

Sherry * Consulting

Climate Change and
National Security:
A field map and analysis of
funding opportunities



PLANET HERITAGE
FOUNDATION, INC.

Prepared on behalf of the
Planet Heritage Foundation
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Executive Summary

This report was commissioned by the Planet Heritage Foundation, founded in 2008 by Addison Fischer and Cindy Mercer. The Planet Heritage Foundation focuses on climate change, conservation, oceans and species preservation, and pursues projects that address the interconnectedness of these issues. Planet Heritage commissioned this report to understand better the intersection of climate change and national security issues and to share with the field an assessment of funding needs, opportunities and challenges in this work. As a new funder in the field, Planet Heritage invested in this project to learn more about funding opportunities and to share its research with others who share common interests.

The key findings from this report are:

- Climate security is becoming an increasingly visible topic in the field of climate change, but different constituencies focus on different definitions and approaches. It can mean assessing the long-term domestic and international military and national security implications and risks from global warming, how our national security interests will be enhanced by reduced dependence on foreign oil, or the broad intersection of climate, security, development, population, environment and conflict.
- Although the number of grants for combating climate change has increased dramatically in recent years, there are a relatively small number of large funders (namely, Rockefeller Brothers Fund, the Pew Charitable Trusts, and to a lesser extent the Hewlett Foundation and Energy Foundation) and not yet a great deal of money being invested in the area of climate security. There are some well-established as well as emerging key players in funding, research, advocacy, and policy. This report describes some of the activities of a number of U.S. and international organizations.
- Opportunities for partnership are great, and a number of prominent organizations would find funding very useful. Potential strategies range from supporting domestic advocacy, to track II diplomacy, to practical dialogue between practitioners and researchers, to targeted policy advocacy or analysis that can fill some important gaps in the work done to date.
- Much of the attention in the United States on climate and energy legislation has been focused on the prospective passage of a comprehensive climate bill or sector specific legislation on clean energy. Most funders expect considerably greater prospects for passage of sector specific clean energy legislation than a comprehensive cap and trade bill.
- A well-established community of U.S. and international scholars has written extensively about these issues, and many will be convening in Norway in June 2010 for a four-day conference. Much of the recent literature focuses on how to improve prospects for international cooperation in the lead up to and aftermath of Copenhagen and why further analysis of risks, policy planning, and strategic planning need to integrate with climate adaptation policies.
- Considerable government money, both in Europe and through the U.S. Department of Defense's \$7 million Minerva project and the U.S. intelligence community, is providing for further research.
- Although a wealth of research has been done, there is still some limited need for up to date research to provide policymakers with high confidence in the analysis of threats and opportunities to guide strategic investments.
- The missing link appears to be efforts to translate research and analysis to the policy sphere and the public. The consensus among funders I spoke with is that we need fewer scholarly research reports and conferences amongst academic experts and more efforts to make this research available and comprehensible to policymakers, spokespeople on this issue, military leaders, the broader security community and the general public. It is worth exploring whether there is a role for foundations to advocate for further research within the Department of Defense (DOD), to fund concrete applied policy analysis, or to identify what universities or other interdisciplinary centers may have such practical work underway that could be useful to policy makers.
- The work of CNA and CNAS as well as Senators' Clinton and Warner amendment of the 2008 Defense Authorization Act to require the QDR to include consideration of climate change has helped galvanize the DOD to become more proactive on this issue. The challenge in the future is how to engage the military in a deeper way to expand their influence in senior government circles and in bilateral and multilateral discussions.
- Three emerging themes seem to resonate with the public: our national security is threatened by dependence on foreign oil, we can create jobs through clean energy, and our country needs to address climate issues more directly in order to compete with China in the global economic competitive landscape. The Pew Charitable Trusts, Rockefeller Brothers Fund, the Bipartisan Policy Center, and others have been working on how to engage the military as a messenger on the first message.

- There are highly divergent views of organizations engaging with the military on climate issues. Not everyone believes that the message conveyed is sufficiently nuanced, and many funders and experts are fearful of the backlash that may come from making the issue overtly partisan or political. Some policy experts are critical of linking instability to terrorism or national security threats.
- E3G, Chatham House and GLOBE are regularly mentioned as organizations that help broker dialogue on climate security and military issues globally. A possible energy funding strategy could be to encourage more dialogue between international and U.S. military leaders regarding this topic.
- The current timing is not right for track two diplomacy with China regarding climate security. But with the right players and at the right time, such exchanges might be of value.
- Governments are funding a lot of work on low carbon economies and adaptation but very little on building constituencies in certain key countries like India and those in the Eastern bloc.
- There is also a need to focus on long-term capacity building rather than short-term wins.
- There is often a gulf between civilian and environmental groups and the military on climate issues. Military leaders are often uncomfortable talking about climate issues, though less so on energy issues. There is often miscommunication if not mistrust between military and civilians on this point. Some environmental groups are very reluctant to, in their view, “militarize” climate change. Many military members are also reluctant to become too political.

The experts in the field continue to focus on the following key trends:

- What we learned post-Copenhagen was that there was insufficient track two work done to set the stage for meaningful negotiations. Distrust was high among negotiators because the groundwork had not been laid to understand and vet ideas, translate concerns, and provide a forum for better dialogue. This experience suggests the critical importance of this work going forward.
 - There is little institutional knowledge about climate issues inside most high-level government agencies. It is often seen as a less immediately pressing foreign policy priority.
 - In the wake of Climate Gate, there will be a need for governments to reconfirm the basic climate science and to rebuild credibility.
 - There continues to be a need for core funding to build the capacity of serious players who can bring together coalitions from different sectors to make climate a higher priority. Not many players are conversant across climate and security, much less all the connected dimensions.
- Recommendations
- There is currently very little funding on the climate security issue, so there is plenty of room for greater funding to leverage the work of those organizations that do exist in the space. There also may be a need to develop new strategies and support new coalitions.
 - There is an opportunity for policy-oriented NGOs to speak up domestically and internationally to raise greater awareness of the link between climate change and national security.
 - Even modest advocacy funding could be significantly leveraged to achieve high impact policy outcomes.
 - As the military and security community have become more deeply engaged in this issue there are opportunities for philanthropy and the NGO community to work more closely with them going forward on areas of mutual interest.
 - Interested funders should convene to discuss what is working and what additional measures should be taken to increase the impact of their funding.

I. Introduction & Summary

This report was commissioned by the Planet Heritage Foundation, founded in 2009 by Addison Fischer and Cindy Mercer. The Planet Heritage Foundation focuses on climate change, conservation, oceans and species preservation, and pursues projects that address the interconnectedness of these issues. Planet Heritage commissioned this report to understand better the intersection of climate change and national security issues and to share with the field an assessment of funding needs, opportunities and challenges in this work.

Climate security is becoming an increasingly visible topic in the field of climate change. In the last few months, articles have appeared in *The New York Times*, the *National Journal*, and elsewhere, linking climate change to national security. The latest Quadrennial Defense Review, released in mid February, devoted four pages to climate and energy; the Homeland Security Department identified climate change and dependence on fossil fuels as security risks; and the CIA reportedly opened a center dedicated solely to climate change. Recently the Pew Project on National Security, Energy and Climate released “Climate Patriots: A Military Perspective on Energy, Climate Change and American National Security.”¹ This five-minute video on the links between climate change and national security features former Senator John Warner (R-VA), two retired Admirals and a former Army Captain. In April of 2010 Pew released a new report entitled “Reenergizing America’s Defense,”² which describes the initiatives underway within the Department of Defense to reduce the security threats of dependence on fossil fuels and climate change. The issue has clearly gained currency and visibility.

The term “climate security” is one that is increasingly in parlance, but it means different things to different constituencies. To some, it involves how to assess the long-term domestic and international military and national security implications and risks from global warming. To others, the focus is more on how our national security interests will be enhanced by reduced dependence on foreign oil. To yet others, it speaks to the broad intersection of climate, security, development, population, environment and conflict. Humanitarian organizations are more focused on the implications of climate change for human well being, while many others are interested in how climate change will affect country level security issues. Moreover, some experts view any focus on climate security as too narrow in not embracing the larger concept of “natural security.” However, the term has generally come to be used in the context of exploring the national and military security risks and implications of climate change.

1. <http://www.pewclimatesecurity.org/news/debut-of-climate-patriots-video/>.

See also coverage by *The New York Times* blog: <http://greeninc.blogs.nytimes.com/2010/02/18/of-national-security-and-climate-change/>.

