Center for *Future* Studies

May 2, 2007

House and Senate Select Committees
On Forward Engagement
United States Congress
Washington, DC 20515

Dear Committee Members:

We are pleased to submit to you the attached first annual report of the Center for Future Studies. Operating pursuant to amendments made to Public Law-6414, the Center is charged with providing non-partisan research support to the House Committee on Forward Engagement (HCFE) and its Senate counterpart (SCFE). This report utilizes the concept of "forward engagement" in an effort to identify and analyze significant challenges to the United States' domestic tranquility and national security. Upon creation of the Center in January 2007, we began a thorough review of the findings of past Blue Ribbon panels, particularly the report of December of last year. Building upon the work of our predecessors, the Center identified four thematic policy 'tracks' that we believe requires the immediate attention of the United States Congress. While our intention is for this document to be viewed holistically, we believe that each of these four tracks necessitate urgent and thoughtful consideration.

Our assessment prompted an effort to streamline the methodological process by which FCIs and issues are analyzed. In the process of identifying these FCIs and their causal trends, we determined that bureaucratic inertia is not the sole cause of our present situation. The American electorate itself, due to rising levels of cynicism and political disengagement, must come to understand the gravity and complexity of the challenges facing our nation. In addition to the citizenry, we believe that it is essential for Members and staff of this and future Congresses to be trained in the methodological techniques of forward engagement, as it promotes greater dialogue across issue disciplines and demands an intellectual foresight which has become endangered in recent political times.

While the Center was given a mandate to report to the Legislative Branch, our work is part of a broader effort to encourage greater foresight on the part of the American people and their elected representatives. For this reason, we have recommended that the Committees revisit a recommendation of the most recent Blue Ribbon panel, regarding Executive Branch reform.

This document should be read as a work in progress. Feedback is not only welcome, but requested. Please forward all comments and questions to the undersigned. We thank you in advance for your feedback.

Sincerely,

Tyler J. Hudson
Staff Director

Enclosure

[SIMULATION: For Classroom Purposes Only]

Center for *Future* Studies

Inaugural Report to the
House and Senate Select Committees on Forward Engagement

May 2, 2007

Center for *Future* Studies

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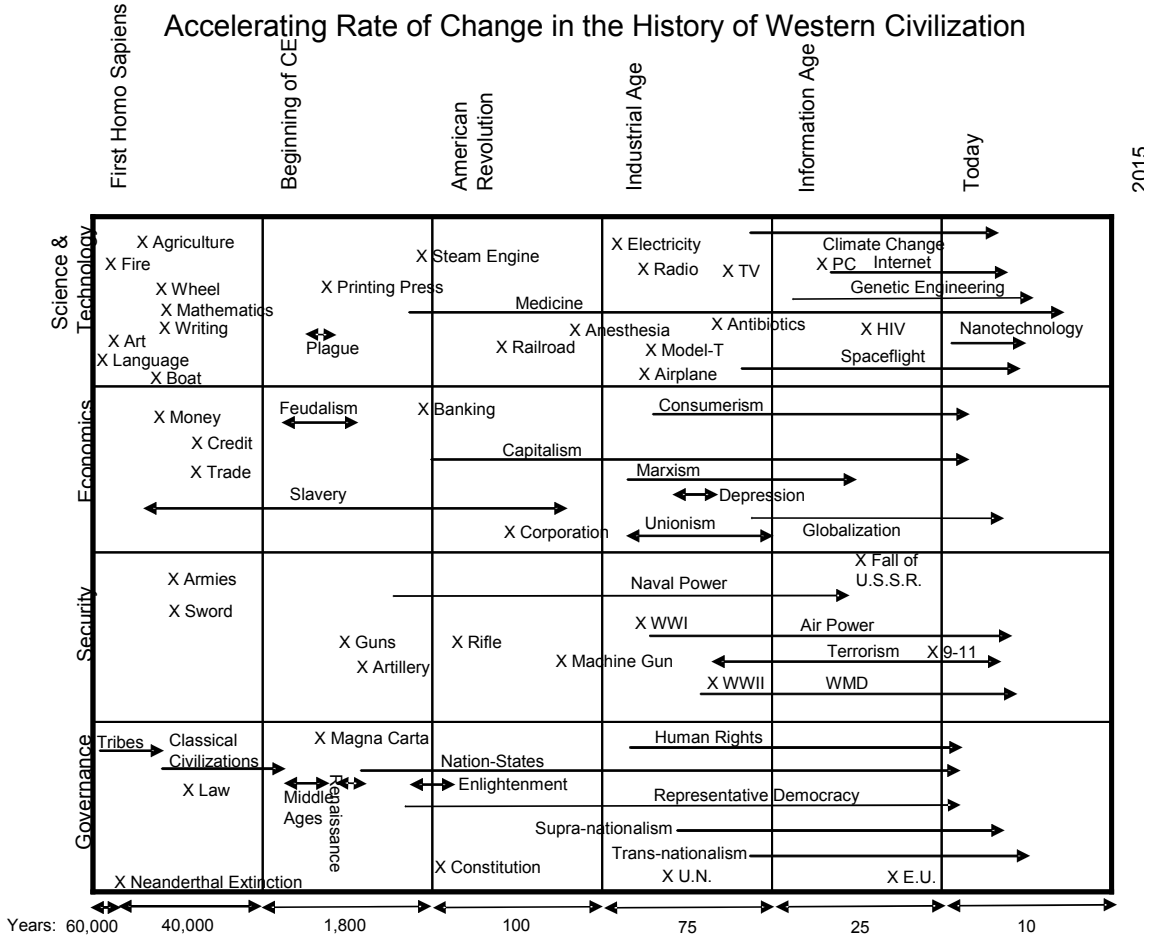
The Accelerating Rate of Human Change

The evolution of our species, as we exist today, culminated in a period of 100,000 years. Modern science evolved only in the past 400 years, while the Industrial Revolution was still over two centuries away. In the last fifteen years, science has unlocked cures and therapies that would be hailed as modern miracles decades ago. The Internet Age has facilitated unimaginable levels of human communication and interaction, as well as information storage and exchange. These enormous leaps forward in human achievement have had a parallel effect on the relationship between human beings and our conception of time: simply put, it is unfolding faster than before. Nearly instantaneous information sharing and communication abilities are threatening concepts such as linear causation with extinction, and replacing them with a paradigm of complexity and unpredictability.

Figure 1 demonstrates the shrinking of evolutionary time in relation to human achievement.

Figure 1. Accelerating Change in Human History.



Bureaucratic government—exemplified by the United States federal government—may well be the first casualty of this accelerating change. Madison and Jefferson's America was a country that reinforced the values of the government they designed: deliberative, unhurried, and inwardly-focused. As the country begin to expand from the Atlantic to the Pacific, federalism preserved the Union with its deference to the states on some matters, and insistence on obedience to Washington for others. In the 20th century, technological and social change, as well as a globalizing world forced some American institutions such as corporations and universities, to embrace these new forces. Other institutions, such as the U.S. federal government, were not so quick to understand or act upon these forces which were changing the course of human history.

Forward Engagement

"A process of thinking systematically about the longer-range future, and about ways in which public policy might engage the future sooner, rather than later. Forward Engagement conveys a three-part thought: (1) we are facing an acceleration of major historical events, some of them carrying the potential for major societal and international consequences; (2) society in general and government in particular, need to address such possibilities as far in advance as possible, in terms of policies and resources; and (3) there needs to be a system to help government visualize more consistently what may be approaching from the longer-range future, and to deliberate in a more timely way about possible responses. Forward Engagement seeks to comprehend major future developments in the broad categories of defense, economics, science and technology, and governance and to strive to understand how these developments interact and influence each other."

--Leon Fuerth

Executive Summary

In the last decade alone, events of enormous magnitude have shattered the trust that the American people once placed in their government. The rise of 24/7 cable news has fostered a hyperpartisan political environment that has threatened the capacity of the legislative branch to carry out its constitutional charge. A lack of information sharing and inter-agency communication are partially responsible for two of the greatest domestic tragedies in American history: the attacks of September 11th and the devastation of Hurricane Katrina. Erroneous intelligence, strategic clumsiness, and a dearth of cultural and geopolitical wisdom have contributed to an occupation of a foreign country that has been costly in terms of both blood and treasure.

These challenges facing America are not the result of fate or bad luck; they are a consequence of political nearsightedness and bureaucratic inertia. To competently perform in an increasingly complex and multi-polar world, the United States federal government must begin to *forwardly engage* looming challenges, and develop *robust* policies that mitigate threats in the near, intermediate, and long term. Last year's passage of an amended Public Law 6414 was an important step in ensuring the primacy of forward engagement as a paradigm of governance for the 21st century.

The law formed a non-partisan, federally-funded research center called the Center for Future Studies (CFS). The charge of the Center is to provide Members of Congress and their staffs with an institutional awareness of forward engagement and develop policy proposals for mitigating challenges to peace and welfare of the United States of America. Drawing upon expertise from both

the public and private sectors, CFS seeks to provide the Congress with constant assessment of future threats, as well as opportunities. Our primary mission is to enable Congress to create legislation preemptively and authoritatively to address future developments in technology as well as rapid social, environmental, economic and political change. Our ultimate purpose is to empower Congress to push the entire federal government to develop a national strategy for addressing an accelerating onslaught of complex and diverse challenges.

As the current personnel of the CFS staff, we have operated under the direction of the amended PL-6414 since January 2007. By statute, it is our duty here in May to produce this inaugural report to the House and Senate Select Committees on Forward Engagement (HSCFE and SSCFE). In preparation for this report, we were encouraged to:

1) Continue to develop nodal or thematic analysis, of clusters of FCIs, together with more powerful ways to permit graphic presentation and tracking of interactions
2) Develop an intermediate stage of policy formulation that highlights issues for resolution
3) Continue to use CLIP as a means to present legislative initiatives designed to operate over sustained periods of time
4) Apply network-theory concepts to congressional and executive branch processes, for the formation and execution of long-range policy.

Over the course of the past four months, the Center staff energetically identified a host of diverse and challenging FCIs, developed a novel categorization of engagement policies, utilized CLIP within these engagement categories, and researched networked-government theories. Where past Blue Ribbon panels focused heavily on structural reforms to the U.S. federal government, the Center chose to devote the bulk of its creative energy to the conceptualization of an FCI response strategy. The Center's four tracks of engagement—People, Government, Private Sector, and World—offer Congress and the Executive Branch independent and cohesive policy analysis reports that should spur robust policy generation.

A brief outline of our methodology of our components can be found later in this report. However, to paraphrase our predecessors, "we implore the Committee to devote appropriate effort to developing a full understanding of our methodology." The Blue Ribbon led by MR. Faber did a tremendous job of articulating the elements of complexity theory, as well as nodal and thematic FCI analysis. One of our project engagement teams—Engaging the Private Sector—made excellent use of the nodal analysis techniques presented in panel report of last year.

Methodology: A Guide to the Report

Forecasting Methodology

Future Contingencies of Interest (FCIs) – *Thematic and Issues-Based Methodology*

Previous HACFE staffs directed their FCI analysis toward assessing, in detail, the specific trends or events that they believed warranted substantial and immediate government response (or consideration at the very least). The Center staff found the December 2005 Blue Ribbon Panel's approach to FCI's to be an attractive visual representation, as well as intuitive for Members and staff alike to understand. We encourage the Committees to include sophisticated FCI analysis as a continuing part of CFS' mission; however, it is vital that CFS staff have competent counterparts in Member and Committee offices to assure a smooth transition from policy analysis to legislative drafting. In evaluating multi-polar issues arising from multiple FCIs, an uncomplicated visualization such as a matrix can be more advantageous than a multi-dimensional schematic.

FCI Matrix – Visualizing Thematic Cross-Cutting in FCIs

Figure 1 is an example of one of the Center staff's initial attempts at visualizing the cross-currents that exist across a range of diverse FCIs. Some of these FCIs, such as Iranian Proliferation and Carbon Markets, may seem more 'present' than future, yet most policymakers are not accustomed to viewing the multi-polar impacts of a given FCI. Other FCIs, such as 'Unidentification' and Arctic Ice Melt provide lawmakers with the multi-polar implications of FCIs that are beyond the current 'issue horizon.' Our staff analyzed each of the FCIs across the following 'impact spectrum': environmental; economic; governmental and societal; scientific and technological; and defense and security.

Figure 1 FCI Matrix

FCIs	Environmental Impacts	Economic Impacts	Governance/Society Impacts	Science/Technology Impacts	Defense/Security Impacts
Iran As A Nuclear Power	Nuclear strike in the region devastates local environment. Loose Iranian nukes in the hands of non-state actors pose health and environmental risks from radioactive materials. Rush to build new nuclear power plants and poor controls increases the chances of a meltdown. Iran confronted with problem of nuclear waste disposal as it develops civilian nuclear energy. "Clean" energy from Iranian nuclear power means less domestic reliance on fossil-fuel generated energy (e.g. oil, gas, coal).	International trade activity takes a hit due to UN sanctions on Iran; lost opportunities for bilateral trade between U.S. and Iran as well. Iranian nuclear power and/or threat of a nuclear-supplied terrorist entity (via Iran) drives up U.S. defense spending related to the War on Terror and Iraq. Iranian economy expands substantially with new domestic supply of cheap, reliable electricity. Business relying heavily on electric power grow, leading to fall in unemployment and increase in standards of living.	USG attempts to use the UN as leverage in its effort to isolate Iran from the international community with the end goal of the overthrow of the Iranian government with a less hostile regime. Preemptive attack by Israel on Iranian stockpiles or as a response to border raids by emboldened terrorist groups supported by Iran pulls U.S. into conflict indirectly through support for Israeli Defense Forces; further deterioration of Arab-Israeli peace process.	An Iranian nuclear weapon would act at a catalyst for the spread of nuclear weapons technology in the region. States around the world would fear that nuclear weapons could ultimately end up in the hands of terrorists groups or other non-state actors. Increased emphasis on developing the technology for an effective missile defense system results.	Nuclear armed Iran threatens the stability of the Middle East, and leads to a domino effect of Middle Eastern countries seeking nuclear power. Iran could provide nuclear weapons to a third party group for proxy attacks against strategic enemies.
Private War	Private armies may be less cognizant of or concerned about their environmental footprint than those accountable to their own governments and citizenries. Possible use of mercenaries for environmental terrorism or by environmental organizations intent on eco-terrorism.	Private security companies reap large profits, expanding defense contracting market. U.S. must devote increasing portions of the defense budget to compete with private security company salaries in order to meet mandated retention goals. Increasing payroll costs offset by larger economic efficiencies garnered through security outsourcing. U.S. loses tax revenues to some private security companies (under contract to U.S. government) registered off-shore.	USG passes laws covering privately-contracted soldiers during deployments. Specifically, they are held to the same UCMJ standards as DoD forces. When the National Guard is not available, USG increasingly uses privately-contracted soldiers in domestic disaster areas where it would not be politically viable to use Active Duty soldiers. States do not require federal approval to allocate resources towards forming contracts with companies like Blackwater, etc.	Science and technology will push the creation of less discriminatory weapons as the line between soldier and private mercenary becomes increasingly blurred. Private war companies are profit oriented, thus interest will be given to the cheapest and most efficient weapons technology. The advances in cheap, indiscriminate weapons will spur an increase in the relative war fighting capabilities of non-state actors.	Countries begin contracting out their military defense to mercenary groups that have no national loyalty. Increased risk of extortion, embezzlement, and espionage. War becomes seen as a means of profit, which provokes further violence for the purposes of extending the conflict, and thus extending the profit stream.

