CLARIFYING OUTCOMES FOR THE NUCLEAR SECURITY INITIATIVE

Prepared for The William and Flora Hewlett Foundation
by The Redstone Strategy Group, LLC

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EXECUTIVE SUMMARY

THE HEWLETT FOUNDATION'S WORK ON INTERNATIONAL NUCLEAR SECURITY BEGAN during the Cold War, with an initial phase from 1984 to 1992. In 2007, the Foundation re-entered the field and has since provided the Nuclear Security Initiative (NSI) with a grants budget of $2.5 to $4 million per year. Based on recent successes and expert recommendations, the Board decided to extend funding through 2014. In light of the extension the NSI has elected to review and clarify its work.

This report summarizes The Redstone Strategy Group's recommendations for clarified outcomes, metrics, funding strategies, and spending decisions for the NSI. It is based on interviews with external experts and practitioners (including the Initiative's three advisors), papers and background material, and program officer expertise. The report balances this research with practical concerns such as limited staff resources and the landscape of spending by other funders. The recommendations seek to identify the most effective niche for the Hewlett Foundation to pursue in the field.

The NSI's work in the field of international diplomacy entails great uncertainty, making it difficult to estimate numerical metrics of success for its work. However, the program believes that explicit goals and outcomes—despite inherent imprecision—will help it ensure that its grantees and its own staff are clear about the program's intentions. Consequently, the program has established numerical targets below for its goal and outcomes while also acknowledging that these targets are directional rather than precise.

With that background, the NSI's goal is to reduce the probability of a state or terrorist nuclear attack. To accomplish this goal, the NSI will invest in three major outcomes that fill important holes in the funding landscape, while also leaving some funds for opportunistic funding strategies. Listed below are the three outcomes with 2020 objectives for each.

1. **P5[1]—By 2020, no new US weapons are deployed in Europe or Northeast Asia, US and Russia commit to reduce deployed warheads to below 1,000 each, and the US does not develop new types of weapons** (30–35% of funds). Work with the P5 is crucial as their behavior influences the world view and actions related to nuclear weapons and nonproliferation. However, in the near term, another arms control treaty is unlikely (in part due to the success of the recent New START treaty and in part due to a likely divided US Congress fairly unable to pass legis-

[1] The P5 are the five Permanent (P) members of the United Nations Security Council: the United States, Russia, China, France, and the United Kingdom.

lation in the near future). Thus, it is important for Hewlett to pursue two strategies: US nuclear policy preparation, and work to promote dialogue between the US and China.

2. **Non-nuclear emerging states—By 2020, Turkey and Brazil support Iran adhering to the AP (or equivalent negotiated solution), Turkey supports a Middle East Nuclear Weapons Free Zone and does not decide to develop nuclear weapons, and Brazil enunciates clearer, practical steps that nuclear-armed states could take that would be accepted as reinforcing the NPT and does not decide to build a nuclear weapon** (30–35% of funds). Given the rapidly increasing importance of emerging states in international negotiations, their support on nuclear discussions and non-proliferation policies can influence the P5 nuclear powers and other issues such as Iran or North Korea. While new for Hewlett, this area offers unusually high expected return for the Foundation. Grantmaking in this area will initially focus on developing influential nonproliferation champions in Turkey and Brazil.

3. **Nuclear power—By 2020, countries pursuing nuclear power display confidence in the market for nuclear fuel rather than insisting on creating indigenous programs, at least two countries pursuing nuclear power break precedent and establish waste management plans ahead of building nuclear plants, 100 percent of all nuclear power plant exporters will adopt the Nuclear Power Plant Exporters' Principles of Conduct, and no new countries will pursue enrichment other than for civilian purposes** (20–25% of funds). Following increased visibility due to the Fukushima disaster, work on nuclear power remains crucial in promoting nonproliferation and limiting access to nuclear materials and is an area where Hewlett has a strong niche. Grantmaking in this area will pursue 1) strong long-term policies on fuel management, personnel, timelines, and funding for countries or utilities newly interested in nuclear power, 2) enforcement, funding, and implementation of the principles of conduct, and 3) work with South Korea.

4. **Opportunity** (10–15% of funds). Opportunity funds will be used where high-return strategies present themselves, and can enhance the three outcomes above or actions that will move the dialogue forward in Iran, India/China, North Korea, or India/Pakistan.

The remainder of the report is divided into five sections that provide further detail on the NSI's refined strategy:

1. Context and project objectives
2. The program's theory of change, the funding landscape, and Hewlett's role
3. Outcomes and funding strategies with current funding
4. Monitoring and evaluation plans
5. Future funding scenarios

The report is supplemented by supporting appendices, which include a full logic model and details for the outcomes and funding strategies pursued and considered.

1. Context and project objectives

The Hewlett Foundation's work to increase international nuclear security began during the Cold War. In its initial phase, from 1984 to 1992, the Foundation's work contributed to a significant reduction in the number of states pursuing nuclear weapons and in the number of warheads deployed. In 2007, the Foundation re-entered the field when concern began growing worldwide about developments in North Korea, Pakistan, India, Iran, and the large number of nuclear weapons left in the world after the end of the Cold War. Since then, the Foundation has funded the Nuclear Security Initiative with annual grants varying from $2.5 million to $4 million per year.

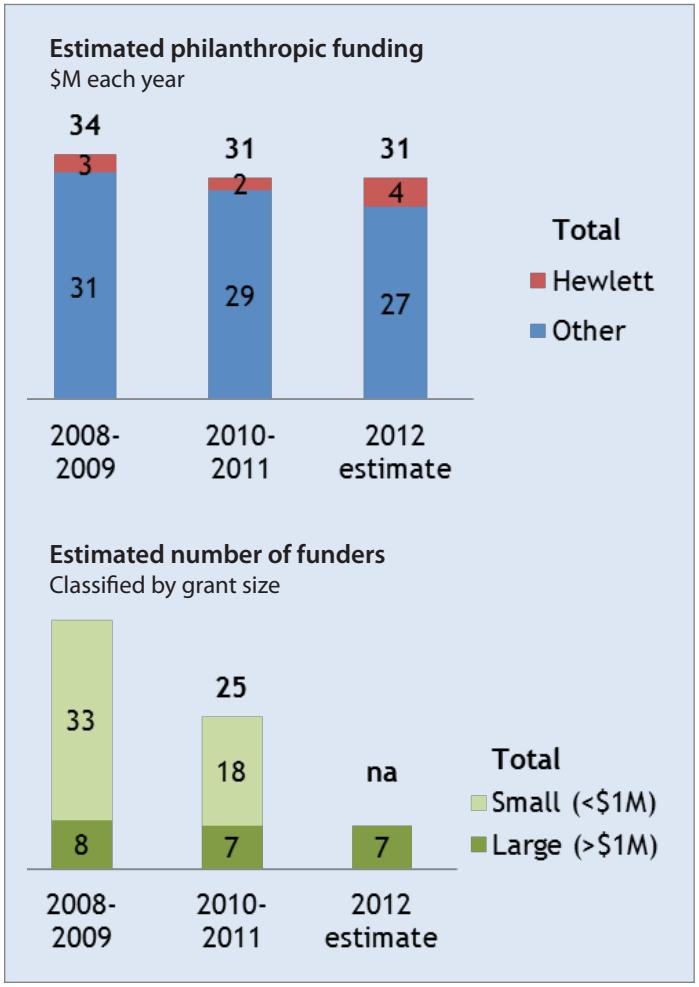

FIGURE 1

Based on the Initiative's progress and the recommendations of expert reviewers, the Board decided in 2011 to extend funding through 2014, providing a grants budget of $4 M per year. In turn, the Initiative has elected to review and clarify its potential outcomes and its rationale for funding decisions. This review is especially timely because:

- The NSI's initial scope and goals were intentionally quite broad given the exploratory nature of the early investments. Having learned where the Foundation is best suited to achieve results, it is time to increase focus on a tighter set of specific strategies.
- Other funders are also engaging in strategic planning to refine their priorities, which will change the overall balance of funding for various nuclear security objectives. At the same time, the number of funders has dropped significantly since 2008–2009 even though philanthropic funding levels[2] have decreased only slightly (Figure 1). Ford and Smith Richardson have left the field while Peterson, and Colombe have reduced funding levels; other funders such as Skoll Global Threats are entering the field.

[2] Includes estimates for the following funders (in descending funding order): MacArthur, Carnegie Corporation, Ploughshares, Stanton, Simons, Peterson, Colombe, Skoll Global Threats, Prospect Hill, Sloan, and Connect US Fund. *Sources: Peace and Security Funders Group Nuclear Funding 2008–2011, draft report April 2012 Hewlett grant database, and 2012 estimates from nuclear funding meeting (via Megan Garcia)*

- The political landscape has changed. The Senate provided its advice and consent on New START (Strategic Arms Reduction Treaty) in 2011 which will shrink the total number of deployed nuclear weapons in the US and Russia to 1,550 each over seven years, a reduction of around ten percent. Yet work to ratify the Comprehensive Test Ban Treaty (CTBT) in the US, originally expected to be complete in 2010, has remained on hold.

- The March 2011 Fukushima nuclear disaster in Japan opened a window of opportunity to push issues of nuclear power safety higher on worldwide agendas. Beyond this, though, work on nuclear power remains crucial in promoting nonproliferation and limiting access to nuclear materials from those that could use them harmfully.

- The international community is gripped by concerns over Iran and North Korea, and how those two countries approach their nuclear programs will have significant ripple effects, including potentially affecting the policies of the P5.

With that as background, this plan aims to:

- Clarify the NSI's theory of change, goal, scope, and logic model

- Highlight Hewlett's niche and strengths while considering the work of other players in the field, including governments

- Match the NSI's funding strategies to its level of funding and staff resources, being clear about what is in, potentially in, and out of the strategy

- Propose specific metrics and targets for the resulting strategy

2. Theory of change, funding landscape, and Hewlett's role

Theory of change

As noted earlier, the NSI's goal is to reduce the probability of a state or terrorist nuclear attack. To achieve this goal in a world where issues of nuclear security are global, the program's geographic scope is worldwide (for a map of the NSI's intended scope of influence, see Figure A1 in Appendix A).

Nuclear security philanthropy tends to focus heavily on immediate policy changes (e.g., within the next year) and longer-term academic development and studies with 10–20 year horizons. What is missing is a drive to affect policies in the next 2–5 years and strategic plans to put those policies in place, e.g., securing warhead reduction commitments. We recommend that the NSI will therefore focus most of its efforts on investments in the 2–5 year timeframe.

