Ken Luongo Remarks

Nuclear Energy and Nuclear Power in the 21st Century

Center for the National Interest and Energy Innovation Reform Project

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* In my view the context for evaluating the contributions of nuclear power in the 21st Century have evolved significantly from the 20th Century. But the evaluation framework has not been adequately updated.
* The challenges, the financing, the competition, the technology, the markets, and the expectations are all different today than they were even at the close of the 20th century.
* All of these issues – and more - are entwined and you need more than single issue silo communities to tackle them.
* We do not have the luxury of being single issue communities anymore. The issue set is evolving and they are inter-related.
* You cannot just care about nuclear nonproliferation, or nuclear waste, or security, or safety, or kilowatt hour price. You need to care about all of these issues. And you need to be able to find the balance that addresses those concerns and recognizes the continuing strategic and geopolitical importance of nuclear power and commerce.
* To address this new environment, it will require: (1) new policies; (2) new partnerships; and (3) the recognition of new realities.
* The new environment considerations include –
	+ climate and low carbon energy demands
	+ cyber, artificial intelligence and non-state actor threats
	+ aggressive, state-backed international competitors
	+ newcomer nuclear nations in dangerous neighborhoods
	+ clean air, public health, and sustainable economic development requirements in the developing world
	+ new, advanced reactor technology development and the creation of an effective regulatory and security structure around it
	+ elimination of electricity inequality as power and reliability demands grow around the globe
* This session was described as a way to begin to navigate the tension between high U.S. standards for global nuclear trade, the nuclear market assault from Russia and China, and the importance of maintaining influence over projects and governance.
* So, let me try to address three of those key areas - Nuclear Security, Governance and Geopolitics – and then offer some ideas for guiding the next generation of nuclear power.

**Security**

* Nuclear security is a big issue. It has outgrown the traditional definition of guards, guns and gates. Those physical protection issues are still important, but there are a number of new security challenges in this century.
* As a first order of concern, the international nuclear security system is not well structured. This is in contrast with safeguards and security which rely on international agreements like the CNS and NPT.
* It is not well integrated, it is opaque, and it does not mandate consistent standards and implementation across nations. It is primarily based on the IAEA’s useful recommendations but they can be voluntarily implemented or ignored.
* This situation creates the opportunity for the creation and perpetuation of weak links in the global system.
* In the past decade, there were four international nuclear security summits designed to strengthen the system. They made some improvements, particularly by eliminating fissile material stockpiles and promoting attention to the issue.
* But, that is not enough in our new environment. Nuclear security has morphed into something much more complex. For example -
	+ Cyber security is a growing and mutating challenge to all digital infrastructure and nuclear is one of the most consistently attacked. There is a level of alarm about this challenge.
* Non-state actor and nuclear terrorist challenges continue to cast a shadow on the nuclear landscape. Much has been done since 9/11, but there is also much more to be done as terrorist tactics mutate rapidly.
* Artificial intelligence is an emerging and uncharted field in the nuclear area. It is unlikely to be a purely benign technology or one limited only to states. Corporations are largely controlling this technology in the West.
* A lurking issue is the potential for a geo-engineering response to a failure to limit greenhouse gasses. The decline of existing nuclear reactors and the uncertain future of the next generation of technologies has a significant impact here as a significant zero carbon energy source.
* There is little in place in the international system to stop any nation from acting on geoengineering if climate change poses a direct threat to their national security and stability – including the food supply. The international security implications of actions in this area can be globally profound and uncertain.
* The next phase of nuclear power will be in regions where the U.S. and western nations may not have as much influence on nuclear decision making. While we have eliminated fissile material stockpiles in many nations, newcomer nuclear nations contracting with aggressive, new nuclear suppliers, may decide that uranium enrichment and reprocessing are in their national interest.
* So, there is considerable work to be done in nuclear security 3.0 that is very different from the analyses and considerations that have received most of the attention since 9/11. But it is not being acted upon in a strategic manner by governments or other key players.

**Geopolitics**

* It is clear that nuclear power is most rapidly growing in the developing world. But it is important to note that it is expanding most aggressively in tense regions of Asia, particularly in South and North East Asia, and it is slowly emerging in the stability-challenged Middle East. There also is interest in Africa. This poses special challenges.
* In many nations contemplating nuclear power, the educational, regulatory, and training systems are in need of significant strengthening. We need to collectively ensure that nuclear newcomers are very well prepared to safely and securely operate their nuclear infrastructure.
* But who is the “WE”?
* The question that is rising in importance is who is going to supply this next wave of nuclear power – LWS and advanced reactors - and how committed are they to ensuring the highest levels of governance?
* Traditional nuclear suppliers, including the U.S. and its allies, have primarily written the current rules. But, they are in the process of losing ground on nuclear commerce to Russia and soon China. Their nuclear ambitions are state backed and are integrated into the strategic and geopolitical objectives of these countries.