Sub-State Fragmentation	Newer, smaller states have little (if any) environmental governance capacity. As a result, environmental damage occurs as new states, eager, to attract foreign investment, relax or ignore international environmental standards. More states on international scene make it more difficult to reach consensus and agreement on global environmental issues. Result: global action on global issues (climate change, bio-diversity, nuclear proliferation, etc.) delayed or denied.	Net fall in per-capita income and living standards as industries/businesses leave new micro-state for former parent state. Government, unable to rely on fleeing tax base and poorer population, is forced to cut spending and/or raise taxes: result is recession in newly independent state. Possible support for new micro-state by international financial institutions and/or OECD donor nations. New state incurs international debt, compromising future growth.	Micro-states and state fragmentation will weaken existing international regimes and lead to greater regionalization. Multiculturalism will greatly strain democratic institutions and may accelerate state disintegration. Weakening of the nation-state will give MNCs greater weight as they are unitary actors with comparatively vast financial resources and global reach.	Power shifts to complex networks at the sub-state level force governments to compete with powerful entities on their own geographical territory, thus increasing the demand for more advanced identification techniques (e.g. bio-data ID methods) and surveillance technologies. Privacy and trust will deteriorate as scientific information and empirically-proven knowledge become public goods.	Sub-state actors asserting their rights for independence increases insurrection and civil war within countries. Civil wars of secession are increase as sub-state actors fight to redraw borders based on identity. Transnational battles increase as some ethnic groups are not confined to one nation-state. (i.e. Kurdistan comprising parts of Turkey, Iran, Syria, and Iraq).
Arctic Ice Melt and Sea Lane Openings	Exploration for and development of potential oil and gas fields will disrupt fragile Arctic ecology. Also, increased risk of major oil/gas spill or industrial accident, leading to ecological catastrophe in fragile northern lands.Bio-diversity impacted by arrival of large numbers of vessels in newly-created shipping lanes. Fish, mammals (sea otters), polar bears, caribou, etc. all threatened by disruption of traditional feeding and breeding grounds.	Immediate spur to economies of northern countries. Facility of access means more exploration, trade, business investment - local economies go through "boom" as money pours in. High demands drives up local prices - inflationary impact on national economy.Influx of workers as local population unable to supply man-power for new industries. Rise in wage levels to attract needed workers.	Newly accessible sea lanes and resource fields usher in new territorial competition which will spill-over and complicate state-state relations in international organization such as NATO or the UN.The strategic significance of Arctic nations will substantially increase, as will the importance of those nations with international trade through shipping.	Oil and gas fields in the Artic may reduce oil prices, thus thwarting economic incentives for industries to pursue new green technologies. Alternatively, the melting ice caps and rising sea levels will become visible and foreboding indicators of climate change, potentially resulting in an accelerated pursuit for green technologies and alternative energy sources.	The increasing value of the Arctic islands leads to greater territorial disputes and piracy. Lack of nation-sponsored security gives rise to more routes for smugglers of drugs, humans, and weapons of mass destruction.
Carbon Markets	A carbon tax could reduce emissions in the U.S. by 40% by 2075. Carbon trading may have only a slight impact on the environment given that only a quarter of the reductions called for in the Kyoto Protocol by 2012 have been achieved in Europe with this system.	Increased investment in Brazil's sugar-cane based ethanol products and reduced economic dependence on oil rich countries such as Russia and Venezuela. Economy would become more efficient as companies wean away from the taxed fossil fuel inputs in favor of alternative energy sources.	In an effort to subsidize the US auto industry to improve fuel efficiency and reduce emissions, USG incentives low emissions vehicle development. USG recognizes that carbon taxes are ineffective, implements a cap-trade system with carbon shares set at arbitrary levels.	International market demand increases for technologies that will mitigate the added costs to production resultant from this tax. This demand stimulates technological innovation in efficiency and in alternative energy sources.	Decreased resource flows into unstable regions such as the Middle East undermine status quo regimes such as Saudi Arabia, providing a catalyst for insurrection.

Desertification	The desertification process results in the erosion of nutrients in the soil, destruction of vegetation, and the eventual erosion of topsoil, often resulting in large dust storms. Mass migration may cause increased desertification in refugee-receiving areas	The desertification process is causing major disruptions in food production. Loss of livestock and destruction of agricultural regions, deforestation, mass refugee migration and emigration, large-scale food aid, resettlement costs, destruction of infrastructure, loss of industry, and needed investments in science and technology will create an incredible world-wide economic burden.	USG devotes significant foreign assistance to programs designed to combat desertification. USG changes trade patterns to account for the loss in some traditional trading partners. Environmental refugees are not recognized and are viewed as illegitimate burdens to the US.	Rampant desertification acts as a catalyst for change and technological innovations. Important research advances are made into more efficient use of natural water resources, better control of salinization, improved irrigation techniques, and long-term desert reclamation.	Desertification leads to resource scarcity, causing conflict between neighboring nations over healthy land that is still productive in order to make up for the resource loss. Full-scale migration of populations looking for resources clash with other populations.
Medical Nanotechnology	Medical advances sustain burgeoning populations which puts pressure on dwindling natural resources. Spin-off nanotechnologies may be used to clean ecosystems and reduce carbon emissions.	Increasing life expectancies in all countries strains health care systems. Work force changes as the minimum retirement age increases and older, experienced employees work longer. Technological advances reduce medical equipment and treatment costs for individuals.	Growing and aging population, but shrinking workforce and decreasing productivity put enormous pressure on social welfare programs.	The introduction of nanotechnology has startling implications for the facilitation of disease detection and diagnosis. Life expectancy reaches 100 years in both the developed and developing worlds. These breakthroughs necessitate and catalyze an increased focus on developing nanotechnologies to end water and energy scarcity.	Increased life expectancy leads to increased population density, which creates conflicts over limited resources. Nanotechnology is used to create advanced and untraceable weapons such as weapons programmed to burst capillaries to induce a stroke.
"Unidentification"	Firms and individuals could falsify licenses, permits, and duplicate emissions credits leading to de facto deregulation of environments and environmental controls. Wholesale statistical manipulation by companies, certified by dummy inspectors, to avoid the costs of clean energy and health regulations.	Intellectual property rights are seriously threatened by those impersonating authors, designers, or even entire production companies. Governments may no longer be able to properly identify employees: Medicaid, welfare, or social security recipients. Firms restrict or remove services (online, credit-based) due to the prohibitive risk of fraud.	DHS greatly expanded to counter this new threat which subsequently lessens the government's ability to deal with non-identity-related threats (natural disasters, etc) Governments have to participate/coordinate development of technologies to detect and prevent identity theft/unidentification related crimes.	Scientific and technological advances to protect identity can no longer stay ahead of the advances that enable people to steal it. Scientists cease sharing their ideas online because of the inability to substantiate identity, thus inhibiting a fertile means of scientific advancement.	Terrorists enjoy greater success at infiltrating countries with flawless documents. Terrorists or agents of rogue regimes begin perpetrating attacks under a "false flag," implicating their enemies in the attack.

FCI Impact Summaries

Iran as a Nuclear Power

Environmental: Nuclear strike in the region devastates local environment. Loose Iranian nukes in the hands of non-state actors pose health and environmental risks from radioactive materials. Rush to build new nuclear power plants and poor controls increases the chances of a meltdown. Iran confronted with problem of nuclear waste disposal as it develops civilian nuclear energy. "Clean" energy from Iranian nuclear power means less domestic reliance on fossil-fuel generated energy (e.g. oil, gas, coal).

Economic: International trade activity takes a hit due to UN sanctions on Iran; lost opportunities for bilateral trade between U.S. and Iran as well. Iranian nuclear power and/or threat of a nuclear-supplied terrorist entity (via Iran) drive up U.S. defense spending related to the War on Terror and Iraq. Iranian economy expands substantially with new domestic supply of cheap, reliable electricity. Businesses relying heavily on electric power grow, leading to fall in unemployment and increase in standards of living.

Governmental and Societal: USG attempts to use the UN as leverage in its effort to isolate Iran from the international community with the end goal of the overthrow of the Iranian government with a less hostile regime. Preemptive attack by Israel on Iranian stockpiles or as a response to border raids by emboldened terrorist groups supported by Iran pulls U.S. into conflict indirectly through support for Israeli Defense Forces; further deterioration of Arab-Israeli peace process.

Scientific and Technological: An Iranian nuclear weapon would act at a catalyst for the spread of nuclear weapons technology in the region. States around the world would fear that nuclear weapons could ultimately end up in the hands of terrorists groups or other non-state actors. Results in an increased emphasis on developing the technology for an effective missile defense system.

Defense and Security: Nuclear armed Iran threatens the stability of the Middle East, and leads to a domino effect of Middle Eastern countries seeking nuclear power. Iran could provide nuclear weapons to a third party group for proxy attacks against strategic enemies.

Private Warfare

Environmental: Private armies are less cognizant of or concerned about their environmental footprint than those accountable to their own government. Mercenaries would be used for environmental terrorism or by environmental organizations intent on eco-terrorism.

Economic: Private security companies reap large profits, expanding defense contracting market. U.S. must devote increasing portions of the defense budget to compete with private security company salaries in order to meet mandated retention goals. Increasing payroll costs offset by larger economic efficiencies garnered through security outsourcing. U.S. loses tax revenues to some private security companies (under contract to U.S. government) registered off-shore.

Governmental and Societal: USG passes laws covering privately-contracted soldiers during deployments. Specifically, they are held to the same UCMJ standards as DoD forces. When the National Guard is not available, USG increasingly uses privately-contracted soldiers in domestic disaster areas where it

would not be politically viable to use Active Duty soldiers. States do not require federal approval to allocate resources towards forming contracts with companies like Blackwater, etc.

Scientific and Technological: Science and technology will push the creation of less discriminatory weapons as the line between soldier and private mercenary becomes increasingly blurred. Private war companies are profit oriented, thus interest will be given to the cheapest and most efficient weapons technology. The advances in cheap, indiscriminate weapons will spur an increase in the relative war fighting capabilities of non-state actors.

Defense and Security: Countries begin contracting out their military defense to mercenary groups that have no national loyalty or legal accountability. Increased risks of extortion, embezzlement, and espionage. War becomes seen as a means of profit, which provokes further violence for the purposes of extending the conflict, and thus extending the profit stream.

Sub-state Fragmentation

Environmental: Newer, smaller states have little (if any) environmental governance capacity. As a result, environmental damage occurs as new states, eager, to attract foreign investment, relax or ignore international environmental standards. More states on international scene make it more difficult to reach consensus and agreement on global environmental issues. Result: global action on global issues (climate change, bio-diversity, nuclear proliferation, etc.) delayed or denied.

Economic: Net fall in per-capita income and living standards as industries/businesses leave new micro-state for former parent state. Government, unable to rely on fleeing tax base and poorer population, is forced to cut spending and/or raise taxes: result is recession in newly independent state. Possible support for new micro-state by international financial institutions and/or OECD donor nations. New state incurs international debt, compromising future growth.

Governmental and Societal: Micro-states and state fragmentation will weaken existing international regimes and lead to greater regionalization. Multiculturalism will greatly strain democratic institutions and may accelerate state disintegration. Weakening of the nation-state will give MNCs greater weight as they are unitary actors with comparatively vast financial resources and global reach.

Scientific and Technological: Power shifts to complex networks at the sub-state level force governments to compete with powerful entities on their own geographical territory, thus increasing the demand for more advanced identification techniques (e.g. bio-data ID methods) and surveillance technologies. Privacy and trust will deteriorate as scientific information and empirically-proven knowledge become public goods.

Defense and Security: Sub-state actors asserting their rights for independence increases insurrection and civil war within countries. Civil wars of secession are increase as sub-state actors fight to redraw borders based on identity. Transnational battles increase as some ethnic groups are not confined to one nation-state. (i.e. Kurdistan comprising parts of Turkey, Iran, Syria, and Iraq).

Arctic Ice Melt and Sea Lane Opening

Environmental: Exploration for and development of potential oil and gas fields will disrupt fragile Arctic ecology. Also, increasing risk of major oil/gas spill or industrial accident, leading to ecological catastrophe in fragile northern lands. Bio-diversity impacted by arrival of large numbers of vessels in newly-created shipping lanes. Fish, mammals (sea otters), polar bears, caribou, etc. all threatened by disruption of traditional feeding and breeding grounds.

Economic: Immediate spur to economies of northern countries. Facility of access means more exploration, trade, and business investment - local economies go through "boom" as money pours in. High demands drives up local prices - inflationary impact on national economy. Influx of workers results as local population is unable to supply man-power for new industries. Rise in wage levels to attract needed workers.

Governmental and Societal: Newly accessible sea lanes and resource fields usher in new territorial competition which will spill-over and complicate state-state relations in international organization such as NATO or the UN. The strategic significance of Arctic nations will substantially increase, as will the importance of those nations with international trade through shipping.

Scientific and Technological: Oil and gas fields in the Artic may reduce oil prices, thus thwarting economic incentives for industries to pursue new green technologies. Alternatively, the melting ice caps and rising sea levels will become visible and foreboding indicators of climate change, potentially resulting in an accelerated pursuit for green technologies and alternative energy sources.

Defense and Security: The increasing value of the Arctic islands leads to greater territorial disputes and piracy. Lack of nation-sponsored security gives rise to more routes for smugglers of drugs, humans, and weapons of mass destruction.

Carbon Markets

Environmental: A carbon tax could reduce emissions in the U.S. by 40% by 2075. Carbon trading may have only a slight impact on the environment given that only a quarter of the reductions called for in the Kyoto Protocol by 2012 have been achieved in Europe with this system.

Economic: Increased investment in Brazil's sugar-cane based ethanol products and reduced economic dependence on oil rich countries such as Russia and Venezuela. Economy would become more efficient as companies wean away from the taxed fossil fuel inputs in favor of alternative energy sources.

Governmental and Societal: In an effort to subsidize the US auto industry to improve fuel efficiency and reduce emissions, USG incentives low emissions vehicle development. USG recognizes that carbon taxes are ineffective, implements a cap-trade system with carbon shares set at arbitrary levels.

Scientific and Technological: International market demand increases for technologies that will mitigate the added costs to production resultant from this tax. This demand stimulates technological innovation in efficiency and in alternative energy sources.

Defense and Security: Decreased resource flows into unstable regions such as the Middle East undermine status quo regimes such as Saudi Arabia, providing a catalyst for insurrection.

Desertification

Environmental: The desertification process results in the erosion of nutrients in the soil, destruction of vegetation, and the eventual erosion of topsoil, often resulting in large dust storms. Mass migration may cause increased desertification in refugee-receiving areas

Economic: The desertification process is causing major disruptions in food production. Loss of livestock and destruction of agricultural regions, deforestation, mass refugee migration and emigration, large-scale food aid, resettlement costs, destruction of infrastructure, loss of industry, and needed investments in science and technology will create an incredible world-wide economic burden.

Governmental and Societal: USG devotes significant foreign assistance to programs designed to combat desertification. USG changes trade patterns to account for the loss in some traditional trading partners. Environmental refugees are not recognized and are viewed as illegitimate burdens to the US.

Scientific and Technological: Rampant desertification acts as a catalyst for change and technological innovations. Important research advances are made into more efficient use of natural water resources, better control of salinization, improved irrigation techniques, and long-term desert reclamation.

Defense and Security: Desertification leads to resource scarcity, causing conflict between neighboring nations over healthy land that is still productive in order to make up for the resource loss. Full-scale migration of populations looking for resources clash with other populations.

Medical Nanotechnology

Environmental: Medical advances sustain burgeoning populations which put pressure on dwindling natural resources. Spin-off nanotechnologies may be used to clean ecosystems and reduce carbon emissions.

Economic: Increasing life expectancies in all countries strains health care systems. Work force changes as the minimum retirement age increases and older, experienced employees work longer. Technological advances reduce medical equipment and treatment costs for individuals.

Governmental and Societal: Growing and aging population, but shrinking workforce and decreasing productivity put enormous pressure on social welfare programs.

Scientific and Technological: The introduction of nanotechnology has startling implications for the facilitation of disease detection and diagnosis. Life expectancy reaches 100 years in both the developed and developing worlds. These breakthroughs necessitate and catalyze an increased focus on developing nanotechnologies to end water and energy scarcity.

Defense and Security: Increased life expectancy leads to increased population density, which creates conflicts over limited resources. Nanotechnology is used to create advanced and untraceable weapons such as weapons programmed to burst capillaries to induce a stroke.

'Unidentification'

Environmental: Firms and individuals could falsify licenses, permits, and duplicate emissions credits leading to de facto deregulation of environments and environmental controls. Wholesale statistical manipulation by companies, certified by dummy inspectors, avoid the costs of clean energy and health regulations.

Economic: People impersonating authors, designers, or even entire production companies threaten Intellectual property rights. Governments may no longer be able to properly identify employees: Medicaid, welfare, or social security recipients. Firms restrict or remove services (online, credit-based) due to the prohibitive risk of fraud.

Governmental and Societal: DHS greatly expanded to counter this new threat which subsequently lessens the government's ability to deal with non-identity-related threats (natural disasters, etc). Governments have to participate/coordinate development of technologies to detect and prevent identity theft/unidentification related crimes.

Scientific and Technological: Scientific and technological advances to protect identity can no longer stay ahead of the advances that enable people to steal it. Scientists cease sharing their ideas online because of the inability to substantiate identity, thus inhibiting a fertile means of scientific advancement.

Defense and Security: Terrorists enjoy greater success at infiltrating countries with flawless documents. Terrorists or agents of rogue regimes begin perpetrating attacks under a "false flag," implicating their enemies in the attack.

Engagement Methodology

In looking at the complexity of the above set of FCIs, it is clear that we need a strong strategy to plan and prepare for the many issues raised by these contingencies. We need a way forward that will enable us to address the central question of how to marshal U.S. assets to do the best job of guiding the country. In examining this question, we also need to capture the dynamic process of engagement and to organize our ideas in a way that enables leaders to think in these terms.

With these factors in mind, we have organized our engagement strategy into 4 major categories, *engaging the American people, engaging the Federal government, engaging the private sector, and engaging the world.* Each of these categories is examined in depth in later sections of this report, accompanied by a detailed CLIP timeline. (See CLIP section to follow)

In addition to the considerations mentioned above, this categorization has several benefits. First, these categories, while permitting some necessary overlap, are distinct enough to enable independent strands of analysis and recommendations. Second, they allow for a tremendous breadth of subject

matter to be covered. And third, they are easily identifiable concepts, which facilitate understanding of both their content and purpose.