Interviewees suggested that more effort is needed to ensure that academic studies are designed with specific policy questions in mind so that they can be used to affect policy, either by those conducting the studies or non-academics with more policy expertise. For example, one interviewee cited providing strong

intellectual support to diplomats as a key role for philanthropy in the field. Efforts to make research more policy-relevant might include asking authors to specify why their work will be relevant to current policy decisions, supporting communication specialists for grantees, linking technical or academic organizations to advocacy organizations for communication of their ideas, or having funders require theories of change about how the transmission of information to decision makers will occur.

One interviewee suggested that regional studies of the current landscape are some of the most significant areas in which philanthropy can make a difference in the next 2–5 years. Such studies would seek to clarify how a region (or country) works internally, what the domestic politics are, who the nuclear decision makers are, and transmit that information to policymakers who may not understand regional nuances. Regional studies are important for the emerging states (such as Turkey, Brazil, South Africa, or Egypt), but also for other areas or countries such as China, the Middle East, and how countries such as South Korea might make sanctions in the Middle East more effective. It is important, however, to not just stop at the study level, but to "have a comprehensive communications plan and pursue related policy implications." Such communications plans should be incorporated into every grant by any philanthropic funder.The NSI therefore will focus its efforts where the philanthropic gap is biggest—primarily on policies designed for implementation in the next 2–5 years, including regional studies as appropriate and communications and outreach plans that outline how to put those policies in place. NSI staff will work with grantees throughout the proposal process and during the grant period to create a plan for policy adoption and implementation including: developing analyses, educating policymakers about policy options, harnessing unusual validators when appropriate, eliciting maximum consensus, and anticipating opposition.

Based on expert and advisory views, the resulting theory of change presumes that five things must be true for the program to achieve its goal (Outcomes in Figure 2). Specific funding strategies that the NSI will pursue and 2015 targets are below. A detailed logic model is in Appendix A.

The funding landscape

An overview of the funding landscape (Table 1) shows that there are many players in the field, including US government, philanthropy (see Figure 3), and other funders.

- **Within the P5**, the five permanent members of the United Nations Security Council, there has been an enormous amount of work and political capital invested over the past few years by government and philanthropy; however the results have been mixed. There have been some great successes, such as passing of New START with Russia, which cuts strategic nuclear missile launchers by half and reduces deployed missiles by 10% in the next seven years. However, there have also been significant challenges and backlash from those successes, including push-back from France and Russia, postponing conversations on the Comprehensive Test Ban Treatyin the US,

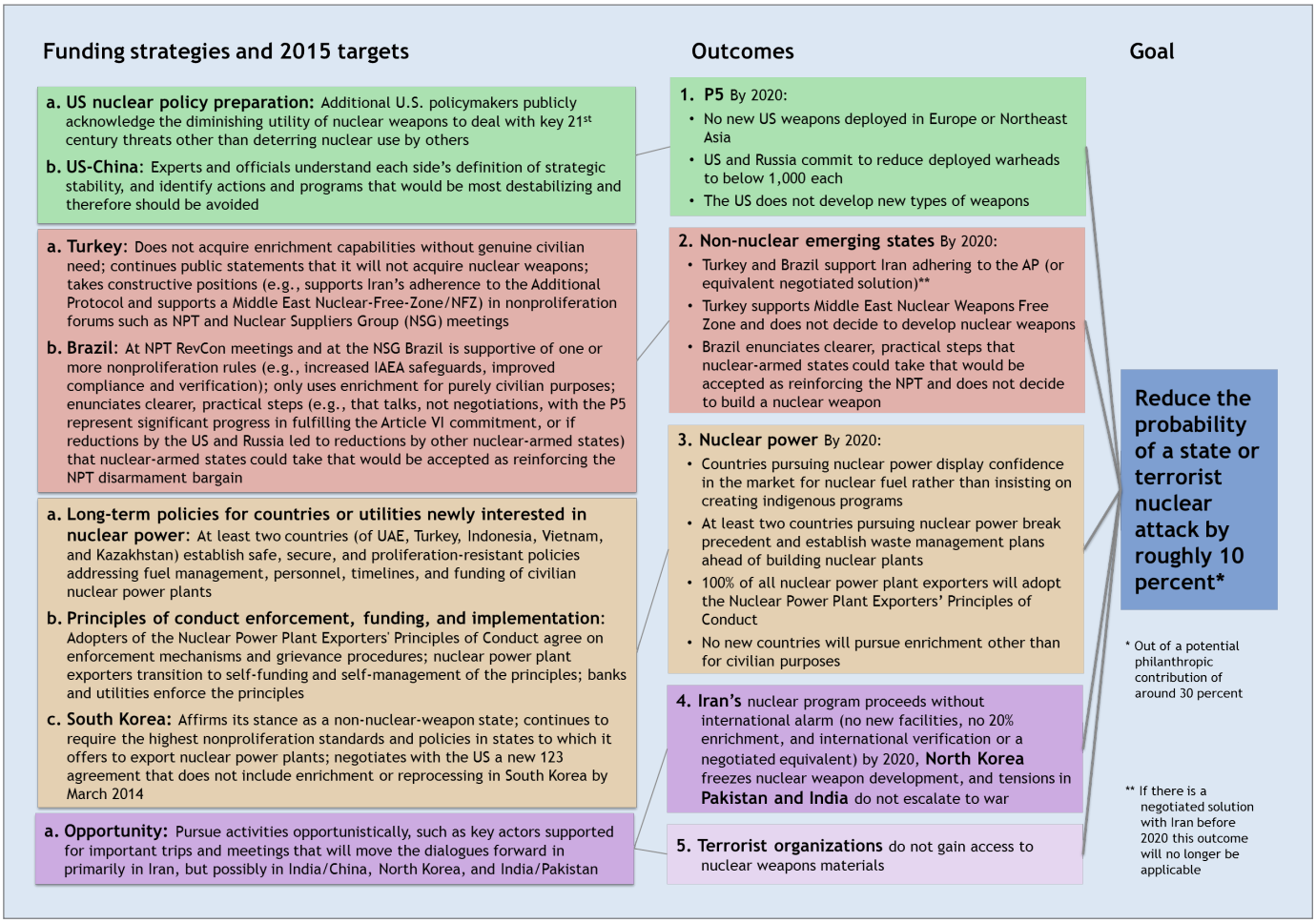

FIGURE 2 Theory of change. See full logic model in Figure A2 for more details

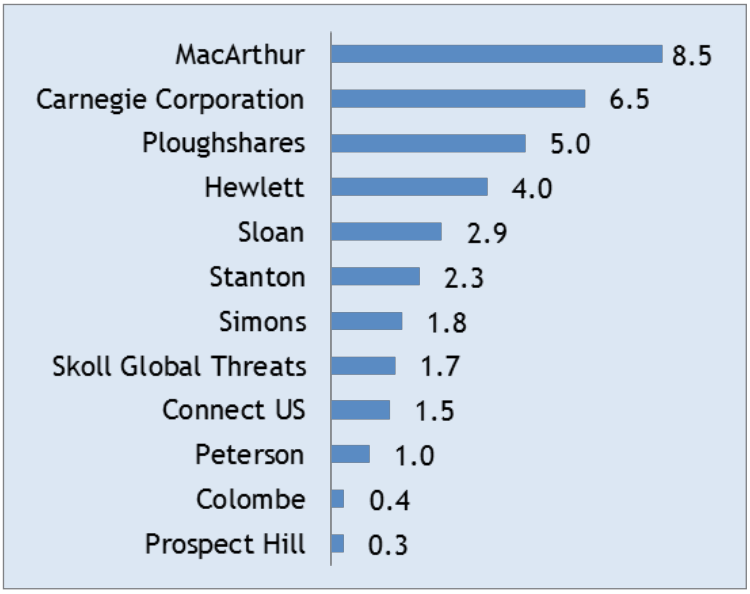

FIGURE 3 Top 12 philanthropic nuclear policy and nuclear security funders. Approximate $M/year.
(Note that exact annual budgets are difficult to calculate due to multi-year grants and multi-project grants)

Outcome	US government	Philanthropy and other funders
P5	Department of State Department of Energy Department of Defense	Carnegie Corporation Ploughshares Colombe Prospect Hill Norway and Sweden
Non-nuclear emerging states	Department of State Department of Energy Department of Defense	Carnegie Corporation Norway DTRA/Naval Post Graduate School Stanley Foundation Finland, Canada, Sweden and Denmark
Nuclear power	Department of Energy	MacArthur Carnegie Corporation Hewlett Sloan
Iran, North Korea, Pakistan and India	Department of State Department of Defense	Carnegie Corporation MacArthur Ploughshares
Terrorist organizations	Department of State Department of Energy Department of Defense Department of Homeland Security	MacArthur Carnegie Corporation Connect US Fund

TABLE 1 Funding landscape (see Tables B1, C1, D1, and E1 for more details, including specific topics of focus for each funder and grantees)

international deadlocks on missile defense policies or concerns with rogue states, and limited progress on significantly reducing US reliance on nuclear weapons. While philanthropy does place heavy emphasis here, it could do more by shifting its focus away from near-term policy change and academic research and toward broader dialogues and 2–5 year policy advocacy. Doing so recognizes that major short-term wins are unlikely, but also that long-term success depends on productive policy dialogues in the coming years. Philanthropy is particularly able to pursue these types of policy objectives since it has broader funding flexibility than governments, can pursue unique avenues such as pulling in the voice of non-nuclear emerging states, and has an ability to focus on nearer-term goals than academics. For all of these reasons, Hewlett could have a productive role.

- **For non-nuclear emerging states**, the focus of government and philanthropy is low because the important role that emerging powers are playing and will play in nuclear security is not generally recognized. This area is a good fit for Hewlett.
- **Within the nuclear power field**, there generally is a low level of governmental and philanthropic effort focused on nonproliferation. Again, this indicates a potential good fit for Hewlett.

- **For Iran, North Korea, et al, as well as for terrorist organizations**, the US and other governments focus heavily here, and philanthropic funders such as MacArthur and the Carnegie Corporation also expend significant resources. As such there seems to be lower opportunity for Hewlett to add value, particularly given the possibility that Hewlett's funding may be transitory.

Hewlett's role

Expert interviewees suggested that the NSI should invest particularly in three areas. Two areas—P5 and nuclear power—would largely entail a continuation of existing efforts. Spending around 25–30 percent of the NSI's funding on each of them, as the experts recommend, is relatively consistent with historical spending, though a slight decrease for the P5.

The third area—work in emerging states—is likely to be constrained by practical concerns including staff capacity. However, Redstone believes that the program might spend as much as $1.4 million per year (or 35 percent of the annual budget) on interventions that do not rely on major travel or other time commitments by the program staff. Work in up to three focus countries would go through an exploratory phase over a year or so to determine the potential opportunity and in-country capacity before ramping up over time if appropriate; countries already explored by the NSI (such as Turkey or Brazil) could continue without the higher level of program officer involvement needed for original exploration.