2. <http://www.pewclimatesecurity.org/reenergizing-americas-defense/>

The different uses of terminology reflect different objectives of players in the foundation and nonprofit sector when they look at the intersection of climate and national security. Some advocacy groups view the security angle as a more compelling argument for passing comprehensive climate change legislation than one that focuses on the needs of future generations. Others fear oversimplification of the message that may lead to a backlash within the military or to certain messengers being discounted in more politically conservative circles. They are concerned particularly in the wake of Climate Gate that oversimplification of the issues or overstatement of linkages will lead to the problem not being taken seriously in some quarters. Some experts in the environmental movement are suspicious of the role of the military in this debate, while many in military circles are uncomfortable with being too public in discussions of climate change. Not surprisingly, there is tension between those who want to use the national security message for short-term political outcomes and those who are concerned about making arguments that may be more nuanced over the long-term.

Framing climate change as a national security issue can carry risks. For example, the environmental community advocating for domestic energy production to reduce dependence on foreign oil could inadvertently promote environmentally damaging practices such as offshore or arctic drilling. Directing national security attention toward domestic energy resources may also discourage negotiation and encourage more aggressive foreign relations positions, in particular with Iran. Such risks can be managed by thoughtful and balanced approaches by both foundations and nonprofit organizations.

Several things are clear from this mapping of the field. First, there are a relatively small number of funders and organizations that are leading players in the space. Second, there is not yet a great deal of money being invested here. Third, opportunities for partnership are great. Fourth, additional funding would be very useful to some leading organizations. Fifth, there are a variety of strategies that could be pursued on both the domestic and international front. All of these topics are described in more length in the report.

This report starts with an overview of the field and trends in climate change funding and then funding at the intersection of climate and security. We review the major groups involved in this area, do a detailed review of the literature, identify some of the key strategies and their goals and risks, and end with some recommendations.

II. The U.S. Funding Landscape on Climate Change

Reliable estimates of the precise amount of climate change funding in the United States are difficult to secure with perfect accuracy. The Monitor Group is presently preparing materials which will track the key funding trends in various areas of climate change funding among ten major foundations. The Foundation Center has also commissioned a recent study, although some have criticized its methodology so the data cited below may not be fully accurate or reliable.

According to the Foundation Center, between 2000 and 2008, the numbers of grants for combating climate change doubled and the dollar commitment from foundations surveyed increased from less than \$100 million to more than \$900 million, according to a report by Steven Lawrence, Director of Research.³ However, a small number of very large funders still account for most of the support. The top 25 climate change funders provided more than 90 percent of the funding, led by the William and Flora Hewlett Foundation at over \$500 million. The remaining top foundations' giving ranged from about \$2.5 to about \$70 million. More than 50 funders provided at least \$1 million for climate change in 2008, up from just 19 foundations in 2000.

This report shows that “foundation funding targets all facets of the global climate crisis, from reducing global greenhouse gas emissions to studying the role of tropical rain forests in determining the global carbon balance to supporting a national commission on energy policy.” A number of grants have focused on resilience and adaptation to climate change. For example, the Rockefeller Foundation provided a \$5.4 million grant to study resilience strategies in selected cities in Asia. This effort reflects a multi-year commitment to focus on how communities most likely to be affected by climate change will build resilience.⁴

Other grants focus on adaptation strategies, such as a \$1 million grant to Resources for the Future, to explore how most of the anticipated harmful effects of climate change can be addressed through adaptation strategies. According to the Foundation Center study, about one in six U.S. foundation climate change grants focused on policy initiatives, with the total giving in 2008 to policy efforts in the range of \$112.2 million. These policy initiatives ranged from efforts to convene a summit on energy and global warming for Midwestern governors to a \$1 million grant by the Kresge Foundation to address climate policy in Southern states.

By far the largest recipient of climate change grants is ClimateWorks, established by the Hewlett, Packard and McKnight Foundations in 2008. ClimateWorks seeks to reduce greenhouse gas emissions in nations and economic sectors with the highest emissions in three general policy areas: energy efficiency standards, low carbon energy supply, and forest conservation and agriculture. It is both a grant recipient and a grantmaker. The focus of its grantmaking is supporting local in-country foundations such as the European Climate Foundation. ClimateWorks currently has twenty employees and works with regional best practices networks worldwide to seek reduction in carbon emissions on a sectoral level. They utilize a venue analysis, where they seek to inform policy makers who hold the key to critical decisions on carbon reduction strategies.

In another study in 2008, the Climate and Energy Funders Group found that the United States' \$244.5 million accounted for 72% of total global climate funding and only 0.9% of all U.S. grantmaking. The most common subject areas of climate funding are energy efficiency, renewables, state and regional policy (with a huge growth from 2006 to 2008), federal policy, and coal. Even with the dramatic increase in environmental philanthropic spending, opponents are still outspending these non-profits. Oil and gas industries have contributed \$834 million

3. Lawrence, Steven. “Climate Change: The U.S. Foundation Response.” Research Advisory. December 2009 Revised Edition. The Foundation Center. http://foundationcenter.org/gainknowledge/research/pdf/researchadvisory_climate.pdf

4. The Rockefeller Foundation focuses its climate change efforts within the “Developing Climate Change Resistance” Initiative on building resilience (adaptive capacity) in Asia and Africa and building new constituencies and funding networks to support domestic climate resilience policy in the U.S. One major project, the “Asian Cities Climate Change Resilience Network” (ACCCRN) has selected 10 Asian cities in Thailand, Vietnam, India and Indonesia to serve as models of adaptation for other cities around the world. Robert Buckley, James Nyoro, and Ashvin Dayal are the Managing Directors of ACCCRN. The ACCRN Mission is “to catalyze attention, funding, and action on building climate change resilience for poor and vulnerable people by creating robust models and methodologies for assessing and addressing risk through active engagement and analysis of various cities.” ACCRN is currently in phase two of a four phase roll-out plan, focusing on capacity building in cities before implementing resilience building projects later this year. Phase four will scale up the organization's efforts to other cities. Total investment of about \$2.2 million so far has gone to the Kenya Agricultural Research Institute, Michigan State University, the Food Agriculture and Natural Resources Policy Analysis Network, the Thailand Environment Foundation, and the International Red Cross Foundation/Red Crescent Center on Climate Change and Disaster Preparedness. In Africa, efforts have been largely in the agricultural sector, preparing farmers to handle increased droughts, floods, and drops in yield. The Rockefeller Foundation has partnered with Oxfam International, Swiss Re, and leading agricultural research development associations in Africa. The Foundation has also produced a short film called “10 Hot Cities” and a high-quality online photo essay, produced with the American Museum of Natural History, showing images of the impacts of climate change around the world in combination with detailed descriptions of the impacts and solutions: <http://www.rockefellerfoundation.org/impacts-adaptations/> <http://www.cleanenergyworks.us>

over the past 10 years, and opponent spending totaled \$435 million in 2008, which mostly went to lobbying and influencing public policy.

Other funders are entering the picture. George Soros has committed a substantial investment to a new initiative headed by Tom Heller, the Climate Policy Initiative, which is designed to advise on international issues and the architecture of national regulatory systems. They are at a very early stage but will be a substantial player. The Alliance for Climate Protection was founded in 2006 by Al Gore, Nobel Laureate and former Vice President of the United States. With more than 5,000,000 members worldwide, the Alliance is a nonprofit, non-partisan organization that is committed to educating the global community about the urgency of implementing comprehensive solutions to the climate crisis.

The Connect U.S. Fund is a foundation-NGO initiative that supports more responsible U.S. global leadership through grantmaking, policy advocacy and community-building. One of their four core areas focuses on promoting an international development perspective in the U.S. policy debate on climate change – particularly as divisions between developed and developing countries have proven to be a key obstacle to a global deal on climate change.

Ambassador Nancy Soderberg became President of the Fund and Heather B. Hamilton assumed the position of Executive Director in July 2009. The Connect U.S. Fund was founded in 2004 and is based in Washington, D.C. The Connect U.S. Fund receives funding from the Hewlett Foundation, the Open Society Institute, the Ford Foundation, the Ploughshares Fund, the Rockefeller Brothers Fund, the Atlantic Philanthropies and the Charles Stewart Mott Foundation. The Tides Foundation manages the Connect U.S. Fund, and a council comprised of representatives from the above supporting foundations provide programmatic and policy advice to the Connect U.S. Fund.

In 2008-2009, this grant-making institution awarded \$280,000 total in grants under the category of “U.S. Leadership on International Climate Change Policy.” The grants were awarded to applicants through one of their two grant-making programs, the Global Security and Cooperation Initiative, which focuses on building NGO collaboration toward more effective advocacy. The other Connect U.S. Fund grant-making program, the Rapid Response fund, offers smaller grants of up to \$25,000 for unforeseen opportunities to influence the immediate policy debate. The Connect U.S. Fund also convenes leaders in the environment and development communities for meetings with policymakers and to build support for common advocacy goals.