While these categories may not capture perfectly every possible aspect of engagement going forward, we believe they are an excellent start and a useful way to discuss our way forward.

Implementation Methodology

Introduction to Component-Level Implementation Process (CLIP)

We strongly recommend continuing the Fall 2006 panel's use of the Component-Level Implementation Process (CLIP), which enables policy makers to "examine long-term developments, break them down into nearer-term components, and then consider the broader relevance of those components." We believe this approach represents an improvement over today's piecemeal approach and complements this Commission's structural recommendations.

- CLIP breaks complex problems into manageable pieces, turns those pieces into policy recommendations, and then translates the recommendations into legislative language and timelines. FCIs appropriate for CLIP could come from the Inter-Agency Working Group on Forward Engagement (IAWGFE), the Center for Future Studies (CFS), or through the House or Senate Select Committees on Forward Engagement (HSCFE/SSCFE).

- CLIP's success depends on describing a desired long-term end state and developing a series of short-term steps to achieve it. It is important that each component be valuable in its own right and can stand on its own so that benefits are achieved regardless of whether or not the final goal is achieved. CLIP mitigates the political risk inherent in introducing legislation when the final results may not be seen for decades.

Organizational Process and Structural Recommendations

INTRODUCTION TO PROCESS AND RECOMMENDATIONS

The nature of FCIs requires a proactive policy approach that evaluates many alternative futures. In doing so, we avoid making assumptions regarding a most likely future and assessing only the present. There must be a venue that allows the process to holistically evaluate context, develop policy, and build capability to deal with strategic, long-term developments. Therefore, we must create an enduring organization that leverages strategic advantage and develops a forward-looking, robust, iterative decision process.

What follow are this staff's recommendations to reorient both the legislative and executive branches of US Government to more actively engage FCIs. Our key recommendations are:

- Continue funding of House and Senate Select Committees on Forward Engagement
- Increase funding of Center for Future Studies to allow for liaising with Executive Branch
- Establish an executive-branch Inter-Agency Working Group on Forward Engagement.

LEGISLATIVE ORGANIZATION

The Center staff was very hesitant to spend four months worth of creative energy considering further structural reforms to the legislative branch. We believe that it would be strategically clumsy for the Center's inaugural report to discuss extensive internal reforms, and partially abdicate our statutory responsibilities.

Operationally, the Center for Future Studies has succeeded within the constraints of its budget, yet we believe that budgetary increases must be commensurate with the growing influence of CFS as a research center. As we discuss in the proceeding section, CFS could serve a proposed executive-branch Inter-Agency Working Group on Forward Engagement in the same way it currently serves the Select Committees. We would reasonably expect that such an expansion of mission would come with a corresponding increase in budgetary resources.

REFORMS TO THE CENTER FOR FUTURE STUDIES

While we have no structural recommendations for the direct relationship between CFS and Congress, we do have some recommendations for Congress that would enhance CFS' influence and relevance. These recommendations are as followed:

- **Encourage CFS/Member Staff Osmosis.** The Committees should encourage future CFS Staff Directors to coordinate 'staff exchanges' between Member or Committee offices and the Center. This would enhance Member and Committee staff competence in FCI identification and robust policy formulation, as well as CFS staff competence in formulating legislation.
- **Facilitate Member and Staff Training**. The Center believes that the 'osmosis' plan must be executed in conjunction with an organized training program that introduces

Members of Congress and their staffs to the methodological tools of Forward Engagement. The Committee should note that, as this will be a budgetary obligation of the Center, an increase in the overall operational budget would be reasonable and expected.

- **Research Foreign Counterparts to CFS.** The Center encourages the Committee to request a report that will examine developed countries' FCI identification/response formulation offices. If similar entities are identified, the Committees should investigate potential cooperation and coordination opportunities.
- **Preserve Media Primacy of CFS.** The Committee should designate the Center as the exclusive on-the-record designee for both House and Senate committees. Member outreach efforts regarding their work on the Committee should be handled through their constituent office.
- **Expand CFS' Public Image.** The Committee should allow CFS to aggressively market its non-classified research to any and all media outlets including but not limited to: Print, television, radio, online, consumer-generated, and scholarly media.

EXECUTIVE ORGANIZATION

Note: To preserve original intent, the Center staff decided to reproduce verbatim the recommendation of the House Annual Report on Forward Engagement from December 2006.

As Forward Engagement is a topic that spans most sectors of government, it is inappropriate to force a home for it at any one executive agency. In addition, through combining perspectives, a broader series of threats and challenges can be seen on the horizon. Therefore we propose the creation of an inter-agency working group, empowered to coordinate Forward Engagement across various policy areas, so as to avoid strategic surprise.

We recommend that the working group be composed of, at the least, officials from the Office of Management and Budget and the Departments of State, Commerce, Defense, Homeland Security, Energy, Health and Human Services. These represent a minimum set of "stability" interests. Furthermore, we would also desire to see inclusion of staff from the Environmental Protection Agency and the Justice Department. We envision that the working group be chaired by a new position, the Deputy National Security Advisor for Forward Engagement.

This working group would be responsible for fulfillment of the policy goals set out through legislation as well for forwarding an agenda to prevent strategic surprise. Ideally such a group would be a funding agency in the vein of the Defense Advanced Research Projects Agency (DARPA), but with a broader mandate (not simply defense and enabling technologies for the military) and smaller budget, as they would not need to make prototype versions of capital systems. Their vision would be more long term, and specific to some of the issues and FCIs determined by either the Select Committee or through the CFS, acting, again, in an advisory role. However, we envision a working group that builds in a capability to adapt to near-term challenges through aggressive funding of specific technologies, studies, or pilot projects.

In addition, it may be of interest to contemplate a Goldwater-Nicholls-type reform for the executive agencies. As Goldwater-Nicholls mandated that military promotions be dependent on periods of working in cross-service capacity, a new reform could mandate that promotions to specific positions within the federal service be contingent on time on the staff of this working group. In doing so, we

would broaden inter-agency cooperation, spread awareness of agency culture, and build functional ties between the federal agencies.

Without such a group, what would government response to FCIs look like? Policies could be carried out through the executive branch, but the executive agencies are resistant to change. In addition, as discussed in the above section, FCIs are often not domain specific. If we require a transition, for example, to a hydrogen economy as outlined in the CLIP section of this report, what agency would lead that effort? How would, for example, the Department of Energy hasten the military acquisition process so that the military would move away from the use of JP-8 fuel? Would the Department of Defense be able to view a potential reworking of the National Highway System that could exploit more efficient technologies?

The ability to fund research and development is another problem for the current agency system. Research and development that serves multiple purposes can fall through the cracks, or does not receive the levels of funding that it might "need". In addition, members of Congress currently attempt to fill that gap by funding universities in their home district or state, although these researchers may not be the most capable. The creation of a working group with a broader vision and without geographic bias would prevent some of these problems.

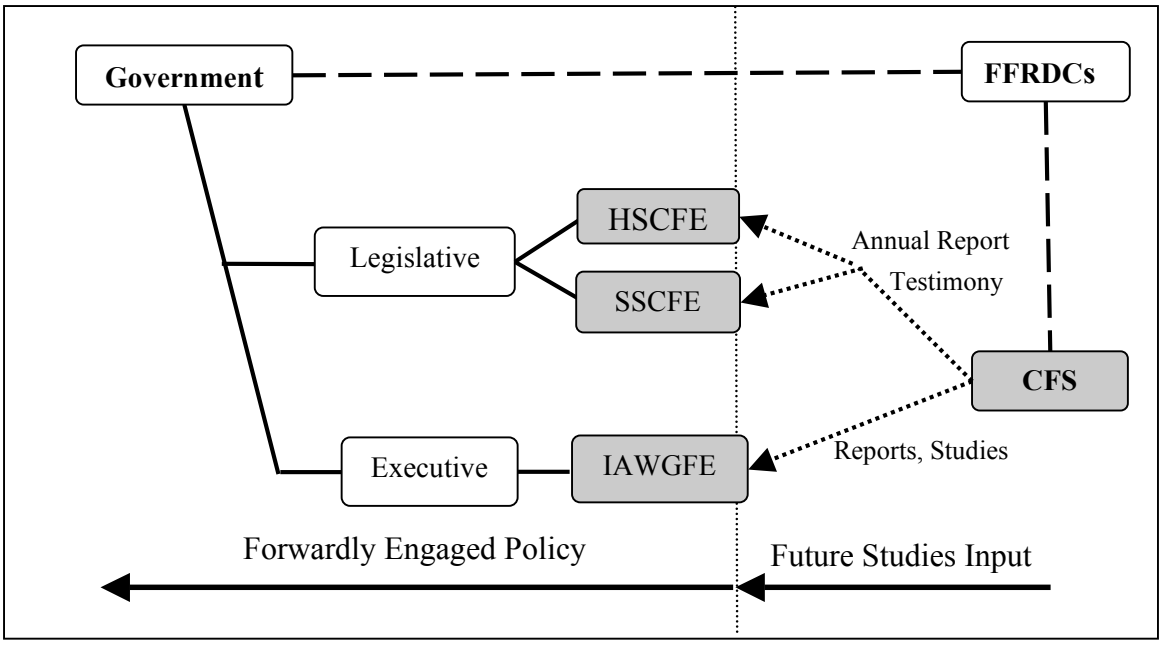
Note: The Center does not endorse the December panel's proceeding recommendation for a 'joint commission.' We believe that the Center itself acts as a liaising agent between the Executive and Legislative.

The creation of this working group enables a robust response to Future Contingencies of Interest and a deeper capacity for Forward Engagement in general. By creating a working group, we move further away from the patchwork policy that leads to haphazard approaches to strategic planning. A serious approach to Forward Engagement requires institutional capability to enact long-term policy, as well as cultural reforms to ensure that the capability is not squandered. This proposed working group would enable both. We also recommend that Congress and the Administration create a Joint Commission to research and report on the executive branch recommendations articulated above. This Commission should report by the end of the Spring Congressional Session.

CONCLUSION

The Spring 2007 Commission has proposed an institutional structure by which we believe a holistic approach to FCIs and the policy issues related to them might be introduced into the practices of the federal government. This structure is shown in Figure 2. By adopting this institutional structure we believe that both the executive and legislative branches will become forwardly engaged in terms of identifying and responding to looming internal and external challenges.

Figure 2: Institutional Framework for Forward Engagement



ENGAGING THE AMERICAN PEOPLE

History is accelerating, events are converging, and the United States faces a host of increasingly complex, interdisciplinary and transnational challenges. To meet these challenges and preserve its national identity, the United States not only needs to build institutional structures that can cope with them, but must fundamentally change the way it plans and implements policy. Being a democratic republic the ability of the United States to cope and meet future challenges is reliant upon the quality of its citizenry, the American people.

Engaging the American People is an attempt to improve the quality of the citizenry of the United States by cultivating the skills, talents, and national sense of self that will preserve American ideals and equip its people with the ability to participate in their own governance, drive innovation, and meet on-coming transformational challenges.

America is not a nation but the geographic manifestation of an 18th century notion. Unfortunately, that notion has begun to lose meaning, not for lack of relevancy in the 21st century, but from lack of engagement by the American people with the idea of what constitutes "America." Declining rates of voter turnout, particularly among American youth[1], are emblematic of this disengagement which threatens the very *raison d'etre* of America.

A primary means by which the United States can improve the quality of its citizenry and, in turn, their ability to cope with the emerging challenges they will face as well as their ability to participate effectively in representative government is through education reform. Today, the United States lags in its output of students trained in mathematics, the hard sciences, and engineering. These are the disciplines that have historically driven innovation and they will continue to do so in the future. The United States must regain its intellectual primacy in these fields or face its inevitable decline as competing states surpass American innovation. Engaging the People establishes the conditions for success by having the federal government provide incentives and encouragement for students to gain the skills necessary to be the 21st century's leaders, innovators, and domestic and international problem solvers.

Additionally, the United States must improve its citizens' ability to navigate the world beyond its shores. Future challenges to the United States will require a citizenry able to cooperate with and understand the motivations of other nations and their people. This means that, along with math and science, language and culture must take on greater emphasis in the primary education of American youth.

Civically Engaging the American People begins, familiarly, with education. The daily recitation of the Pledge of Allegiance by elementary students is designed to imbue pride in America at an early age. More than pride, however, there exists a need to engender a firm belief in the rightness of American values embodied in the Constitution, rather than in the rightness of America's actions throughout

[1] The overall percentage of eligible voters participating in U.S. elections has been in steady decline since the 1950s. In 2006, only 41% of eligible voters participated in the general election. Additionally, only 28 percent of voters between the ages of 18 and 24 voted in the 2000 election, whereas twice that number of voters over age 65 cast ballots.

history. To be sure, there is much history to be proud of, but whitewashing our own history will serve only to undermine our nation in the long run. Currently, Civics, the study of civic responsibilities and privileges is relegated to a single semester in high school. In order to fully engage American citizens in the whole of public responsibility, Civics should be a standing part of the core curriculum taught throughout primary and secondary school. Beyond education, ownership in America should be cultivated by instituting a compulsory national service program, similar to the Clinton-era Americorps program.

Issue Areas

Participatory Democracy

The U.S. must engage its citizens to participate in the democratic process. The overall percentage of eligible voters participating in U.S. elections has been in steady decline since the 1950s. In 2006, only 41% of eligible voters participated in the general election. Implications of this continuing decline in civic participation in elections include overall malaise and disconnectedness with the government. Politicians are most likely to concentrate on issues that affect the voters, and voters are most likely to participate when they feel their vote matters. Voter apathy threatens the very reason for our nation's existence: representative democracy.

One possible method to accomplish this is to make it easier for individuals to vote. Modern society is driven by convenience. In this age of direct deposit paychecks and online banking, one is not required to ever step foot in a bank. Widespread access to online voting increases the likelihood that citizens will take the time to vote as they don't have to search for their polling place or wait in line to pull the lever. To be sure, there are numerous security risks associated with a remote access of secure servers monitoring election results. However, creating a more convenient method to vote can entice greater participation. Increased emphasis on civic responsibility in primary and secondary education is also necessary; voting should be painted as a grave responsibility and an American ritual. By revising the method in which voting is presented to children from a young age, perception of voting can be shaped to encourage future democratic participation.

Global Competitiveness

A recent report of the National Academies concludes, after having reviewed trends in the U.S. and abroad, stated that it is highly alarming that "the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength."[2] As this quotation exemplifies, many of these concerns arise in the context of the U.S. economy's future competitiveness in the global marketplace.

Increasing levels of information flow and accelerating rates of societal change are both aspects of the transformation from an industrial society to a post-industrial, knowledge society. Professional activities but also communal institutions require new skills and flexible organization in order to function effectively in an ever more complex and networked society[3].

Global Awareness

[2] National Academies of Science (2007). *Rising Above the Gathering Storm – Energizing and Employing America for a Brighter Economic Future,* p. 4. Available:

The increasingly networked world requires a culturally-aware, language-skilled citizenry capable of understanding local nuances and parlaying this information into a comparative advantage for the United States in the international arena. Historically, language skill and regional expertise have not been widely regarded as top tier marketable skills. If the U.S. is to be successful in the 21st century, then increased cultural awareness and language skills must be a primary focus in America's educational system.

In the contemporary world, the need for foreign language capability will not abate. It is crucial that citizenry understand the values, norms, institutions, and artifacts of foreign groups to properly engage them. Domestically, robust foreign language and foreign area expertise allows the USG to understand global trends in order to safeguard our interests from potential, otherwise undetected threats. Internationally, these skills and knowledge sets are critical to sustaining coalitions; building partnership capabilities; pursuing regional stability; and conducting multi-national missions, especially in post-conflict operations and missions un-related to combat, security, humanitarian, nation-building, and stability.

Further, the United States cannot be expected to make wise policy decisions, nor can its representatives abroad be expected to be effective, without fully developing human capital to meet these ends.

Global Climate Change

One complex, transnational challenge confronting the United States is global climate change. Though effects of global climate change are already being measured, the full brunt of its impact is yet unseen. Global climate change is driven by the release of carbon dioxide and other greenhouse gasses into the atmosphere. Their release, in turn, is driven by reliance upon hydrocarbon fuels for the vast majority of energy consumption – be it energy consumed by using inefficient appliances or by using petroleum combusting vehicles, for example. The ramifications of global climate change may include expansion of deserts, the rise of sea levels, global depression, and increased conflict. While the ramifications of global climate change are truly transnational and global, the United States can do much domestically to help stymie its effects and to prepare for them, which will benefit the United States and the world.

Critical Responses

Historical

The need to develop an engaged, educated citizenry is not new. Thomas Jefferson wrote:

"Education is here placed among the articles of public care, not that it would be proposed to take its ordinary branches out of the hands of private enterprise, which manages so much better all the concerns to which it is equal; but a public institution can alone supply those sciences which, though rarely called for, are yet necessary to complete the circle, all the parts of which contribute to the improvement of the country, and some of them to its preservation."

