Statement before the U.S. Senate Committee on Foreign Relations

"CIVILIAN NUCLEAR COOPERATION AGREEMENTS: ENHANCING OUR NONPROLIFERATION STANDARDS"

A Statement by

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Mr. Chairman, Mr. Ranking Member, Members of the Committee, I would like to thank you for this opportunity to appear before the Senate Foreign Relations Committee to discuss U.S. policy on peaceful nuclear cooperation and specifically, the draft agreement with Taiwan recently submitted to Congress.

Background

For almost seventy years, trade in nuclear materials, equipment, and technology has been heavily regulated by the United States and many other countries for one fundamental reason: supplies intended for peaceful purposes can be diverted to help make nuclear weapons. For almost a decade after the first atomic explosion, the United States discouraged the spread of any nuclear technology, advocating international control of nuclear materials and technology to deter or prevent their military use. The 1946 Atomic Energy Act expressly prohibited even exchanges of information until "effective and enforceable international safeguards against the use of atomic energy for destructive purposes" were in place. A few years later, the Soviet and British nuclear tests, as well as nascent nuclear weapons programs in other countries, underscored the futility of trying to keep the lid on this Pandora's box of nuclear energy, and a new approach was born: the Atoms for Peace program. President Eisenhower's December 1953 initiative boldly coupled engagement in the peaceful uses of nuclear energy with reducing the nuclear threat. The establishment of the International Atomic Energy Agency followed within a few years, but the Nuclear Nonproliferation Treaty took more than a decade to take shape.

Ensuring that nuclear energy is used only for peaceful purposes is a *sine qua non* of the nuclear nonproliferation regime that has grown up since then. To do this, the regime has focused on making diversion from peaceful purposes difficult -- from the legal agreements signed by recipients of technology (i.e., NPT and IAEA safeguards agreements) to implementation of accounting and inspections by the IAEA, supplier guidelines promulgated within the Nuclear Suppliers Group (NSG), multilateral and national sanctions, and finally, national export control regimes. Peaceful nuclear cooperation agreements are a mechanism for sharing the benefits of peaceful nuclear energy, but also for promoting national priorities in export control and nonproliferation. In the U.S. case, they establish the scope and guidelines for collaboration, including expectations for and demonstrations of nonproliferation.

The United States has been a leader in both the military and civilian uses of nuclear energy, but its dominance of the civilian market faded some decades ago. While early cooperation agreements envisioned the United States supplying all reactors and enriched uranium for small nuclear power programs in, for example, South Korea and even EURATOM, that kind of supplier relationship is no longer desired or possible. Today, three factors are leading to a reassessment of the role of U.S. nuclear cooperation policy: the need to renew many of the agreements renegotiated after passage of the landmark Nuclear Nonproliferation Act of 1978 (NNPA); the potential for new agreements with countries considering nuclear power for the first time; and a

desire to enshrine policy restrictions on sensitive nuclear technologies like enrichment and reprocessing.

Renewal of Existing Nuclear Cooperation Agreements

The 1978 Nuclear Nonproliferation Act amended the Atomic Energy Act of 1954 in several important respects, but particularly by incorporating nine requirements in Section 123 that helped to ensure that U.S. nuclear cooperation would not be diverted for military uses. India's 1974 nuclear test certainly played a role in increasing concerns that there were not enough safeguards in place to ensure that peaceful nuclear atoms were not misused for weapons, but attempts by countries like Brazil, Pakistan and South Korea to openly acquire full fuel cycle capabilities from U.S. allies also played a role. The nine provisions, briefly, included requirements for 1. The perpetuity of safeguards on all material and equipment supplied; 2. Full-scope safeguards (safeguards on all nuclear material in a country) for non-nuclear weapon states; 3. Assurances that nothing transferred or subsequently produced from U.S. material, equipment or technology would be used for nuclear explosive purposes or for any other military purpose; 4. The right of return in the event a recipient state detonates a nuclear explosive device or terminates or abrogates an IAEA safeguards agreement; 5. Prior consent by the United States for any transfers; 6. Adequate physical protection; 7. prior consent by the United States for enrichment, reprocessing or other alteration in form or content of U.S.-supplied material or material used in or produced through the use of U.S.-supplied material equipment or facilities; 8. Approval in advance of storage facilities; and 9. Application of all the previous requirements by a recipient state to any special nuclear material, production facility or utilization facility produced or constructed by or through the use of any sensitive nuclear technology transferred under a peaceful nuclear cooperation agreement. A detailed analysis of these requirements and how they have been applied over time and how they can be strengthened is available in a report written by Fred McGoldrick and published by CSIS entitled "Nuclear Trade Controls: Minding the Gaps" (January 2013).[1]