In 2010-2011, grantmaking will focus on projects designed to promote a development perspective on climate change in the U.S. policy debate and build bridges between the development and environmental communities in support of an integrated approach. They will consider projects that tackle the question of how, in the context of a global financial crisis, the U.S. can help generate the resources necessary to address developing country concerns and bridge the gap between North and South that will be necessary for reaching an international agreement. This could include support for projects aimed at promoting robust U.S. engagement in the various international fora dealing with climate change – such as the UNFCCC, the Major Economies Forum (MEF), the G20 and the G8 – and efforts to build the political space necessary for the conclusion of a U.S. climate and energy policy that includes provisions for international climate finance and legitimate and effective mechanisms for the delivery of that finance.

III. U.S. Foundation Funding on Energy Security

The foundation community of late has paid considerable attention to the issue of energy security. The major funders in this space have been the Hewlett Foundation and the Energy Foundation, both of which have invested millions to work on issues relating to clean energy and energy security. The Hewlett Foundation is focusing a great deal of its attention on passage of clean energy legislation in the United States, either as part of a comprehensive cap and trade bill or through separate legislation targeted to less carbon dependent energy policies on a sectoral approach. The Energy Foundation focuses much of its work on domestic policy issues and funds key groups like the Bipartisan Policy Center (see description on p.12). The Energy Foundation funds both 501(c)3 work as well as 501(c)4 work. Among the initiatives that they support are Operation Free, which takes Iraq War veterans on the road to talk about the importance of reducing dependence on foreign oil (see p.18 for more details). E3G has received support from the Energy Foundation for its work on climate and energy. ClimateWorks, which receives Hewlett and Energy Foundation funding, supports another organization, Project Catalyst, which provides analysis to political negotiations.

While the terms are used differently by different players, it is important to distinguish energy security and climate security. Energy security typically refers to reducing dependence on foreign oil by securing sufficient domestic energy resources. Climate security refers to the impacts of climate change on

national security and identifies strategies to reduce these security risks, including mitigating climate change by achieving energy security. It should be noted, however, that the environmental community tends to consider energy security to mean a domestic low-carbon energy economy robust with renewables whereas the security community frequently focuses more on domestic energy production, which could include clean coal, offshore drilling, etc.

While energy security and climate change are closely linked, for the purposes of this report, I have not undertaken a detailed analysis of all the funders and their strategies in the area of energy security. For a basic overview of the Hewlett and Energy Foundations efforts in these areas, see <http://www.hewlett.org/programs/environment-program/energy-and-climate> and <http://www.energyfoundation.org/>.

Also notable is Clean Energy Works⁵, a coalition of more than 60 grassroots organizations including faith leaders, labor organizations, veterans, environmental activists, sportsmen, farmers, business leaders, youth, community leaders, and other groups, representing more than 12 million Americans. Alliance for Climate Protection and Truman National Security Project, among others, are part of this coalition dedicated to “More jobs. Less pollution. Greater security.”

IV. U.S. Foundation Funding on Climate Security

There are relatively fewer funders who specifically identify climate security as an area of focus. In the United States, two of the most important initiatives are the Pew Project on National Security, Energy and Climate and the work of the Rockefeller Brothers Fund.

A. THE PEW PROJECT ON NATIONAL SECURITY, ENERGY AND CLIMATE

The Pew Charitable Trusts is a leading player in the field of climate change, energy and national security. Pew acts as both grantmaker and grant recipient. It has used its own resources to fund most of the projects it supports but also seeks funding partners as it looks to the future work needed. The philosophy of the Pew Charitable Trusts in this area is to take research into the public and policy domains through direct outreach to elected officials, town hall meetings and the like.

5. <http://www.cleanenergyworks.us>

6. <http://www.pewclimatesecurity.org>

7. <http://www.pewclimatesecurity.org/reenergizing-americas-defense/>

The Pew Project on National Security, Energy and Climate⁶ is an initiative of The Pew Environment Group that is dedicated to highlighting the critical linkages among national security, energy independence, the economy and climate change. The Pew Project brings together science and military experts to examine new strategies for combating climate change, protecting national security, increasing energy independence and preserving U.S. natural resources.

Pew’s initiative is designed to work with military and former senior national security experts like Senator John Warner to be messengers on the importance of addressing climate change. They have worked with the CNA Corporation as well as the Department of Defense (DOD) to try to get the message out that energy, climate and security issues are integrally connected. They are actively working with Senators Warner, Kerry and Nelson as well as focusing on the Quadrennial Defense Review.

In April 2010 Pew released a new report entitled “Reenergizing America’s Defense,”⁷ which describes the initiatives underway within the Department of Defense to reduce the security threats of dependence on fossil fuels and climate change. The report concludes that overall, most progress has been made in increasing energy efficiency at the facilities level. Specific actions the armed forces have taken include using solar power plants to power bases, building LEED certified housing on bases, upgrading HVAC systems, making tents more energy efficient, and developing alternative energy fuels to power jets and vehicles. The military is working with the Defense Advanced Research Projects Agency (DARPA) to develop and integrate these new alternative energy technologies.

The Pew Charitable Trusts is working with initiatives like Operation Free of the Truman Security Project (see p.20), which brings veterans out on speaking engagements in more conservative states, to veterans’ halls and other locations seeking to bring the message to the public and local press. They have also funded two videos, one two and a half minutes and another five minutes long, which seek to link the issues. Pew is also supporting Partnership for a Secure America (see p.20). Other funders like the Energy Foundation have adopted similar strategies. All of these strategies center on how to move a climate bill forward in this political climate and ensure that these spokespeople are viewed as credible among a small group of centrist Democratic and Republican decision makers who are key to the successful passage of a climate bill.

The Pew Project has received good coverage to date, and they are actively seeking partnerships with other funders. In the future, Pew is looking to continue outreach with the National Guard, the Coast Guard and others on the frontlines of the domestic response to national disasters. They will also be working with DOD on issues such as renewable energy, new technologies, alternative fuels and efficiency. Other areas of attention will be on reducing oil consumption and the security of the grid.

B. ROCKEFELLER BROTHERS FUND

The Rockefeller Brothers Fund has been helping to build the field of climate security. They began to show interest in the intersection of peace and security, energy security and climate change after 9/11. They have funded at length in the area of soft advocacy through support to CNA, CNAS, and E3G (see descriptions on pp. 11, 12, and 16), and Truman's Operation Free project. Their work in advocacy has picked up in the last several years, part of strategies similar to those used by the Bipartisan Policy Center and others to bring outside voices to the climate debate.

RBF has concentrated on convening experts in the foreign policy and climate change communities to focus on the solutions to the energy challenges that enhance sustainability, as well as security. Some of their grants, such as to CNAS, the Aspen Institute, and the Chicago Council on Global Affairs, are examples of this work. RBF believes that partly as a result of this work, there is now a community of foreign policy experts who understand how the twin issues of energy security and climate change are intimately related and who believe that one of the best things this country could do to reassert global leadership is to take a bold stance on climate.

V. The International Funding Landscape

My interviews included several conversations with European funders, who indicated that climate security was not a typical frame for most funders and “not at the top of the list” for most grantmakers. One key player is Zennstrom, who supports GLOBE's work in bringing those with expertise on security issues together with legislators. In addition, there has been considerable funding of research and academic analysis by a variety of foreign governments, as the extensive literature review shows. The British, German, Swedish and Danish governments in particular have funded considerable research in this area.

8. <http://www.envirosecurity.org/cctm/> Press release from the White House: <http://www.whitehouse.gov/the-press-office/president-obama-announces-more-key-administration-posts-121009>

VI. Key U.S. Think Tanks and Organizations on Energy and Climate Security

As noted above, there are a number of organizations working closely at the intersection of climate security, energy security and national security. The following is an overview of some of the most relevant and frequently mentioned.

American Security Project

<http://www.americansecurityproject.org/>

The American Security Project is a nonprofit, bipartisan public policy and research organization dedicated to fostering analysis and debate on a wide range of national security issues. Through polling and research, roundtables, speaking engagements, online events and other public outreach, ASP seeks to improve Americans' understanding of the security challenges facing the United States, to spur dialogue that fosters consensus, and to prescribe substantive, innovative solutions. Their projects include: A New National Security Strategy, Security in the Age of Terrorism, America's Defense Needs, and Public Attitudes on National Security. They have a number of publications on their website, in the form of reports, perspectives, and insights. James M. Ludes is the Executive Director, and John Kerry is on the ASP Board of Directors. Along with many of the other organizations identified below, they are associated with the Institute for Environmental Security's Climate Change and the Military Project.⁸

Bipartisan Policy Center (National Commission on Energy Policy)

<http://www.bipartisanpolicy.org/>

The Bipartisan Policy Center (BPC) is a nonprofit organization that was established in 2007 by former Senate Majority Leaders Howard Baker, Tom Daschle, Bob Dole and George Mitchell. Their advisory board also includes former Majority Leader Richard Gephardt. BPC is primarily funded by the Hewlett Foundation and itself provides support to other organizations as convener and intermediary.