In the wake of the launch of Sputnik in 1958, the United States encouraged a generation to pursue science so that the United States might not be defeated by Soviet research and its applications – so that America might remain competitive. George W. Bush attempted to revitalize education at the

dawn of the 21st Century with the No Child Left Behind Act, which required all states to test their pupils in reading and math and to show annual progress towards the achievement of the states own proficiency standards.[4] An important feature of the bill is the way in which it measures the school's progress: The progress is not only measured by the scores of the school's total enrollment but by the achievement of specified economic and ethnic subgroups: Latinos, Blacks, poor children, English language learners and others. Among other problems federal government did not provided the funding promised in the original bill and the successful implementation of the bill becomes more and more uncertain, especially the important but very expensive mandate of getting highly qualified teachers. The No Child Left Behind Act must be reauthorized this year by Congress. The reauthorization presents the opportunity to revise the act to make it more workable and responsive.

Integrated within the No Child Left Behind Act is the American Competitiveness Initiative, committing $50 billion of government funding over ten years to increase aid for research in the fields of math, science and engineering and $86 billion for Research and Development tax incentives. The American Competitiveness Initiative works too improve K-12 math and science education by training teachers and developing effective teaching materials. It also provides grants for schools to execute research-based mathematics and science curricula in the classroom. Likewise, the America Competes Act also helps to improve and maintain the U.S.'s competitive edge in the math, science and engineering fields by increasing U.S. investment in basic research, strengthening educational opportunities in science, technology, engineering and math at all educational levels, and encouraging young people to pursue careers in those fields. The America Competes Act was passed by the Senate on 25 April 2007. It will now go to the House for vote.

The Higher Education Act represents the cornerstone of the U.S.'s commitment to tertiary education for its citizens and an opportunity through which to compel institutions of higher learning to strengthen math, science, engineering curriculum and provide greater incentives to low-income and minority youth to pursue such fields at the university level. The Act is the most momentous federal law affecting American colleges—governing Education Department programs on accreditation, international and graduate education, teacher training and several financial aid programs for students. The Act must be reauthorized by Congress every five years, and is currently awaiting reauthorization by Congress before June 2007, when it will expire.

Despite the groundwork already laid by the U.S. government to pursue endeavors to better the ingenuity and competitiveness of its populace, the U.S. citizenry must do its part by engaging with policy-makers and communicating its interests. A generally apathetic U.S. citizenry, evident in overall low U.S. voter turn-out, has complicated government efforts to truly hear the concerns of its constituency and create policies acutely sensitive to citizens' needs. Fear that democracy might be defeated by apathetic citizens who don't vote and feel little ownership over their government has spawned civic organizations like "Rock the Vote" to encourage participation as well a series of national service programs from the Vista Volunteers to America Corp to City Year. Yet, in 2006, only 41% of eligible voters participated in the general election.

Past Blue Ribbon Panel Recommendations

These issue areas have received little attention from previous Forward Engagement classes. The House and Senate Select Committees on Forward Engagement have been mandated (in Fall 2006)

[4] Schrag, P. (2004). 'America"s Orgy for reform'. In: Rotberg, I. (Ed.). (2004). *Balancing Change and Tradition in Global Education Reform.* Lanham, Maryland: ScarecrowEducation, p.362.

to provide long-term strategic planning, including over labor and education as related to future needs for science and technology research and development.

Spring 2005 recommended the creation of an Effective External Relations Office to conduct public outreach. Spring 2006 then burdened the Effective External Relations Office with the task of increasing public awareness and interest in, as well as support for, Forward Engagement.

Recommended

As today's world demands innovative knowledge and skill-sets in the math, science and engineering fields, the U.S. government must ensure its citizens are endowed with the know-how necessary to drive innovation, thus maintaining the U.S's overall competitive edge internationally. The U.S. government will do so by building upon key existing legislation, focusing particularly on areas related to expanding the quantity and improving the quality of math, science, engineering curricula and student/teacher programs.

The U.S. will utilize a three-pronged approach to achieve this goal.

1) The reauthorization of the Higher Education Act of 1965 (including subsequent passage of appropriations bill authorizing adequate government funding) and the integration of an amendment to create Congressionally-mandated math, science, engineering programs and curricula into U.S. universities grounded in environmental sustainable, or "green" studies. The resolution will provide matching dollars to US universities that promote "green"-focused paid internships and study-abroad programs; give grants to outstanding science/math/technology students with interest in "green" studies; mandate students take "green" courses, specifically related to US long-term strategic tackling of global warming; mandate universities engage in outreach to attract low-income and minority students to math, science, engineering programs coupled with offering a greater number of scholarships to such individuals; mandated outreach campaigns to low-income and minority youth with the goal of attracting such individuals to university math, science, engineering programs; increasing levels of scholarships to such youth interested in pursuing math, science, engineering studies.

2) The adoption of strengthened math, science, engineering curriculums and programs in the U.S. primary and secondary education systems through the No Child Left Behind Act's American Competitiveness Initiative. Congress shall pass an appropriations bill supporting the execution of the Initiative's programs that include providing lucrative research opportunities in math, science, engineering and technology to students in institutions of higher education; increased funding for training opportunities and scholarships for K-12 teachers; increased grants for K-12 schools to strengthen and innovate math, science, engineering and technology curriculum with an emphasis on sustainability or "green" studies; adoption of a flexible, nation-wide and comprehensive testing scheme for K-12 in the areas of math, technology, science and language on which students must receive a C or better to advance to the next grade; developing a blueprint for strengthened communication channels and reporting mechanisms by which primary, secondary and tertiary schools can provide feedback to the federal government (including continued development of the "What Works Clearinghouse").

3) The passage by the House of the America Competes Act and subsequent passage of an appropriations bill to fund the Act's programs. Implementation of the Act will focus upon the integration of critical language and cultural awareness/sensitivity programs into primary, secondary

and tertiary education systems. Primary education institutions will be required to train children in foreign language skills immediately upon their enrollment. Children, prior to advancing to the next grade level, must meet certain foreign language benchmarks, and high school students must pass a nation-wide foreign language proficiency test prior to graduating.

Component Level Implementation Process (CLIP)

Policies: 1) *Strengthening primary, secondary and tertiary education in the critical subject areas of math, science, technology, language and cultural awareness to equip future generations with the necessary skill-sets and knowledge needed to compete in an increasingly competitive and technical world; increasing a sense of community and oneness through improved access by minorities and low-income youth to math, science, technology, language and cultural awareness curriculums and programs*

Drivers:

- The accelerating outsourcing of low-skilled jobs coupled with both increased demand for individuals with technical knowledge and know-how and increased import of highly-skilled foreigners to fill demand for employees with expertise in math, science and engineering..
- Fragmenting effects of an ever-increasing economic flexibility as well as the growing gap between rich elite and marginalized minorities strain community bonds between citizens. Public education is increasingly called for tackling issues of race, color and injustice and fostering a sense for continuing membership in the community across group boundaries (ethnicity, gender, class, etc.).
- Lack of opportunities available for US students who posses superior math/science/technology ability to find their niche in institutions of higher learning (critical vehicles by which to build the skill-sets of such persons).
- Lack of funding by US universities to implement state-of-the-art math/science/engineering/technology programs with a "green" angle.
- Lack of teachers (K-12) equipped with the knowledge to teach youth math/science/engineering/technology.

Obstacles

- Lack of ample funding in the federal budget for university programs to truly make a significant contribution to the higher education system.
- Lack of interest among institutions of higher education to integrate expanded programs into their curriculum.
- Lack of robust political will among Congress and/or the Executive Branch
- Demographic disadvantage of younger generations vis-à-vis the old, which directs public awareness away from the issue of educational reform and development of future generations' capabilities.

Timeline

110th Congress

- Continuation of hearings on the reauthorization of the Higher Education Act.
- Reauthorization by both chambers of the Higher Education Act that includes an amendment promoting an array of federally-funded math, science, technology and engineering programs grounded in "green" theory among universities nationwide. The resolution will provide matching dollars to US universities that promote "green"-focused paid internships and

study-abroad programs; give grants to outstanding science/math/technology students with interest in "green" studies; mandate students take "green" courses, specifically related to US long-term strategic tackling of global warming; mandate universities engage in outreach to attract low-income and minority students to math, science, engineering programs coupled with offering a greater number of scholarships to such individuals.

- Introduction of appropriations bill authorizing the government to provide funding for amended programs to the Higher Education Act referenced above.
- Introduction of appropriations bill as part of implementation of the No Child Left Behind Act's American Competitiveness Initiative to provide lucrative research opportunities in math, science, engineering and technology to students in institutions of higher education; increased funding for training opportunities and scholarships for K-12 teachers; increase in grants for K-12 schools to strengthen and innovate math, science, engineering and technology curriculum with an emphasis on sustainability or "green" studies; Adoption of a flexible, nation-wide and comprehensive testing scheme for K-12 in the areas of math, technology, science and language on which students must receive a C or better to advance to the next grade; a blueprint for strengthened communication channels and reporting mechanisms by which primary, secondary and tertiary schools can provide feedback to the federal government (including continued development of the "What Works Clearinghouse"
- House vote on the America Competes Act (Senate already passed); Among other actions to enable US global competitiveness, emphasis will be given on the implementation of critical foreign language and cultural awareness programs in primary, secondary and tertiary education systems; act should be amended to make mandatory student proficiency in at least one foreign language prior to high school graduation.
- Planning and introducing of an initiative entitled the "Pro-Education Initiative I" to create awareness among politicians and the general public about the importance of education in the fields of math, science and engineering, and better integration of socially marginalized groups into these fields. A broad and inclusive public discussion should be the aim that can carry the proposed reform and pressure for a re-shuffling of government funds into the educational field.

Short-term benefits

- Congress will continue laying the groundwork for robust, codified initiatives at all levels of the education system.
- The U.S. government will enable a large public debate that creates awareness about the importance of education in math, science and technology in today's world, and provoke an exchange of ideas concerning the future character of the US knowledge society.
- Citizens begin to gain a sense that the U.S. government is serious about strengthening the nation's education system to maintain its competitive advantage internationally.

Long-term benefits

- Creation of a large pool of knowledge that will significantly improve future small or larger-scale reform initiatives.

111th Congress

- Passage of appropriations bill related to implementation of Higher Education Act programs referenced in "110th Congress."

- Passage of appropriations bill related to implementation of the No Child Left Behind Act's American Competitiveness Initiative.
- Passage by both chambers of the America Competes Act.
- Introduction of an appropriations bill authorizing government to fund the America Competes Act, particularly pieces related to language and cultural awareness education.
- Congressional and Executive analysis of the impact of the "Pro-Education Initiative;" based upon the findings re-launch the initiative as "Pro-Education Initiative II."

Short-term benefits

- Further movement of proposed initiatives in legislative process; moving closer to actual implementation.
- Increased media exposure and the real possibility that greater funding will be available to institutions of learning for exciting, innovative math, science, engineering, technology studies (with a "green" focus) serves as a catalyst for youth interested in related careers to more vehemently pursue their goals;
- U.S. government will earn public credit for its pro-active engagement with the important issue of high quality and more egalitarian education. Confidence in the future competitiveness of the US market will boost investment

Long-term benefits

- Sustaining the momentum for and improving the impact of the reform.

112th Congress

- Passage of appropriations bill authorizing government to fund the America Competes Act, particularly pieces related to language and cultural awareness education.
- In partnership with K-12 educational institutions and universities, begin early stage implementation of Higher Education Act's amended initiatives, American Competitiveness Initiative and America Competes Act.
- Continued launching of the "Pro-Education Initiative II."

Short-term benefits

- Greater progress in moving bills through legislative process.
- Nascent implementation of Higher Education Act and American Competitiveness Initiative programs promoting an array of federally-funded math, science, technology and engineering programs grounded in "green" theory among primary, secondary and tertiary education institutions; America Competes Act does the same, in addition to focus on critical language skills training and cultural awareness education.
- Passage of appropriations bills prompts heightened exposure in the media of the need for U.S. innovation related to science, math, engineering, and language/cultural studies through a "green" lens; and increasing levels of interest among youth to further "green" studies in *US* institutions of higher learning.
- Minority and low-income youth increasingly attracted to math, science and engineering programs at universities due to greater incentives offered and university outreach campaigns.

Long-term benefits

- Greater numbers of American companies drawing upon their own citizenry to fill high-tech jobs requiring advanced technical knowledge, and thus less outsourcing for such positions from U.S. international competitors.
- Enhanced ability of Americans to operate internationally in professional environments due to language skills training and greater cultural awareness
- Enhanced sense of community felt by minority and low-income youth due to increased ability to access the education system through greater incentives offered by universities.

113th Congress

- Continued implementation of the amended Higher Education Act, the American Competitiveness Initiative and the America Competes Act
- Congressional review of best practices through an analysis of the American Competitiveness Initiative's "What Works Clearinghouse" and the development of similar reporting channels to garner feedback on successes and failures related to programs put forth by the amended Higher Education Act and the America Competes Act.
- Congressional assessment of "Pro-Education Initiative II;" production of a Congressional report on the successes and failures associated with the Initiative

Short-term benefits

Long-term benefits

- Rising levels of U.S. graduates equipped with advanced math, science and engineering skills coupled with the knowledge and skill sets to initiative innovative endeavors towards curbing global warming.
- A more diversified set of U.S. citizens involved in the math, science, engineering professions.
- Rising level of U.S. competitiveness on the world stage; particularly increased ability to serve as a key driver of innovative responses to complex environmental issues.

ENGAGING THE FEDERAL GOVERNMENT

Prepared By: Lauren Geeter, Andrew Miller, Roger Morier, and Parke Nicholson

Executive Summary

The U.S. government is straining its capacity to deal with policy formation and implementation in an increasingly complex, globalized, and interconnected world. This shift to a largely transnational operating environment is not entirely new nor has it escaped the attention of our political leadership. Ever since the fall of the Berlin Wall in 1989, policy makers everywhere have come to appreciate that, in terms of national security, there are no longer any "walls" in the world. Whatever happens in one part of the globe can have immeasurable and unpredictable consequences elsewhere. The emergence of a host of new states, the proliferation of state-sponsored international agencies and non-governmental organizations, the power and influence of non-state actors, and the rise of new technologies and instantaneous global communication have all led U.S. policy makers to realize they cannot continue to rely on a mid-20th century model of government that functions through the structures and mechanisms of an antediluvian, hierarchical, bureaucratic apparatus, itself operating under the aegis of 18th and 19th century constitutional rules.

Issue Areas

The rise of these transnational challenges has been concurrent with decreasing domestic confidence in U.S. leaders. In 1964, three quarters of Americans polled said they trusted the government to do the right thing. By the mid-1990's, confidence levels had dwindled to between one quarter and one third. Polls in Western European countries echoed this declining confidence in government. By many accounts, U.S. citizens today are even more dissatisfied with their national government and elected congressional leadership. In recent surveys (Gallup, Harris, CBS), 35% of respondents had little to no confidence in Congress; a ranking that was third worst behind the press and the White House. Those polled see government as too big, too bureaucratic, too expensive, too remote from their daily concerns, too captured by special interests, too inclined to avoid the tough decisions that need to be made, and too resistant to reform. These many critiques feed into two larger issues: a decreased general capacity to govern effectively and immunity from real accountability when mistakes are made or basic gaps in governance are apparent.

Yet at the same time, U.S. citizens do not seek a form of government different from modern representative democracy. Their criticism lays in current governance, not with the system of government, an important distinction. This suggests that reforms from *within* the system are necessary -- necessary, because despite cynicism and flagging expectations, citizens still turn to their government to provide them with many goods and services that form a part of daily life. This includes everything from public education to law enforcement to major social welfare programs.

What is needed today is a flatter, more decentralized, more responsive, but also more forward-looking U.S. government that is able to respond to the challenges arising from global public goods (those "goods" or issues that " belong" to no one person or state, that cut across frontiers, and that the global community must address because no one country can solve the problem on its own. For

instance, pollution, terrorism, the drug trade, climate change, refugee populations, HIV/AIDS, etc.). For the benefit of U.S. citizens, the government must strive for much greater inter-agency cooperation and coordination. The recommendations to follow outline proposed steps to address the challenges identified in this section and lay out a road-map to address them.

Critical Responses

Executive Responses

Throughout the nation's history, the executive branch has demonstrated the capacity to undergo significant reforms, expansions, or other changes in response to domestic or international crises, particularly in the security realm. The massive growth of the U.S. government during the New Deal and the evolution of the U.S. national security apparatus in the post-war period serve as examples of how the government successfully restructured itself to confront changing threats and citizen's needs. The establishment of the National Security Council in 1947, which consisted of the President as chairman, the secretaries of the each branch of the armed forces, and the Director of the newly-created Central Intelligence Agency, allowed for a much greater degree of cooperation between the White House and the military.

Four decades after the National Security Act of 1947, the Goldwater Nichols Department of Defense Reorganization Act of 1986 Pub.L. 99-433 was signed into law by President Reagan as an effort to streamline the military command structure and address the corrosive inter-service rivalry issues that had become increasingly problematic since their emergence during the Vietnam War. These reforms stress the importance of "jointness" for our national defense. A premium is placed on inter-service experience, cooperation, and a broad education.

