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## ***The Use of Foresight Methodologies to Improve Public Policy***

The Center for Complex and Strategic Decisions:  
A Proposal for the  
U.S. Executive Office of the President of the United States

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● **SLIDE 1** Thank you, Martin. I am very honored to be here. And, thank you for your kind invitation to share my efforts as the Vision Working Group leader for the Congressionally mandated and funded Project on National Security Reform in the United States. We were tasked with making recommendations to improve the U.S. national security system. Using foresight methodologies, the vision working group tested our assumptions and our Project's recommendations. This afternoon, I'll describe the results of the Project and how we are prototyping my Working Group's major recommendation.

● **SLIDE 2** The Vision Working Group, recommended the establishment of a Center in its July 2010 *Report and Scenarios* to the U.S. Congress. Over a five-year period of study, we determined that the United States' President needs a place, a process and set of capabilities, to develop and test grand strategy and policy decisions of the nation and particularly to support the national security system.

● **SLIDE 3** In addition, the need for the nation to develop "anticipatory governance," a research effort led by Professor Leon Fuerth at George Washington University, reinforced and validated the findings of the Vision Working Group of the Project on National Security Reform.

● **SLIDE 4** In the United States, The *National Security Strategy* is the closest published document that represents a comprehensive discussion of where the country is going and what it wants to accomplish. Published from The White House from time to time, it is neither sufficiently long term

nor a true strategy that links ends, ways and means over time. It represents, at best, a list of aspirational goals by an administration. In a world of increasing complexity, the United States needs to develop long-term, whole of government thinking and planning.

Other countries have established such a set of capabilities within the heart of their governments, such as Israel, Finland, Singapore and, here in the UK.

- **SLIDE 5** My journey began nearly twenty-five years ago when as a strategic management consultant to the private sector I had an opportunity to do some work with the U.S. Army War College. When I read the U.S. National Security Strategy for the first time, I assumed it was a subset of a larger national strategy. But, I was wrong. That summer I realized for the first time that

- **SLIDE 6** the United States does not develop long-term, whole of government “Grand Strategies.”

- **SLIDE 7** For decades the private sector has routinely used management tools such as forecasting, scenario based planning, strategic visioning, political and economic risk analysis, and so on, but the government, especially in a whole of government way, rarely, if ever, uses such tools across agencies although sometimes those tools are used in pockets, within specific agencies or departments.

- **SLIDE 8** The question is, “what mechanisms should the U.S. government develop to improve the nation’s ability to

plan in a whole of government way for its future; to be better prepared for a future that is very different from its past?”

• **SLIDE 9** At the end of World War II, General George C. Marshall said, “We are now concerned with the peace of the entire world, and the peace can only be maintained by the strong”. But, how does the United States remain strong? What does that mean in a world of globalization? And, how should the country define what national security is in such a complex and interdependent world?

• **SLIDE 10** At PNSR, we took a systems approach to examining this series of questions. The Group stepped out into the next larger system and the system beyond that to look across the entire mosaic at the elements and their interdependence and interactions to better understand the whole and its behavior. The study engaged in both analysis and synthesis and used visioning tools to assist in testing the creation of the new structures, policies, strategies and processes necessary for a successful 21<sup>st</sup> Century national security system as outlined in *Forging a New Shield*, the overall study presented to the President of the United States, The President-elect and the U.S. Congress in December, 2008.

• **SLIDE 11** U.S. security is rooted in the successful integration of all major elements of national power; economic, diplomatic, military, informational and so on. When done well, the vitality of the nation is ensured and the country’s ability to encourage positive change

throughout the globe is enhanced. The Project on National Security Reform proposed a modern apparatus to serve the nation's needs well into the 21<sup>st</sup> Century to support the broad national security challenges and address the interagency mechanisms in the organizational space between the President of the United States and the Cabinet level agencies and departments.

- **SLIDE 12** The Vision Working Group asked the question, “what is the basis for re-thinking the national security system and how will success in the future be characterized?”