BPC acts as an incubator for bipartisan policy proposals. The National Commission on Energy Policy (NCEP) focuses on climate change as one of BPC's eight main areas of research. NCEP's main goal is to enable energy policy reform by identifying and overcoming the barriers that have thwarted previous energy policy reforms. The Commission has been operational since 2002 and is composed of 20 experts on energy policy. In 2009 and 2010 the Commission plans to focus on oil security, climate change, and energy infrastructure adequacy and siting.

The Commission's major accomplishments include the incorporation of many recommendations in their 2004 paper, "Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges," into the Energy Policy Act of 2005, as well as the adoption of their recommendations to increase fuel economy standards in 2007. BPC's work has been widely cited in reputable sources including the Wall Street Journal, NYTimes, PBS, and the Washington Post.

NCEP currently has three main areas of study: workforce preparedness for future energy jobs ("green jobs"), regional climate change impacts and adaptation planning, and climate policy impacts on energy-intensive manufacturing. The Task Force on America's Future Energy Jobs has studied the preparedness of the American workforce training and education systems to manage adaptation to new low-carbon energy technologies. The Regional Impacts and Adaptation Project has produced papers detailing the economic impacts of climate change in the U.S., and specific studies of Texas, Florida, New Mexico, and North Carolina.

In June 2009 NCEP put out a climate policy paper titled "Forging the Climate Consensus: The Case for Action," delineating a proposal for a new national climate policy. The paper identified the six major points of contention on climate policy: cost-containment, harmonization of state and federal policy, international participation and competitiveness, offsets, allowance allocation and market oversight. Their recommendations for overcoming these barriers include setting a price collar on emission allowance prices (a price floor and a price ceiling to reduce the risk of volatility in allowance permit price), and less reliance on international offsets, encouraging state action on climate change but avoiding overlapping cap-and-trade programs.

BPC is led by Jason Grumet (jgrumet@bipartisanpolicy.org), the director of NCEP. Julie Anderson (janderson@bipartisanpolicy.org) is a Senior Vice President at the Bipartisan Policy Center. Previously, Ms. Anderson was Manager of the Climate Change Campaign for the Union of Concerned Scientists after being Special Assistant for Legislative Affairs handling energy and environment issues for President Clinton. Earlier, she had practiced environmental law and then served in several roles at the

Environmental Protection Agency, including Acting Associate Administrator for Congressional and Legislative Affairs.

The Brookings Institution

<http://www.brookings.edu>

Brookings is a nonprofit public policy organization that has done research on a broad range of public policy issues and is associated with the Institute for Environmental Security's Climate Change and the Military Project. The Energy Security Initiative at Brookings examines three key substantive aspects. From a strategic perspective, Brookings scholars focus on the geopolitics of energy around the world, security risks posed by vulnerabilities to key supplies transport routes and markets, the way energy demand drives national security decisions in countries such as China and India, and the opportunities and risks posed by the geopolitics of nuclear power and coal. From an economic perspective, they focus on the effect of supply disruptions and price spikes on the U.S. and world energy markets, shifts in global wealth, the impact of open and sustainable economic systems on energy-consuming and energy-producing nations, and how trade might be affected. Looking at the environment, they focus on climate change and greenhouse gas emissions, including an examination of non-fossil supply sources, demand management, regulatory, tax and other policy tools that can influence market incentives to pursue various technologies, the political and economic implications of alternative technologies, and the international arrangements needed to cut global emissions. Governance and security arrangements that cut across all three major issue areas are also examined.

The Project Manager of the Energy Security Initiative is Lea Rosenbohm (lrosenbohm@brookings.edu). For more information and access to ESI working papers, see: <http://www.brookings.edu/topics/energy-security.aspx>.

The CNA Corporation

<http://cna.org/>

CNA is a nonprofit federally funded research organization in Washington, DC, that operates the Center for Naval Analyses and the Institute for Public Research. CNA's research and analysis is designed to help decision makers form sound policies, make better-informed decisions, and manage programs more effectively. The organization is defined by multi-disciplinary, field-based "real world" research and analysis, and possesses a staff of more than 300 researchers, including mathematicians, engineers, physicists, economists, and specialists and scholars in international relations, education, health care and public health, homeland security, community safety, public policy,

history, psychology, computer science, and other fields of study. CNA addresses a broader range of public interest issues including education, health care and public health, homeland security, human capital management, air traffic management, climate change and energy security.

In 2006 CNA convened a Military Advisory Board (MAB) of eleven retired three- and four-star flag and general officers from the Army, Navy, Air Force and Marine Corps to assess the impact of global climate change on key matters of national security and lay the groundwork for mounting responses to the threats found. The project on National Security and Climate Change is led by CNA's General Counsel, Sherri W. Goodman, who has more than 25 years' experience at the intersection of national security, science and technology, and environmental policies and programs in Congress, the Pentagon, and research organizations. Ms. Goodman and other members of the MAB often give testimony before congressional committees, brief other organizations, and present at international conferences on climate change. General Gordon Sullivan, U.S. Army (retired), former Army Chief of Staff and current president of the Association of the United States Army, is the MAB Chairman. CNA also collaborates to some extent with the Pew Project on National Security, Energy and Climate and the Military Officers Association of America (MOAA).

CNA's April 2007 report "National Security and the Threat of Climate Change" articulated the concept of climate change acting as a "threat multiplier" for instability and offered several recommendations. A follow-up report in May 2009, "Powering America's Defense: Energy and Risks to National Security", considered the security risks inherent in the U.S. energy posture, the impact of climate change on U.S. energy choices and national security, and the role that the Department of Defense can play. Summaries of the reports are included in the appendix, starting on p.25. The 2007 report is still considered one of the most definitive reports in this area by experts in the field.

Center for a New American Security (CNAS)

<http://www.cnas.org/>

The Center for a New American Security (CNAS) is an independent and nonpartisan research institution that engages national security leaders, policymakers, experts and the public with fact-based research, ideas and analysis. Located in Washington,

DC, CNAS was established in February 2007 by Kurt Campbell and Michele Flournoy. Its topics of focus are natural security, regional security challenges, terrorism & irregular warfare, U.S. foreign policy, U.S. military forces & operations, U.S. national security strategy, and weapons of mass destruction (WMD) & nuclear proliferation.

Sharon Burke was until recently the Vice President for Natural Security at CNAS, where she directed work on the national security implications of global natural resources challenges and climate change. The program looks at how international demand for energy, minerals, water and land can affect security, as well as the consequences of high consumption of these resources, such as climate change and loss of biodiversity. On December 10, 2009, President Obama nominate Ms. Burke to the key post of Director of Operational Energy Plans and Programs at the Department of Defense⁹ which she has since assumed. Burke is considered one of the leading experts in this field.

CNAS also has an Energy Security and Climate Change project, which seeks to integrate communities of interest, improve the flow of information to decision-makers, and design strategies and policies for achieving energy security. A number of reports, working papers, policy briefs, and other publications are available on the website. See the appendix, starting on p.31 for summaries of key publications.

From July 27-30, 2008, CNAS convened 45 scientists, national security strategists, and members of the business and policy communities from Asia, South Asia, Europe, and North America to play an international climate change "war game¹⁰," a scenario of the "2015 World." Four mixed nationality teams were assigned to represent China, the European Union, India, and the United States. The ten other supporting organizations were: the Brookings Institution Global Economy and Development Program, the Center for American Progress, the CNA Corporation, the Heinrich Böll Foundation, McKinsey Global Institute, Oak Ridge National Laboratory, the Pew Center on Global Climate Change, the Rockefeller Brothers Fund, the Sustainability Institute, and Woods Hole Oceanographic Institution. As the United Nations Intergovernmental Panel on Climate Change now finds that the effects of climate change are likely to unfold faster and more dramatically than previously predicted, it is believed that by 2015 most nations will have to adapt to sea level rises, more intense and volatile weather, floods, droughts, and other effects. The teams were asked to consider four specific challenges: mass migration,

9. Press release from the White House: <http://www.whitehouse.gov/the-press-office/president-obama-announces-more-key-administration-posts-121009>

10. "Climate Change War Game: Major Findings and Background," working paper by Sharon Burke and Christine Parthemore (June 2009). http://www.cnas.org/files/documents/publications/Climate_War_Game_Working_Paper_0.pdf

resource scarcity (specifically food and water), disasters, and emissions reductions.¹¹

Center for Strategic and International Studies (CSIS)

<http://csis.org/>

The Center for Strategic and International Studies (CSIS) provides strategic insights and bipartisan policy solutions to decision makers in government, international institutions, the private sector, and civil society. A bipartisan, nonprofit organization headquartered in Washington, DC, CSIS conducts research and analysis and develops policy initiatives that look into the future and anticipate change. CSIS was founded by David M. Abshire and Admiral Arleigh Burke at the height of the Cold War, in 1962. CSIS has more than 220 full-time staff and a large network of affiliated scholars focused on defense and security, regional stability, and transnational challenges ranging from energy and climate to global development and economic integration. Former U.S. Senator Sam Nunn became chairman of the CSIS Board of Trustees in 1999, and John J. Hamre has been president and chief executive officer since April 2000.