These requirements provided a benchmark against which the U.S. Congress could judge the adequacy of peaceful nuclear cooperation agreements and were folded into export licensing requirements. Many, but not all, existing U.S. nuclear cooperation agreements were renegotiated after the NNPA was enacted (Section 404 of the NNPA required renegotiation of all existing cooperation agreements) and the few that remained outside are now up for renewal, including those with Thailand, Taiwan and South Korea. The agreement with Taiwan was submitted to this Committee on January 7, 2014 and the Senate recently voted to extend the existing South Korean agreement for two years.

Other agreements with approaching expirations include Norway (2014), China (2015), Egypt (2021) and Morocco (2022). The 1988 agreement with Japan has a thirty-year duration but specifies that it will remain in force thereafter (2018) unless terminated by either party with 6-months notice. Since the negotiation of the agreement with Japan, subsequent U.S. nuclear

[1] Available at: http://csis.org/publication/nuclear-trade-controls

cooperation agreements have adopted increasingly creative approaches to duration, with the practical impact of reducing congressional approval responsibilities. Whereas agreements written prior to the NNPA did not commonly include language on extensions of duration (for example, the Taiwanese and South Korean agreements have simple 42 and 41-year durations, respectively), those following the NNPA all refer to either mutually agreed extensions, automatic 5- or 10-year rolling extensions, or in the case of the agreement with Japan and the draft agreement with Taiwan, indefinite extensions or indefinite duration. While mutually agreed extensions may require legislative action, the automatic, rolling and indefinite extensions seem designed to circumvent the congressional approval process in the long run.

The Proposed Agreement with Taiwan

Earlier this month, the President submitted the Proposed Agreement for Cooperation Between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office in the United States (TECRO) Concerning Peaceful Uses of Atomic Energy to this Committee.

The draft agreement supersedes a 1972 agreement (amended in 1974) signed with the Republic of China (the first such cooperation agreement dates back to 1955) that is similar to the 1974 agreement signed with South Korea. It provided for all enriched uranium fuel for Taiwan's reactors at the time (ChinShan I and II) with an option to seek outside sources if the then U.S. Atomic Energy Commission could not supply the requisite amount. It also allowed for reprocessing "in facilities acceptable to both Parties" upon a joint determination that safeguards could be applied. Taiwan would retain title to special nuclear material resulting from reprocessing. Although the Republic of China ratified the NPT in 1970, the agreement provided for U.S. safeguards and the application of IAEA safeguards under a 1964 trilateral (U.S., ROC, IAEA) that could be replaced by IAEA NPT safeguards once they came into effect. In light of what we now know about Taiwan's clandestine activities at the time, the fuel assurances on the front end and relative lack of restrictions on the back end seem too little and too late.

Although the unclassified Nuclear Proliferation Assessment Statement refers only to "the direction of the nuclear program of the authorities on Taiwan in the 1970s and 1980s" as having been "widely reported in the press," the classified version should provide this Committee with the details of a Taiwanese nuclear weapons program that reportedly began in the mid-1960s and continued somewhere into the 1980s, at least according to IAEA reports of undeclared plutonium activities and other sources. The plutonium program included a research reactor (from Canada), heavy water production, and plutonium separation. U.S. official documents released under the Freedom of Information Act detail repeated demarches to Taiwanese representatives by U.S. government officials in the mid-1970s to halt clandestine nuclear activities.[2]

[2] National Security Archive Electronic Briefing Book No. 221, available at http://www2.gwu.edu/~nsarchiv/nukevault/ebb221/