- **SLIDE 13** If “what is” and “what is not” in the arena of National Security is artificially or prematurely narrowed, it is likely that situations will be misread that can ultimately, and negatively, affect the nation. Not too many years ago the challenges related to sub-prime mortgages, diseased birds, automobile emissions, and pilot training rosters were not typically the focus of national security. Today, it is clear that they might well have been. The point is no one can imagine or determine now with certainty what might affect the nation in the future.

- **SLIDE 14** Threats can be assessed and prioritized based upon considerations such as urgency, impact, magnitude, mitigation options, and intention.

- **SLIDE 15** Opportunities can be assessed and prioritized based upon considerations such as knowledge, expertise,

probability of success, resources, long term sustainability, proportionality, and intention.

Based on this approach, National Security can be considered:

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*Any situation, condition, or entity that has the potential to enhance or degrade the viability and vitality of the nation.*

*So that*

*The National Security System would be responsible for and measured by:*

• **SLIDE 17**

- *The viability and vitality of the nation,*

• **SLIDE 18**

- *Peaceful and positive development throughout the countries of every region, and*

• **SLIDE 19**

- *Cooperation and collaboration around the globe.*

• **SLIDE 20** The National Security System needs to become a “learning organization” that can anticipate, adapt to, and successfully address the widest range of threats and opportunities.

• **SLIDE 21** As a complex adaptive system, the future security system will need to possess certain inherent qualities that will be critical to success. It must:

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Share information and collaborate horizontally,

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Accommodate unanticipated needs and partnerships,

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Ensure agility in the face of uncertainty,

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Incorporate ad-hoc structures and processes, and

• **SLIDE 26**

Maintain a long-term view.

• **SLIDE 27** Because the U.S. national security system is a complex adaptive system, it is difficult to separate geopolitical, social, technological or economic phenomena. These elements interact as a system of systems. In most instances, it is a complex system of complex systems and that is the challenge facing the nation. It's also the challenge facing the world.

• **SLIDE 28** One of the major issues is that we are always being asked to predict and control. But, prediction assumes theories and theories require assumption testing to learn. The complexity sciences say that in complex systems there are limits to what we can learn or know with any precision - we can predict with probabilities but not with certainty. In physics, the Heisenberg Uncertainty Principle tells us we are not always able to predict everything; if we know some things, we cannot know other things. Such is the case in the systems that we are responsible for.

• **SLIDE 29** I find it troubling that although scientists may understand these ideas, many of the policy makers we work for and the bureaucracies we serve are not populated with knowledgeable leaders on this subject. They want and expect us to predict and control the real world complex systems we work in. And, the physicist in me knows we cannot. And, the sociologist in me knows we cannot and the management professor in me knows we cannot.

• **SLIDE 30** I have stopped trying to explain the laws of thermodynamics and entropy and have started to simplify things to both policy and lawmakers. I do try to explain that we can still be successful in developing tools and methodologies that can help us in being better prepared even if we can't predict or control with certainty; we can predict and control with probabilities. Working in the world of complex systems, which is the real world of policy, requires planning and learning. And, the more planning and learning we do, the more successful our capabilities in

designing, developing and ultimately improving the complex systems we need for the future because complex systems can be influenced if you understand the system well enough.

More than 2500 years ago, the ancient Chinese Philosopher, Sun Tzu, said in his masterpiece, *The Art of War*,

• **SLIDE 31** “If you know your enemy and you know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained, you will suffer a defeat. But if you know neither yourself nor the enemy, you will succumb in every battle.”

In today’s global context, this quotation suggests that if a nation is in any kind of competition, it must be familiar with, and develop knowledge of its competitors as well as itself if success is to be expected. Nations must actively be learning. How well have nations developed relationships with their partners and friends to ensure cooperation when there is a problem anywhere on the globe? No one is big enough or wealthy enough to truly cover the world in terms of knowledge or capabilities. Not today. Success can only be achieved with learning, planning, anticipating and, most importantly, collaborating.