CSIS's energy and climate change program includes the Asian Regionalism Initiative, which looks at how the Asia-Pacific region can work together to address the challenges of energy insecurity, climate change, and humanitarian crises; research and analysis on emerging energy and national security issues; and a series of dialogues hosted by Mariam Atash Nawabi that focus on global challenges, including the eight United Nations Millennium Goals. CSIS has published a number of reports and commentary on energy and climate change, which can be found on its website: <http://csis.org/publications/browse/all/14>.

Council on Foreign Relations

<http://www.cfr.org/>

Founded in 1921, the Council on Foreign Relations is one of the leading organizations on foreign policy issues in the United States. While climate security is not a focus area per se, CFR has

published some important work in this area by Joshua Busby, an Assistant Professor at the Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin. Busby is the author of several studies on climate change, national security, and energy policy from the Council on Foreign Relations, the Brookings Institution, and CNAS, where he has worked closely with Sharon Burke. He is currently part of a Minerva grant team looking at climate and conflict in Africa. Minerva is the National Science Foundation (NSF)/Department of Defense grant to have more social science relevant to security questions get funded by the U.S. government.

Busby's November 2007 report, "Climate Change and National Security: An Agenda for Action"¹² for the Council on Foreign Relations focuses on three main areas: risk reduction and adaptation, mitigation of greenhouse gas emissions, and institutional changes in the U.S. government. He supports substantial investment in risk reduction including coastal defenses, building codes, emergency response plans, evacuation strategies, and enhanced vulnerability assessments. He points out that the U.S. government has done very little to support developing countries' need for tens of billions of dollars for this agenda. He also highlights the need to reach agreement with major emitters China and India to reduce greenhouse gas emissions. Busby asserts that climate and security concerns do not get enough attention in the U.S. government because of a lack of high-level champions and advises creating new positions in the Department of Defense and National Security Council dedicated to environmental security.

National Security Network

<http://www.nsnetwork.org/issues/energy>

The National Security Network (NSN) was founded in June 2006 with the goal of revitalizing America's national security policy and bringing cohesion and strategic focus to the progressive national security community. NSN's 2000 members and experts believe in countering emerging threats by drawing on a strong and flexible military combined with shrewd diplomacy, the effective use of alliances, and a commitment to America's basic values. NSN convenes networks of foreign policy experts

11. The key findings of this convening were the following: National security is a viable framework for understanding climate change. It is important to leverage a diversity of disciplines and develop deeper understanding across nationalities. Negotiators can accommodate some uncertainty but need better information about climate change consequences in order to effectively plan and make tradeoffs. Chinese leadership is as important as American leadership. China and India are not necessarily going to be allies in climate change negotiations, but both will seek to balance any agreement with economic growth. Russia will be an important player and a potential spoiler in negotiations. A focus on cutting greenhouse gas emissions runs the risk of crowding out full consideration of adaptation challenges. The international community lacks the institutional structures to deal with climate change issues. There is insufficient data for economic cost and benefit estimates for mitigation and adaptation. Finally, implementation is more important than the actual agreements.

12. <http://www.cfr.org/publication/14862>. This report draws from the National Security Task Force on Energy July 2006 report "Energy Security in the 21st Century."

to identify, develop and synthesize policy ideas and solutions. It then translates those ideas into messages that will resonate with a broad audience and distributes them to elected officials, progressive political candidates, the media, national security experts, community leaders, and non-governmental organizations. NSN covers country-specific and thematic issues.

Their website features a number of reports on energy and climate change issues. The paper “The Progressive Approach: Energy”¹³ calls investing in energy security “one of the smartest things we can do for our own national security, as well as our economic and environmental future.” But solutions will take decades and demand the involvement of everyone – government, business and every citizen – to use energy more efficiently and build an economy that generates energy more sustainably. The paper defines energy security as protecting supply lines from disruptions (including terrorist attacks), moving away from fossil fuels, taking clear steps to respond to global warming, investing in green technology and green jobs, changing our behavior at home, and working with others overseas to make ourselves safer as individuals and as a nation. The key policy recommendations are to reduce dependence on foreign oil and natural gas, tackle climate change abroad and at home, maximize energy security by coordinating policies with traditional allies and potential partners, and secure our energy supply lines and infrastructure. Criticizing the conservative record, the paper argues that the Bush Administration has been all talk and no action, our failed energy policy has made us less safe, the U.S. remains the largest contributor to the climate change problem rather than becoming a leader in finding a solution, the Bush Administration has not supported initiatives to increase automobile fuel efficiency, the failure to support research and development is undercutting American firms that should be taking advantage of opportunities for new energy technologies, and we are more vulnerable to weather and terrorists because the Bush Administration failed to modernize our energy infrastructure and diversify distribution channels.

Partnership for a Secure America

<http://www.psaonline.org>

The Partnership for a Secure America was founded in 2005 to forge a bipartisan center on U.S. national security and foreign policy by bringing together leading Democrats and Republicans to seek common ground and by building public support for bipartisan policy. PSA builds coalitions on national security and foreign policy using a national media campaign and by hosting

events including conferences and speaker series. PSA has also issued recent statements on nuclear non-proliferation, U.S.-Russia relations, and renewing the U.S. relationship with the UN.

The Advisory Board for PSA is composed of many former Senators, National Security Advisors, Secretaries of Defense, and a number of other high-level members of the defense community. Funders of recent work include the Energy Foundation, the U.S. Civilian Research & Development Foundation (CRDF), The American Association for the Advancement of Science, (AAAS), the Richard Lounsbery Foundation, and the Ploughshares Foundation.

PSA has recently held many events to raise awareness of the intersection of climate change and national security. In late 2009 these included a panel discussion for veterans titled “Climate Change and Energy Dependence Pose Serious Threat to National Security” and another panel on the same topic featuring Senator Joe Lieberman (ID-CT), former Director of Central Intelligence R. James Woolsey, Vice Admiral Dennis McGinn (Retired), and PSA Advisory Board member Ambassador Frank Wisner. The same day PSA released a full-page ad in Politico that featured signatures of prominent Democrats and Republicans working together to prevent climate change. The organization has also co-hosted a Hill briefing with the Security for a New Century Program. PSA’s executive director, Matthew Rojansky, has been a featured speaker at many of these events, including a recent conference on “Science Diplomacy and the Prevention of Conflict” hosted by the USC Center on Public Diplomacy in conjunction with the United States Institute of Peace. See the appendix, starting on p.45, for a summary of this and other statements.

Truman National Security Project (Operation Free)

<http://www.trumanproject.org/>

The Truman National Security Project is a national security leadership institute that recruits, trains and positions a new generation of progressives across America. Their mission is to provide the skills, knowledge and network to create an influential force of leaders who advance strong progressive national security policy. Their programs include the one-year Truman Security Fellowship, one-day National Security Bootcamps, 90-minute Military 101 sessions taught by progressive veterans, Congressional Security Scholars program for junior-level Capitol Hill staffers, Summer Intern Security Springboard, Executive Agency Training Program, and Truman Project Partners.

13. <http://www.nsnetwork.org/node/846>

Operation Free is a coalition of veterans and national security organizations formed in 2009. They advocate for clean energy and urge Americans to stop relying on oil as a fuel source. The coalition was formed by The Truman National Security Project, The National Security Initiative (a diverse team that creates bipartisan strategies for national security), VoteVets.org Action Fund (an advocacy group for veterans and serving members of the U.S. Armed Forces), and VetPAC (another veterans advocacy group voicing veterans' views on a range of policies).

