

BRIEFER

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The Climate-Nuclear-Security Nexus: A Collision Course or a Road to New Opportunities?

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Today, new nations are pursuing civilian but dual-use nuclear capabilities, the threat of non-state actors seeking nuclear materials may be growing, and countries continue to debate proper ways to enhance nuclear safety, security, and nonproliferation systems to keep up with the pace of change. At the same time, governments worldwide are having difficulty managing the effects of a rapidly changing climate, such as more damaging natural disasters and resource stress. The relationships among nuclear, climate, and security risks are growing more complex and interconnected, and these issues are likely to begin converging in new ways. By early 2016, it has become clear that the international community must take a fresh look at the ways in which they are likely to connect and potentially collide in the years ahead, and foster deeper dialogue on what should be done about it.

A Confluence of Concerns

While experts have long spoken of a “nuclear renaissance” in the global energy market, a confluence of recent events related to both nuclear energy and climate change are contributing to heightened concerns about nuclear security, and other security problems. The July 2015 Iran nuclear agreement raised to a truly global debate the decades-old tensions between allowing peaceful nuclear energy programs to advance and preventing the expansion of nuclear threats.

The following month, the International Atomic Energy Agency (IAEA) and Kazakhstan concluded a long-awaited agreement to move forward on an international fuel bank to hold and supply low-enriched uranium for nuclear reactors, with a goal of reducing the desires of countries to invest in their own fuel enrichment capabilities.¹ The climate change negotiations concluded in Paris in December 2015 raised yet more questions about the world’s nuclear trajectory.

In early 2016, climate change, energy needs, regional political balancing, and other drivers have combined to push many countries to pledge increases in their nuclear energy capacity, a trend revealed by the Intended Nationally Determined Contributions (INDCs) submitted by many countries in support of the Paris summit. This dynamic necessitates a close look at the potential nuclear futures the world may be facing, and an examination of the security implications likely to result if nuclear energy expands in the various ways the Paris negotiations and other recent indicators have brought to light.² Trends in Asia and the Middle East, where nuclear dynamics are changing the fastest and carry the starkest strategic and security consequences, are particularly important spaces to watch.

In the wake of the 2015 Paris climate conference, four key trends are emerging that animate the most

credible security concerns. These are concerns, however, that if addressed comprehensively, can create opportunities for making both climate and nuclear security policies more effective.

1. Clarity on the increasing scale of nuclear ambitions. The scale, scope, and speed of some countries' ambitions have caused perhaps the most concern by those focused on nuclear affairs. China's plans have been a major focal point as the country added public details on the extreme rate of its nuclear energy expansion plans in late 2015. The country has announced plans to build 6 to 8 new reactors per year through 2020 and increase the rate of production thereafter, becoming the world's top nuclear energy supplier by 2030.³

Following its new climate commitments, in April 2016 China publicly revealed plans to develop floating nuclear power stations to increase its electricity availability in disputed areas of the South China Sea.⁴ These plans, if carried out, could be seen as enhancing the country's military capabilities in the region and contribute to already-rising tensions.

2. Detailed intentions on nuclear technologies of high concern. Less noticed are cases like India, whose INDCs not only state the scale of its nuclear energy expansion goals but also provide details that raise deeper security questions.⁵ India's INDC submission specifically calls out its continuing commitment to develop fast breeder reactors -- of higher concern for their rate of plutonium production -- to illustrate the emissions mitigation technologies the country is eyeing. As the media in India reported in early December 2015, the country is planning six additional fast breeder reactors after the prototype that is currently being finished becomes operational.⁶ This is particularly worrisome in light of the "presence of groups interested in and capable of illicitly acquiring nuclear materials" and other factors that recently led the Nuclear Threat Initiative to rank India as one of the countries of highest risk for theft of nuclear materials.⁷

3. Nuclear programs being pursued in absence of climate considerations. In a third category of concern are countries that appear to be reinvigorating their pursuit of nuclear energy *without* linking these ambitions to climate considerations. For the international community, this can exacerbate fears that these countries seek to develop latent nuclear weapons capabilities or challenge the existing bal-

ance of power among their neighbors. Saudi Arabia is the most extreme case, having directly tied its nuclear energy ambitions to the Iran nuclear agreement in 2015 while simultaneously omitting its nuclear energy activities from its INDC submission to the Paris negotiations.