More recently, changes on the international stage such as the rise of transnational terrorist organizations have prodded the U.S. government to recognize the need to revamp and adapt its national security apparatus, particularly in the intelligence realm. These reforms have attempted to deal with the changing nature of warfare and the challenges posed by transnational terrorist organizations. In particular, the disjointed structure of intelligence community was viewed as insufficient to identify and evaluate threats posed by expanding terrorist networks. One step taken by the Bush Administration was to institute the Office of the Director of National Intelligence (ODNI) which was established to coordinate the operations of the previously un-networked intelligence agencies.

Although the above examples are not perfect examples of reform, they do represent a consistent effort on the part of the executive branch to acknowledge changing threat environments and attempt to adjust accordingly. They also suggest the need for further executive branch reforms, particularly in the need for the development of institutional long-range strategic analysis capacity and civil service reforms.

Congressional Responses

In contrast to these developments in the executive branch, the structure of Congress has changed little since the 19th century. Committees and subcommittees have been added and renamed, but still reflect the hierarchical categorization of an earlier era. Although redundancy has its place, the

jurisdiction of new committees overlapping with old ones often results in nothing more than increasing layers of bureaucracy. For example, before the recent reforms of homeland security, DHS officials were obliged to testify before 88 different committees and subcommittees. This is not just a waste of government resources; it also slows our response to potential threats.

History suggests that congressional reform is slow and messy, but not hopeless. Those who understand the changes taking place in the nation's culture and attitude and who have the political will and ability to promote and implement systemic change can take the initiative. In the past, Congress has failed to apply sustained attention to the current and emerging transnational issues identified in the previous section. This paper suggests that internal Congressional reforms are necessary as a catalyst to incentivize such long-range thinking by the Congress.

On the Congressional side, the inception of the Center for Future Studies is an important step towards addressing long-range issues, but it is not sufficient to address government-wide problems. CFS was founded this past year to provide research to the committees responsible for forward engagement. As a Federally Funded Research and Development Center, it will continue its mission to be a non-partisan institution dedicated to exploring future trends. It is our hope that the recommendations listed below will compel the new Committee on Forward Engagement (CFE) to reverse this trend. Party and committee leaders must work together and engage the public and the executive branch. It is in their hands to affect the changes necessary so the government can better address emerging threats to our citizens, commerce, and environment.

Recommended Responses
Addressing the issues requires action across all levels and branches of government but must be driven by change at the Federal level. It will require significant cultural and institutional reform of the Congress, the U.S. Civil Service, and the Executive Branch.

This paper recommends reforms intended to address the following three critical needs of the government:

1) Institutionalization of a joint culture in the civil service, akin to the Nichols-Goldwater recommendations for the military.
2) Establishment of new relationships with our international partners to address transnational issues
3) Development of a long-range strategic analysis capability in the Federal government based on the suggestions of the Princeton Project on National Security (Project Solarium)

The following section will address two possible CLIP processes for Congressional and Civil Service reforms. At the end of our report, we summarize the findings of the Princeton Project on National Security (Project Solarium).

Legislative CLIP

111th Congress (2009-2010)

- Review all forward engagement-related activities of Congress and the Executive Branch.

- Identify relevant members and committees and begin implementation of lobbying campaign to bring FE issues to attention of Congress, particularly appropriators.
- Encourage congressional staffs to take on "futurist" fellows, much in the way staffs now routinely have guest fellows from the military or inter-agency structure.
- In conjunction with academic institutions, the private sector, and civil society groups undertake a comprehensive review of existing forward engagement education programs across the country (their objectives, curricula, measures of success, and degrees of cooperation). With the same partners, and through the Department of Education, examine ways to strengthen incentives for creation of such programs.
    - Short-term Benefits:
        - Demonstrates to staff the importance that Congress attaches to the issue
        - Forward Engagement committee members travel to principal allies to explore and make connections.
        - Builds on current mechanisms of inter-agency cooperation
        - Immediate benefit to Congressional staffs from insights of futurist fellows; chance to put FE issues on the table within Congressional offices
    - Long-term Benefits
        - Assesses quality of futuring and explores further cooperation with intelligence community and the public.

112th Congress (2011-2012)

- Encourage Congressional newspapers such as Roll Call and Congressional Quarterly to include a section on FCIs
- Provide funds for a new *Congressional Exchange Initiative* to analyze, initiate, and develop sustained contact with interested governments and their agencies engaged in long-range national security strategic planning.
- Establishment of mandatory curriculum for all Congressional staffers and interested members on long-range strategic analysis
- Cultivate several "long-range/FE" cheerleaders in both chambers to consistently and vocally champion issue.
- FE committee members engage in conference report negotiations to facilitate FE issue consideration in wide swath of legislation
    - Short-term Benefits
        - Integration of FE issues into upcoming legislation
        - Establishes a funding framework necessary for the issue to gain traction
        - First steps in international cooperation
    - Long-term Benefits
        - Lays the groundwork for international governance structures to address FCIs collaboratively
        - Conference committee reform lays the groundwork for further internal reform to Congressional structures

113th Congress (2013-2014)

- Implement first stage of new *Congressional Exchange Initiative*: authorization to participate in an inter-parliamentary assembly designed to share with other national legislatures draft legislation relating to forward engagement.
- Make long-range analysis curriculum mandatory for all incoming members of House and Senate as part of a Congressional in-briefings/orientation

    - Short-term Benefits
        - Raise immediate awareness of FE issues for new Members
    - Long-term Benefits
        - Increase U.S. engagement with international partners

114th Congress (2015-2016)

- Mandate an annual joint-session of Congress in which a highly distinguished speaker discusses the importance of a specific long-term issue or general concept of foreign engagement
- Provide funds to Congressional Research Services (CRS) to employ a number of futurist scholars to research the long-term impact of FCIs
- Congressional participation in inter-parliamentary assembly
- Provide funds for Congressional staff to meet with the staff of other parliaments to discuss the concept of Forward Engagement
- Reward foreign parliament members and staff which research the long-term impact of trends by inviting them to Washington to meet with the Congressional leadership
- Mandate the Select Committees on Forward Engagement to make non-binding recommendations to other committees on long-term policy initiatives
    - Short-term Benefits
        - Foreign parliament members and staff will become encouraged to research FCIs and think about the long-term impact of trends on their countries
        - Inter-parliamentary exchange will increase Congress' understanding of the issues important to other countries and other countries will better understand issues important to the U.S.
    - Long-term Benefits
        - Congressional staff will become more adept at analyzing FCIs
        - CRS will be able to manage the increased number of product requests regarding FCIs as Congress begins to increasingly consider long-term issues
        - Foreign parliaments will themselves begin to analyze FCIs and perhaps implement institutional reforms mimicking those in the U.S. Congress (e.g. the establishment of Select Committees on Forward Engagement).

Executive CLIP

111th Congress (2009-2010)

- Undertake a comprehensive review of the civil service to assess the state of inter-agency cooperation on issues relating to national security (in the broadest definition of this term). At the same time, mandate a high-level task force, working in conjunction with the White House and the United Nations, to assess the state of international cooperation on issues relating to international security.
- Undertake a comprehensive review of existing forward engagement education programs across the country in conjunction with academic institutions, the private sector, and civil society groups (their objectives, curricula, measures of success, and degrees of cooperation). With the same partners, and through Department of Education, examine ways to strengthen incentives for creation of such programs.
- Work with OPM to strengthen inter-agency rotational opportunities within existing programs such as the PMF

- Short-term Benefits:
    - Establishes current status of inter-agency cooperation before setting future objectives and benchmarks
    - Builds on current mechanisms of inter-agency cooperation
- Long-term Benefits
    - Assesses quality of futuring and explores further cooperation with intelligence community and the public.
    - Lays the groundwork for future progress in addressing FE issues through stronger inter-agency interactions

112th Congress (2011-2012)

- Work with Office of Personnel Management (OPM) to create a National Security Career Path in order to develop a cadre of professionals familiar with inter-agency processes. Congress creates a School for Inter-agency Operations and Training. New federal employees are obliged to take courses relevant to their field.
    - Short-term Benefits
        - In-class collaboration fosters inter-agency networking.
    - Long-term Benefits
        - Development of a federal government workforce engaged in forward thinking and analysis

113th Congress (2013-2014)

- Provide funding for an internationally recognized advanced degree program (Masters and PhD level) for students wishing to specialize in the analysis, conception, and implementation of strategic decision-making on a 5-10-15-25 year horizon.
- Initiate Congressional reporting requirement on progress made to date on improving forward thinking and inter-agency cooperation in civil service.
- Mandates that, at the start of each Congress, all Senators and Congressmen be required to take part in two-day session on "over-the-horizon" threats and opportunities, conducted by government and outside experts.
- Institutes Fuerth Award (annual cash grant of $100,000) given to a person or organization whose work on forward engagement and whose strategic analyses of long-range security issues facing the nation best help Congress and the country prepare for them.
    - Short-term Benefits
        - Substantially raises the profile of forward engagement issues
    - Long-term Benefits
        - Development of a segment of the federal government workforce with particular expertise in advanced forward thinking and analysis

114th Congress (2015-2016)

- Begins joint hearings with legislators from other countries (televised live worldwide) to hear expert opinion on state of security threats facing cluster of or all states (e.g. global warming, nuclear proliferation, HIV/AIDS, international criminal syndicates, etc.). With legislators from other countries, introduces harmonized legislative proposals (bills) to address those issues.

Project Solarium Recommendations

Due to the rise of global terrorist networks which have filled the vacuum created by the collapse of the Soviet Union, the executive branch faces a number of challenges ahead in order to confront changing threats to the nation's security. Since the attacks of September 11, there has been a clear consensus among in security policy circles that the Executive branch needs to reform its structure.

In particular, the Princeton Project on National Security offers a set of solutions on how the executive can reform its structure to more effectively confront national security threats posed by the rise of terrorism. The Center staff endorses and recommends the following reforms and actions:

(1) create a quadrennial national security review which will engage all relevant agencies in order to identify prioritize national security objectives
(2) establish an inter-agency threat assessment process to identify future trends
(3) establish a semi-annual "over the horizon" reviews for agency deputies to anticipate potential future crises and challenges
(4) establish an annual table-top exercise program for senior national security officials to practice managing future national security challenges and identify capability shortfalls that need to be addressed
(5) create a classified National Security Planning Guidance to be reviewed by the NSC, signed by the president in the first year of a new administration and updated on a biannual basis
(6) create an NSC senior director and office dedicated to strategic planning
(7) conduct NSC/OMB mission area reviews for top national security priorities that require resource allocation and implementation across multiple agencies

Michèle Flournoy and Shawn W. Brimley, "Strategic Planning for U.S. National Security: A Project Solarium for the 21st Century," *The Princeton Project Papers* (2006)

ENGAGING THE PRIVATE SECTOR

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EXECUTIVE SUMMARY

An essential component of future-oriented policymaking is ***engaging the private sector*** to serve an important function in addressing a host of transnational issues in a manner that secures the position of the United States as a global leader. While government will undoubtedly serve a significant role by spearheading policy integration and regulating future contingencies of interest to curb externalities and other undesired effects, the private sector must also play a very sizeable role as an initiator of change and pilot of progress.

The private sector has the capability to attract the top talent—thinkers, engineers, and managers alike will flock to the corporations promising high salaries and attractive benefits. Corporations and nonprofits are also less likely to be strongly influenced by the will of constituencies; shareholders may, more than voters, tolerate years of minute achievement and little forward progress before a firm manages to make a large breakthrough, so long as stock values remain constant or increase. The private sector is indeed in a unique position to develop the innovations necessary for the United States to remain forwardly engaged.

Not only is the private sector responsible for the economic security of the United States, but also its broad focus and wide range of expertise positions it as a leader in many areas of concern to societal welfare, including energy technology, education, and healthcare and social well-being. The private sector, in its entirety, encounters daily obstacles in its attempt to address the various transnational forces threatening the ability of the United States to navigate and lead in a globalizing world. Such barriers include, *inter alia*, the heavy global reliance on advanced foreign technology, a decline in U.S. human capital in the engineering and sophisticated technology fields, the waning U.S. influence in the technological sector, and the reduction of a robust production base in energy and other goods critical to maintenance of a durable, secure infrastructure and a robust economy. In addition, individual firms face significant particularized challenges, including protecting their own facilities and ensuring for their own security, counteracting the effects of the movement of investment to other countries, maintaining sound industrial policy, and serving fiduciary functions and acting in accordance with principles of corporate responsibility.

Engaging the private sector will require Congress to be cognizant of the unique characteristics of the corporations and nonprofit firms. In the past, Congress has spurred progress by inducing the private sector to undertake research and development through the implementation of tax incentives, subsidies, and grants along with enabling conducive regulatory schemes imposed by executive branch departments and agencies. In broad terms, Congress should continue these legislative efforts. Among other goals, legislation should (1) encourage private research by providing tax incentives to companies that undertake efforts to design continuously-improving systems and processes and subsidizing subsequent upgrades; (2) endow research positions at major scientific universities to foster education and research; (3) induce private financial institutions to invest in scientific and technological progress; and (4) provide a framework for favorable regulatory regimes to ensure that the research and production capabilities remain centered in the United States and not outsourced to foreign countries with more advantageous regulatory conditions.

Possessing great wealth as well as critical capital and intangible resources, the private sector can undertake a vital mission to enhance the ability of the United States to not only navigate, but also lead in the face of significant transnational contingencies of interest and concern. Namely, the private sector can provide the scientific, technical and economic expertise necessary to secure the United States' position at the forefront of global progress.

Issue Areas

Preserving National Interests by Converting Technological Competitiveness into Economic Security

Globalization and climate change—two of the most potent and transformative transnational forces of the 21st century—pose major threats to the status quo. Amidst such a rapidly changing and volatile global environment, a key question arises: Is the U.S. government taking steps to engage the private sector in ways that help to protect and serve its national interests? In light of this question, six major issues emerge: *education*, *energy and technological innovation*, *infrastructure security, industrial policy/corporate responsibility*, *offshore investment*, and *health and welfare*. These issues, however, do not stand alone; they are in fact connected to one another via a higher point of activity—or issue-node—which we call "Preserving National Interests by Converting Technological Competitiveness into Economic Security."

Our decision to incorporate all six issues into this single and unifying issue-node satisfies two fundamental prerequisites of forwardly engaging the private sector. The first is to establish the increasing significance of technological competitiveness. According to the Committee on Prospering in the Global Economy of the 21st Century, technological competitiveness is the backbone of the U.S. economy:

> The vitality [of the U.S. economy] is derived in large part from the productivity of well-trained people and the steady stream of scientific and technical innovations they produce. Without high-quality, knowledge-intensive jobs and the innovative enterprises that lead to discovery and new technology, our economy will suffer and our people will face a lower standard of living. Economic studies conducted even before the information-technology revolution have shown that as much as 85% of measured growth in US income per capita was due to technological change. (1)

As globalization continues to accelerate technological change and destabilize economic systems, strength and competitiveness in a nation's science and technology (S&T) base are vital to its national and economic security. Therefore, in order to preserve our national interests through private sector engagement, viewing our six issues through a "technological competitiveness" lens is essential.

The second prerequisite of forwardly engaging the private sector is to address complexity theory, which also explains the convergence of our six issues into a single node. According to complexity, components of various systems are constantly interacting, evolving, devolving, and even breaking down altogether. As an actor or some other agent alters one issue, each other issue may be changed. *National welfare*, for example, is directly affected by whether or not students receive the proper

education and training to be innovative in firms, because firms are major contributors to *technological competitiveness* and overall economic stability. When describing, evaluating, and confronting various issues at once, the rules of cause-and-effect linearity no longer apply. Therefore, by connecting each issue to a larger node, we not only gain perspective on the process of forward engagement, but we also increase accuracy in our mission to engage the private sector.

What follows is a short description of each of the six issues, with a special emphasis on how they relate to the broader issue-node, "Preserving National Interests by Converting Technological Competitiveness into Economic Security."

Education

According to the Task Force on the Future of American Innovation, countries in Europe and Asia are beginning to rival the U.S. in the academic fields of science and engineering (S&E). To begin with, the U.S. share of worldwide undergraduate S&E degrees awarded annually has dropped. In 2000, Asian universities accounted for almost 1.2 million S&E degrees; European and Russian universities accounted for about 850,000 S&E degrees; while North American universities accounted for only about 500,000 degrees. Furthermore, last year in China, over 350,000 engineers, computer scientists, and information technologists graduated with advanced degrees. Comparatively, in the U.S. only 140,000 students graduated with advanced degrees in the hard sciences.

The current trend towards outsourcing also has an effect on the degrees that people seek due to the altering skill-sets being demanded by U.S. markets. Fewer people in the U.S. are pursuing advanced degrees in the hard sciences because there is no guarantee that a job will be waiting for them once they graduate. Those jobs are instead being transferred overseas due to the increasingly highly-skilled, low-cost work forces emerging in foreign countries (see "Industrial Policy/Corporate Responsibility"). This trend is already starting to materialize in the U.S. and could be exacerbated in the long-term if the technological competitiveness of the U.S. continues to decline.