Interviewees also tended to allocate token amounts (10–15 percent) to issues surrounding Iran, N. Korea, and similar states, and to work regarding terrorist organizations. But Redstone recommends that the NSI avoid work on these countries and topics. The rationale includes: the NSI's indeterminate lifespan, which might lead to funding instability in already unstable settings; the major government and other outside funding directed to those areas; and shortage of staff time.

Finally, given the complexity of the field, a flexible funding pot of 10–15 percent could be allocated to exploratory or opportunistic funding strategies that are likely to offer high returns. These funding strategies could enhance work within the outcomes described in the theory of change or take advantage of other high-return opportunities.

This approach would lead to a set of grantmaking areas that are in, potentially in (depending on specific criteria), and out of the strategy. Figure 4 illustrates one possible list of such funding strategies.

3. Outcomes and funding strategies with current funding

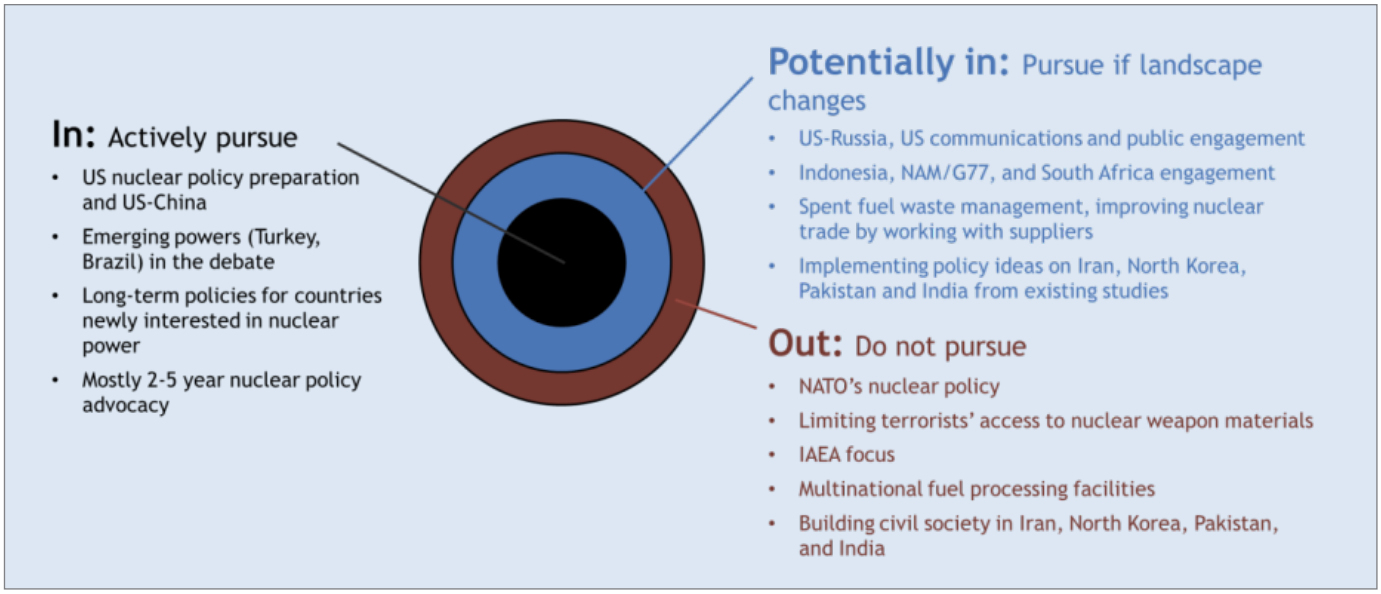

FIGURE 4 Examples of what is in/potentially in/out of the strategy
See logic model in Figure A2 for more details

Following that strategy, the NSI will pursue the four outcomes described at the beginning of this memo, and described in more detail below.

Outcome 1: P5 (30–35% of funding)—*By 2020, no new US weapons deployed in Europe or Northeast Asia, US and Russia commit to reduce deployed warheads to below 1,000 each, and the US does not develop new types of weapons*. The P5 is where much of the action in nuclear security takes place. However, this also means that there are many players already focusing here (see Table B1) and there are relatively entrenched policies. Additionally, in the near term, another arms control treaty is unlikely (in part due to the success of the recent New START treaty), and in part due to the likely scenario of a divide US government in the near future (making Congress unlikely to pass new legislation).

Given this, there are still two important funding strategies for Hewlett to pursue, with 2015 targets detailed below:

a. **US nuclear policy preparation**: Additional U.S. policymakers publicly acknowledge the diminishing utility of nuclear weapons to deal with key 21st century threats other than deterring nuclear use by others.

b. **US-China**: Experts and officials understand each side's definition of strategic stability, and identify actions and programs that would be most destabilizing and therefore should be avoided.

Detailed descriptions of these two funding strategies and other supporting details (including the 'potentially in' funding strategies of US communication

and public engagement, US-Russia, US executive branch, and US legislature) are in Appendix B.

Outcome 2: Non-nuclear emerging states (30–35% of funding)—*By 2020, Turkey and Brazil support Iran adhering to the AP (or equivalent negotiated solution), Turkey supports Middle East Nuclear Weapons Free Zone and does not decide to develop nuclear weapons, and Brazil enunciates clearer, practical steps that nuclear-armed states could take that would be accepted as reinforcing the NPT and does not decide to build a nuclear weapon*. Outcome 2 should receive the largest share of the NSI's funds. One expert even suggested that up to 70% of Hewlett funds be directed to this outcome. Increasing the voice of emerging states in nuclear discussions and non-proliferation policies is "absolutely crucial." Some of these emerging states have quite a lot of power and potential influence on the P5 nuclear powers and other nuclear weapon concerns such as Iran or North Korea. Working with emerging states is Hewlett's best niche, especially considering that not a lot of other money is currently spent in this area.

There are two main funding strategies to pursue, with 2015 (and other intermediate) targets detailed below:

a. **Turkey**: Does not acquire enrichment capabilities without genuine civilian need; continues public statements that it will not acquire nuclear weapons; takes constructive positions (e.g., supports Iran's adherence to the Additional Protocol and supports a Middle East Nuclear-Free-Zone) in nonproliferation forums such as NPT (e.g., 2013 and 2014 PrepCon[3], 2015 NPT RevCon) and Nuclear Suppliers Group (NSG) meetings.

b. **Brazil**: At NPT RevCon meetings and at the NSG Brazil is supportive of one or more nonproliferation rules (e.g., increased IAEA safeguards, improved compliance and verification); only uses enrichment for purely civilian purposes; enunciates clearer, practical steps (e.g., that talks, not negotiations, with the P5 represent significant progress in fulfilling the Article VI commitment, or if reductions by the US and Russia led to reductions by other nuclear-armed states) that nuclear-armed states could take that would be accepted as reinforcing the NPT disarmament bargain.

Note that the NSI's funding strategies in South Korea are focused on nuclear power and therefore described below under Outcome 3.

Detailed descriptions of the two funding strategies above and other supporting details are in Appendix C. Indonesia, the NAM/G77, and South Africa are also 'potentially in' (see Appendix C for more details). However, many interviewees noted that the selection of individual countries to work within should be dependent on the strength of the grant proposal, including factors such as the principal investigator's qualifications, potential for impact, and in-country connections. The selection of these top-five strategies incorporated both the

[3] PrepCon (preparation conference) meetings are held for the three years prior to five-year NPT RevCon (review conferences), with the next RevCon in 2015

recommendations of interviewees (see funding allocations in Figure C1) as well as previous Hewlett work investigating the capacity potential in select countries.

In general, the goals for each country are to 1) increase the understanding of Nuclear Weapons States (NWS) decision-makers and experts of the nuances of the country's positions on nuclear security; 2) increase the understanding of the country's decision-makers and expert community of how its decisions have ripple effects internationally; and 3) eventually develop grantees with the capacity to inform government decision-making in the country. The theory of change contends that the interplay of these three things will encourage the countries in question to become more integrated into international nuclear security institutions, more likely to support key nonproliferation priorities, and more likely to work with the US and other NWS to contain 'rogue' nations during crises. In addition, the NWS will become better able to constructively engage the emerging powers on nuclear policy.

Outcome 3: Nuclear power (20–25% of funding)—*By 2020, countries pursuing nuclear power display confidence in the market for nuclear fuel rather than insisting on creating indigenous programs, at least two countries pursuing nuclear power break precedent and establish waste management plans ahead of building nuclear plants, 100 percent of all nuclear power plant exporters will adopt the Nuclear Power Plant Exporters' Principles of Conduct, and no new countries will pursue enrichment other than for civilian purposes*. Outcome 3 is in an area where Hewlett has a strong niche and high relative impact.

There is a window of opportunity to address the safety of nuclear power in the next 1–2 years. Beyond the visibility raised through Fukushima, it remains very important to address nuclear power. The challenges are to allow full access to the benefits of nuclear power but with clear reductions in possible proliferation and regional security concerns, and increases in safety, environmental, and waste management. Access to nuclear materials is a key barrier (and one of the only major remaining ones) to reducing the probability of a nuclear attack.

There are three important funding strategies for Hewlett to pursue, with 2015 targets detailed below:

a. **Long-term policies for countries or utilities newly interested in nuclear power**: By 2015, at least two countries (of UAE, Turkey, Indonesia, Vietnam, and Kazakhstan) establish safe, secure, and proliferation-resistant policies addressing fuel management, personnel, timelines, and funding of civilian nuclear power plants.

b. **Principles of conduct enforcement, funding, and implementation**: By 2015, adopters of the Nuclear Power Plant Exporters' Principles of Conduct agree on enforcement mechanisms and grievance procedures; nuclear power plant exporters transition to self-funding and self-management of the principles; banks and utilities enforce the principles.

c. **South Korea**: Affirms its stance as a non-nuclear-weapon state; continues to require the highest nonproliferation standards and policies in states to which it offers to export nuclear power plants; negotiates its 123 agreement with the U.S. that does not include enrichment or reprocessing in South Korea by March 2014.

Detailed descriptions of the three funding strategies and other supporting details (including the 'potentially in' funding strategies of spent fuel waste management, nuclear trade, and safety) are in Appendix D.

Outcome 4: Opportunity (10–15% of funding)—This funding is to be used where high-return opportunities present themselves. These funds could focus on the first three outcomes or investments aimed at other parts of the overall theory of change—such as supporting efforts for Iran, North Korea, Pakistan, and India to freeze nuclear weapon development, or to ensure that terrorists do not gain access to nuclear weapons materials.