The absence of nuclear-climate nexus thinking can be equally dangerous for domestic political and social reasons. Countries such as Jordan, Saudi Arabia, and Bangladesh are pursuing nuclear energy despite the clear indicators that the changing climate coupling with existing population and geographic constraints may limit their future ability to operate water- and land-intensive power stations. Governments pursuing nuclear power in spite of climate pressures risk driving social instability and stoking political opposition, which can raise new security risks within and beyond their borders.

4. A changing export marketplace weakening nuclear norms and standards. The emergence of Russia and China as key nuclear energy exporters is already beginning to reshape how global norms and standards of nuclear safety, security, and non-proliferation are being set. The rising international interest in expanding nuclear power generation may be on a collision course with trends of importing countries signing more extensive deals to work with suppliers with lower standards for nuclear materials tracking and less capital to invest in providing strong verification and monitoring systems. This increasingly pervasive but little explored challenge will necessitate changes in U.S. and international nuclear security and nonproliferation policies and programs, most of which are grounded in outdated assumptions that countries like the United States will remain the heavy-hitters of the future international market for nuclear technologies.

The international community must manage these types of challenges -- and others that may not yet be obvious -- if countries move forward with the nuclear aspects of their INDCs and other recently-announced nuclear plans.

Security and Other Risks

A number of countries are already taking steps toward establishing or expanding nuclear power programs, including Saudi Arabia, Jordan, the United Arab Emirates, South Korea, Vietnam, China, India, Bangladesh, Turkey, Belarus, Po-

land, Kazakhstan, and Pakistan. The countries exploring nuclear energy but not yet moving forward on very concerted paths include Thailand, Indonesia, Italy, Nigeria, Kenya, Laos, Malaysia, and Morocco.⁸ Some of this growth, if it occurs, will be offset by a significant portion of the world's existing nuclear reactors ageing out of the system or ending operations for financial reasons. Still, the nuclear program expansions that do take place among these and other countries in the decades ahead will carry direct and indirect security challenges that must be mitigated.

There are a number of direct safety and security risks of concern. Depending on the dominant players, the resources they are willing to commit, and other factors, nuclear norms and standards may be either weakened or strengthened in the coming decades. If global stocks of nuclear materials increase overall, this will raise concerns that recent progress in reducing the risks of diversion by terrorist organizations and other disruptive non-state actors may be slowed or set back. Of equal or greater concern is the potential for nuclear energy-consuming countries to develop their own domestic enrichment and reprocessing capabilities. Safety and security laws and regulations, human capital, operational acumen, and robust training regimens take time and sustained support to develop. A hastened rate of global nuclear expansion may make it easier for standards to be compromised as countries develop these systems. In areas of heightened risk of terrorist and other sub-national groups targeting critical infrastructure, nuclear reactors may form attractive targets.⁹ This is a growing concern even in countries such as Belgium where, until recently, that risk seemed relatively low.¹⁰

Indirectly, some of the countries listed above may be challenged by social disruptions or political instability if they move forward as robustly on nuclear energy as they have indicated in recent climate commitments. News reports since 2015 have shown the potential for national-level decisions regarding nuclear energy (whether for climate or other reasons) clashing with local desires.¹¹ Nuclear commitments made at the national level may incite public resentment toward the capital-intensive early investments required. Likewise, any countries advancing nuclear energy projects without sufficient consideration of the climate-related risks involved – such as water stress, power

generation issues, and other resource challenges – may trigger backlash.