Energy and Technological Innovation

The U.S. approach to innovation may no longer be sufficient; the Task Force on the Future of American Innovation recently identified key benchmarks in several areas, including R&D investments, the high-tech economy, and specific high-tech sectors, including information technology, where the U.S. is losing its competitive edge. To what degree can policymakers engage the future of technological innovation without damaging the natural flow of market progress? Moreover, how certain can policymakers be that the market is making the "right" decisions for technological innovation? And who should determine what is "right"?

Currently, there is no real systematic way to set priorities across disciplines or fields in S&T policymaking. The Office of Management and Budget (OMB) controls the budget for S&T, even though its members require no expertise in science or technology. There is a clear lack of scientific and technological experience in budget allocation. Furthermore, the short-term behavior of mission-oriented agencies seeking R&D funding means a shortage of attention given to the planning and execution of long-term development goals. Because the overall health of the research enterprise is overlooked, our capacity to innovate is weakened, generating detrimental effects on our national technological competitiveness.

In particular, technology policy has not been sufficiently linked to the development of alternative forms of energy. Currently, the U.S. relies heavily upon foreign energy sources, which are regularly

burdened with conflict and anti-American sentiment. At this point, long-term oil reserves are scheduled to come from the Middle East, a center of regional and sub-state conflict. Furthermore, as the effects of climate change become increasingly apparent, the vitality of the U.S. environmental interests requires the search for cleaner energy sources that are less harmful to national and global ecosystems. Lively U.S. citizen demand is growing for independent, self-sustaining, and cleaner energy sources.

Infrastructure Security

The urban setting provides access to a set of highly integrated public and private infrastructure systems—water and electrical supplies, communications, and mass transit—as well to numerous major buildings and places of public assembly. As observed by the Committee on Science and Technology for Countering Terrorism, these structures present a target-rich environment for terrorists. Larger buildings are vulnerable to catastrophic collapse following an attack, as what happened with the World Trade Center on 9/11. Major buildings are also vulnerable to infections or toxic materials being circulated by heating, ventilation, and air-conditioning systems after their release into the air. In light of these problem-areas, the federal government is challenged to encourage the private sector to help protect it, as infrastructure security is a vital precondition for technological competitiveness. Infrastructure security can be increased through research and development leading to improved blast-resistant designs, fire-resistant materials, high-tech surveillance systems, and better sensors that can be installed in the air circulation system.

Industrial Policy/Corporate Responsibility

Industrial policy—government regulation that encourages investment into a particular industry—contributes to the overall welfare of the economy. While this policy is meant to encourage creating an industry that is internationally competitive, it has often been seen to endorse the protection of existing jobs for immediate political gain. Presumably, in order to create or encourage an industry, the government must attract skilled laborers to foster and improve their own individual capital. The problem for the U.S. appears to be the distinction between international trade rules and government policy. Industrial policy is often subservient to the tax, tariff, and trade rules imposed by outside trade pacts, which means limited subsidies and decreased protectionism. Many developing nations, therefore, have the competitive advantage of a low wage structure. Given such conditions, how can the U.S. engage its private sector to optimize its knowledge-based resources, sustain a fertile environment for new industries, and remain technologically competitive?

Closely related to industrial policy is corporate responsibility, which refers to the responsibilities and obligations a corporation has to its customers, employees, shareholders, communities, and the environment. The actions taken and consequences felt by corporations are closely linked with national health and welfare. While corporations have obligations to the general public, do they have any responsibility to contribute to the overall state of the U.S. economy? By moving their operations abroad to avoid taxes, are they decreasing U.S. technological competitiveness and economic security?

Offshore Investment

Offshore investment, also related to corporate responsibility, refers to the keeping of money in a jurisdiction or area outside of one's country of residence. This is often done to protect one's assets, to take advantage of tax and privacy laws, and to facilitate the flow of money. Avoiding the tax burden, however, deprives the home country of income that would have otherwise come from the investment. In addition, these offshore havens have created elaborate domiciles to conceal and

protect illegally acquired money from law enforcement and the investor's home country. Money laundering has slowly risen since the creation of these offshore havens, and funds can easily be transferred into the hands of terrorists and other non-desirables. The issue is how to regulate these investments, as they are currently legal and accessible to anyone who can meet the initial investment requirements. Once again, are corporations responsible for helping to maintain national welfare and economic security by paying full taxes instead of hiding or funneling money through these offshore investments?

Health and Welfare
National health and welfare are, as illustrated, directly related to each of the five other issues. The manner in which *education*, *energy and technological innovation*, *infrastructure security, industrial policy/corporate responsibility*, and *offshore investment* are addressed determines the condition of U.S. health and welfare. Oftentimes, the interests of the private sector do not coincide with the interests of the nation. The question, therefore, is how to motivate the private sector to care about national welfare. Or alternatively, how can the federal government encourage private industries to take risks and seek profits in the specific areas that, as a byproduct, result in an increase of economic security and national welfare?

Critical Responses

Historical
Engaging the private sector is not a new concept. Rather, the United States Government has, historically, chosen to engage various aspects of the private sector in pursuit of specific policy goals. In particular, the current Administration has shown a strong interest in relying on the private sector to meet challenges that had, in the past, fallen instead upon the public sector.

For instance, the Bush Administration has strongly backed the formation of charter schools. Through the No Child Left Behind Act, students in chronically underperforming public schools have the opportunity to choose these alternative schools instead. While still receiving some public funds, charter schools are exempt from many regulations governing other public schools. This begins to blur the line between what has, historically, been a public service, and begins to apply principals of market economics to the provision of education.

Conversely, with regard to infrastructure protection, the U.S. government has, to date, taken a very "hands off" approach. In the wake of the September 11 attacks and the formation of the Department of Homeland Security, increasing attention has been placed on protecting the critical energy, transportation, communications, medical, industrial, and other infrastructure of the country. Yet, little has been done to date. Chemical security provides a startling example of this lack of engagement. Though the majority of chemical sites in the U.S. are privately owned, the government has been loath to enact regulations for security, instead preferring to allow the industry to self regulate. So far, the industry has shown little incentive to improve security without further government prodding.

In part to counter the continued out-sourcing of white-collar jobs, the Bush Administration announced, in 2006, the American Competitiveness Initiative (ACI). As part of the announcement of this initiative, President Bush claimed that, "we will maintain America's competitive edge, we will create more jobs, and we will improve the quality of life and standard of living for generations to

come." The ACI includes a full range of programs intended to stimulate the private sector and academia, including permanent research and development tax credits, increased Federal funding for research and development, and funding to improve math and science education for the Nation's children.

The corporate scandals of the last decade have reintroduced corporate responsibility into the public conversation. In response, the Sarbanes-Oxley Act of 2002 created the Public Company Accounting Oversight Board, a semi-public agency is charged with overseeing, regulating, inspecting, and disciplining accounting firms in their roles as auditors of public companies. In many respects, the Sarbanes-Oxley Act reaffirmed the government's recognition of the private sectors role in the public and economic futures of the nation.

The 2007 State of the Union marked a renewed interest of the Bush Administration in alternative fuel technologies. As part of the new "Twenty in Ten" goal of reducing U.S. fuel consumption by twenty percent over the next ten years, the President is providing tax credits for hybrid and alternative fuel vehicles, and supporting the research and development of biodiesel and ethanol fueled vehicles. By spurring private sector development of alternative fuel vehicles, the Administration hopes to reduce U.S. reliance on foreign energy sources, thus making the energy sector more secure.

As is made clear by these examples, the private sector continues to play an increasingly critical role in meeting the challenges of the 21st Century. It is no secret that, in many ways, the private sector is far more able to quickly adapt to the changing landscape. These examples are simply a few of the many ways in which the government can continue to harness this ability, while continuing to shape the national agenda.

Proposals of Blue Ribbon Panels

The Spring 2005 panel proposed the establishment of an External Relations Office, intended to enhance public perception of the relevance and criticality of potential human repercussions of FCIs and of the import of a governmental mechanism designed to forwardly engage. The proposed External Relations Office has an important role in fostering relationships with academia, with the private sector, and with non-profit and professional organizations. With the cultivation of a networked community of influential partnering individuals and organizations, information and awareness would be disseminated through a variety of established communications networks.

Similar to our panel, the Spring 2005 panel noted that private industry, spurred by protection of self-interests, would also inform the actions of the Commissions and may ultimately help to implement some of the recommendations of the Commissions on certain FCIs. Multi-national corporations, defense contractors, energy conglomerates and others potentially affected by FCIs would: 1) testify before the Commissions on FCIs under consideration; 2) report on the potential affects (positive or negative) of action on FCIs; 3) take un-legislated steps to address FCI issues (incentivised by Congress).

The Spring 2005 panel further noted that some private industry representatives might lobby against what the Commissions recommend. However, those industry contacts that Congress can influence to make changes would lead the way in working with government to address FCIs. The

prestige factor of becoming an industry leader in a certain arena (best practices) can be self-motivating. Nevertheless, Congress should not rule out tax breaks or other incentives for companies that take action on FCI issues (e.g. changing business practices to prevent future economic or ecological problems). Favorable responses from private industry would be highly dependent on Congressional action inspired by related recommendations from a Commission.

The Component Level Implementation Process, recommended by the Fall 2004 and 2006 panels is an essential tool, enabling policy makers to "examine long-term developments, break them down into nearer-term components, and then consider the broader relevance of those components." CLIP breaks complex problems into manageable pieces, turns those pieces into policy recommendations, and then translates the recommendations into legislative language and timelines. Following the format laid out by the Fall 2006 panel, we have formulated a CLIP for realizing the goal of fostering and re-cementing US leadership in board base energy efficiency, and a renewed emphasis on innovative developments and research into alternative energy technologies.

Recommended

Effective engagement of the private sector is an essential component to achieving a revitalization of US strategic and economic security for the long-term. Market forces are *already at work* moving jobs to countries with less costly, often better-educated, highly motivated workforces and friendlier tax policies. Without a renewed effort to bolster the foundations of our competitiveness, we can expect to lose our privileged position. In order to compete with the rest of the international community, the US must optimize its knowledge-based resources, particularly in science and technology. Further, the US must sustain a fertile environment for new and revitalized industries and the well-paying jobs they bring. In order to bring about such a change, the US needs to adopt new priorities and policies that place emphasis on the vital human, financial, and knowledge capital necessary for future US prosperity.

Availability of quality research and innovative talent is one of the most influential factors in the decisions by multinational companies in determining facility and job location. Thus, efforts to engage the private sector must begin at the most basic level of education. The recommended actions by the Committee on Prospering in the Global Economy of the 21st Century are important building blocks towards achieving long-term US competitiveness. First, the US needs to increase America's talent pool by vastly improving K-12 science and mathematics education. Annually, 10,000 science and mathematics teachers for the public K-12 schools should be recruited with offers of four-year scholarships. This will foster the development of a public school system with high-quality teaching, world-class curricula, standards and assessments of student learning. Doing so will allow for 10 million minds to be educated in the hard sciences, improving the long-term potential and capacity for innovation in the US. Efforts must also be made to strengthen the skills of 250,000 teachers through training and education programs, emphasizing and rewarding efforts at continuous learning.

Another important recommendation from the Committee is for the US to sustain and strengthen the nation's traditional commitment to long-term basic research that has the potential to be transformational to maintain the flow of new ideas that fuel the economy, provide security, and enhance the quality of life. To realize this goal, the US should increase the federal investment in long-term basic research by 10% each year over the next 7 years through reallocation of existing funds5 or, if necessary, through the investment of new funds. Special attention should go to the

physical sciences, engineering, mathematics, and information sciences and to Department of Defense (DOD) basic-research funding. Another important action recommended is the provision of new research grants of $500,000 each annually, payable over 5 years, to 200 of the nation's most outstanding *early-career* researchers. Efforts must also be made, through reallocation of existing funds or, if necessary, through the investment of new funds, to ensure that universities and government laboratories create and maintain the facilities, instrumentation, and equipment needed for leading-edge scientific discovery and technological development.

In following with the Committee's findings, we also recommend the allocation of at least 8% of the budgets of federal research agencies to discretionary funding that would be managed by technical program managers in the agencies and be focused on catalyzing high-risk, high-payoff research of the type that often suffers in today's increasingly risk-averse environment. We also encourage the creation of the Committee's recommended Advanced Research Projects Agency-Energy (ARPA-E) which will be charged with sponsoring specific research and development programs to meet the nation's long-term energy challenges. The new agency would support creative "out-of-the-box" transformational generic energy research that industry by itself cannot or will not support and in which risk may be high but success would provide dramatic benefits for the nation. Funding for ARPA-E would start at $300
million the first year and increase to $1 billion per year over 5-6 years, at which point the program's effectiveness would be evaluated and any appropriate actions taken.

In order to engage the private sector, the US also needs to make the United States the most attractive setting in which to study and perform research so that we can develop, recruit, and retain the best and brightest students, scientists, and engineers from within the United States and throughout the world. As the Committee notes, efforts to realize this goal include, but are not limited to: Increasing the number and proportion of US citizens who earn bachelor's degrees in the physical sciences, the life sciences, engineering, and mathematics by providing 25,000 new 4-year competitive undergraduate scholarships each year to US citizens attending US institutions, increasing the number of US citizens pursuing graduate study in "areas of national need" by funding 5,000 new graduate fellowships each year, and provide a federal tax credit to encourage employers to make continuing education available (either internally or through colleges and universities) to practicing scientists and engineers.

Efforts to incentivize innovation are also important components in the engagement of the private sector to achieve long-term US strategic and economic security. Changes must be made to ensure that the United States is the premier place in the world to innovate; to facilitate invest in downstream activities such as manufacturing and marketing; and to create high-paying jobs based on innovation by such actions as modernizing the patent system, realigning tax policies to encourage innovation, and ensuring affordable broadband access. As recommended by the Committee, the US must enhance intellectual-property protection for the 21st century global economy to ensure that systems for protecting patents and other forms of intellectual property underlie the emerging knowledge economy, but still allow research to enhance innovation. The US must also enact a stronger research and development tax credit to encourage private investment in innovation. Congress and the Administration should make the credit permanent, and it should be increased from 20 to 40% of the qualifying increase so that the US tax credit is competitive with those of other countries.

Another important recommendation from the Committee is the provision of tax incentives for US-based innovation. Options for the realization of this goal include, changes in overall corporate tax rates and special tax provisions providing incentives for the purchase of high-technology research and manufacturing equipment, treatment of capital gains, and incentives for long-term investments in innovation. A comprehensive analysis should also be undertaken examining how the United States compares with other nations as a location for innovation and related activities with a view towards ensuring that the United States is one of the most attractive places in the world for long-term innovation-related investment and the jobs resulting from that investment. Congress and the administration should also take action—mainly in the regulatory arena and in spectrum management—to ensure widespread affordable broadband access in the very near future.

The United States faces an enormous challenge because of the disparity it faces in labor costs. Science and technology provide the opportunity to overcome that disparity by creating scientists and engineers with the ability to create entire new industries—much as has been done in the past. Importantly, resultant from the complexity and inter-connectedness of these issue-areas, by improving conditions for innovation in the US, companies that have been moving jobs to countries oversees will now have significant incentives motivating them to halt and potentially reverse those practices. Additionally, by increasing the availability of high-paying jobs in the US, the gross income per capita of US workers will increase. Improvements in education, per capita income and technological advances in the US, particularly advances in the medical field, will have significant, positive implications for overall US health and welfare. Also, by enlarging the degree to which companies interests are invested domestically, companies will be incentivized to protect their investments, motivating the infrastructure protection efforts that have heretofore languished.