Focusing on these latter objectives would be new for Hewlett because of the NSI's limited grantmaking budget and short-term timeframe (and therefore low potential contribution), as well as the significant presence of other players (government and philanthropic). However, the objectives are important overall to reduce the probability of a state or terrorist nuclear attack. Interviewees noted a potential niche for the NSI that recognizes these constraints.

Specifically, some experts suggested support for important trips and meetings that will move the dialogues forward primarily in Iran, but possibly in India/China, North Korea, and India/Pakistan. Most experts agreed that Iran is by far the most important and should receive attention. To track progress in Iran, the NSI would monitor whether Iran's nuclear program proceeds without international alarm (no new facilities, no 20% enrichment, and international verification or a negotiated equivalent) by 2020.

A next focus might be India/China: Currently it is hard to decouple India and Pakistan. However the trajectory of India is very different than Pakistan's, China is a bigger strategic threat to the region, and there are new dynamics with India's rise that were not as prominent a decade ago. All of which means that focusing on the relationship between India and China could be important. Experts suggested that little effort should be put toward North Korea or Pakistan/India. Additional details are in Appendix E.

4. Monitoring and evaluation plans

The NSI's monitoring and evaluation plans have two components: tracking major changes that might require fundamental alterations to its theory of change, and monitoring and evaluation of grantmaking under the current theory of change.

Tracking major changes

A variety of external conditions could cause the NSI to alter its theory of change. These include (in descending number of references by experts) the following conditions and potential changes in the larger landscape:

1. **US Presidential and Congressional elections**: If the US elects a Republican President, strategy changes might include a higher effort in the US executive branch (creating champions, preventing backsliding on policies), increased work with the military and military graduate schools, decreased focus on the US legislature, and more money spent overseas.

2. **Changes in other philanthropic focus**: For example, the Ploughshares Fund is undertaking strategic planning over the next six months, which could revise their priorities. Funders such as Skoll Global Threats also are entering the field and may take on particular strategic areas.

3. **Iran**: Development of a nuclear weapon there would increase the global focus on Iran and cause philanthropy to reconsider what a productive role could look like. Negotiations over the next few months may also influence philanthropic direction: Negotiators may address questions such as what a compromise agreement looks like (e.g., what constitutes building a weapon, appropriate safeguards, fuel cycle details).

4. **Terrorist groups**: If a terrorist group was known to be closer to nuclear weapons, or was known to have and/or use a nuclear weapon, more effort could be focused on stronger non-proliferation rules that would decrease the likelihood of that and other groups being able to use a nuclear weapon.

5. **Pakistan**: A catastrophic collapse of the state could shift more resources here. Depending on the response of the US and other governments under such a scenario, if Hewlett funds could make a difference then the NSI may shift more resources here. If international response to such a scenario were high (with dedicated resources via military intervention or foreign assistance), then the NSI would not increase funding.

6. **North Korea**: Further resistance to diplomacy, or emergence of other large problems would increase the focus on North Korea. The importance of philanthropic work would increase with the severity of the situation, and philanthropy's ability to have a positive impact on the situation could increase with greater diplomatic focus in the area.

7. **Egypt**: If the emerging state's stability were in question, more effort might be placed there. Again, depending on the response of the US and other governments under such a scenario, if Hewlett funds could make a difference then the NSI may shift more resources here. If international response to such a scenario were high (with dedicated resources via military intervention or foreign assistance), then the NSI would not increase funding.

8. **Additional defections from the Non Proliferation Treaty**

9. **Greatly diminished role of nuclear weapons** in the security policies of the Nuclear Weapon States

Monitoring and evaluation

The NSI will continually monitor its work by annually tracking intermediate outcomes for individual investments. Additionally, the external conditions noted above will be continually monitored and may prompt adjustments to the strategy described in this document. Small changes in the environment that create new opportunities can be funded through the NSI's opportunity funding.

Evaluation will focus on where the NSI is spending the most money and there is the most uncertainty, in this case focusing on US policy and emerging states with evaluations in 2014 and 2015 (Figure 5). If funding is extended into future years, additional evaluations of nuclear power and other P5 strategies may be pursued.

5. Future funding scenarios

The NSI is funded currently at $4M per year through 2014 (with grants running through 2015). The baseline scenario outlined in this document (shown

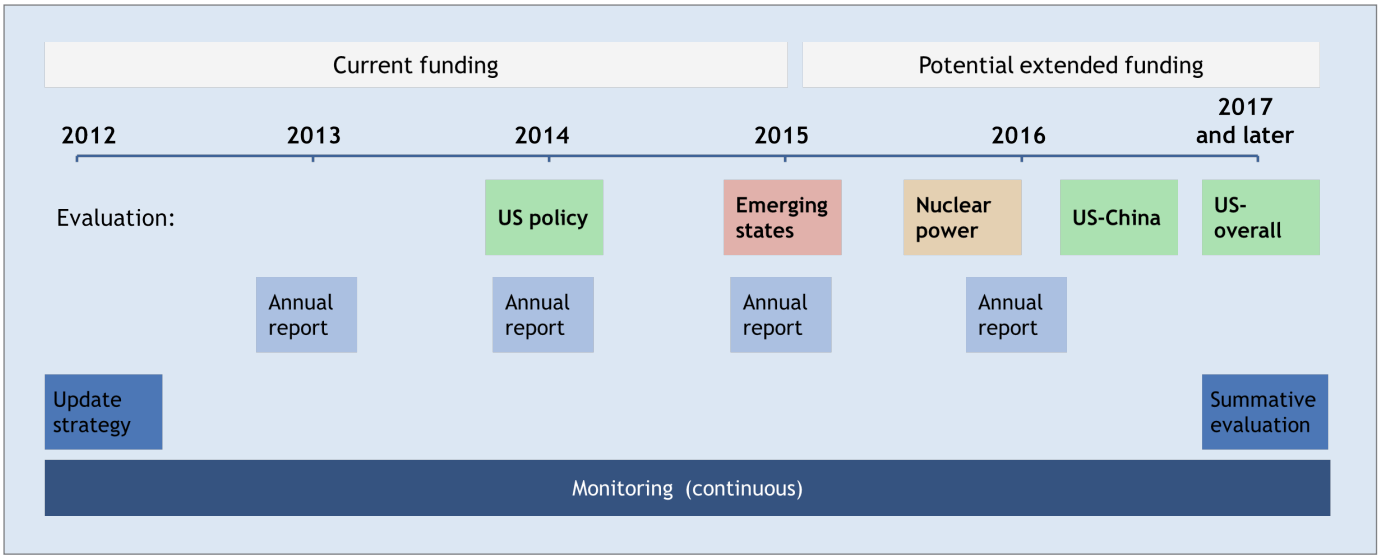

FIGURE 5 Recommended monitoring and evaluation plan

as Scenario 1 in Table 2 below) is expected to yield intermediate outcomes in 2015, but longer-term outcomes would remain quite uncertain. Three additional scenarios listed below explore higher funding ($6M per year) and grantmaking through 2020. Appendix Table A1 lists detailed outcomes for each

scenario, although these may need to be adjusted as the program learns more about potential opportunities.

APPENDIX A SCOPE, FULL LOGIC MODEL, AND OUTCOMES UNDER SCENARIOS

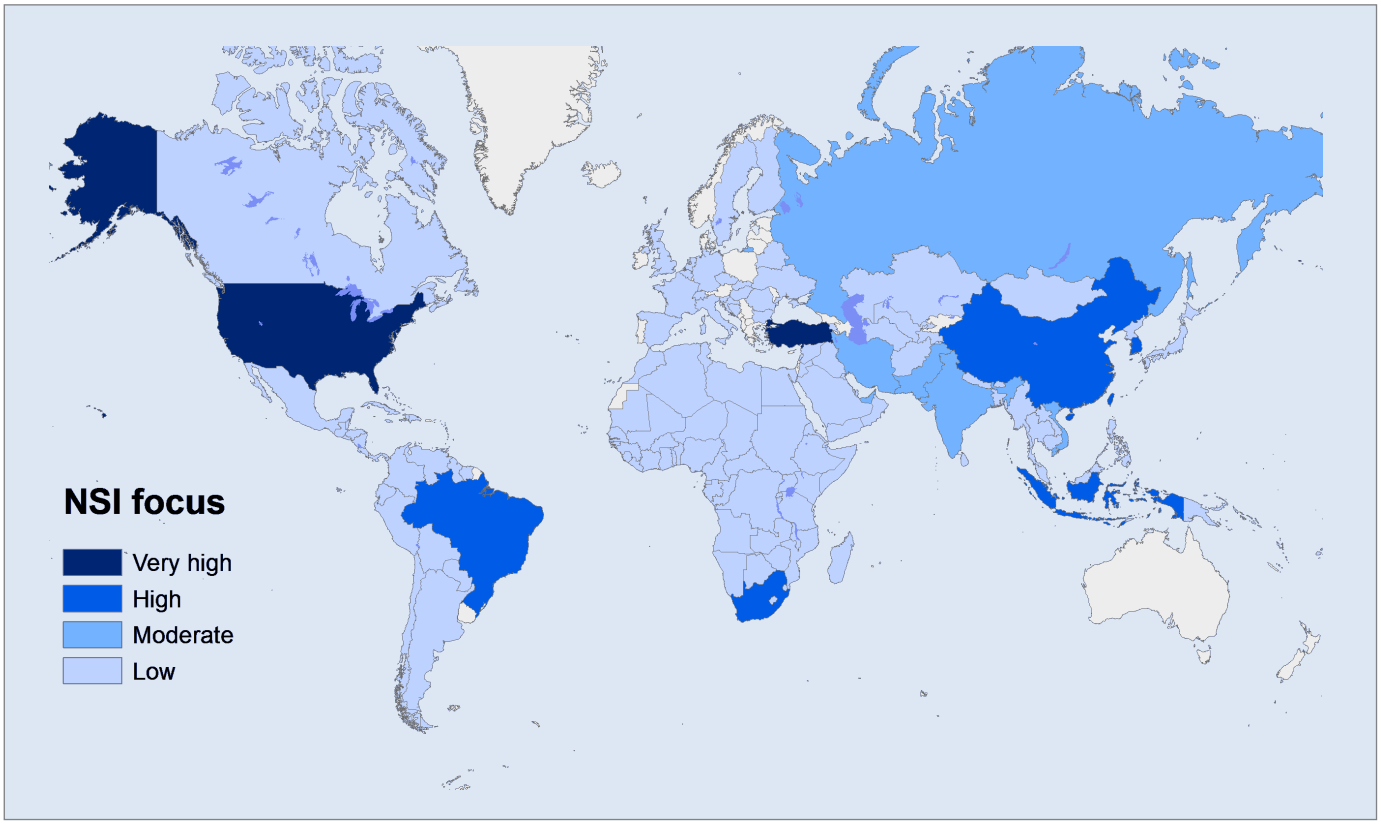

FIGURE A1 Scope of influence
See logic model in Figure A2 for more details and Figures B2, C2, D2, and E2 for the scope of individual outcomes

A revised full logic model is shown in Figure A2, which incorporates input from the the Nuclear Security Initiative's three advisors, external experts, and a field assessment. As introduced in Figure 4, "In" focus funding strategies for the NSI are in black text, "Potentially in" funding strategies that are important but would largely be the responsibility of others, and would be pursued only if the landscape changed are in purple, and "Out" funding strategies that were considered, but have a lower immediate opportunity so will not be pursued are in red. The funding strategies are intended to represent achievable targets by 2015.