Foreign and security policy concerns abound as well. With increasing nuclear investments will come increasing international demand for transparency that may contribute to rising suspicions or alter threat perceptions among countries. The unending concerns that non-nuclear weapon states such as Japan and South Korea will put their peaceful nuclear capabilities to military use show how pervasive these issues can become, even when countries devote great political capital and resources to promoting non-proliferation. These concerns are perhaps highest for countries that appear to now be moving forward on nuclear power but for which these plans seem detached from their climate-related commitments or actual energy needs.

Potential Opportunities

All these risks can be managed and mitigated – in some cases, more readily than those associated with the production and consumption of other energy resources. The international community may find new opportunities in addressing the challenges outlined above.

Continuing strong international support, including financial resources, for the IAEA will have broad-spectrum benefits. The trends outlined in this brief make nuclear security and safety – and the critical global security responsibilities of the IAEA – as imperative as ever. But the agency's contributions to these global security issues extend well beyond the nuclear energy realm. IAEA leaders are increasingly touting the utility of nuclear-related technologies in mitigating and adapting to the effects of climate change, including in health, agriculture, and environmental monitoring and detection. The IAEA conducting training for detection of the Zika virus as it continues to spread in early 2016 is an example of the agency's potential future utility as the changing climate contributes to different patterns of vector-borne diseases.¹²

Next, countries, experts, and scholars should explore – not ignore or muffle – the social and political disruptions triggered by nuclear-related decisions whenever they occur. Nuclear-related protests are not new. However, the encroaching effects of a changing climate, the continually expanding access to information, legacy and emerg-

ing security dynamics, and other trends are combining in new patterns that may be changing the potency of these disruptions. Luckily, the understanding of complex crises that arise from thorny combinations of modern drivers has advanced significantly in recent years. Because of the interrelated nature of the issues at hand, key questions to investigate will include the balance of local concerns across the range of economic, security and safety, environmental, and other issues. Anti-nuclear protests may actually be about nuclear-related concerns, but they may also be predominantly driven by water stress, unemployment, injustice, and other challenges. These distinctions are necessary to understand for designing effective remedial policies.

Finally, ensuring decision makers connect security, nuclear, climate, and other intertwined topics as they develop new policies and programs can help ensure there are complementary gains across these issue sets. For example, keeping climate and nuclear issues connected may create new diplomatic opportunities. Addressing climate change has created productive avenues of cooperation – notably, between the United States and China – that may be built upon to develop the trust and confidence required for discussions on notoriously thorny issues like arms control. Multilateral and international mechanisms that originally focus on climate concerns may also be grown or leveraged in the future to further mitigate nuclear risks, and vice versa.¹³

For the United States, the legal agreements, international programs, and Congressional oversight that help form the foundation of its global civil nuclear transactions and norms must fully account for both the security dimensions of countries proceeding to expand nuclear investments and the

very real climate concerns those countries face. The nuclear safety, security, and nonproliferation standards countries adopt will be shaped by which exporting countries agree to supply technology and training. For potential nuclear importing countries of highest security concern, such as Bangladesh and Saudi Arabia, their nuclear futures will be profoundly influenced by whether countries like Russia serve as their primary suppliers, or if that role is played by countries such as Japan and France. U.S. policies must also be adjusted to help shape the global nuclear energy trajectory despite its reduced role in this export market; international cooperative programs that deliberately address climate issues in tandem could help. Any adjustments the next U.S. administration makes to the national security strategy and regional cooperative plans must likewise thoroughly account for both the risks and opportunities that will come from whatever trajectory dual nuclear and climate trends take.

Conclusion

There exists today a decidedly worrying lack of examination of how nuclear and climate trends may shape one another in the years ahead, and how addressing these trends in tandem could both mitigate risks and create opportunities. It's imperative that conducting this kind of cross-sectoral analysis, and identifying related new avenues for enhancing security, happen in earnest, as both climate change-related risks and nuclear security risks are rising, and rising fast. National, regional and international strategy, policies and investments will need to be made in order to adequately address this confluence of risks, and there is little time to lose.