With the establishment of U.S. diplomatic relations with the People's Republic of China in 1979, Taiwan's political status changed and although Taiwan is prevented from formally joining multilateral treaties and export control regimes, the authorities on Taiwan have voluntarily committed to adhering to all the major nonproliferation-related agreements and initiatives. A U.S.-Taiwan nuclear cooperation agreement is critical for Taiwan to engage in nuclear supply relationships with other countries, since the trilateral safeguards transfer agreement provides the functional equivalent of Taiwan's adoption of full-scope safeguards under the NPT. In other words, the 123 agreement with the United States is critical for Taiwan's nuclear power program as long as it intends to operate those reactors. From November 2011, authorities on Taiwan have declared they will phase out nuclear power eventually.

The current Taiwan agreement has a few notable characteristics: Article 7 provides that TECRO shall not possess sensitive nuclear facilities or otherwise engage in activities related to enrichment or reprocessing of material or alteration in form or content and it is the first agreement to specify an indefinite duration. Like the UAE agreement, there is a provision for advance consent to transfer irradiated source or special fissionable material to France or other countries as agreed for storage or reprocessing. In the Agreed Minute, the scope of the agreement specifically covers tritium, an item that is not found in many other agreements.

The Taiwan agreement has been heralded in some press reports as a victory for the "gold standard" – that is, for the United States requiring that its nuclear partners rely on the international market for fuel supply services instead of leaving future options open for domestic enrichment or reprocessing. As a country of unique political status that is overwhelmingly dependent on U.S. nuclear technology and trade, with a documented history of clandestine nuclear activities, it is hard to see how Taiwan would have otherwise reacted to a U.S. request for such restrictions. In light of Taiwan's envisioned phase-out of nuclear energy, it would also have been difficult to insist on leaving its options open for future domestic enrichment or reprocessing. Thus, while the Taiwan agreement may helpfully build a norm of countries declaring they will rely on the international market, it is hardly a bellwether for future agreements.

New Agreements with Countries and Policy Restrictions on Enrichment and Reprocessing

The rising enthusiasm for nuclear energy of the past decade, tempered somewhat by the 2011 accident at Japan's Fukushima Daiichi nuclear power plant, has spurred interest in cooperation agreements with new nuclear partners, including those in the Middle East (the United Arab Emirates, Saudi Arabia and Jordan) and in Southeast Asia (Vietnam). Concerns about the spread of sensitive nuclear technology are particularly high in the Middle East in light of Iran's continued development of uranium enrichment technology. The conclusion of an agreement in 2009 with the UAE that incorporated language in Article 7 specifying that the UAE would not possess sensitive nuclear facilities on its soil or otherwise engage in reprocessing of spent fuel or enrichment of uranium raised expectations that the United States would require similar commitments by other nuclear partners in the Middle East, or even globally. In fact, the 1981 U.S. agreement with Egypt contains an agreed minute that any reprocessing that might in

future take place would be conducted outside of Egypt, which has the same practical effect of the UAE agreement (although Egypt did not make the same commitment for uranium enrichment).

Like Taiwan, the nonproliferation "win" in the UAE case may also have resulted from other mitigating circumstances. The UAE already had a policy not to seek domestic enrichment and reprocessing, whether to burnish its nonproliferation credentials as the first state in the Middle East with nuclear power or because it simply did not make economic sense. Although it would be useful for the UAE to enlist other countries in the region to create an Enrichment-&-Reprocessing-Free-Zone, other countries currently seeking nuclear power are slow to follow. For example, Saudi Arabia reportedly has signed a memorandum of understanding with the United States to that effect, but there is no evidence that Saudi officials are eager to tout their nonproliferation credentials openly or that such language would make its way into a formal peaceful nuclear cooperation agreement. Jordan has resisted U.S. requirements for similar restrictions in its draft agreement with the United States. Outside of the Middle East, Vietnam reportedly has agreed to rely on the international market for fuel cycle services but is not eager to put such language in a legally binding agreement.