• **SLIDE 32** In the 1950’s, President Dwight D. Eisenhower said, “Plans are worthless, but planning is everything.” I think that President Eisenhower was explaining that through the knowledge learned in planning

processes, plans are more likely to be successful. And, this is learning in the Sun Tzu sense.

• **SLIDE 33** The complex systems within the national security community have interesting characteristics worth identifying and discussing. Probably the most important characteristic is that complex systems cannot be controlled – at best, they may be influenced. And, the systems can only be influenced if understood intimately.

• **SLIDE 34** A White House Center needs to be a learning organization to support whatever national security structure is in place in the United States. The Center for Complex and Strategic Decisions is being prototyped to learn, analyze, assess and synthesize risk, foresight and the development of “grand strategy” across the government. The Center would anticipate potential futures.

• **SLIDE 35** One of the Vision Working Group findings included the need to synthesize “all of government” solutions to complex system issues and problems, and sometimes “all of society.” The only successful way to do that is to be learning about the system issues. These enable the development of scenarios for planning... and ultimately being able to develop “Grand Strategies.” We also found that the United States needs to systematically use these tools and processes to improve decision-making and, create mechanisms for that to happen at the whole of government level -- at the level of the President... and that requires context and synthesis. It also requires breaking down the stovepipes of government so they can work together

effectively. We offer these kinds of tools to the Secretaries of State, Defense, Energy, Agriculture, to the Director of National Intelligence and so on. Why not our President?

● **SLIDE 36** So, to illustrate the kinds of capabilities needed in the White House and to stress test our recommendations to the Congress before they were made, PNSR developed nine scenarios in three time frames.

The methodology of a full visioning effort was used in the project. In addition to complementing and enhancing our findings, the visioning process resulted in detailed scenarios against which specific options generated by the project were assessed.

The process we used to develop the scenarios...

● **Slide 37**

began by determining the purpose and scope of the scenarios. Since The National Security Act of 1947 survived largely intact for sixty years, despite major social, technological, economic, environmental, and political changes, the Vision Working Group looked ahead about fifty years. The nation will face extraordinary changes in the next fifty years. Most forecasters and technologists believe that the rate of change in the next decades will accelerate so rapidly it will be difficult to imagine.

● **Slide 38**

It is with this in mind that the Vision Working Group was asked to create scenarios that would provoke discussion and debate within the Project and hopefully lead to better, more resilient recommendations.

### ● Slide 39

We then began the development of a questionnaire to be given to experts representing some of the best minds in the nation. For that process, we enlisted the assistance of experts in many fields including a cross section of the sciences and engineering and in particular The National Academies in the United States. They sponsored a workshop that developed the survey instrument and questionnaire used to solicit the input of experts across the entire spectrum of human inquiry and science.

### ● Slide 40

The Vision Working Group, with input from The National Academies, then created a list of experts to receive the questionnaire in many disciplines across the sciences, engineering, arts, futurists, and fields too numerous to mention. The experts' viewpoints would be critical to the successful development of scenarios that would be based on their projections of the future.

### ● Slide 41

The questionnaire was sent to over 1500 experts who were queried via email about the future of their disciplines. It was hoped that 2-3% of the population would return their opinions regarding the future. The Project obtained 133

responses; a 9% response so we were very pleased and the responses represented a full spectrum of disciplines.

### ● Slide 42

The experts' insights on future trends and milestones were aggregated, analyzed and synthesized to better understand the ways that the future could unfold.

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The trends identified by the experts were then woven into the scenarios representing three time horizons; 2020, 2040 and 2060.

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Before the scenarios could be used to stress test the recommendations of the Project, the Vision Working Group asked the Commandants of three major schools at the National Defense University to choose selected faculty who taught in the national security curriculum of each school to read the scenarios.

### ● Slide 45

The scenarios were then stress tested with the national security faculty

- at the National War College,
- the Industrial College of the Armed Forces, and
- the Joint Forces Staff College.

Based on the feedback of the faculty, the scenarios were finalized.

● **Slide 46**

The five major solution sets of the Project were then stress tested by the Working Group Leaders using the finalized scenarios.