CLIP

111th Congress (2009 – 2010)

Section A: Government introduction to energy sector initiatives

- Employ QDR-similar process to investigate and delineate the current status of the U.S. energy industry

Immediate, short-term payoffs:

- Demonstrates government commitment to both reducing US dependence on foreign energy sources and to repairing America's environmental situation
- Gives the nation's leaders up to date status of the US energy sector allowing for future planning

Long-term, contingent payoffs:

- Creates the basis for a stronger relationship between government and private firms which helps preserve America's competitive advantage in advanced technologies as scientific advances continue to enhance firms' capabilities

112th Congress (2011 – 2012)

Section A: Government introduction to energy sector initiatives

- Encourage implementation of the Advanced Technology Program
- Enable the development a technically proficient human capital within the federal government
    - Funding – pay competitive salaries
    - Public Relations – tap into the sense of duty to federal government
    - Management – expand the scope of §1101 authority to many vital government offices that require high level science and technology expertise

Immediate, short-term payoffs:

- Supports US universities and researchers
- Contributes to maintaining America's competitive advantages in basic scientific research and technological innovation
- Creates demand for experts and scientists in alternative energy technologies

Long-term, contingent payoffs:

- Bridges the gap between the research lab and the market place, stimulating prosperity through innovation.
- Develops innovative technologies that promise significant commercial payoffs and widespread benefits for the nation
- Progress in basic research leads private firms to invest more in applied research

113th Congress (2013 – 2014)

Section B: Beginning to engage the private sector

- Federal government subsidies of private research through tax incentives
- Federal government endowed research positions at educational institutions
    - Define a set of research priorities of primary importance to the energy sector
    - Cultivate further research into fields tangentially related to the energy sector
- Implement programs to ensure that research capabilities remain centered in the U.S. and are not outsourced to other countries
- Ease regulatory regimes to encourage private sector investigation into areas important to the energy sector

Immediate, short-term payoffs:

- Boosts private firms investment into research and application of alternative energy technologies
- Jobs remain in the US, increasing the demand for skilled workers with expertise in advanced science and alternative energy technologies

Long-term, contingent payoffs:

- Leads firms to produce and sell alternative energy technologies, which are highly demanded by other countries making them competitive for export to countries where the technology is needed most
- Combines with policies already present to introduce alternative energy technologies
- Gives the industry direction relevant to the overall direction of the nation, syncs their industries with the rest

114th Congress (2015 – 2016)

Section C: Specific private sector energy industry programs

- Establish competitions to induce the private sector to produce innovative energy production, distribution, and usage practices and processes
- Transition the competition by-product technologies from educational institutions to the private sector
- Adopt these new technologies in limited applications
    - Federal Government
    - Funding to state and local governments to adopt these new technologies

Immediate, short-term payoffs:

- Legislation signals government's intention to subsidize and support the transition to new technologies, giving a dramatic boost to venture capital investment in the technology.
- Provides secure "first customer" demand which allows firms to invest in mass production of new technologies
- Wins the support of private customers encouraged by the subsidies
- Helps create jobs that remain in the US for the new alternative energy technology sector

Long-term, contingent payoffs:

- Demonstration of cost-effective use of new technologies in government buildings leads to their adoption by private sector industries and eventually individual homeowners
- Creates competitive market for alternative energy market
- Solidifies the link and relationship between the research labs and the public markets
- Facilitates establishment of new alternative energy technology niche market for the US industries and government, which will become a key US competitive advantage as the new technologies spreads around the world
- Oil companies respond to rise of new technologies by investing in mass distribution of them at conventional gas stations and plan for their new market share

115th Congress (2017 – 2018)

- Tax incentives and other incentives for early adopters of new technologies
- Enact disincentives to discourage the use of inefficient energy sources

Immediate, short-term payoffs:

- Demonstrates federal government's commitment to a alternative fuel economy
- Demonstrates US government's commitment to protecting environment and reducing dependence on foreign oil
- Alternative energy technology becomes more visible to the US general public
- Greater visibility of new energy technology increases investment in the technology
- Increases autonomy of alternative energy technology industry firms

Long-term, contingent payoffs:

- Provides strong incentive to reduce emissions by switching to alternative energy technology
- Builds market for future energy technology stations

116th Congress (2019 – 2020)

- Phase out incentives as adoption of new technologies becomes more widespread
- Encourage multinational institutions to establish similar incentives and disincentives to foster global development of U.S.-developed energy initiatives

Immediate, short-term payoffs:

- Diplomatic dividends as US is no longer a free rider on the Kyoto protocol
- Puts US in a position to pressure other countries on their non-US technologies and emissions; this can be used as a diplomatic bargaining chip and linked to other issues of interest to the US
- Reduces government spending and frees up budget for other priorities
- Increases autonomy of alternative energy technology industry firms

Long-term, contingent payoffs:

- Provides strong incentive to reduce emissions by switching to alternative energy technology
- US leadership on alternative energy technologies converge with increasing international concern and more conclusive scientific evidence on the relationship between emissions and climate change, creating the conditions for the establishment of an effective global emissions cap-and-trade system
- Solidifies US leadership in alternative energy technologies
- Since firms know government subsidies will be phased out, they invest in cost-effective energy technology processes from the start
- The private sector is more efficient in production and innovation of alternative energy technologies, so withdrawal leads to quicker innovation

ENGAGING THE WORLD

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Executive Summary

The explosion of globalization over the last fifteen years has created an immense challenge to nations, political systems, and the people who live in them. The concern this challenge poses to the international community is whether or not adjustments can be made in a stable manner. The transnational aspect that globalization brings to the world blurs the lines between domestic security and international security; one nation's acquiescence to transnational threats becomes a security nightmare for regional as well as the international community. The ability of non-state actors to move and operate freely across national borders creates a problem for U.S. national security. The U.S. cannot pursue its own security without engaging the international community. Issues are continuing to emerge at a staggering rate and the U.S. must, in the interest of national security, find a way to adjust its policy making ability in order to address these issues. There are numerous issues that warrant the U.S.'s "Engagement of the World." These issues not only vary in size, scope, and depth, but also cover a vast range that includes the environment, security, defense, and the economy.

Issue Areas

Climate Change

Climate change threatens human life, economic and social development, and international stability. As opposed to the basket of other issues, climate change, unless mitigated, will change the world as we know it. Nuclear proliferation, privatization of the armies, sub-state fragmentation and most other FCIs discussed represent threats of the second order by comparison,(i.e. another thing has to happen for them to have similar impact globally).

Global climate change threatens to change the environment and human civilization in innumerable ways. If greenhouse gases (expressed as carbon dioxide equivalent concentrations) are limited to 550 parts per million (an optimistic policy outcome), there will be a 70-80% chance that the global mean average temperature will increase by 2°C and a 50% chance it will increase by 3°C or more.[i] At these levels, effects will include "hundreds of millions of people exposed to increased water stress," species extinction of 30-40% or more, decreases in cereal productivity, loss of 30% of global coastal wetlands, and increasing disease burdens.[ii] A panel of distinguished retired flag officers calls these effects "a threat multiplier for instability in some of the most volatile regions of the world" and finds that they "will add to tensions even in stable regions."[iii] These worrisome findings do not even refer to the possibility that positive feedbacks in the climate system (such as decreasing albedo from melting ice caps or release of land or ocean methane sinks) could lead to runaway warming and rapid, catastrophic climate change.

Climate change would be an important future contingency even if this science proves inaccurate, simply because policy makers are likely to respond to it. Nicholas Stern, working for the UK Treasury, found that policies to stabilize greenhouse gas concentrations between 500 and 550 parts

per million are likely to cost at least 1% of global GDP,[iv] with costs increasing the later policies are enacted.[v]

Nuclear Proliferation

The issue of nuclear proliferation is a steadily growing problem for the international community. Rogue states such as North Korea and Iran have pursued their nuclear ambitions, threatening the stability of their respective regions. The U.S. has led the charge calling for the disarmament of these new nuclear powers to stem the spread of nuclear weapons, however this is an issue that the entire international community must be involved in.

If new nuclear powers are permitted to form, the validity of the Non-Proliferation Treaty (NPT) is threatened. The NPT has served as a global check against an exponential increase in nuclear weapon states. However, even if only one or two nations are permitted to ignore the requirements of this agreement, a domino effect may take place, with other signatories of the treaty rejecting the regulations they had previously agreed to, dramatically increasing the number of countries in possession of a nuclear arsenal. While it could be argued that such an increase would stabilize the international arena through a means of deterrence, there is an even greater likelihood that this spread of nuclear weapons could lead to possession of these weapons by terrorist groups, accidental launch, nuclear accidents, etc. The risks outweigh the potential benefits in this scenario, for all nations, which is why the U.S. must make the maintenance of the NPT a global priority.

Security Privatization

The privatization of warfare is a major future contingency of interest related to defense and security. Since the Treaty of Westphalia ended the 30 Years War in 1648, the nation-state has been the primary actor in the international system. With the rise of nationalism in the subsequent centuries, the state has come to possess a monopoly on the legitimate use of force. Before the modern international system, monarchs often contracted out the defense of their kingdoms to foreign mercenaries. Unlike today, the inhabitants of a country were not responsible for the common defense. Given current trends however, states could be moving towards outsourcing greater portions of their defense to private companies.

Since the end of the Cold War, many third world countries have lost the strategic importance they once held in the eyes of the super powers. Along with the American experience in Somalia in 1993, this has made western governments loath to get directly involved in the domestic or regional disputes that they used to influence. These events have allowed for a niche in the market that various security companies have exploited. In the past several years we have seen the use of developing countries hiring private security companies to defend their interests. The best example of this was the South African company Executive Outcomes and its employment by the governments of Angola and Sierra Leone during the 1990s to crush rebel movements in those countries.

Another aspect of the privatization of warfare is shown by the logistical responsibilities outsourced by developed countries. In an attempt to cut costs in the Iraqi and Afghani theatres, the United States government has shifted many duties that were formerly done by soldiers to private companies. KBR, a subsidiary of Halliburton, is the most obvious example of this.

U.S. defense and security is inextricably linked to the peace and stability of other regions of the world and this will become increasingly so in this century. As conflict spreads, trade is also disrupted, adding to the chances of intervention by large world powers. The privatization of security adds to the proliferation of conflict throughout the world because of the lack of restraint on the combatant actors.

Less political pressure to avoid casualties and conflict

As private companies gain a greater share of the responsibility for waging war, they will inevitably share proportionally in the number of casualties. When a private company sustains dead or wounded, the public does not see these casualties as a tragedy equal to when the country's soldiers are killed. As a state contracts out more aspects of its defense to the private sector, the chance of it losing one of its own soldiers in hostile action declines proportionally to the risk assumed by the private sector. The public has a much higher tolerance for deaths of private contractors than for fatalities among its own soldiers. As the public outcry against soldiers' deaths diminishes, the restrain on politicians to take a country to war loosens. Countries will find it easier to go to war, and stay at war, because casualties will be relatively lower. There will be less of political cost at resorting to armed conflict to solve international disputes with both national and transnational opponents. This will, of course, hurt the chances for diplomacy and greatly increase the number of armed conflicts around the world. As with most contemporary conflicts, the greatest harm will come to civilians of the conflict's host country. In the long run, more national soldiers will become casualties although the perception may be the opposite. One of Emanuel Kant's strongest arguments for a democratic society is that when a government is beholden to the people for its continued power, the ones who will bear the greatest burden of war also have a say in the leaders who push for the conflict. This acts as a check on leaders who would otherwise launch the country into an unnecessary military adventure. The privatization of war negates this theory.

Depletion of the ranks

A major issue stemming from this FCI is the depletion of the ranks of western militaries' special operations forces. As the number the private security and mercenary companies grows, more and more highly trained soldiers will be lured away from their national militaries with the promise of higher pay and more off time. In effect, national defense budgets would serve to subsidize the training for these private companies' best employees. We can already see the beginning of this with many American and British special operations soldiers retiring from the military in order to work for security companies such as Blackwater USA. With repeated hazardous deployments, low pay relative to what their skill set could earn in the private sector, and very little time with their families, special operations soldiers can be lured away from the military by private security companies.

Human Rights

The ramifications of this trend are not only political but legal as well. Private militaries are dangerous because of the awkward legal status they hold. If a member of one of these groups commits a war crime, they are not subject to the Uniform Code of Military Justice (UCMJ) like soldiers. The question of whether a private contractor should be accountable to the laws of the country in which he is operating, or the laws of his home country, is a difficult one. This question is complicated further if his defense organization is a multinational corporation. Who is it beholden to? Does it have any responsibilities beyond making a profit for its shareholders? Milton Freidman would argue the negative. American officers are taught from day one that they serve something greater than themselves, and certainly something greater than a bottom line profit. They are subject to the laws

codified in the UCMJ and are held accountable as such. A world in which soldiers fight for dollar signs rather than ideals put forth in a constitution would not be pleasant.

Landmines

The issue of landmines is one on which the U.S. government will have to engage the rest of the world. Because the main interest of private security companies is the bottom line profit, they will be tempted to use those tools which maximize efficiency in their particular line of work. In this case (the line of work being war), companies will use the most effective killing weapons, even the most indiscriminate. One example of an anti-personnel and anti-armor weapon that could be used is the landmine. As of February 21, 2007, 153 countries had ratified the ban on landmines.[5] The U.S., which is not a signatory, would be foolish to let such an obvious expression of international consensus be subverted by the will of profit seeking security corporations. The U.S. government will need to actively engage the rest of the world in order to regulate the actions of these companies and prevent them from deploying landmines in conflict zones.

Conclusion

The privatization of various aspects of defense is a current trend that is likely to continue well into the future. The main driver of this trend is the financial profits that come with war, particularly in its modern form. A greater tendency for leaders to resort to armed confrontation and a higher exodus from the military by highly trained soldiers are two critical issues that policy makers will have to deal with.

Artic Sea Lanes

The issue of melting artic sea ice is one in which the U.S. government will have to engage the rest of the world, particularly as it applies to opening up new sea lanes in the Artic Circle. In order to take advantage of the full range of possible trade benefits, as well as avoid conflict as a result of this huge environmental change, the U.S. government will have to actively engage other nations constructively with mutual benefit.

The opening of sea lanes and the increased access to natural resources may well lead to disputes between the United States and the other Arctic nations: Canada, Russia, Norway, and Denmark. Already there are tensions among these countries concerning sovereignty issues. The need for an international regime to monitor and police international activity in the Artic will gather momentum and the State Department (in consultation with all other affected departments) will need to have policy recommendations ready for the inevitable international conference(s) called to regulate the issue. The current United Nations Conference on the Law of the Sea rules that apply will likely have to be renegotiated; again, various U.S. departments will have to cooperate, working across sectors, agencies, and departments, to produce a coherent response to the issue. Barring progress and agreement on such regulatory regimes, the Defense Department will need to consider its position on the deployment of forces to protect U.S. vital interests in the region.

Avoiding confrontation in the political, military, and economic spheres will require the U.S. government to practice active engagement with the rest of the world, particularly those which border the Artic Ocean.

[5] http://www.icbl.org/treaty

Critical Responses

Historical
There is no clear historical analogy to climate change. The economic costs are too high, and the eventual effects of action or inaction too distant. Although the U.S. experience with sulfur dioxide emissions under the Clean Air Act and the EU experience with the Emission Trading Scheme under Kyoto are each analogous, they are very limited guides.

Recommended
1. The U.S. policy response to climate change should be built on four pillars:

1. *Research* into the science of climate change. It is essential to continue to improve our scientific understanding of the climate and of our effects on it. Continuing research should monitor the effects of climate change, narrow the uncertainties associated with key questions, such as temperature sensitivity, improve local granularity of future climate predications, and focus on understanding the positive and negative feedback effects of climate change.

2. *Mitigation* of the worst effects by reducing net greenhouse gas emissions (either through decreasing the emissions themselves or changing land uses to absorb more carbon dioxide). Various incentive and regulatory approaches may contribute to mitigation, but the most important policy response will be reflecting the *social* cost of carbon in its *economic* cost, for example through carbon taxes or cap and trade regimes.

3. *Adaptation* to the unavoidable consequences of climate change, both from greenhouse gases already emitted and those certain to be emitted in the future. This may include addressing weaknesses in public health system, improving sea and water defenses or moving coastal populations, changing crop rotations, and managing political conflict. Developing countries are both naturally and socially more susceptible to the most harmful effects of climate change, and they have fewer resources to address their vulnerabilities, so they will need assistance.[vi]

4. *Geo-engineering* to counter rapid, catastrophic climate change, if necessary. As insurance against the most severe dangers, it may be worth examining measures such as the artificial reflection of sunlight to counteract the climate forcing of greenhouse gases, or the capture and sequestration of atmospheric greenhouse gases. Such technological solution would be inherently dangerous, but they should be carefully researched given the danger of massive positive feedbacks in the climate system.[vii]

Each of these pillars is complex, politically difficult, and expensive. None can be achieved in a single bill, or a single congress. Moreover, in a democracy, the massive changes needed to address climate change should not be undertaken without a vigorous public debate. The 110th Congress should prepare institutionally to address the challenge of climate change and set modest goals for substantive achievements.

2. The U.S. policy response to nuclear proliferation threat should involve:

Enforcing Consequences for Withdrawal from NPT

The U.S. must make clear to nations that they cannot simply withdraw from NPT and pursue nuclear weapons without consequence. In the case of Iran, its nuclear ambitions have led to condemnation from the majority of the international community involving heavy sanctions that have isolated the country and its people from the rest of the world. While Iran's leadership continues to pursue nuclear weapons in the face of many calls to stop, its people will begin to realize from their new isolation from the rest of the world that the leadership does not have their best interests in mind. These actions have the potential to lead to a bottom up approach to changing the Iranian government to a more moderate position, stepping away from the nuclear brink.

The U.S. needs to make the case of Iran the rule, not the exception, when considering consequences against nations seeking nuclear power. Following through with disciplinary action against rogue nations validates the sanctity of the NPT, stressing that it is not an agreement to be taken lightly. The U.S. cannot, however, take these actions alone. In order for consequences such as sanctions to be effective, the majority of the international community must be in agreement. Only with a strong coalition of supporting countries can disciplinary action be effective.

Providing Assurances of Defense to Allies

In addition to supporting consequences for withdrawal from the NPT, the U.S. must reassure nations that its nuclear umbrella via its alliance with the superpower is still intact. Concern that the U.S. will not uphold its pledges to defend its allies against nuclear attack with the threat of retaliation against aggressors has the potential to lead NPT signatories to believe that it is in their best interests to become a nuclear power themselves, thus losing the need for an outside umbrella to defend them.