New agreements, particularly with states that have few if any nuclear power plants operating, are not an unreasonable place to begin to strengthen standards for nuclear cooperation agreements. Since 2009, the policy debate about the "gold standard" has centered on whether, in the absence of a consistent policy that applies to all U.S. nuclear partners, the executive branch can persuade other countries that it is pursuing a politically neutral nonproliferation goal. Critics of the case-by-case approach believe that a consistent policy strengthens U.S. negotiating leverage because it cuts off debates in negotiations about prestige, national sovereignty or allies' worthiness while proponents believe that an inflexible approach will result in fewer nuclear cooperation partners for the United States, with diminished nonproliferation returns.

U.S. policy for many years has proceeded on a "case-by-case" basis in order to preserve flexibility in negotiating, despite an extended period of review under the Obama administration. Recently, administration officials have reiterated their policy goal of discouraging the spread of enrichment and reprocessing technologies. However, this has been articulated as a comprehensive policy that extends beyond the scope of peaceful nuclear cooperation agreements and officials have suggested that other policy tools to achieve this objective may be preferable to incorporating specific language in 123 agreements. Acting Undersecretary of State Rose Gottemoeller told an Atlantic Council audience in December 2013 that legally binding requirements were too inflexible and that many tools were available, referring to the 2011 revised NSG guidelines on restraint in transferring sensitive nuclear technology and to the availability of fuel banks of low-enriched uranium for fuel. Privately, administration officials have suggested that Vietnam's reported willingness to rely on the international market for nuclear fuel and the U.S. consent rights for enrichment or reprocessing are enough.

Clearly, the Obama administration should use multiple tools to discourage the spread of enrichment and reprocessing. In thinking about the broader nonproliferation tools that could be applied, however, it is important to step back and place this debate in context.

A Changing Landscape

The proliferation landscape has shifted over time, both in terms of the technologies that are perceived as posing significant proliferation risks and the countries (or non-state actors) that may have clandestine intentions. For example, at the time of NPT negotiations, experts assumed that the tremendous costs, energy requirements and physical footprint of uranium enrichment plants (based on gaseous diffusion technology) would make clandestine enrichment very difficult if not impossible. This is certainly not the case today, as we have discovered with Iran and North Korea. In fact, the major difficulty is in detecting such clandestine enrichment. Looking forward, the commercial development of laser enrichment could shrink detection parameters even further.

Not all elements of the system adapt at the same time in the face of changing technical and/or political proliferation risks and some do not adapt at all. The NPT remains constant, while IAEA safeguards were strengthened in response to Iraq's nuclear weapons program in the early 1990s (i.e., with the adoption of the Additional Protocol in 1998). Although some observers might wish for stronger withdrawal provisions or penalties for non-compliance in the NPT, the tension among its states parties makes amendment a rather risky enterprise. The Nuclear Suppliers Group, for its part, responded relatively quickly to Iraq's noncompliance by finally implementing a requirement for full-scope safeguards for nuclear trade in 1992 that several members had adopted more than a decade earlier (e.g., Canada, Japan, United States, Australia). In response to revelations in 2004 about the A.Q. Khan nuclear black market network, the NSG was a bit slower: after seven years of debate, the NSG tweaked its restrictions regarding sensitive nuclear technology transfers in 2011.

Sanctions, on the other hand, can be quite flexible, for better or worse: some U.S. sanctions imposed on Pakistan and India after the 1998 nuclear tests were famously short-lived, while imposition of other sanctions was delayed until it was no longer possible to hold them off (e.g., declaring that Pakistan was in possession of nuclear weapons). In the multilateral realm, U.N. sanctions have generally been slower to ramp up but fairly flexible: in the case of Iran, the scope of sanctions has expanded from those targeted on the nuclear program and the Iranian Revolutionary Guard to wider petroleum-related investments and trade over the course of a decade. They could shrink substantially if Iran responds well to the latest negotiated deal.