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As a caveat, the scenarios were intentionally designed to stress the Working Group's recommendations from several angles. The scenarios should not be viewed as predictions, but rather glimpses into plausible alternative futures. The scenarios are intentionally inconsistent and oft times bleak, all in the interest of provoking a wider range of conversation.

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For each scenario five general questions were used in testing the solution sets. We asked:

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1. What are the stressors in the scenario?

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2. How well was the system able to anticipate the scenario problems?

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3. If the system was not able to prevent/remove the threat, how well was the system able to react?

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4. How well was the system able to recover?

● **Slide 53**

5. How well does the “system” function as a whole; specifically, the structures and processes?

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Each scenario was followed by specific discussion questions to ponder. Three general questions we used when reading each scenario were:

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How will the recommendations function in the scenario presented?

● **Slide 56**

Are there problems or solutions identified that we have not addressed?

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If this future is not desirable, what choices should we be

making today to avoid it? What is the impact of that to our policies?

As the Working Group leaders worked through the scenarios, it was clear that each solution set performed differently in the different scenarios. Strengths and weaknesses of the solution sets gradually emerged.

The 2020 scenarios included:

- **SLIDE 58** Scenario 1: Red Death, in which the country is struggling to get back on its feet after a major biological attack and witness a debate about the future role of the US government both at home and abroad. Societal and governmental infrastructure breaks down as more than two billion people perish in this disturbing scenario.

- **SLIDE 59** Scenario 2: The People's War in which the United States faces global asymmetric warfare against a nuclear-armed great power. The entire federal government is caught in the conundrum of how to respond to anonymous attacks at home and abroad while avoiding an escalation to nuclear war with China.

- **SLIDE 60** Scenario 3: A Grand Strategy in which the utility of an integrated grand strategy development capability is explored for smoothing the transition from one Presidential Administration to another; the time when the country is most vulnerable.

The 2040 scenarios include:

• **SLIDE 61** Scenario 4: A New Economy in which the United States faces its worst economic crisis since the Great Depression. The crisis is a perfect storm of the unintended consequences of new technologies, policies, court decisions, and popular expectations.

• **SLIDE 62** Scenario 5: An Army of One in which the intersection of unmanned, robotic warfare and on the ground, assisted diplomacy, is explored. This scenario depends upon the continuation of current trends in robotics and sensors technology, as well as a public policy choice to enable greater real-time interaction between the military and diplomatic arms of the US government.

• **SLIDE 63** Scenario 6: Who Holds the High Ground in which major competitive changes in the Earth-Moon system are envisioned from the perspective of a traditional interagency space working group.

• **SLIDE 64** Scenario 7: A Brave New World in which a plan is examined to apply proven neuroscience, psychiatric, and medical techniques to the control of pathological behaviors in a world of readily accessible weapons of mass destruction and genetic engineering.

The 2060 scenarios include:

• **SLIDE 65** Scenario 8: A Warm Reception in which the challenge of developing international consensus for action on the issue of global climate change and the possibility of

unintended consequences is focused.

- **SLIDE 66** Scenario 9: It's a Small World in which the implications of a very different future are explored, wherein small, molecular scale machines (nanotechnology robots or "nanobots") have become ubiquitous.

- **SLIDE 67** Finally, the possibility of a technological singularity by 2060 is noted, when robots will be smarter than human beings and how this will affect life on earth is unknown.

- **SLIDE 68** The scenarios demonstrated that the five major findings of the Project on National Security Reform significantly improved system performance.

- **SLIDE 69** But, in addition to the Project, I had a Fulbright in 2012 in Singapore that included studying the Strategic Policy Office, in the Office of the Prime Minister of Singapore where many lessons were learned that will assist in the establishment of the U.S. Center.