Table A1 lists 2015 and 2020 outcomes for each scenario described under *Future funding scenarios*. *These outcomes are exploratory as their feasibility remains uncertain.*

FIGURE A2 Full logic model

2015 intermediate outcomes	Potential 2020 outcomes
Scenario 1 **1a. US nuclear policy preparation:** Additional U.S. policymakers publicly acknowledge the diminishing utility of nuclear weapons to deal with key 21st century threats other than deterring nuclear use by others **1b. US-China:** Experts and officials understand each side's definition of strategic stability and identify and avoid destabilizing actions and programs **2a. Turkey:** Does not acquire enrichment capabilities without genuine civilian need and continues public statements that it will not acquire nuclear weapons **2b. Brazil:** At NPT RevCon meetings and at the NSG Brazil is supportive of one or more nonproliferation rules (e.g., increased IAEA safeguards, improved compliance or verification); Brazil only uses enrichment for purely civilian purposes **3a. Long-term policies for countries or utilities newly interested in nuclear power:** At least two countries (of UAE, Turkey, Indonesia, Vietnam, and Kazakhstan) begin to establish safe, secure, and proliferation-resistant policies addressing fuel management, personnel, timelines, and funding of civilian nuclear power plants **3b. Principles of conduct enforcement, funding, and implementation:** Adopters of the Nuclear Power Plant Exporters' Principles of Conduct agree on enforcement mechanisms and grievance procedures; nuclear power plant exporters transition to self-funding and self-management of the principles; banks and utilities enforce the principles **3c. South Korea reprocessing limits:** Affirms its stance as a non-nuclear-weapon state; continues to require the highest nonproliferation standards and policies in states to which it offers to export nuclear power plants; renegotiates its 123 agreement with the US that does not include enrichment or reprocessing in South Korea by March 2014 **4a. Other / opportunity:** Important dialogues move forward primarily in Iran, but possibly in India/China, North Korea, and India/Pakistan through support for meetings	**Scenario 3** **1a. US nuclear policy:** Sustained commitment to continue to reduce number of nuclear weapons, lessoning their significance in global security; commit not to develop new types of nuclear weapons **1b. US-China:** develop cooperation in promoting security of nuclear weapons and materials in Pakistan **1c. US communication and public engagement:** Increased support among the elite public for reduction in number of U.S. nuclear weapons and improved nonproliferation policies **1d. US-Russia:** Commit to reduce their nuclear arsenals to the U.S. level; commit not to develop new nuclear weapons; avoid production and deployment of new heavy intercontinental ballistic missile (ICBM) delivery systems in both Russia and the US that would be destabilizing **1e. US executive branch:** Depending on the results of Presidential elections, the U.S. ideally supports reduced reliance on nuclear weapons and positions itself as a leader in disarmament or at a minimum maintains the idea of the diminishing utility of nuclear weapons **2a. Turkey:** Takes constructive positions (e.g., supports Iran's adherence to the Additional Protocol and supports a Middle East Nuclear-Free-Zone/NFZ) in nonproliferation forums such as NPT PrepCons and 2015 RevCon and Nuclear Suppliers Group (NSG) meetings **2b. Brazil:** Enunciates clearer, practical steps that nuclear-armed states could take that would be accepted as reinforcing the NPT disarmament bargain (e.g., that talks, not negotiations, with the P5 represent significant progress in fulfilling the Article VI commitment, or if reductions by the US and Russia led to reductions by other nuclear-armed states) **2c. Indonesia:** Becomes a champion in nonproliferation forums such as NPT and NSG and uses influence to gain support from two or more ASEAN nations **2d. NAM/G77:** Supports key nonproliferation policies such as improved compliance and verification, or increased IAEA safeguards (or equivalent) **2e. South Africa:** Becomes a voice in international dialogues (such as NPT PrepCon and RevCon meetings) around equitable and effective nonproliferation, bridging the gap between non-proliferation and disarmament and develops a plan on what to do with its enriched stockpile of uranium **3a. Long-term policies for countries or utilities newly interested in nuclear power:** At least three countries (of UAE, Turkey, Indonesia, Vietnam, and Kazakhstan) establish safe, secure, and proliferation-resistant policies addressing fuel management, personnel, timelines, and funding of civilian nuclear power plants **3b. Principles of conduct:** One hundred percent of all nuclear power plant exporters adopt and follow the principles of conduct **3d. Spent fuel waste management:** Norms established for safety and security standards for spent fuel facilities and operations worldwide **4b. Opportunistically, policy ideas for conflict states:** Results from others' studies on Iran, North Korea, Pakistan, and India are strategically communicated, used to educate policy makers on implementable ideas, and build consensus in national and international debates

TABLE A1 Potential detailed outcomes under four funding scenarios (numbers/letters refer to outcomes and funding strategies, see Figure A2.)

2015 intermediate outcomes	Potential 2020 outcomes
Scenario 2 **Scenario 1, plus:** **1c. US communication and public engagement:** Increased number of influential media and opinion makers (to be specifically identified) support fewer weapons in the U.S. **2c. Indonesia:** Provides leadership in key international disarmament debates **2d. NAM/G77:** NAM/G77 is better understood by P5 policymakers, who can therefore engage more effectively with the NAM/G77 on non-proliferation and disarmament goals **2e. South Africa:** At NPT RevCon meetings and at the NSG, South Africa is supportive of one or more nonproliferation rules (e.g., increased IAEA safeguards, improved compliance or verification) **3d. Spent fuel waste management:** A technically feasible solution is ready to be deployed once a political opportunity exists for siting a multilateral facility	**Scenario 4** **Same as Scenario 3, plus:** **1f. US legislative branch:** Gives timely consideration to nuclear-related policies **2f. Egypt:** Reaffirms its intentions to remain a non-nuclear-weapon state; supports a Middle East NWFZ; paces nuclear energy efforts to the development of suitable industrial and regulatory infrastructure and economic development **2g. Other international:** Key swing countries (e.g., Malaysia, Taiwan, Saudi Arabia) pass domestic policies that set a good example and support effective nonproliferation **3e. Nuclear trade:** Trade made more secure through work with suppliers, utilities, and related government skill transfer agreements **3f. Safety:** Improved nuclear safety through national and international governance measures **3g. International policy for multinational fuel facilities:** Agreement to cap new development of national fuel cycle facilities and create a multinational facility

TABLE A1 Potential detailed outcomes under four funding scenarios (continued)
(numbers/letters refer to outcomes and funding strategies, see Figure A2.)

APPENDIX B OUTCOME 1—P5

Funding and grantee landscape

Table B1 gives a summary of the funding and grantee landscape, which helped inform which funding strategies were In, Potentially In, and Out of Redstone's recommendation for the P5 strategy. As noted earlier, while there has been a lot of effort over the past few years by government and philanthropy focused on the nuclear policy of the P5, the results have been mixed with some successes but more limited progress in some areas. The Hewlett Foundation will therefore slightly reduce its grantmaking in this area in order to focus on underfunded topics, but will maintain grantmaking where it provides unique value.

See Figure B1 for ranked funding allocations and Figure B2 for the scope of influence.

"In" funding strategies

There are important opportunities for Hewlett to work with key officials in the US administration on nuclear policy preparation and opportunistically in China:

a. US nuclear policy preparation: *Additional U.S. policymakers publicly acknowledge the diminishing utility of nuclear weapons to deal with key 21st century threats other than deterring nuclear use by others.*

While immediate policy opportunities are limited in the US, it is crucial to remain in the area, build capacity, and prepare support for future nuclear policy policies. This support means that Hewlett funding would be lower than in earlier years, but that Hewlett would remain in the field since "you

US government	Philanthropy and others	Grantees
Department of State supports international monitoring through the Comprehensive Nuclear Test Ban Treaty Organization **Department of Energy** conducts fissile materials disposition and focuses on the US and Russia **Department of Defense's** Cooperative Threat Reduction program includes Russia and China	**Carnegie Corporation** focuses on progress on groundwork for a next arms reduction treaty with Russia and better Nuclear Posture Review guidance documents **Ploughshares** focuses on US-Russia, US legislature (including budget issues), and US executive branch. **Colombe** focuses on reducing Pentagon spending **Prospect Hill** focuses on policy analysis for disarmament and CTBT **Norway and Sweden**	**Carnegie Endowment** focuses on reducing the number of nuclear weapons in the US, Russia, and China **National Academy of Sciences, Nuclear Threat Initiative, SIPRI, Arms Control Association, ReThink Media, Connect US Fund, Global Zero, Physicians for Social Responsibility, Council for a Livable World/Center for Arms Control and Nonproliferation, FCNL (Quakers)**

TABLE B1 P5 funding and grantee landscape

cannot afford to ignore policy preparation." Also, as fiscal pressure increases over the next few years, it will be easier to do internal US work than to pursue external work (e.g., with Russia). This support could take the form of educating key officials about nonproliferation issues, such as informing those in the Department of Energy about South Korea. These efforts would target policies in the 2-5 year time horizon (though they are beyond 2014). As earlier, another arms control treaty is unlikely in the near-term, but if a significant policy opportunity emerged, additional funds from the NSI's other/opportunity funding pool could be directed here and to the US legislature.

b. US-China: *Experts and officials understand each side's definition of strategic stability, and identify actions and programs that would be most destabilizing and therefore should be avoided.*

The US-China relationship is of profound importance. However, it can be difficult and potentially harder to achieve intermediate outcomes in the near future because of the hot and cold strategic relationship, cultural misunderstandings, differing threat perceptions, a history of mistrust on both sides, and U.S. and Chinese internal politics. Even given this, work should continue with China. One idea is to further explore linkages between conventional warfare and nuclear warfare. China also offers interesting lessons, as they developed nuclear weapons but do not have a huge nuclear arsenal (currently they have around 200 active warheads vs. around 2,000 in the US and in Russia). They made a political decision that the likelihood of success in a nuclear war was very low, so chose not to pursue an arms race and to maintain some weapons primarily as deterrence. As such, in some ways they may be a "model for any future nuclear power," or at least their arguments may be useful in the nuclear non-proliferation debates.