National export control regimes, including policies and laws governing nuclear cooperation and exports, can also be flexible compared to other tools and powerful if harmonized with those of other countries. In the United States, the Atoms for Peace program required a big shift from the 1946 Atomic Energy Act to allow international cooperation. Section 3e of the Atomic Energy Act of 1954 called for "A program of international cooperation to promote the common defense and security and to make available to cooperating nations the benefits of peaceful

applications of atomic energy as widely as expanding technology and considerations of the common defense and security will permit." The scope of activities included: "1) refining, purification, and subsequent treatment of source material; 2) civilian reactor development; 3) production of special nuclear material; 4) health and safety; 5) industrial and other applications of atomic energy for peaceful purposes; and 6) research and development relating to the foregoing." The United States put in place bilateral research agreements, the first of which was signed in 1955 with Turkey. According to the Congressional Research Service, the "United States established its own program for promoting the peaceful uses of atomic energy with the idea that later they would be coordinated with and even undertaken by the International [Atomic Energy] Agency."[3] By the end of 1967, the United States had 34 agreements in place with countries or groups of countries (e.g., EURATOM); of these, about two-thirds were strictly for research.

Comparing U.S. nuclear cooperation agreements of almost fifty years ago with those of today, two changes are striking: We have changed partners several times (sometimes in reaction to bad behavior and sometimes not) and we have changed what we are willing to supply. This is fairly unsurprising over a span of fifty years, but provides a few lessons.

In 1967, the United States had agreements with some countries with which it does not now have agreements: Iran, Israel, Venezuela and Vietnam. Cooperation with the Soviet Union over the years was sporadic until a 123 agreement entered into force in 2010.[4] In addition to Iran and Israel, two others on the 1967 list of partner countries are still cooperating partners, but had at that time nuclear weapons programs that were subsequently abandoned: South Korea and South Africa.[5]

The nature of cooperation has also changed over time. First, the 1954 Atomic Energy Act allowed for cooperation in the production of special nuclear material. The Ford Administration adopted the first restraint policy in the transfer of sensitive nuclear technology and facilities in 1974, prohibiting export of reprocessing and other nuclear technologies, firmly opposing reprocessing in Korea and Taiwan, and negotiating agreements for cooperation with Egypt and

[3] Ellen C. Collier, "United States Foreign Policy on Nuclear Energy," Library of Congress Legislative Reference Service, May 6, 1968, p. LRS-7.

[4] Collier, op. cit., describes an arrangement in 1967 for cooperation in atomic desalination; in 1973, the United States and the Soviet Union signed a 10-year agreement for cooperation in fast breeder reactors, fusion, and fundamental research. See Mary Beth Nikitin, “US-Russian Civilian Nuclear Cooperation Agreement: Issues for Congress,” CRS Report, RL34655, January 11, 2011.

[5] In the case of South Africa, the U.S. first signed a 50-year nuclear cooperation agreement in 1957. Cooperation lapsed in the 1970s because of evidence of South Africa’s nuclear weapons program. When South Africa dismantled its nuclear weapons and joined the NPT in 1991, the United States negotiated a new cooperation agreement that entered into force in 1997.

Israel that contained "the strictest reprocessing provisions".[6] In his 1976 statement on nuclear policy, President Ford called on all nations to join the United States "in exercising maximum restraint in the transfer of reprocessing and enrichment technology and facilities by avoiding such sensitive exports or commitments for a period of at least three years."[7] This policy of restraint has endured despite the fact that the Atomic Energy Act itself does not prohibit sharing of enrichment and reprocessing technologies (although the NNPA amendments ensured that any production facilities transferred would be subject to all the nonproliferation requirements outlined in Section 123).

Second, for many years, the United States exported quantities of uranium enriched between 20% and 90% (in U-235), U-233 and plutonium routinely under nuclear cooperation agreements. In 1993, the U.S. Nuclear Regulatory Commission reported to Congress that the United States had exported 25 metric tons of HEU, at which time about 17 metric tons were still abroad. By 1978, the United States began a program (the Reduced Enrichment for Test Reactors program, now encompassed in the Global Threat Reduction Initiative Convert Program) to encourage the use of lower enriched uranium in research reactors abroad that continues today. The current policy of the U.S. government is to support the minimization of HEU in civilian nuclear commerce where technically and economically feasible.[8]

The examples above illustrate that nuclear cooperation does and must shift over time to reflect changing circumstances, whether or not laws change. The trend over time largely has been to tighten restrictions. Exceptions to that trend should be undertaken only in circumstances where a country overwhelmingly has demonstrated its commitment to nonproliferation. Even then, it is far better to adopt an approach that is justifiable for how it reduces the risk of proliferation than what was simply politically possible at the time.