The Operation Free¹⁴ campaign, managed by Jonathan Murray, has crafted their message on energy security around the physical and political threats of continued oil use. The campaign considers a range of topics including threats to the military, increased humanitarian crises, the U.S. relationship with Russia, an increase in terrorist acts, support of dictatorships, threats to the U.S. electricity grid, America's soft power, health security, food security, border and water security.

Veterans participating in Operation Free made recent public statements this February in Seattle, Washington and Reno, Nevada. Veterans point to the high cost of foreign oil that supports dictatorships, how the U.S. carbon-based economy exacerbates climate change and thus fosters international insecurity and terrorism, and the newly released Quadrennial Defense Review, an important DOD document that for the first time has included climate change as a national security threat.

Woodrow Wilson International Center for Scholars

<http://www.wilsoncenter.org>

The Woodrow Wilson International Center for Scholars aims to unite the world of ideas to the world of policy by supporting pre-eminent scholarship and linking that scholarship to issues of concern for officials in Washington. Geoff Dabelko is the Program Director of the Environmental Change and Security Program and a well-recognized expert in this field. He writes a blog post called the New Security Beat, which is a useful and readable resource on this issue. One of his key postings is titled "Climate and Security Reaches a Crescendo¹⁵" (April 2007), with a number of references and links to key recent reports and events. An October 2009 blog post titled "Steady Drum Beat for Climate and Security Linkages¹⁶" includes links to coverage of key 2009 occurrences. In December 2009, he also posted

a short video on NATO, where the new Secretary General, former Danish Prime Minister Anders Fogh Rasmussen, says he wants to have a say on the issue but will likely meet a lot of institutional resistance. Dabelko also wrote a COP-timed Huffington Post piece¹⁷. See the appendix, starting on p.47, for summaries of the Environmental Change and Security Program Report for 2008-2009 and 2006-2007 as well as interviews with International Alert Secretary General Dan Smith and colleague Shruti Mehrotra.

VII. Key International Think Tanks and Organizations on Energy and Climate Security

While not exhaustive, the following is a list of key international organizations in this field.

Adelphi Research

<http://www.adelphi-research.org/>

Adelphi Research is an independent, nonprofit institute that advances environmental, economic and social policies and implements innovative sustainable development strategies. It seeks to increase awareness and understanding of the political, economic, and technological forces driving global change. Alexander Carius is co-founder and co-director of Adelphi Research and Adelphi Consult and has been working in environmental security since the mid 1990s. He is reportedly well versed in European thinking and funding in this area and does a lot of work for the German government and the EU. Dennis Tänzler also has ten years of experience in international environmental policy, European environmental policy and policy integration, climate change and institutional aspects of environment, conflict and cooperation and has undertaken more than 50 projects in the EU, the U.S. and developing and transition countries. He has spent significant time seconded to the German government, where he worked on a brief for the Ministry of Foreign Affairs. Achim Maas is a more junior researcher at Adelphi Research who focuses on the interlinkages between natural resources, violent conflict and peace, including the security implications of climate change.

14. <http://www.operationfree.net/home/>

15. <http://newsecuritybeat.blogspot.com/2007/04/climate-and-security-reaches-crescendo.html>

16. <http://newsecuritybeat.blogspot.com/2009/10/steady-drum-beat-for-climate-and.html>

17. <http://newsecuritybeat.blogspot.com/2009/12/nato-says-dont-fight-planet.html#comment-form>

In January 2009, Adelphi released “Regional Security Implications of Climate Change: A Synopsis,” which was commissioned by the European Commission and funded by the German Federal Ministry for the Environment, Nature Protection and Reactor Safety program. The synopsis summarized past studies to inform the EU Roadmap process on climate change and international security. The April 2008 report “Climate Change and Security: Challenges for German Development Cooperation” by Alexander Carius, Dennis Tänzler, and Achim Maas concluded that in addition to prevention, the need to adapt to unavoidable change will become ever more urgent. See the appendix, starting on p.25, for more detailed summaries.

Advisory Council on Global Change (WBGU)

http://www.wbgu.de/wbgu_home_engl.html

The German federal government created the Advisory Council on Global Change (WBGU) in 1992 to serve as an independent science-oriented body. The council reviews and evaluates research on climate change, identifies arenas in which to initiate new research, and monitors environmental policy on an international and national level. The council is comprised of nine four-year term members, including economists, lawyers, political scientists, physicists, ecologists, chemists, and engineers. WBGU publishes an in-depth report every two years and also prepares special reports and policy papers for the German government. “Climate Change as a Security Risk,” published in 2008, identified six key threats that climate change posed to international security and stability: an increase in weak states, a threat to global economic growth, an increased gap between the main causes of climate change and those experiencing the most severe impact, questions of the legitimacy of industrialized nations, forced migration, and intensification of classic security issues. See the appendix, starting on p.25, for a detailed summary and recommendations.

Chatham House

<http://www.chathamhouse.org.uk/>

This London-based organization aims to be a world-leading source of independent analysis, informed debate and influential ideas on how to build a prosperous and secure world for all. They research major policy challenges, bringing together diverse perspectives and constituencies, and injecting new ideas into the international arena. The Energy, Environment and Development Programme (EEDP), one of three main research

areas at Chatham House, seeks to advance the international debate on energy, environment and development policy and to influence and enable decision-makers (governments, NGOs and businesses) to make well-informed decisions that contribute to achieving sustainable development. Directed by Bernice Lee, the program’s research and activities are focused on three main areas: promoting climate security, enabling energy security, and strengthening sustainable development solutions.

On 10 November 2009, Chatham House held a one-day conference entitled “Avoiding worst case scenarios: Tackling resource challenges in the 21st century.” The aim of the conference was to highlight some of the potential fault-lines and flashpoints in international affairs associated with climate change and resource challenges in the next quarter century, and to generate innovative thinking around the consequences of bad policy planning. The conference also marked the launch of a special issue of International Affairs on tackling resource challenges in the 21st century, which featured articles by several Chatham House researchers.

Relevant publications include “Managing the interlocking climate and energy resource challenges,” “From constants to variables: how environmental change alters the geopolitical and geo-economic equation,” and “Nuclear energy and proliferation risks: myths and realities in the Persian Gulf.” See the appendix, starting on p.27, for summaries.

E3G (Third Generation Environmentalism)

<http://www.e3g.org/>

Third Generation Environmentalism (E3G) is an independent, nonprofit European organization that forms coalitions among NGOs, governments, and the private sector to stimulate high-level action on climate and energy security. E3G also offers advisory and strategy consulting services to organizations such as Environmental Defense (USA). The organization was founded in 2004 by three former senior-level employees of the British Government and has offices in London, Brussels, Berlin, Stockholm and Washington, DC, as well as a regular presence in Beijing. E3G is funded by foundations, NGOs, and government departments, specifically the UK Department for the Environment, Food, and Rural Affairs, Department for International Development, Environmental Defense (USA), the Esmee Fairbairn Foundation, the European Climate Foundation, the Children’s Investment Fund Foundation, the Italian Ministry for Environment and Territory, Natural Resources Defense Council, Shell Foundation, and the World Wildlife Foundation (WWF).

E3G's coalition-building portfolio includes: forging a network of public officials, political leaders, professional advisers and non-government activists in five countries to help broker agreement between Russia and the EU over ratification of the Kyoto Protocol in 2004; close involvement in 2005 with informal EU-China negotiations that led to the agreement to build an advanced coal demonstration plant with carbon capture and sequestration (CCS); building an EU-China coalition in March 2007 to discuss climate and energy issues; and bringing together a coalition of diverse European stakeholders in 2007 that prompted the European Council to agree to an ambitious set of carbon capture and sequestration demonstration projects by 2015. Importantly, E3G has started to work more in the United States, bringing together experts in the climate and security community. This work is headed by Katherine Silverstone.

E3G has offered strategy consulting to the UK Department for International Development, the Renewable Energy and Energy Efficiency Partnership (REEEP), Chatham House, the International Institute for Environment and Development (IIED), and for a client of the Goldsmith Foundation. E3G also provides policy analysis advice to government, NGO, and private sector leaders. Clients include the German Chancellery, the EU and G8 Presidencies (through the Potsdam Institute for Climate Impact Research), UK Foreign and Commonwealth Office, UK Department for Environment, Food and Rural Affairs, WWF International, Environmental Defense (USA), and Kudos Film and Television Ltd.