FIGURE B1 Outcome 1: P5 funding suggestions
Percent, +- standard deviation

"Potentially In" funding strategies: pursue if landscape changes

There are two potentially in funding strategies that could be pursued if the landscape changes, either through a decreased focus by others or increased NSI funding:

c. US communication and public engagement: *Increased support among the elite public for reduction in number of U.S. nuclear weapons and improved nonproliferation policies.*

Engaging the public through media and education of opinion makers is

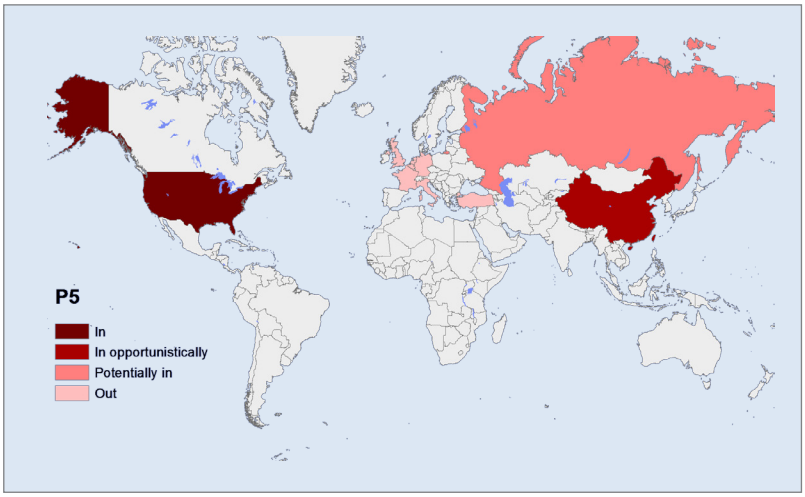

FIGURE B2 Outcome 1 scope of influence

important preparatory work that will enable grantees to be able to successfully advocate for policies in the future.

d. **US-Russia:** *Commit not to develop new nuclear weapons; avoid production and deployment of new heavy intercontinental ballistic missile (ICBM) delivery systems in both Russia and the US that would be destabilizing; define operationally the requirements of strategic stability in ways that both accept; prepare for talks on reducing nuclear arsenals to 1,000 warheads each.*

The US-Russia relationship is of prime importance. However, near term opportunities are limited due to uncertain presidential stances (President Obama is not expected to release his internal reviews until the end of the year and there would likely be slim opportunities for arms control if Romney were elected President). It also is important to consider US missile defense policies, as they are contentious with Russia (and China). At the same time, there is currently political opposition inside Russia to cooperating with the United States on reductions or missile defense. Given limited Hewlett funding, the NSI should not directly pursue work with Russia.

If the NSI chose to work on the US-Russia relationship, opportunities may exist to perform a systematic survey to understand Russia's interests, red lines (e.g., the solution space and what is in or out as options), and priorities, as well as work through Track II dialogues. However, Russian leaders can be locked into a 1980's mindset that includes the idea that they need significant nuclear weapons. Any progress on reducing the stockpile in the US should be accompanied by a reduction in the Russian stockpile.

e. **US executive branch:** *Decision to reduce the number of nuclear weapons in the stockpile below 1,000 and adjusted targeting requirements.*

While work with the US executive branch is important, progress is contingent on the Presidential elections. Note that President Obama may make progress on this (e.g., adjusted targeting requirements). Additionally, Ploughshares focuses here. As a result, unless the landscape changes, Hewlett's focus should be limited.

f. **US legislature:** *Does not appropriate additional funds to a new type of weapon or nuclear testing, nuclear-related policies get timely consideration.*

Work with the US legislature received mixed support. Some believe that no Hewlett funds should be spent here (while one can't ignore the legislature, sometimes efforts are "a fool's game: you might win the battle, but lose the war," as the price paid to pass legislation might be too high). Others noted that avoiding backsliding is important, so will require some funding. Ploughshares devotes substantial funding to this area (especially with respect to spending on nuclear weapons). As a result of these concerns, Hewlett should not focus here. In the remote possibility that the CTBT comes up in the legislature in the next few years, then funds could be directed here.

"Out" funding strategies: do not pursue

Other funding strategies (umbrella states, NATO, and P5, see Figure A2 for details) are lower priority opportunities for Hewlett. New items suggested by interviewees include working with the umbrella states (e.g., to develop a strategy to instill confidence in regional security and deterrence that does not include nuclear weapons) and working with media and opinion shapers (e.g., educated in nuclear concerns to support why the US could manage with fewer weapons and influence public opinion). Extended deterrence through the nuclear umbrella states is a major stumbling block to reducing arms, however overall this is a lower opportunity for Hewlett.

Suggested Metrics

A variety of potential metrics were suggested from the interviewees. Key metrics for funding strategies that are 'in' or 'potentially in' are listed first, followed by others:

- Key metrics
  - Number of warheads reduced in Russia and US
  - No or decreased number of US tactical weapons deployed in Europe and Russia
  - No US tactical weapons deployed near China
- Additional potential metrics
- Statements in defense papers and policies in P5 countries that are or will reduce the reliance on nuclear weapons
  - No Russian/Chinese arms race
  - States under existing nuclear umbrellas renounce or at least diminish their reliance on positive nuclear assurances (i.e., provide inducements for states such as Japan, ROK, and Germany to encourage the US to rely on non-nuclear means of assurance)
  - Redeployment of all non-strategic nuclear weapons to the US

APPENDIX C OUTCOME 2—NON-NUCLEAR EMERGING STATES

As noted earlier, a variety of experts report that increasing the voice of emerging states in nuclear discussions and non-proliferation policies is "absolutely crucial." Working in venues that do not have entrenched policies opens up the opportunity for small scale engagements to have a big effect.

However, developing influential champions in emerging states is a long-term undertaking (e.g., at least five years, to ensure career opportunities needed to attract experts), which exceeds Hewlett's current funding horizon. The suggested approach can include identifying promising young experts and institutions in which they can have a "home", integrating them into the international community, building their expertise, and over time increasing their voices in the international dialogue, including influencing the US's and other states' actions.

Funding and grantee landscape

Table C1 gives a summary of the funding and grantee landscape, which helped inform which funding strategies were In, Potentially In, and and Out of Redstone's recommendation for the strategy. Overall, the focus of government and philanthropy is low. One interviewee noted "the US government is quite bad at this and we should be empowering emerging states."

See Figure C1 for ranked funding allocations and Figure C2 for the scope of influence.

US government	Philanthropy and others	Grantees
Department of State contributes to IAEA to support safeguards, safety and security and supports UN-related domestic controls to stem proliferation **Department of Energy** funds nonproliferation and verification research and development **Department of Defense's** Cooperative Threat Reduction program includes Africa, Afghanistan, and Iraq **DTRA/Naval Post Graduate School**	**Norwegian government** focuses on Brazil and capacity building for the NAM **Carnegie Corporation** focuses on a more effective IAEA by working with the US and moderate NAM countries and the IAEA Board of governors **Stanley Foundation** **Finland, Canada, Sweden and Denmark**	**Carnegie Endowment** focuses on Brazil and Turkey (with Hewlett), and Pakistan **Monterey Institute** focuses on South Korea, the NAM, Egypt, and Indonesia with other work in other countries **Kings College London, Connect US Fissile Materials Working Group, Partnership for Global Security, Harvard Managing the Atom Project, CNS, Stimson, CITS, VERTIC**

TABLE C1 Emerging states funding and grantee landscape

"In" funding strategies

There are two main funding strategies to pursue in Turkey and Brazil. These are listed below, with 2015 targets detailed in italics:

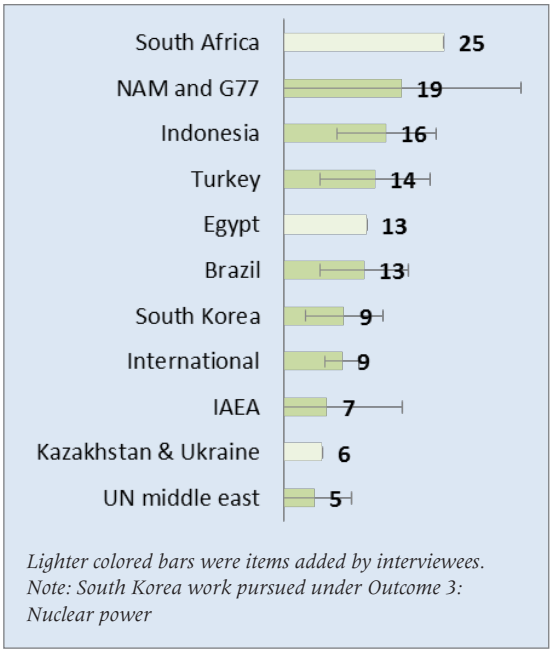

FIGURE C1 Outcome 2: Emerging states funding suggestions
Percent, +- standard deviation

a. Turkey: *Does not acquire enrichment capabilities without genuine civilian need; continues public statements that it will not acquire nuclear weapons; takes constructive positions (e.g., supports Iran's adherence to the Additional Protocol and supports a Middle East Nuclear-Free-Zone) in nonproliferation forums such as NPT (e.g., 2013 and 2014 PrepCon1, 2015 NPT RevCon) and Nuclear Suppliers Group (NSG) meetings;*

Turkey is a key emerging state for a variety of reasons: It is an important player as it is relatively stable in a volatile Middle Eastern region; it is a secular Islamic state; it is a NATO nuclear weapons sharing state (under the nuclear umbrella) and as such there are nuclear weapons deployed there; it is developing nuclear power (they recently bought a reactor from Russia); and it has seen significant economic growth. For all these reasons, it can act as a model for surrounding states. The NSI has already made progress through exploratory grants in Turkey. Barring significant political changes there, the NSI will continue and expand its efforts.