The U.S. and other nuclear powers, such as the U.K. and Russia, must pledge their support of retaliation against nuclear attacks upon any of their allies. This assurance will further decrease the desire of non nuclear countries to pursue these weapons.

CLIP

110th Congress

Security Privatization:

- Initial legislation is passed restricting acceptable activities by private security firms;
- Initial legislation mandating public posting of annual reports and statements of compliance with U.S. standards is passed with required enforcement of the mandates a year following being signed into law;
- Ways and Means Committees in Congress reach agreement and pass legislation increasing taxes on private security firms;
- Legislation passed mandating private security firms to be licensed by the Department of Commerce, to be enacted two years after passage into law;
- Mandatory COLA military pay funding bill and Member pay raise contingent on Military Appropriations passage legislation is passed and signed into law;

Climate Change:
First, the Congress should clarify the responsibilities of the multiple committees vying for jurisdiction over climate change. As described above, the challenges associated with climate change will touch upon almost every corner of government operations, but there must be a permanent and adequately resourced committee responsible for monitoring climate change and representing the Congress. Then, the following substantive actions should be undertaken:

- Research. Continue to investigate the politicization of scientific findings by the executive. Fully fund climate research, especially earth observation satellites now scheduled for budget cuts as NASA pursues symbolic manned missions.[viii]
- Mitigation. It is unlikely that any progress can be made on applying a cost to carbon in this Congress. Through committee hearings and mandates or requests for studies from the Congressional Budget Office, Congressional Research Service, and the Government Accountability Office, the Congress can signal that a carbon cost is coming, energy plants built now will not be exempted, and trade policy will reflect the cost of carbon (through, for example, border tax adjustments). Consider global warming in pending farm and transportation legislations. At the same time, Congress could request "friendly" independent think tanks such as Center for American Progress for the Democrats and American Enterprise Institute for the Republicans to undertake studies on compensating U.S. constituencies likely to be harmed by mitigation efforts, like coal communities.
- Adaptation. Pay in full U.S. arrears to the Global Environment Facility. Make generous donations to the Least Developed Countries Fund and the Special Climate Change Fund. Support efforts like New York City's Plan 2030 to plan for climate change. Mandate the Director of National Intelligence to prepare a National Intelligence Estimate on the security implications of climate change.
- Geo-engineering. Mandate that the National Academy of Sciences report on a research agenda for geo-engineering.

Nuclear Proliferation:

- Continues to support the executive in its decision to continue punishing Iran by way of sanctions and international condemnation due to its pursuit of nuclear weapons.
- Works more closely with the executive
- Authorizes funding to ensure the continued viability and "usability" of U.S. nuclear arsenal, to reassure allies that their nuclear umbrella is still in tact and feasible.
- Authorizes funding and continues to support the proposed nuclear forensics program, which increases the accountability of nuclear powers should a nuclear attack from a non state actor be made against the U.S. or any of its allies.

Immediate Stand-Alone Payoffs:

- The international community sees a united front from the U.S. in its determination to support and enforce the NPT.
- The U.S.'s nuclear deterrent capability remains viable.
- Nuclear forensic program deters rogue nations from giving their nuclear technology to non-state actors since there is a threat that they will be held accountable for the technology's use (including the threat of nuclear retaliation).

Long Term Contingent Payoffs:

- Signatories of the NPT uphold their commitments and join the U.S. in enforcing nuclear accountability.
- Allies feel secure in U.S. support and thus do not seek to create a nuclear deterrent of their own.

111th Congress

Security Privatization:

- Secretary of Commerce shall report on progress of licensing and annual reporting to Congress;
- Oversight and Investigations Committees to the House Science, State, Commerce, Justice and Senate Commerce, Science and Transportation shall hold hearings and review implementation of this legislation, and the first annual reports filed by firms for possible revision and modification;
- House and Senate Armed Services Committees shall review outcome of new legislation regarding service members' pay and benefits and its effect if any on recruitment and retention rates;
- Secretary of State shall indicate U.S. commitment to restricting private security firms in conflict;

Climate Change:

- *Research.* Fund research in preparation for Intergovernmental Panel on Climate Change (IPCC) 5.
- *Mitigation.* Enact carbon cost, ideally with an automatic inflator. Participate actively in preparations for Kyoto II negotiations.
- *Adaptation.* Assess activities of international institutions funded in 110th Congress. Instruct executive agencies to include adaptation planning in all activities. This would include, for example, road and infrastructure projects in the US and all foreign assistance.
- *Geo-engineering.* Fund geo-engineering agenda proposed by National Academy of Sciences (NAS).

Nuclear Proliferation:

- Monitors U.S. nuclear technology development, allocates sufficient budget to continue research and development

112th Congress

Security Privatization:

- House and Senate Oversight and Investigations Committees for the Department of Commerce shall review the number of firms entering the private security market to determine if the new measures have succeeded in reducing the incentives to enter that field of work;

- The Committees shall also review violations of restrictions on firms engaging in conflict areas to evaluate efficacy of the policies and recommending modifications as necessary.

Climate Change:

- *Research.* Fund research in preparation for IPCC 5.
- *Mitigation.* Monitor effects of carbon cost. Provide financial or regulatory support to renewable technologies, as necessary.
- *Geo-engineering.* Begin to consider how a decision to deploy inherently risky geo-engineering technology would be made.

113th Congress

Climate Change:

- *Research.* Fund participation in IPCC 5.
- *Mitigation.* Participate in Kyoto II negotiations.

114th Congress

Climate Change:

- *Mitigation.* Adopt Kyoto II.

International Timeline for Security Privatization:

Next Year

- Resolution passed condemning use of private militaries and establishing commission to review Geneva Conventions;
- Delegates are nominated and named to Commission;

Next 5 years

- Review of Geneva Conventions commences;
- Report completed and recommendations presented for review, modification and final approval;
- The Commission researches and reports on findings regarding the connection of private militaries and the proliferation and extension of conflicts;

5-10 years

- Adaptations made to Geneva Conventions;
- Ratified by all Members to the Convention;
- International Criminal Court is prepared to try countries for violations of these new rules.
- United Nations General Assembly reviews findings of the Commission and shall pass resolutions as needed to modify international standards in response.

APPENDIX A: Review of Identified FCIs

Fall 2006

Global warming, abrupt climate change
Disruption of maritime commons
Nuclear proliferation
Global pandemics intensified by multi-drug resistance
Islamic population in European states reaches tipping point
The internet and mobile phones become widely accessible in developing countries
Transnational corporations become more powerful than governments
Traditional War becomes obsolete → Onset of new age of war
Convergence of Nano-Info-Bio-Cogno Technologies
The onset of Neurotechnology
Life expectancy reaches 100 years
Widespread adoption of alternative energy
Viable human clone
First contact with extraterrestrial life
Weaponization of space
Governments gain ability to track all citizens/pervasive domestic surveillance
Large-scale biological/chemical attack/outbreak
The End of NATO
Genomic testing becomes commonplace

Spring 2006

China and India Emerge as Global Superpowers
Global Warming Causes Drastic Climate
Pervasive Computing Redefines Human Activity
America Ages, Stops Senescing
Nuclear/Biological/Chemical (NBC)
Iran Becomes a Regional
Nuclear Fusion Becomes a Viable Source of Energy
US Credit Implodes

Fall 2005

Global Pandemics Intensified by Multi-Drug Resistance
Life Expectancy Reaches 100 Years
Humans Attain Ability to Forecast and Manipulate Long-term Weather Patterns
Converging Sciences Yield Thorough Understanding of Brain Operations
Biological Basis of the "Human Soul" is Discovered
Governments Attain the Ability to Track All Citizens
The End of Energy Scarcity
The End of Water Scarcity
US Loses Control over Internet
Oil Production Reaches its Peak Prematurely

Spring 2005

Appendix I: Economics FCIs
The Future Contingency of the Loss of Dollar Dominance
Obesity: A Weighty Future Contingency of Interest
Appendix II: Science and Technology FCIs

Climate Change
The End of the Antibiotic Era
Emergent Applicants of Quantum Physics
Appendix III: Security FCIs
Superpowers Old and New
Suicide Attacks Become Commonplace
The Nanotechnology Revolution
The Proliferation of Failed States
An Energy Revolution
A Revolution in Military Affairs
The Weaponization of Space
Regional Balance of Power: Nuclear North Korea or Iran
Bio-Terrorism
Governing the Globe's Nuclear Arms Race
Appendix IV: Governance FCIs
AIDS
Increased Domestic Surveillance
Colonization of SpaceWaging
Private War and Winning Public Peace

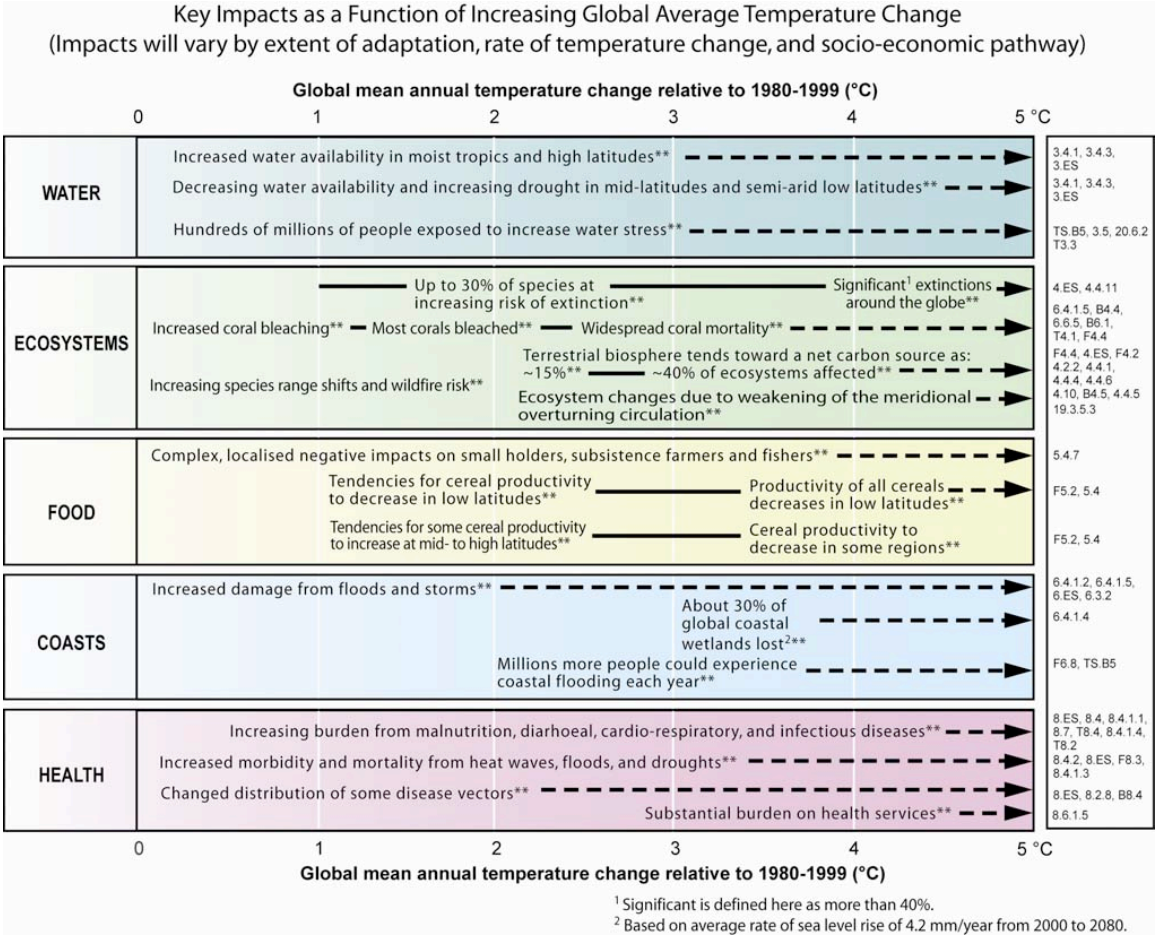
Fall 2004
Appendix I: Economics FCIs
Global Warming: A Creeping Future Contingency of Economic Interest
Structural and Theoretical Shifts in the Global Economy
The Elderly Hold Health Care Hostage – A National Interest Contingency
A Safe and Clean Method of Destroying Spent Nuclear Fuel.
Appendix II: Governance FCIs
Will Russia Survive?
Nuclear Terrorist Attacks: Implications for Governance
The Global Grid.
A Standing Army for the EU: Implications for US Global Leadership
Appendix III: Science & Technology FCIs
Discovery of extraterrestrial life, past or present
Confirmation of a Grand Unified Theory (GUT) in physics
Computing power continues to rise exponentially
Discovery of a large asteroid on a collision course with Earth
Space exploration and utilization leads to the successful mining of resources from near-Earth objects (NEOs)
A room-temperature superconductor is discovered
Nanotechnology becomes the "industrial revolution" of the 21st Century
Alternative energy sources, including wind, solar, and hydrogen power, become standard
Environmental degradation continues around the globe, leading up to the potential for a major catastrophe
Medical advances redefine human life
Appendix IV: Security FCIs
Cyberstrikes: A Future Contingency of Interest
Space Arms Race.
The Rise of Transnational Criminal Groups—A Threat to International Security
The Problems and Prospects of Private Military Corporations

APPENDIX B: Review of CLIP Timelines

Pillar	111th Congress	112th Congress	113th Congress	114th Congress
Engaging the American People	- Reauthorization and appropriations for the Higher Education Act -Passage into law of the America Competes Act -Planning and introducing of an initiative entitled the "Pro-Education Initiative I" -Reform of No Child Left Behind	-Pass appropriations bills for Higher Education Act, America Competes Act and No Child Left Behind -Congressional and Executive analysis of the impact of the "Pro-Education Initiative;" -Re-launch as "Pro-Education Initiative II" with amendments based upon the analysis	-Begin early stage implementation of amended initiatives of Higher Education Act, America Competes Act, and No Child Left Behind -Continue implementation and evaluation of "Pro-Education Initiative II"	-Congressional review of best practices through the "What Works Clearinghouse" - Development of similar reporting channels to garner feedback on successes and failures - Congressional assessment of "Pro-Education II" with analytical report on Initiative's successes and failures -Hearings on need for reform or modification of program.
Engaging the Federal Government	-Review current forward engagement-related activities -Initiate lobbying campaign -Encourage "futurist" fellows"	-Engage Congressional newspapers -Provide funds for Congressional Exchange Initiative -Establish Congressional curriculum -Cultivate Congressional "issue champions" -Matrix FE committee members to conference committees	-Authorize participation in an inter-parliamentary assembly -Implement Congressional Exchange Initiative -Mandate Congressional FE analysis curriculum -Make non-binding recommendations to other committees -Institute Fuerth Award	-Mandate annual joint-session of Congress with speaker on FE issue -Provide funds to CRS to employ a number of futurist scholars -Provide funds for Congressional staff to meet with the staff of other parliaments -Begin televised, joint hearings with legislators from other countries

Pillar	111th Congress	112th Congress	113th Congress	114th Congress
Engaging the Private Sector	Section A: Government introduction to energy sector initiatives -Employ QDR-similar process	Section A: Government introduction to energy sector initiatives -Advanced Technology Program -Technically proficient human capital within the federal government -Funding -Public Relations -Management	Section B: Beginning to engage the private sector -Subsidies of private research through tax incentives -Federal government endowed research positions at educational institutions -Retain research capabilities centered in the U.S. -Ease regulatory regimes	*Section C: Specific private sector energy industry programs* -Establish competitions -Transition the competition by-product technologies -Adopt these new technologies in limited applications
Engaging the World	-Fund research in preparation of Intergovernmental Panel on Climate Change (IPCC) session 5; -Enact Carbon Cost; -Participate in Kyoto II negotiations; -Initial Legislation passes both Houses regarding regulation and taxation of private security firms; -Legislation passes regarding Mandatory funding for COLA raises for military personnel and Member Pay Raise contingent upon Military Appropriations bills passage and signed into law; -Authorization of funding for study on current nuclear arsenal viability, and nuclear forensics program;	-Continue research; -Monitor effects of carbon cost. Provide financial or regulatory support to renewable technologies, as necessary; -Begin study on how best to deploy inherently risky geo-engineering technology; -Congressional oversight committees shall review progress in regulation of security companies; -House and Senate Armed Services Committees shall review outcome of new legislation regarding service members' pay and benefits and its effect if any on recruitment and retention rates; -Monitors U.S. nuclear Technology development, funds continued research and development	-Fund participation in IPCC 5; -Participate in Kyoto II negotiations; -Congressional oversight committees shall review number of private security firms that are licensed to determine if incentives have been reduced; -Department of Commerce shall investigate violations of guidelines for private security engagement in conflict areas and report to Congress;	-Adopt Kyoto II.

APPENDIX C: Key Impacts of Climate Change[6]



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