Founder and CEO Nick Mabey was previously senior advisor in the UK Prime Minister's Strategy Unit leading work on energy, fisheries, unstable states and organized crime. Mabey also served as Head of Sustainable Development in the UK Foreign and Commonwealth Office's (FCO) Environment Policy department and as the FCO lead on the Johannesburg Summit, where he was responsible for establishing a number of innovative international partnerships including the Renewable Energy and Energy Efficiency Partnership (REEEP) and the Travel Foundation. He holds a master's degree in Technology and Policy from MIT. Mabey currently is involved in the EastWest Institute's International Task Force on Preventive Diplomacy, the Advisory Committee for the Energy, Environment and Development Programme at Chatham House, and the Centre For Computational Finance and Economic Agents at the University of Essex.

Founder John Ashton is the Special Representative for Climate Change of the UK Foreign Secretary. He previously worked in the UK's Foreign and Commonwealth Office where he founded and lead its Environment Policy Department. John

Ashton has served as a political advisor to Hong Kong Governor Chris Patten and currently holds a post as Visiting Professor at Imperial College London and serves on the Advisory Boards of the Climate Institute (Washington, DC), the UK Tyndall Centre for Climate Change Research, the Bren School of Environmental Science and Management (University of California, Santa Barbara) and Climate Change Capital.

The third founder, Tom Burke is an Environmental Policy Adviser to Rio Tinto PLC, Visiting Professor at Imperial and University Colleges, London, and Chair of the Review of Environmental Governance in Northern Ireland. He was formerly Executive Director of Friends of the Earth, served on the Council of English Nature (the advisory group to the British Government on biodiversity), and previously was Special Advisor to three Secretaries of State for the Environment. Burke also served as Director of the Green Alliance during the 1980s.

Relevant reports by E3G include: "Climate Change and the Military: The State of the Debate," "Development, Climate Change and Security: Final Report to DFID," "Tackling Worst Case Scenarios: Developing a risk management approach to delivering climate security," "Europe in the World: Political choices for security and prosperity," "Down But Not Out? Reviving the EU's Political Strategy After Copenhagen," "Targets, Foundations and Transformation: Benchmarks for a Successful Copenhagen Agreement," and "What does the Security Community need from a Global Climate Regime?" See the appendix, starting on p.34, for a summary of these reports, E3G's past activities and its 2010-2011 goals.

GLOBE (Global Legislators Organisation for a Balanced Environment)

<http://www.globeinternational.org/>

Founded in 1989, GLOBE facilitates high-level negotiated policy positions from legislators from the G8+5 parliaments and from regional dialogues informed by business leaders and key international experts. GLOBE's objective is to support ambitious political leadership on issues of climate and energy security, land-use change and ecosystems, and economic and population growth. Internationally, GLOBE focuses on progressive leadership by G8 leaders and the leaders of the major emerging economies, as well as formal negotiations within the United Nations. GLOBE has a particular interest in the role that international financial institutions can play.

GLOBE first raised the issue of security implications of climate change in 2008 at its Tokyo forum. Panelists included

the former Japanese Defense Minister and National Security Adviser, Yuriko Koike MP, Canadian Shadow Defense Minister Bryon Wilfert, and MP and Admiral of the Danish Fleet, Rear Admiral Nils Wang. As a direct result, the Defense Select Committee in the Canadian Parliament began hearings on the implications of climate change for Canada's national security, with Admiral Wang as one of the key witnesses. Admiral Wang also charged his Navy with devising ways of reducing its own emissions and has since developed innovative new technologies that significantly reduce NOx emissions and are being retrofitted to the entire Danish fleet. A special visit was organized for 15 legislators (specifically from countries with large fleets including Russia, UK, France and Brazil) and journalists to witness the new technology being applied on board a DIANA-class Danish vessel.

GLOBE further addressed the security implications of climate change at its Copenhagen forum in October with Admiral Wang and Indian Air Marshal AK Singh. This session focused on the Arctic and South Asia, including the implications of a melting sea ice on search and rescue operations and the potential climate-induced migration of millions of people in Asia as fresh water is threatened due to glacier melt.

Through GLOBE's network of senior legislators in the major economies (including many committee chairs, shadow ministers and others with positions of influence), GLOBE intends to broaden and deepen the discussion on security implications of climate change to cover Africa, the Americas, the Middle East and Australasia (including the Pacific Islands). As a key element of its International Commission on Climate Change, GLOBE will convene senior legislators from the major economies in a policy-focused process to encourage a better understanding of the security implications of climate change, to develop principles and measures to manage the associated risk, and to test political responses.

Institute for Environmental Security

<http://www.envirosecurity.org/>

The Institute for Environmental Security (IES) is an international nonprofit non-governmental organization established in 2002 in The Hague in order to increase political attention to environmental security as a means to help safeguard essential conditions for peace and sustainable development.

18. <http://www.envirosecurity.org/cctm/>

19. <http://www.envirosecurity.org/CCSC/stateofthedebate.pdf>. See p. 40 for a summary.

20. http://www.envirosecurity.org/cctm/MAC_Statement_1.pdf

21. http://www.envirosecurity.org/CCSC/CCSC_AfterCopenhagen.php

Their programs include Climate Change and International Security, Climate Change and the Military, Environmental Security for Poverty Alleviation, the FUEL project to integrate energy needs in humanitarian crisis situations, Greening European Security, Global Policy Coherence, The Hague Environmental Law Facility, the Inventory of Environment and Security Policies and Practices, and the Pathfinder Programme to restrict the import of illegally extracted resources from conflict zones.

The Climate Change and the Military (CCTM)¹⁸ project, headed by Tom Spencer, is based on cooperation of a group of leading think tanks. The project consists initially of two elements: a report prepared with partner organizations entitled "Climate Change and the Military: The State of the Debate¹⁹," and a group of active duty and retired military officers, The Project Military Advisory Council (MAC), which met in Brussels to draft a statement²⁰ calling for effective action at Copenhagen. These 2009 activities formed the basis for an expanded program in 2010 and beyond that will recommend how the military could contribute to the struggle against climate change on an ongoing basis. On 17 February 2010, IES in association with the EastWest Institute and within the framework of the Seventh Annual Worldwide Security Conference, organized the workshop "Climate Change & Security After Copenhagen²¹."

International Alert

http://www.international-alert.org/climate_change/index.php

International Alert is an independent peace-building organization that works for peace and security in over 20 countries and territories. Their regional work is in the African Great Lakes, West Africa, the Caucasus, the Andean region of South America, and South Asia. The organization is based in London and has a worldwide staff of more than 100 from diverse backgrounds and disciplines, led by Secretary General Dan Smith. International Alert combines grass-roots engagement and high-level advocacy, working directly with people affected by violent conflict as well as at government, EU and UN levels to shape policy and practice in building sustainable peace. International Alert focuses on the role of business, humanitarian aid and development, gender, security and post-conflict reconstruction in building peace. They also organize training courses and publish resources on peacebuilding.

International Alert's research on climate change finds that its consequences will make the poorest communities in the world poorer and fuel violent conflict, which also hinders the ability of governments and local communities to adapt to the pressures of climate change. Their widely quoted 2007 publication, "A Climate of Conflict," was updated by the November 2009 report, "Climate Change, Conflict, and Fragility: Understanding the Linkages, Shaping effective responses." See the appendix, starting on p.41, for report summaries and p.48 for a summary of interviews with Secretary General Dan Smith and colleague Shruti Mehrotra held at the Woodrow Wilson Center.

International Institute for Sustainable Development

<http://www.iisd.org>

IISD is a Canadian-based nonprofit policy research institute that champions sustainable development around the world through innovation, partnerships, research and communications. IISD is composed of a diverse team of more than 150 people located in over 30 countries. They partner with more than 200 organizations worldwide, promote open and effective international negotiation processes, and believe in building their own institutional capacity while helping partner organizations in the developing world to excel. Their 13 knowledge themes include Adaptation and Risk Reduction, Climate Change and Energy, Natural Resources. Two key 2009 reports by Brown Oli and Alec Crawford were "Rising Temperatures, Rising Tensions" and "Climate Change and Security in Africa (A Study for the Nordic-African Foreign Ministers Meeting)." See the appendix, starting on p.41, for summaries of these two reports. A number of other publications can be found on their website.

The Royal Norwegian Society of Sciences and Letters Climate Change and Security Conference (June 2010)

<http://climsec.prio.no/Default.aspx>

The Climate Change and Security conference is organized for the 250th anniversary of The Royal Norwegian Society of Sciences and Letters, Norway's oldest scientific society composed of hundreds of Norwegian and foreign scholars. While the science of climate change is well established in peer-reviewed literature, there is currently little academic work on the security implications, which this conference aims to examine with the joint efforts of scholars from multiple fields. The conference will be take place June 21-24, 2010 in Trondheim, Norway.