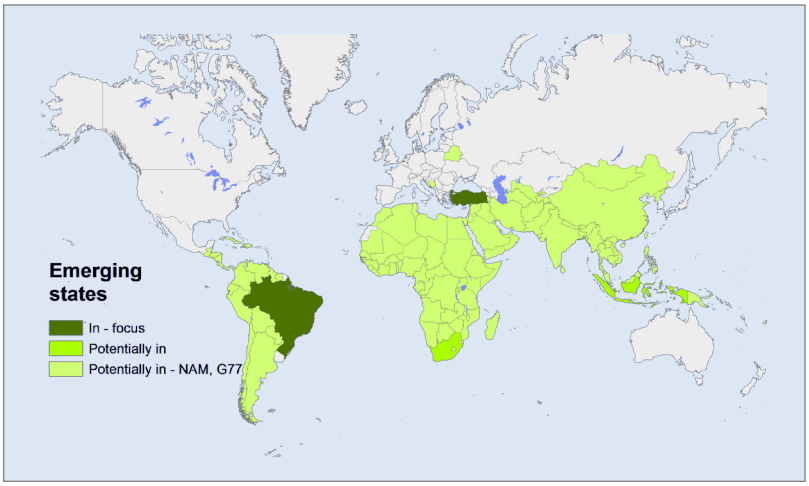

FIGURE C2 Outcome 2 scope of influence

b. Brazil: *At NPT RevCon meetings and at the NSG Brazil is supportive of one or more nonproliferation rules (e.g., increased IAEA safeguards, improved compliance and verification) and enforcement; only uses enrichment for purely civilian purposes; enunciates clearer, practical steps (e.g., that talks, not negotiations, with the P5 represent significant progress in fulfilling the Article VI commitment, or if reductions by the US and Russia led to reductions by other nuclear-armed states) that nuclear-armed states could take that would be accepted as reinforcing the NPT disarmament bargain*

Brazil is very important: It occupies a key position in the world order (as one of the BRICs), it is an economic power (and growing); it has demonstrated the willingness to influence states such as Iran; it is politically stable; it has a low risk of developing a nuclear weapon; and increasing its role in global nuclear discussions can have a ripple affect across the south. Note that

[1] PrepCon (preparation conference) meetings are held for the three years prior to five-year NPT RevCon (review conferences), with the next RevCon in 2015

Brazil is also a focus country for the Carnegie Endowment for International Peace. After 18 months of research and strategy development the NSI will make two to three exploratory grants to Brazilian organizations in November 2012; barring significant political changes there, the NSI will continue and expand its efforts here.

Note that funding strategies in South Korea are focused on nuclear power and therefore described under Outcome 3.

"Potentially In" funding strategies: pursue if landscape changes

There are potentially in activities that could be pursued if the landscape changes, either through a decreased focus by others or increased NSI funding:

c. **Indonesia:** *Provides leadership in key international disarmament debates such as the NPT's 2013 and 2014 PrepCon and 2015 RevCon using its ratification of CTBT to generate broad support of equitable and effective nonproliferation rules. [exact countries to be influenced and potential policies supported to be determined after initial NSI work]*

Indonesia gained momentum by recently ratifying the CTBT in December 2011 after being initially reluctant; lessons could be learned from this success story, as well as using the country to be a stronger voice in dealings with Iran. The focus should also be on their key role as leader of the NAM Coordinator for nuclear disarmament, a position they will retain even after Iran assumes the chair of the NAM in September 2012. The NSI has already begun exploratory work in Indonesia, but expects additional exploration over the next year to determine the potential opportunity and in-country capacity, ramping up efforts up over time if appropriate.

d. **The Non-Aligned Movement and the G77:** *NAM/G77 is better understood by P5 policymakers, who can therefore engage more effectively with the NAM/G77 on non-proliferation and disarmament goals; is moving to support key nonproliferation policies such as improved compliance and verification, increased IAEA safeguards, or increased adoption of the Additional Protocol (or equivalent2).*

Suggestions about how to approach the NAM and the G77 varied, with interviewees allocating from none to half of the funds to this area; on balance though, the interview suggestions were to focus here (see Figure B2). The NSI's work here would be modest and would build on a current assessment of the decision making approach of the NAM, with the goal to help educate others (e.g., US, NATO) about this and support potential investment in helping the NAM make decisions as a collective block. Additional ideas include: 1) "Hewlett could get the most bang for the buck by educating moderate southern hemisphere countries that aren't well informed on these issues; education is easy;" 2) Promoting the regularization of P5

[2] Other potential policies include compliance and verification, supporting the CTBT, increased adoption of the Additional Protocol, cooperation in the peaceful uses of nuclear energy, strengthening nuclear safety, or increased IAEA safeguards. From 2012 PrepCon working papers www.un.org/disarmament/WMD/Nuclear/NPT2015/PrepCom2012/documents.html

deliberations with the NAM could address a wide range of disarmament, nonproliferation, peaceful nuclear use, and nuclear security issues; and 3) Working with the progressive non-nuclear states outside of NAM, such as Austria, Norway, Switzerland, could help develop a more coordinated approach to nuclear disarmament initiatives.

e. **South Africa:** *Becomes a strong voice in international dialogues (such as PrepCon and RevCon NPT meetings) around equitable and effective nonproliferation, bridging the gap between non-proliferation and disarmament.*

South Africa could be a big player, but much is currently unknown about the capacity to work there. While they have ratified an Additional Protocol, they are currently an unconstructive actor in international dialogues. However, they could have a huge amount of sway as they gave up nuclear weapons so are on moral high ground, they are a leader in the Non-Aligned Movement and an important political actor, they are a country that could go nuclear again if they chose to, they have a perspective on the non-proliferation regime that is different from Brazil, and they are a strong voice in Sub-Saharan Africa. Any work with South Africa would be in an exploratory phase to assess the civil society environment.

"Out" funding strategies: do not pursue

Other funding strategies (Egypt, other international, IAEA, UN work for a middle east nuclear weapons free zone, and work in Kazakhstan and Ukraine, see Figure A2 for details) are lower priority opportunities for Hewlett. While work with the IAEA is important (such as making the case for more funding for state-level safeguards), it is an area likely to be the focus of Carnegie Corporation, and is a 'could do, but not necessarily a should do' activity, so limited Hewlett funds should be directed here. Regarding work on a Middle East nuclear weapons free zone, encouraging nations in the region to take ownership of it is the most helpful thing civil society could do. This should not be a Hewlett priority.

Suggested Metrics

A variety of potential metrics were suggested from the interviewees. Key metrics for funding strategies that are 'in' or 'potentially in' are listed first, followed by others:

- Key metrics
  - Turkey and Brazil:
    - Number of non-nuclear experts, policy makers, and states that show leadership and promote non-proliferation in key international disarmament debates (e.g., Conference on Disarmament)
    - The state is more publically critical of Iran
    - The state ratifies a policy (e.g., the Additional Protocol) that supports equitable and effective nonproliferation
  - The NAM and the G77: Adoption of the IAEA Additional Protocol by 75% of all the NAM members

- Additional potential metrics
- South Africa develops a plan on what to do with its enriched stockpile of uranium
- Number of key countries that decide to remain non-nuclear
- No backsliding on existing treaties (e.g., no countries leave the NPT)
- Ratification of the CTBT by at least 25% more of the NNWS
- Adherence by all NNWS parties to all provisions of existing NWFZ (Nuclear Weapons Free Zone) treaties of all of the zonal provisions including prohibition of nuclear trade with countries lacking full scope safeguards
- Conclusion of additional APs and modified SQPs
- Number of emerging country diplomats trained in technical specialties of nonproliferation
- PSI participation
- Reports to the 1540 Committee
- Various CWMD convention ratifications

APPENDIX D OUTCOME 3—NUCLEAR POWER

Funding and grantee landscape

Table D1 gives a summary of the funding and grantee landscape, which helped inform which funding strategies were In, Potentially In, and Out of Redstone's recommendation for the strategy. There generally is a low level of governmental and philanthropic effort focused on the potential proliferation impact of nuclear power. One interviewee noted, "In the post-Japan world, larger health and economic issues dominate many discussions."

US government	Philanthropy and others	Grantees
Department of Energy has a Global Threat Reduction Initiative focusing on materials safety	**MacArthur** focuses on securing fissile material, the back end of the fuel cycle, and new political and technical solutions to the fuel cycle by working with the industry, exporting countries, newcomers, and potential host countries **Carnegie Corporation** focuses on tighter controls over weapons-usable materials, better governance of civilian nuclear exports, and new political and technical solutions to the fuel cycle **Hewlett and Sloan Foundation** focus on codes of conduct	**Carnegie Endowment** focuses on codes of conduct **American Academy of Arts and Sciences, CSIS, Stimson Center work, University of Georgia—CITS, National Resources Defense Council, Princeton University, Harvard University**

TABLE D1 Nuclear power funding and grantee landscape

See Figure D1 for ranked funding allocations and Figure D2 for the scope of influence.

FIGURE D1 Outcome 3: Nuclear power funding suggestions
Percent, +- standard deviation

"In" funding strategies

There are important opportunities to work on long-term policies for countries or utilities newly interested in nuclear power; to follow-up on the principles of conduct related to enforcement, funding, and implementation; and influence South Korea. Details are below, with 2015 targets in italics:

a. **Long-term policies for countries or utilities newly interested in nuclear power:** *By 2015, at least two countries (of UAE, Turkey, Vietnam, and Kazakhstan) establish safe, secure, and proliferation-resistant policies addressing fuel management, personnel, timelines, and funding of civilian nuclear power plants.*

   Establishing strict norms, standards, and safeguards for all countries (including new ones) interested or invested in nuclear power is important. This could include defining responsible behavior and how the world knows that others are following that behavior in addition to assuring responses

to deviations. An agreement such as the "gold-standard" UAE agreement with the South Koreans is one option, but not the only one: the UAE is buying four nuclear power reactors from South Korea, and has agreed not to pursue indigenous enrichment or reprocessing capabilities, but to procure fuels in a healthy open market. Other options could include equity partnerships across countries in a given facility. Hewlett could help countries responsibly develop nuclear power, considering the wide range of decision factors, including fuel management (input, enrichment, waste), personnel to maintain facilities, adequate timelines, funding needed, and times to decommission at the end of life. "Polite but realistic conversations about nuclear power are needed, especially with countries already considering power."

Many countries are considering nuclear power. In fact, after Fukushima, there was surprisingly increased interest in areas such as Africa. However, there has not been a lot of thought about the implications; many nuclear newcomers are making decisions without enough information; and there are more countries considering nuclear power than the US or the International Atomic Energy Agency (IAEA) can address.

Finally, what happens in the UAE and Turkey with respect to nuclear power is related to the larger issues with Iran.

