

Exploring Opportunities for Cooperation in Nuclear Energy, Safety and Security: the US-India Experience

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China-India-US Workshop on Science, Technology and Innovation Policy

Declining resources, rising oil prices, and looming climate change have re-invigorated the global discussion about energy. Developing countries in particular face electricity shortages that have impeded economic growth, threatened political stability, and spurred violent uprisings at an alarming rate.

My interest in attending the 2008 China-India-US Workshop on Science, Technology and Innovation Policy at the Indian Institute of Science in Bangalore, India was inspired by a desire to attain a deeper understanding of the energy challenges confronting emerging—or re-emerging—countries and how experts from across the globe are bringing science and technology to bear on a unique set of evolving problems.

One of the workshop's sessions was focused on the technical and financial feasibility of clean coal technologies. Experts from the US, China, and India discussed not only its future potential, but also the finite availability of coal as an energy resource beyond this century. As for India, though it has the fourth largest coal reserves in the world, it will likely face difficulties in transforming national coal reserves, which are poor in quality, into an efficiently viable solution.¹

Another alternative India is pursuing with renewed vigor is nuclear energy. India's goal is to increase nuclear power capacity so that it is meeting 25% of India's energy demands. It has a long way to go to fulfill this goal as nuclear energy currently contributes just over two percent of India's energy supply.² This is in part a result of a rather contentious history with nuclear technology, dating back to the Atoms for Peace program in the mid-1950s.

Atoms for Peace was a US-led program that sought to transfer nuclear technology and know-how to developing countries for the sole purpose of peaceful nuclear energy. India was a beneficiary of such assistance and acquired technology, equipment and training throughout the 1950s and 1960s. However, in the late 1960s doubts began to emerge about India's nuclear intentions after it refused to sign onto the nuclear Nonproliferation Treaty because of what it argued was the discriminatory nature of the agreement. Those doubts were solidified when, in 1974, India detonated its first nuclear weapon, proving that non-nuclear weapon states were capable of diverting peaceful nuclear technology to military use.

¹ An Indian expert from private industry spoke at the workshop regarding the high ash content in Indian coal, which presents a major challenge for efficiency and reliability for power generation.

² "Nuclear Power in India," World Nuclear Association" September 2008.

The US responded to the detonation by banning nuclear trade with India. It further sought to cut off supplies by helping to establish the Nuclear Suppliers Group (NSG). This international consortium of nuclear suppliers agreed not to export nuclear fuel and nuclear-related technology to countries without full-scope safeguards--including India. India nevertheless managed to follow up its 1974 nuclear test with a detonation in 1998, demonstrating its ability to develop and cultivate homegrown talent in nuclear weapons technology.

What strategic military advantages India might have achieved were somewhat tempered by the negative consequences brought to bear on its civilian nuclear energy program. Since conducting its first nuclear test, India has not been able to buy nuclear fuel or technology on the world market. The country is now running short in domestic supply of uranium for existing reactors, much less any additional nuclear reactors it might plan to build to meet its rising energy demands.

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The future is looking brighter for nuclear energy in India, however. The US is poised to re-establish civilian nuclear cooperation with India as part of a comprehensive plan to strengthen its geo-strategic ties in the region following the 9/11 attacks. The attacks heightened US sensitivities to the prospect of nuclear terrorism carried out by groups that might want to buy or steal from countries with existing stockpiles of nuclear weapons.

In July 2005, President Bush announced a US-India nuclear energy partnership that aimed at providing India with nuclear technology to reboot its nuclear energy sector, in exchange for a strong commitment from India in the field of nuclear nonproliferation.³ Among other things, this commitment would include: 1) identifying and separating India's civilian and military nuclear programs; 2) applying IAEA safeguards to civilian nuclear facilities⁴, and 3) supporting international efforts to prevent the spread of nuclear weapons.

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The US-India nuclear deal might open new windows of opportunity for the US as well. As a global leader in nuclear nonproliferation, the US has initiated a steady stream of initiatives to prevent the spread of nuclear material and technologies to rogue nations or non-state terrorist actors. Indian cooperation in these efforts has been minimal.

For example, the US established the Proliferation Security Initiative (PSI), which includes a broad set of security arrangements that aim to prevent nuclear proliferation by amending countries' national and legal instruments to better respond to illicit WMD trafficking and interdiction opportunities.⁵ Though India has participated as an observer in training exercises, due to domestic political constraints it has not fully signed up to join

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³ Joint Statement Between President George W. Bush and Prime Minister Manmohan Singh, White House Press Release, July 18, 2005, Washington, D.C.

⁴ The International Atomic Energy Agency (IAEA) is an independent organ of the United Nations that serves as the primary international watch-dog for monitoring peaceful uses of nuclear-related technology.

⁵ For further detail see, Proliferation Security Initiative (PSI), Congressional Research Service Report for Congress, Updated February 4, 2008.

PSI efforts.⁶

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The US launched the Container Security Initiative (CSI) in 2003. The initiative is essentially a border security arrangement that allows U.S. Customs and Border Protection (CBP) to search for potential weapons of mass destruction by working with foreign government counterparts to screen high-risk maritime cargo at foreign seaports that are destined for the United States. India does not currently participate in the initiative.

