but also help to create the right setting for the envisioned 2012 conference on developing a WMD-free zone in the Middle East.

Conclusions

As more and more states in the Middle East are jumping on the nuclear renaissance bandwagon, there is an urgent need to build nuclear confidence in the region. Instead of each state having a go-it-alone policy developing its own nuclear fuel cycle, which is likely to increase mistrust and the risk of proliferation, nuclear transparency and collaboration should be the norm. If the intentions behind these new programs are open and clear from the start, the countries involved are more likely to avoid misperceptions. Furthermore, by collaborating more closely on nuclear energy issues, the states stand to gain in economic and technical terms. With increased nuclear confidence through transparency measures and collaborative projects, the region also can reap many benefits regarding security building. There are signs that nuclear cooperation is possible. Regional projects such as SESAME and Israel’s assistance with nuclear power-plant siting in Jordan are evidence. Education is one area in which Israel could contribute to regional nuclear development; safety and security culture is another.

The next step is to promote collaborative efforts on nuclear energy, through joint training programs, exchanges of information and experience, and even talks on joint fuel-cycle facilities. Nuclear confidence building is integrally linked to the wider security agenda in the Middle East, including the establishment of a WMD-free zone in the Middle East.

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ENDNOTES


4. Israeli officials, interviews with authors, Israel, March 2010.


7. This section relies heavily on interviews conducted by the authors in Israel in March with representatives of the IAEC, Ministry of National Infrastructure, Weizmann Institute, Institute for National Security Studies, and NGO Monitor.

8. Israeli energy official, interview with authors, Israel, March 2010 (hereinafter Israeli energy official interview).


10. Article IV of the NPT asserts “the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination.”

11. Although this linkage is not an official policy, Egyptian officials in public statements regarding an additional protocol typically make the link in no uncertain terms. See, for example, http://mfoa.africanews.com/site/list_message/9319.

12. Israeli energy official interview.


15. Israeli academics, interviews with authors, Tel Aviv and Istanbul, March 2010.

16. Israeli government officials, interviews with authors, Israel, March 2010.


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