Singapore's Peter Ho the architect of their system and process has said there are four major roles for their Centre for Strategic Futures, all of which should be represented in the U.S. EOP Center's set of capabilities. They are:

- **SLIDE 70** "Challenge conformist thinking" by building global networks and partnerships with academia, think tanks and global thought leaders through conferences and projects;

- **SLIDE 71** “Identify emergent risks” by creating risk maps and communicating emerging issues to decision makers;

- **SLIDE 72** “Calibrate strategic thinking processes” by using scenario planning and risk assessment to develop policy and new capabilities;

- **SLIDE 73** “Cultivate capabilities, instincts and habits,” by using systems and strategic frameworks and mindsets to deal with uncertainty, disruptive shocks and whole of government approaches regularly.

*This set of capabilities and mindsets represent a strategic capability for Singapore that would certainly enhance the capabilities within the Executive Office of the President, if adopted in the United States.*

- **SLIDE 74** The scenarios used in the PNSR study represent the kind of systems thinking and strategic approaches that the United States needs today; the kind of thinking that should be infused in the White House.

- **SLIDE 75** So, to prototype the Center needed in the White House, we established the Center for Complex and Strategic Decisions. Our vision is to use the application of advanced systems approaches to solving complex problems and improving policy and strategy making for the United States government. Our mission is to provide this capability

through the systems-level integration of foresight and strategic leadership models with high-powered complexity science and decision technologies.

• **SLIDE 76** The Center for Complex and Strategic Decisions has many partners to enable the kinds of analysis required. Our largest partnership is with Argonne National Laboratory. It has a set of processes and capabilities that enable the development and use of forward-looking global contexts. The sophisticated tool sets of Argonne National Laboratory are a major part of the creation of the Center because of their unique capabilities and maneuvering within the complexity of today's world requires strategic thinkers who have the ability to understand non-linear and unintended consequences of their policies and decisions. It has been described as the West playing chess while the East is playing Wei chi or Go and then both sides wondering why they are not making progress in their relationships.

• **SLIDE 77** The Center provides a rigorous framework to analyze, synthesize, test assumptions and solution sets and integrate the elements of national power to provide contexts to support long term strategic decisions.

• **SLIDE 78** It supports the integration of the nation's near, mid, and long-term national security planning based on pragmatic internal (U.S.) and external (the world) assessments and aspirational visions of what the future could be. Visionarios are developed in a continuous stream to study issues along an entire continuum of global and domestic topics of interest to the President.

• **SLIDE 79** The Center works in a project format to better define and understand organizations' complex problems and use systems-level tool sets to support high level decision making.

• **SLIDE 80** It is demonstrating how it can provide many different capabilities for the President but ultimately should move into the White House and the Executive Office of the President.

• **SLIDE 81** The assessment capabilities are needed from deep space to cyber space and everything in between. They are developed using the five essential planning perspectives of 1) space, 2) the planet, 3) regions, 4) countries, 5) and U.S. internal (domestic) as well as cyber space for each of the three time cycles of near, mid, and long-term. These assessments include both geographic and functional dimensions.

• **SLIDE 82** The assessment of risk needs to encompass system risk most of the time. Frequently, the impact of a particular course of action has an economic or political risk associated with it. But, risk in a world of complexity requires an understanding, not only of individual risk variables but of the interactions of risks associated with all of the system variables across the STEEP risk spectrum from sociological, technological, economic, environmental and political risk. Frequently, the risk must be accumulated and the algorithms need to take into the consideration the amount of risk and the associated influence of multiple risk

factors at the same time. Calculation is difficult. And, of course, you can never account for all risk.

- **SLIDE 83** Visioning produces both pragmatic and “what-if” scenarios to test assumptions, ends, ways, and means of plans. The Center includes various inputs from the U.S. intelligence community, homeland security, private industry, academia, think tanks and international entities as needed.

- **SLIDE 84** Our partnership with Argonne National Laboratory is critical to the success of the Center. Working with Pam Sydelko and her colleagues in the Systems Science Center at Argonne, we have developed an outstanding ability to work on serious global problems.

- **SLIDE 85** Right outside of Chicago, Argonne represents an enormous scientific and technological enterprise known for their sophistication at approaching problems using a systems lens.

- **SLIDE 86** Argonne’s vision is to lead the world in providing scientific and engineering solutions to the grand challenges of our time: plentiful and safe energy, a healthy environment, economic competitiveness and a secure nation.