* These are very serious issues for the entire global community. Nuclear operation and supply are special responsibilities. Radiation does not respect borders. Standards must be strong. And suppliers and operators must be responsible. The impacts of TMI, Chernobyl and Fukushima were body blows to the global nuclear industry and public confidence.
* I think that the traditional nuclear suppliers, like the U.S., would agree that nuclear safety, security, non-proliferation, and environmental protection are the essential components for the advancement of civil nuclear power.
* But what do Russia and China think.
* Russia is aggressively marketing its nuclear technology abroad. Its Build, Own, Operate and Return of spent fuel is very attractive to newcomer nations. But it is only possible because it is backed by state financing. No private company can afford to offer that deal, as evidenced by the fact that no private company is offering that deal.
* But, newcomers dealing with Russia have commented that they would prefer to deal with the U.S. for a variety of reasons including technological superiority, relationship building and regulatory support.
* China is poised to become the Amazon.com of nuclear commerce in this century.
* By 2026, China is projected to overtake the United States as the world’s top nuclear power generating nation – making it the largest global nuclear operator and market. But initially, also a leading nuclear nation with the least cumulative number of years of experience compared to other major nations.
* Along with its domestic expansion—20 reactors under construction and 40 more planned – China is seeking to build nuclear plants in emerging economy nations and long-standing nuclear states.
* It also is working hard on advanced reactor concepts, including one that may lead the pack in the race for commercialization.
* One of our key allies – South Korea – is in a state of confusion about its future civil nuclear program and exports.
* Eliminating the role of South Korea - one of the U.S.’ critical and responsible partners in the civil nuclear field - will have significant political, economic, climate and international security implications.
* It may be that the nuclear sabre rattling from North Korea helps to clarify the value and importance of current and future nuclear activities in South Korea.
* In the face of these new realities, the U.S. is not facing the choice of whether to lead or follow. Its choice is to lead or cede – as in cede the international nuclear playing field to Russia and China.
* If the U.S. does not rapidly and actively reinvigorate its global civil nuclear strategy and become a stronger player in the export market, it will still be left with the responsibility and the bill for managing the consequences. Let me offer three example – Iraq, North Korea and Iran. In one way or another, all three of those nuclear programs have cost the U.S. a fortune to date – not the original suppliers of the technology.
* Part of the answer to this situation is that there needs to be much better leadership and strategic thinking at the federal level in the U.S. At the moment, we have outsourced a significant component of our civil nuclear strategy to state legislatures and governors. State capitols, as a general rule, are not rife with geostrategic thinkers.
* But, nuclear geopolitics are as important – if not more so – then kilowatt hour electricity prices for this country.
* There needs to be a clear recognition of the significant implications for the country of continued technical superiority in this area and its corollary implications for the domestic economy, workforce and employment, environmental objectives, and global nuclear safety, security, and nonproliferation standards.
* I worry about the nuclear geopolitics gap that is emerging between the U.S., and Russia and China. They are thinking strategically about their global interests and relationships and backing the effort with government support for nuclear power projects. We do not seem to be thinking strategically and are asking private companies to compete with their own resources on a severely tilted playing field.

**Governance**

* Effective governance is the fundamental foundation of public confidence in nuclear power.
* We have sub-optimal international nuclear governance for the current reactor fleet - one that is mostly reactive - and one that is not adequately evolving to address future challenges. There needs to be a process of realistic continuous improvement in the governance system to keep pace with these evolutions.
* In the 21st Century, governance improvements must be proactive, aggressive, and deliberate because the system is facing a novel set of new challenges, including:
	+ Non-state actors and terrorists seeking nuclear materials and expertise
	+ New nations without deep experience or infrastructure pursuing nuclear programs
	+ New nuclear suppliers that lack a history of strengthening norms and governance
	+ A major technical evolution in the form of advanced reactors that are smaller, use different coolants, and don’t fit neatly into the regulatory frameworks that we’ve created for large LWRs
	+ Zero carbon energy requirements
* It is essential that the U.S. continue to set the tone and scope for the nuclear governance system and to be able to influence Russian and Chinese actions in the international civil nuclear environment from a position of strength. We need a strategy of continuous improvement and cannot afford a race to the bottom.

**Guiding the Next Generation of Nuclear Power**

* I do think that there is a silver lining in the difficult situation that we are now facing because it is clear that the parties that care about climate, and the future of nuclear power, and geopolitics, and nuclear security and governance need to find a way to work together.
* I have been calling this a “break the mold” partnership that can guide the next generation of nuclear power. It is potentially very powerful and the mold is beginning to crack.
* This partnership is based on the premise that no single entity has all the answers or controls all the levers that are necessary to advance progress. However, they have common interests that weren’t obvious in the 20th century. Together they can assess the landscape and formulate balanced, realistic, and effective responses.
* My organization and the Nuclear Energy Institute created the Global Nexus Initiative that is looking at the intersection of climate change, nuclear power and global security. Its working group include a wide swath of expertise.
* We released an important and balanced consensus report that did not water down the new realities. It identified the importance of nuclear power but also made clear the need for strengthening governance. It noted the importance of nuclear geopolitics. And it endorsed the “break the mold” partnership.
* We intend to further build on this foundation over the next phase including addressing the need for proliferation resistance and security in advanced reactors and addressing the geopolitical challenges.
* There also are some important environmental and energy organizations that are supporting next generation reactors as a response to the climate challenge. They understand that security, governance and geopolitics are part of that package.
* Aligning the critical sectors – civil society, the nuclear industry, and committed governments and international institutions, and others — will be an extremely potent force for developing and implementing innovative nuclear policies.
* A “break the mold” partnership – as a function of its diversity - can serve as a credible voice on complex nuclear issues, generate high-level attention to challenges, and provide a platform for creative and effective problem solving.