The current justification for adopting a case-by-case approach to U.S. 123 agreements is the need for diplomatic flexibility. But the examples above should also suggest that a principled approach could weather political changes in governments much better and help minimize the costs of walking back less restrictive policies.

The Role of Congress

Although peaceful nuclear cooperation agreements tend to be treated as foreign policy initiatives, they fall squarely within the Congress' constitutional mandate to regulate trade. Activism on this issue by Congress has varied with the agreements: more controversial countries and capabilities have attracted more attention. Although early legislation may have

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[6] President Ford, "Statement on Nuclear Policy," October 28, 1976, reprinted in *Nuclear Proliferation Factbook*, Senate Print 103-111, December 1994, pp. 48-62.

[7] President Ford, "Statement on Nuclear Policy," op. cit., page 54.

[8] http://www.whitehouse.gov/the-press-office/2012/03/26/belgium-france-netherlands-united-states-joint-statement-minimization-he

envisioned a bigger role for Committees in vetting peaceful nuclear cooperation agreements (for example, in the 30-day period after initial transmittal), many are submitted as boilerplate agreements (the India agreement notwithstanding). The NNPA's adoption of a more streamlined approval process for new agreements, as well as a relatively short (15 days) approval process for subsequent arrangements (e.g., arrangements for partner countries to reprocess U.S.-origin material) has made significant congressional involvement less likely. The fact that 123 agreements compliant with Section 123 requirements enter into force unless Congress passes a law otherwise presents a serious bar for disapproval that subsequent legislation (e.g., 1984 Proxmire amendment to the Export Administration Act) has attempted to address without success.

Members of Congress may want to consider the following issues:

1. ***Approval of 123 agreements may become a historical relic***: Administrations since the enactment of the 1978 Nuclear Nonproliferation Act have lengthened the duration of agreements, including bestowing rolling or indefinite extensions on certain nuclear cooperation partners (Australia, Canada, EURATOM, Switzerland and Turkey have 5-year rolling extensions; India has a ten-year rolling extension and Peru has one automatic 10-year extension). Japan's agreement from 1987 has such an "indefinite" extension while the Taiwan agreement duration itself is indefinite. Whether this is intended to minimize congressional interference by eliminating the need for congressional approval for renewals or whether this is the result of demands from cooperating partners is not clear. However, it seems similar to the Reagan administration's development of the practice of "advance consent" as a form of prior consent. In other words, it seems to contradict the intention of the law. Members of Congress may want to consider whether specific language regarding extensions or congressional review is desirable to protect its equities in ensuring that U.S. nuclear cooperation does not contribute inadvertently to proliferation.

2. ***The Atomic Energy Act does not reflect long-standing policies:*** There are several key nuclear nonproliferation policy initiatives that usefully could be supported and strengthened by incorporation into law.

a. *Additional Protocol:* The first is to require all new nuclear partners (and in renewal agreements) to have Additional Protocols in force before a 123 agreement can be approved. U.S. policy is to seek inclusion of language in 123 agreements but this could be strengthened legally. It should be noted that the NSG has not been able to make the Additional Protocol a condition of supply, despite the fact that many members do require it. Two particular holdouts are Argentina and Brazil, although there are others. Making the Additional Protocol a legally binding requirement could eventually help NSG adoption, in much the same way that countries adopted full-scope safeguards as a condition of supply before the NSG did. In addition, Congress might consider whether additional language in the AEA would be useful regarding the incorporation of improvements in the IAEA safeguards system into U.S. 123 agreements beyond the Additional Protocol. There has been talk of provisions that might amount to the "Additional Protocol Plus" in the case of Iran. Language requiring the executive branch to

report on status of IAEA safeguards improvements, particularly with respect to safeguards for reprocessing and enrichment plants, including an IAEA assessment of the effectiveness of current black-boxing techniques for enrichment technology could help inform the Congress and potentially lead to some on-the-ground improvements.