- **SLIDE 87** The Global Security Sciences Division delivers actionable, defensible and powerful information

and technologies to decision makers who impact and shape global U.S. security interests.

- **SLIDE 88**: The mission of the SSC is to advance, integrate, and apply systems approaches that provide a better understand complex physical, social, and economic interrelationships, enable anticipation of possible futures, and support difficult decision and policy-making.

- **SLIDE 89** and the demonstrated capabilities that Argonne can provide are exactly the kinds of tools the Center requires, such as breaking down the stove pipes of the organizations we all work in.

- **SLIDE 90** Transforming to Systems Approaches requires systems thinking, collaboration, advanced tools and education.

- **SLIDE 91** This leads to thinking systemically; influence – not control; foresight, not prediction.

- **SLIDE 92** Systems research is a core capability at Argonne.

- **SLIDE 93** They are leaders in complex adaptive systems modeling,

- **SLIDE 94** Infrastructure Assurance,

- **SLIDE 95** Energy Security Analysis,

● **SLIDE 96** Integrated Environmental Security Analysis

● **SLIDE 97** Critical Materials Security

● **SLIDE 98** Supply Chain/Logistics Modeling

● **SLIDE 99** Resiliency Analyses in Support of National Security

● **SLIDE 100** and finally Argonne is dedicated to advancing decision science and systems analysis technologies.

● **SLIDE 101** Our partnership with Argonne is enabling extraordinary work and this is a very exciting time for us at the Center. We have other partnerships established as well, such as with Georgia Institute of Technology and the National Defense University.

● **SLIDE 102** The Aerospace Systems Design Laboratory at Georgia Institute of Technology, is another extraordinary partner that is beginning to work on global systemic projects with us.

● **SLIDE 103** Their vision is to be a leader in advanced systems engineering design and operations research.

• **SLIDE 104** As you can see by their organization, directed by Dr. Dimitri Mavris, they are involved in a great range of specific projects.

• **SLIDE 105** Their external advisory board represents a global user community of industry and governmental organizations.

• **SLIDE 106** And, finally, their sponsors are broad based, as well. We are only beginning to work with Georgia Tech, but we are very excited about our new frontiers.

• **SLIDE 108** Finally, our Center has already completed several projects. Let me share a few

• **SLIDE 109** “Forging an American Grand Strategy,” which was a symposium at the National Defense University in which the need for strategic decision support tools and methodologies to develop foresight were discussed, especially at the level of the President.

• **SLIDE 110** “Energy Security as a Grand Strategy,” a conference also at the National Defense University, which explored energy security as a wicked problem needing complexity science algorithms to explore.

• **SLIDE 111** “Israel at 100: A Visionario in 2048,” in which the complex issues surrounding the State of Israel were explored at the Galilee International Management Institute in Nahalal, Israel.

• **SLIDE 112** “Nano-technology in 2050: A Visionario” in which the future of U.S. public policy on nanomanufacturing was explored for the Chief Scientist and Comptroller General of the General Accountability Office in Washington, D.C.

• **SLIDE 113** “A Chicago Story: A Visionario” in which the urban security project for the Chicago Roundtable on Counter-violence explored issues surrounding programs for youth for the Chicago Council on Global Affairs.

• **SLIDE 114** Many new projects for 2014 are currently under way with partners domestically and abroad.

• **SLIDE 115** Other projects are currently being discussed with current and potential partners.

• **SLIDE 116** Many issues in many different areas of interest are being planned for the next year or two. We are delighted that so many projects are in our pipeline with such distinguished partners.

• **SLIDE 117** As a nation, the United States needs to become far more proactive in using foresight, analytical and synthesis tools in shaping the future and working toward a world of increasing liberty, prosperity, justice and peace because that is the world future generations deserve. We hope the Center will play a role in that future by

informing the policy and strategy that emerges from the Executive Office of the President of the United States.

• **SLIDE 118** Thank you for your kind attention! I look forward to your questions.