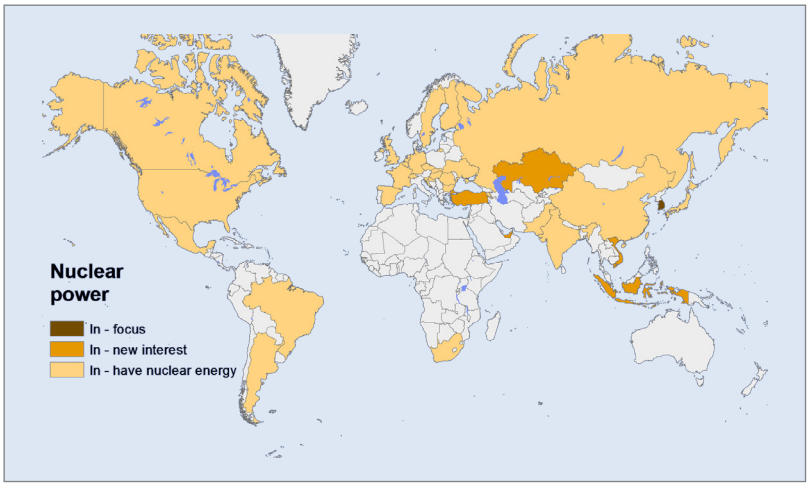

FIGURE D2 Outcome 3 scope of influence

b. Principles of conduct enforcement, funding, and implementation: *Adopters of the Nuclear Power Plant Exporters' Principles of Conduct agree on enforcement mechanisms and grievance procedures; nuclear power plant exporters transition to self-funding and self-management of the principles; banks and utilities enforce the principles.*

The code (or principles) of conduct has been successful with nuclear reactor vendors and work on enforcement, funding, and implementation should continue.

c. South Korea: *Affirms its stance as a non-nuclear-weapon state; continues to require the highest nonproliferation standards and policies in states to which it offers to export nuclear power plants; negotiates with the US a new 123 agreement that does not include enrichment or reprocessing in South Korea by March 2014.*

South Korea is very important. They are a huge player in nuclear power. Its nuclear technical cooperation agreement (123 agreement) with the US is up for renewal in 2014, and under this nuclear umbrella they are part of the reason that the US cannot downgrade the role of nuclear weapons in its policies. As mentioned above, they are supplying reactors to the UAE and have established strong policies in that respect, with the UAE agreeing not to pursue indigenous enrichment or reprocessing capabilities. Getting South Korea to agree to limit reprocessing of nuclear fuel is a high-return

investment for Hewlett, as it is a bellwether agreement that has the potential to influence the actions and policies of other countries. However, because there are many other projects already focused here, Hewlett funding should be moderate, focused primarily on the nuclear power issues. There may also be opportunity to leverage other funds in South Korea by bringing the Hewlett name-brand to efforts, though it should be noted that some policy positions of large funders in South Korea are inconsistent with Hewlett's views.

"Potentially In" funding strategies: pursue if landscape changes

There are three potentially in funding strategies that could be pursued if the landscape changes, primarily if the NSI funding is increased:

d. **Spent fuel waste management:** *Multilateral discussions occur about the potential for spent fuel management in Asia and the Middle East.*

There was a wide variety range of focus put on spent fuel waste management, and it was a highlight for certain experts (Tom Isaacs and Bill Potter). Working on spent fuel and reprocessing waste management is important for security and the environment. This work should not just focus on northeast Asian countries, but also include emerging nuclear nations in the Middle East, southeast Asia, and others possible nuclear nations (e.g., Brazil, Turkey). The work could establish norms for facilities and operations. However, given limited funds and limited timeframes, Hewlett should not actively pursue this activity.

e. **Nuclear trade:** *Work with suppliers, utilities, and related government skill transfer agreements to improve nuclear trade.*

As more and more countries pursue nuclear power, this becomes more important. Efforts might focus on improving transfer of skills between countries at the governmental level through nuclear cooperation agreements, or engaging specifically with utilities.

f. **Safety:** *Improved through national and international governance measures and effective regulation*

"Out" funding strategies: do not pursue

Work on multinational fuel facilities (see Figure A2 for details) has a lower immediate opportunity for Hewlett in the next few years, however it remains a good idea overall (and was a highlighted activity for one expert). Controlling reprocessing is very important for security to limit access to nuclear materials. Multinational fuel facilities must be pursued in conjunction with the NWS. The field should focus on win-win-win solutions that advance nuclear power, national security, and environmental concerns. Some ideas might be to consolidate facilities into three or four places around the world, which lead to many benefits: increased wealth, increased safety, and increased nuclear security worldwide.

Suggested Metrics

A variety of potential metrics were suggested from the interviewees. Key metrics for funding strategies that are 'in' or 'potentially in' are listed first, followed by others:

- Key metrics
  - Number of facilities or countries following international best practices (code of conduct)
  - Number of states that agree to renounce enrichment and reprocessing
  - Countries that want nuclear power have access to fuel and materials at market rates and establish waste management plans ahead of implementing any power plants
- Additional potential metrics
  - Tons of material secured
  - Development of independent and well-trained nuclear regulatory bodies in all nuclear power newcomer states, as well as those states with existing nuclear power programs
  - All future US nuclear assistance is conditioned on countries having in place the AP and potentially agreeing to forego indigenous uranium enrichment and plutonium reprocessing
  - Renunciation by countries in NE Asia of plans to develop plutonium reprocessing

APPENDIX E OUTCOME 4—OPPORTUNITY (POTENTIAL CONFLICT STATES AND TERRORISM)

As described earlier, flexible funding could focus on spending on the first three outcomes, or investments aimed at other parts of the overall theory of change such as supporting efforts for Iran, North Korea, Pakistan, and India to freeze nuclear weapon development, or to ensure that terrorists do not gain access to weapon materials. The following information focuses on the landscape and potential funding strategies applicable to Iran, North Korea, Pakistan, India, and terrorist organizations.

Funding and grantee landscape

Table E1 gives a summary of the funding and grantee landscape, which helped inform which funding strategies were In, Potentially In, and Out of Redstone's recommendation for the strategy. The US and other governments focus heavily here, and philanthropic funders such as MacArthur and Carnegie Corporation also expend significant resources. However, "most of the effort is focused on

US government	Philanthropy and others	Grantees
Department of State supports a Global Threat Reduction program that focuses on Pakistan and Nonproliferation and Disarmament Fund, Export Control and Related Border Security, and WMD Terrorism program focus on terrorism **Department of Defense's** Cooperative Threat Reduction program includes Pakistan and India **Department of Energy**	**MacArthur** focuses on Iran and North Korea and heavily on safety and security of fissile material **Carnegie Corporation** focuses on Iran and North Korea through better informed internal debates and reduced misperceptions that could spark military conflict **Ploughshares** focuses on Iran and North Korea. Future efforts may focus on India/Pakistan, and Asia in general **Philanthropic efforts focus on studies** of the states or regions, but do not often have comprehensive communications plans nor pursue policy implications	**Carnegie Endowment** focuses on India, Pakistan, and Iran North Korea focus: **National Committee on American Foreign Policy, UCSD, Mercy Corps, Institute for Foreign Policy Analysis, Social Science Research Council, Pacific Forum** Iran focus: **Council on Foreign Relations, Institute for Science and International Security, Gulf/2000, US Pugwash, International Institute for Strategic Studies, BASIC, NSN**

TABLE E1 Iran, North Korea, Pakistan, India, and terrorist funding and grantee landscape

military options, and not on political intelligence and messaging on how to reach US leaders."

As described in the main body of the report, there is one main activity to pursue in support of key actors (see Figure E1 for ranked funding allocations and Figure E2 for the scope of influence).

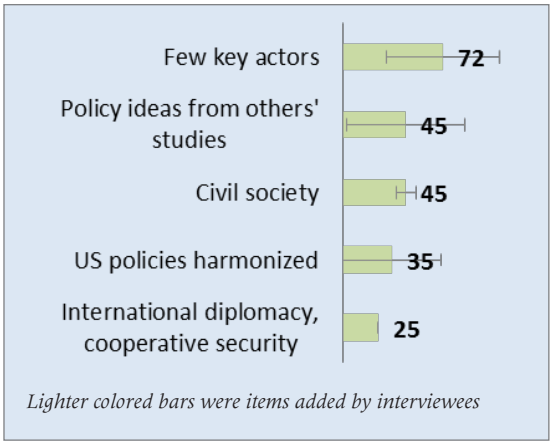

FIGURE E1 Outcome 4: Iran, North Korea, Pakistan, and India funding suggestions
Percent, +- standard deviation

"Potentially In" funding strategies: pursue if landscape changes

There is one additional potentially in activity that could be pursued if the landscape changes, either through a decreased focus by others or increased NSI funding:

a. **Policy ideas from others' studies:** *Results from others' studies on Iran, North Korea, Pakistan, and India are translated into broader messages, used to educate policy makers, build consensus in the national and international debates, and define policy implications and implementable ideas.*

"Out" funding strategies: do not pursue

Other funding strategies (civil society, harmonizing US policies, and international diplomacy and cooperative security, see Figure A2 for details) are lower immediate opportunities for Hewlett. Promoting civil society in these countries is important, but takes significant time, these are entrenched problems, and there is a mismatch between the time needed to affect this outcome and Hewlett's current funding commitments.

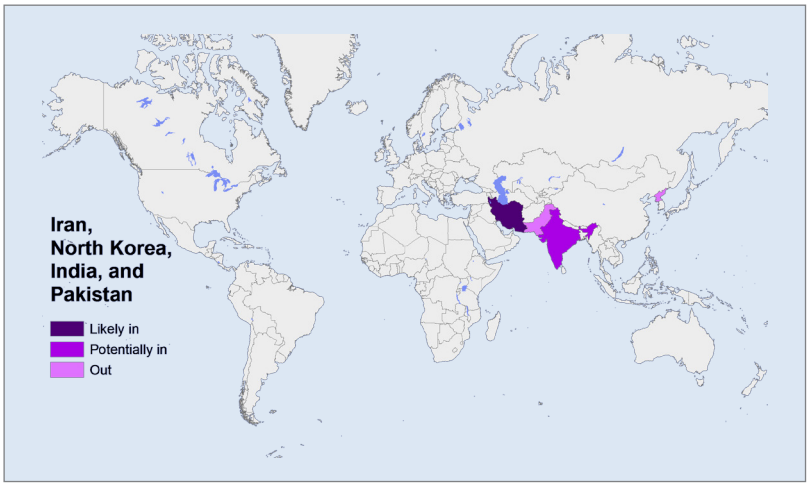

FIGURE D2 Outcome 4 scope of influence

Suggested Metrics

A variety of potential metrics were suggested from the interviewees. Key metrics for funding strategies that are 'in' or 'potentially in' are listed first, followed by others:

- Key metrics
  - Iran stops 20% enrichment
- Additional potential metrics
  - North Korea slows or stops production of new nuclear warheads and warhead suitable material
  - Number of bilateral or multilateral meetings aimed at safety and security that India and Pakistan attend
  - Number of states that agree to freeze weapons development