b. *Interim storage over reprocessing:* The United States as a matter of policy prefers interim storage over reprocessing, both for itself and its partners where proliferation or security risks might be a concern. And yet, recent 123 agreements do not reflect this. In the UAE and Taiwan agreements, advance consent is given for transfer to storage or reprocessing facilities (in third countries like the UK, France, or other). Although some flexibility with regard to the final destination for irradiated fuel may be desirable, U.S. policy clearly places priority on interim storage over reprocessing and this should be reflected in all future agreements.

3. ***Implementation of certain Atomic Energy Act and 1978 Nuclear Nonproliferation Act provisions are weak:***

a. *NPAS makeover:* The 1978 NNPA requires the executive branch to submit a Nuclear Proliferation Assessment Statement with each new agreement or renewal agreement. If the current trend toward indefinitely extended agreements deepens, the ability of Congress to judge the non-proliferation worthiness of partner countries will diminish even more. Even if Members of Congress see no drawback to these agreements of indefinite duration, it may be worthwhile to mandate periodic NPASs from the executive branch. Separately, the Atomic Energy Act provides no guidance to either Congress or the executive branch on the kinds of issues that should be covered in an NPAS. Some of these documents (at least the unclassified versions) do little more than recite how the agreement meets Section 123 criteria. At a minimum, the Congress could require the executive branch to consult with Members on the general scope of Nuclear Proliferation Assessment Statements or about individual NPASs before they are written or more substantially, Congress could enact legislation to specify reporting requirements for NPASs.

b. *Title V:* Title V of the NNPA required the United States to conduct non-nuclear energy cooperation and energy assessment assistance with developing states. All countries need help pursuing low-carbon, renewable options for generating electricity. This Title should be funded, implemented and monitored by Congress.

c. *International fuel cycle collaboration and multilateral approaches:* A holistic and multilateral approach that reduces proliferation risks from nuclear cooperation and fuel cycle activities continues to elude the U.S. government. This, however, was not always the case. In the late 1970s, U.S. nonproliferation policies at both ends of Pennsylvania Avenue seemed to recognize that promotion of nuclear energy cannot come at the expense of nuclear nonproliferation. In the words of Henry Kissinger, “We must take into account that plutonium is an essential ingredient of nuclear explosives and that in the immediate future the amount of plutonium generated by peaceful nuclear reactors will be multiplied many times. Heretofore the United States and a number of other countries have widely supplied nuclear fuels and other nuclear

materials in order to promote the use of nuclear energy for peaceful purposes. This policy cannot continue if it leads to the proliferation of nuclear explosives. Sales of these materials can no longer be treated by anyone as a purely commercial competitive enterprise."[9]

This dilemma is no longer painted so starkly. More often now, one hears the argument that if the United States adopts stricter controls, other states will step in to supply nuclear reactors and components with lower requirements, creating a lose-lose proposition for both U.S. nuclear industry and nonproliferation.

However, the nuclear industry has shrunk since the 1980s, and a truly zero-sum competitive market does not exist – there are many more interdependent suppliers than was the case decades ago. Rather than undercutting each other with government subsidies for nuclear deals, suppliers should be cooperating to encourage the sustainability of their enterprise. Fundamentally, this will require confronting nuclear waste challenges up front to provide favorable options for new recipients (like interim storage for spent nuclear fuel or space in a shared repository) and opportunities to invest in nuclear capacities they cannot themselves develop. A market-driven twist on collaborative fuel cycle approaches, if it is implemented in an equitable fashion among advanced and developing nuclear states, could overcome the inertia that has swallowed virtually all proposals to internationalize the fuel cycle and perhaps, finally, bring much-needed balance to the task of reducing proliferation risks.

[9] Henry Kissinger, "An Age of Interdependence: Common Disaster or Community," Address before the 29th United Nations General Assembly, September 23, 1974