Nor does India directly participate in the US Megaports initiative, which is a similar program run by the US Department of Energy's National Nuclear Security Administration to detect and deter illicit trafficking of nuclear and other radioactive materials by equipping foreign ports with radiation detection and other surveillance technologies.

It is important to note, however, that India has cooperated with US officials to some degree in this effort. Just after the 9/11 attacks India announced its full support for US counterterrorism efforts and offered the use of India's bases for counterterrorism operations. Illustrative of this cooperation, in 2005 Indian authorities notified US officials involved in the Megaports program of a small neutron source detected in a scrap metal container arriving from Sri Lanka,⁷ thus signaling India's willingness and ability to cooperate on detecting and preventing potential nuclear terrorism threats in the region.

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India's reputation with respect to nuclear nonproliferation has received mixed reviews to date. However, the US-India nuclear deal might serve as a means to improve India's track record. The bilateral agreement might help to identify additional partnership-building opportunities to support broader US efforts to both promote civilian nuclear cooperation and prevent nuclear proliferation.

But the benefits might extend beyond the goal of strengthening US-India ties. India might also become a gateway to guiding civilian nuclear pursuits throughout South and Southeast Asia. Certain (though obviously not all) aspects of India's experience in introducing nuclear power could serve as a guide to developing countries in the region that are considering, or are already on the path to establishing a civilian nuclear power program. Bangladesh, Myanmar, the Philippines and Malaysia are just a few of the countries that have expressed such a desire. These countries might have important historical, cultural, and geographic similarities that make an Indian approach to nuclear safety and other nuclear security issues a relevant model to follow on their own roads to nuclear energy development.

⁶ For example, India was an observer at the "Pacific Shield 07" exercise held off the coast of Japan in October, 2007. Stephanie Lieggi, "Proliferation Security Initiative Exercise Hosted by Japan Shows Growing Interest in Asia But No Sea Change in Key Outsider States," WMD Insights, December 2007-January 2008 Issue.

⁷ The neutron source was also picked up on radiation portal monitor (RPM) in Sri Lanka. See "Statement of David Huizenga," Assistant Deputy Administrator Office of International Material Protection and Cooperation, National Nuclear Security Administration, US Department of Energy Before the Senate Committee on Commerce, Science, and Transportation Subcommittee on Surface Transportation and Merchant Marine Infrastructure, Safety, and Security, June 12, 2008.

For example, the porous border between India and Bangladesh has proven to be fertile ground for illicit trafficking in people, drugs, and weapons. Better cooperation between the two governments in implementing some of the training from US-led initiatives might help to prevent and detect such activities, especially the potential for smuggling peaceful nuclear-related material or technology for WMD diversion.

Indian experts already participate as national representatives in nuclear technology networks such as the Regional Co-operative Agreement (RCA) and the Asian Network for Education in Nuclear Technology (ANENT). These groups provide outreach and training programs for developing countries in the region that are pursuing nuclear technology in such fields as medical, industry, research and energy. Still new regional arrangements might be established to forge additional ties with scientists and experts in India who are at the forefront of innovation in nuclear safety and security.

Furthermore, India has the infrastructure and personnel in place to begin such important work. A variety of world-class research institutions are located throughout India, including the Bhabha Atomic Research Center in Mumbai, and departments within the Indian Institute of Science in Bangalore, such as the Jawaharlal Nehru Centre for Advanced Scientific Research, The Centre for High Energy Physics (CHEP), the Indian Linear Collider Working Group (ILCWG), and the Central Power Research Institute. These institutions not only provide important platforms for discovery, but could also serve as venues for hosting regional workshops and conferences on a whole host of nuclear energy, safety and security issues

Indeed, regional energy cooperation within South Asia has been receiving increased attention. An example of such cooperation is the South Asia Forum for Infrastructure Regulation (SAFIR) currently administered by the Tata Energy Research Institute (TERI) in New Delhi, India. The energy arrangement includes Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. SAFIR's mission is limited to assisting in the building of regulatory capacity in the electricity, natural gas, telecommunications, water, and transport sectors. However the recent surge of interest in alternative sources of energy might inspire the establishment of a similar arrangement with respect to nuclear energy.⁸

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Thus, despite its controversial past, India might become an important broker and ambassador for international nonproliferation objectives. Participation in regional networks will also help foster greater nuclear transparency and confidence-building in the region.

The chairman of the Indian Atomic Energy Commission, Dr. Rajagopal Chidambaram, spoke to the international delegation at hand during the 2008 Workshop in Bangalore. He described some of the challenges facing India's science and technology sectors and insisted that India needed to transition from short-term narrowly focused goals in basic

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⁸ For further details, see: www.safirasia.org

research, to long-term national goals that will enable India to become a “global innovation leader.”

But with this role comes responsibility. In terms of nuclear technology it means upholding and supporting international nonproliferation norms and assisting other countries in the region that might be following a similar path. Though my experience traveling through India was brief, I have no doubt India has the ability to live up to its potential. Its society is a vibrant, dynamic, and rapidly evolving epicenter of technical progress and innovation.

Future Workshops might focus on identifying and developing collaborative relationships between the next generation of scientists, experts, and policymakers focused on the potential benefits, and dangers, of nuclear energy. The US-India nuclear agreement is one such opportunity to explore.