¹ Tariq Rauf, "From 'Atoms for Peace' to an IAEA Nuclear Fuel Bank," *Arms Control Today*, October 2015, https://www.armscontrol.org/ACT/2015_10/Features/From-Atoms-for-Peace-to-an-IAEA-Nuclear-Fuel-Bank

² This effort is intended to build on past but pre-Paris agreement work such as the Fall 2009 and Winter 2010 issues of *Daedalus*, "On the Global Nuclear Future Vol. 1 and Vol. 2," <http://www.mitpressjournals.org/loi/daed>; Miles Pomper and Cole Harvey, "Nuclear Power and Proliferation: The Risks of the Nuclear Renaissance," in *Nuclear Power and Energy Security in Asia*, Rajesh Basrur, Cole Harvey, Koh Swee Lean Collin, eds., (New York, NY: Routledge, 2012); and others.

³ Jon Stone, "China to build 40 nuclear power plants over the next five years: The Chinese state is playing a key role in the UK's nuclear power ambitions, too," *The Independent*, January 4 2016; Tetsuya Abe, "China aims to become world's top nuclear power producer by 2030," *Nikkei Asian Review*, October 11, 2015.

⁴ Keith Johnson, “China’s Got Nuclear Power Plans for its Fake Islands,” *Foreign Policy*, April 22, 2016, <http://foreignpolicy.com/2016/04/22/chinas-got-nuclear-power-plans-for-its-fake-islands/>

⁵ Government of India, “India’s Intended Nationally Determined Contribution: Working Towards Climate Justice,” 2015, <http://www4.unfccc.int/submissions/INDC/Published%20Documents/India/1/INDIA%20INDC%20TO%20UNFCCC.pdf>

⁶ “India plans to construct six more fast breeder reactors,” *The Economic Times-India*, December 1, 2015.

⁷ Nuclear Threat Initiative, “Country Profiles: India,” *Nuclear Security Index*, January 2016, <http://ntiindex.org/countries/india/?index=theft>

⁸ World Nuclear Association, “Emerging Nuclear Energy Countries,” updated February 2016, <http://www.world-nuclear.org/information-library/country-profiles/others/emerging-nuclear-energy-countries.aspx>

⁹ Turkey, which is working to develop its nuclear system for energy independence, low-emissions growth, and other objectives, is an often-cited example given domestic terrorism concerns and instability in its neighborhood. See Sinan Ülgen, ed., “Nuclear Security: A Turkish Perspective,” Centre for Economics and Foreign Policy Studies, 2015, <http://edam.org.tr/en/AnaKonu/nuclear-security~a-turkish-perspective>

¹⁰ Michael D. Regan, “Brussels attacks renew concerns over global nuclear security,” *PBS Newshour*, April 3, 2016, <http://www.pbs.org/newshour/rundown/brussels-attacks-renew-concerns-over-global-nuclear-security/>

¹¹ See, for example, Adrian Levy, “India’s nuclear solution to global warming is generating huge domestic protests,” Center for Public Integrity, December 15, 2015, <https://www.publicintegrity.org/2015/12/15/18873/indias-nuclear-solution-global-warming-generating-huge-domestic-protests>

¹² International Atomic Energy Agency, “IAEA Trains Experts to Use Diagnostic Tools for Quick Zika Detection,” April 5, 2016, <https://www.iaea.org/newscenter/pressreleases/iaea-trains-experts-to-use-diagnostic-tools-for-quick-zika-detection>; also see the agency’s “Topics in Focus” highlights at <https://www.iaea.org/newscenter/focus>

¹³ A diverse group of experts developed these types of multi-decade pathways in a conversation called “The Future We Want: Is a World Without Nuclear Weapons Possible?” hosted by Reinvent on April 4, 2015, <http://reinvent.net/the-future-we-want/#scenario2>