The four-day conference consists of morning plenary sessions featuring keynote addresses by experts in the field and afternoon sessions of workshops with research papers selected by open call. The first day will focus on the physical effects of climate change, particularly those with social consequences, such as droughts, floods, and sea-level rise. The second day deals with the positive and negative economic effects of climate change and policies designed in response. The third day will examine the implications of climate change for different kinds of violent armed conflict. The fourth day will address security more broadly, including a wide range of consequences for human livelihoods, the insecurity of climate predictions, and subjective insecurity in facing the future.

Royal United Services Institute (RUSI)

<http://www.rusi.org>

The Royal United Services Institute (RUSI) is an independent think tank engaged in cutting edge defense and security research. Founded in 1831 by the Duke of Wellington, RUSI embodies nearly two centuries of forward thinking, discussion and reflection on defense and security matters. See p. 46 in the appendix for a summary of the report "Climate-Related Impacts on National Security in Mexico and Central America" by Shiloh Fetzek (October 2009).

VIII. Key Research in Climate Security

The field map shows that a considerable amount of research has been funded over the last decade on issues related to climate security. The topics include analyzing the global policy context and the need to build better governance and institutions, regional implications for climate security in areas most likely to be impacted, such as Africa and Asia, and the need to raise the profile of climate and security concerns in the United States government and to better understand the impact of America's energy choices on our national security policies. Some studies have focused on future potential risk scenarios based on expected, severe or catastrophic climate change. The lengthy appendix (starting on p.33) to this report summarizes many of these major studies. Among the most frequently mentioned is the 2007 report prepared by CNA, which was the first to talk at some length about how the military is viewing climate change as a threat multiplier.

There is a well-established community of scholars in the United States and internationally who have written extensively about these issues, and many will be convening in Norway in June

2010 for a four-day conference on these issues. Much of the recent literature focuses on how to improve prospects for international cooperation in the lead up to and aftermath of Copenhagen, and why further analysis of risks, policy planning, and strategic planning need to integrate with climate adaptation policies.

It has become increasingly apparent through this study that extensive scholarly research has already been funded in the field. Considerable government money, both in Europe and in the U.S., is providing for further research. For example, the DOD has commissioned a \$7 million study of the impact of climate change in sub-Saharan Africa through the Minerva project, although I am unaware of other studies of that magnitude.

There is still some targeted need for research to provide policymakers with high confidence in the analysis of threats and opportunities to guide strategic investments in this space. A key missing link, however, appears to be efforts to translate this research and analysis to the policy sphere and the public. While there is no doubt that further research needs to be done in the wake of Copenhagen, the consensus among funders I spoke with is that we need fewer scholarly research reports and conferences amongst academic experts and more efforts to make this research available and comprehensible to policymakers, spokespeople on this issue, military leaders, and the general public.

One gap area appears to be policy planning. Coming out of Copenhagen, governments are mandated to make adaptation plans but there are few tools to help them do this in a concrete way. It is worth exploring whether there is a role for foundations to advocate for further research within the DOD to fund applied policy analysis, or to identify what universities, NGOs or other interdisciplinary centers may have such practical work underway that could be useful to policy makers.

IX. The U.S. Policy Landscape

Much of the attention in the United States on climate and energy legislation has been focused on the prospective passage of a comprehensive climate bill or sector specific legislation on clean energy. This section provides a brief overview of the current state of play on the prospects for climate legislation.

The BP oil spill crisis and talk of prioritizing immigration reform on the Senate's 2010 agenda recently caused key republican Senator Lindsey Graham (R-SC) to balk on moving forward with the climate bill. These current roadblocks aside, the freeze on the climate debate has begun to thaw this spring. After a long holdup caused by the healthcare debate, President Obama has rekindled efforts in the Senate to pass a comprehensive climate and energy bill this year.

Director of the President's National Economic Council Lawrence Summers emphasized that "Going forward for the rest of this year a bipartisan energy solution is an absolutely crucial priority for the president,"²² at an April 4th conference. The President's plan to pass climate legislation is tied to his efforts to reduce unemployment and improve the economy. The climate and energy bill would include incentives for job creation and energy efficiency to reduce rising energy costs. Although the President has continued to express support for an economy-wide cap and trade provision to remain in the bill, Senate support is dwindling.

Senator Lindsay Graham (R-SC) announced this spring, "The cap-and-trade bills in the House and Senate are dead. The concept of cap-and-trade is going to be replaced."²³ Secretary of Energy Steven Chu, however, insisted on the importance of keeping economy-wide cap and trade in the bill, "It is not dead," said Chu, "We need a comprehensive bill. We would very much want and need it this year."²⁴ Scott Brown, who opposed a federal cap-and-trade bill in his campaign, won the Massachusetts Senate seat and eliminated the Democrats' 60-vote majority to overcome oppositional procedural blocks.²⁵ This loss has seriously compromised the bill's prospects of progressing with a robust cap and trade component.

Accordingly, provisions for caps on emissions have been significantly watered down from earlier versions of the bill. Sen. John Kerry confirmed, "It's primarily a jobs bill, and an energy independence bill and a pollution reduction-health-clean air bill" and that "Climate sort of follows. It's on for the ride."²⁶ Instead of an economy-wide cap on emissions, this bill will have sector-specific limits on emissions. Graham has indicated that the plan will first take effect on power plants in 2012, followed by manufacturers four years later.²⁷ In recent reports, Senate aides predict "the climate legislation is expected to require

22. <http://thehill.com/blogs/e2-wire/677-e2-wire/90797-summers-energy-and-climate-bill-a-top-white-house-2010-priority>

23. <http://www.reuters.com/article/idUSTRE62142T20100302>

24. <http://www.reuters.com/article/idUSTRE62142T20100302>

25. <http://www.reuters.com/article/idUSTRE60Q44J20100127>

26. <http://www.google.com/hostednews/ap/article/ALeqM5hM1DYWIWj8EbMAj-WOC1Nui69qSgD9EDB6S80>

27. <http://www.eenews.net/EEDaily/2010/03/26/2/>

a 17 percent reduction in U.S. emissions by 2020, compared with 2005 levels, with the greenhouse gas caps set on key industrial sectors such as power plants, petroleum refiners and manufacturers.”²⁸

In order to win enough votes to pass the bill by strong opposing interests in the Senate, the latest draft will “provide incentives for building nuclear power plants, stepped-up domestic oil and gas exploration and subsidies for reducing carbon dioxide emissions from coal.”²⁹ The three Senators authoring the bill have met with many business representatives including the U.S. Chamber of Commerce and American Petroleum Institute for input on the legislation.

They have also reached out to address other Senators’ concerns. Senators Maria Cantwell (D-WA) and Susan Collins (R-ME) put forward a “cap and dividend” proposal that would eliminate the trade concept and instead auction emissions permits and return three quarters of the revenue to consumers to ease the burden of rising energy costs.³⁰ This has reportedly been incorporated into the new bill, where it is proposed that revenue from emission permit sales will be distributed back to consumers.

Senate moderates from both parties, including Agriculture Chairwoman Blanche Lincoln (D-AR), Budget Chairman Kent Conrad (D-ND), and Senators Byron Dorgan (D-ND) and Judd Gregg (R-NH) have pushed to split the cap-and-trade proposal from the energy bill, and may continue to demand complete removal of any plan to cap emissions.³¹

Sens. John Kerry (D-MA) Lindsey Graham (R-SC) and Joe Lieberman (I-CT) planned to make their latest combined climate and energy bill public by Earth Day, April 22,³² but as of the beginning of May have yet to release the text. However, details of the bill have been sent to the EPA for analysis, which is expected to take 6 to 8 weeks. Eileen Claussen, head of the Pew Center on Global Climate Change observed that the debate must begin before July if there is any chance of passing it this year. “If we don't get energy and climate into the hopper before [July 4th], then the chances become very, very small.”³³ In an effort to increase these chances, a lobby of high profile ex-military

leaders organized by Operation Free is making a powerful push for Congress to get the bill to the floor this summer.

At the Administrative level, President Obama came out in support of clean coal and nuclear investments in his State of the Union address, supported in his budget. Concessions to these industries will clearly increase if the bill is to make it through the Senate.³⁴

This year’s budget includes \$36 billion more for a loan guarantee program for the nuclear energy industry. The Department of Energy, however, already has \$20 billion for the program that has yet to be distributed.³⁵ This budget also includes important funding increases for the EPA and invests \$2.3 billion in applied energy research and development. This funding will position the United States as the world leader in clean energy technology and will help develop new industries and create well-paying new jobs.

2011 Budget references to cap-and-trade bill:³⁶

- In contrast to Obama’s 2010 budget, the 2011 budget does not mention an expected implementation date for a cap-and-trade bill, and it also omits any reference to projected revenue from carbon credit auctions.
- The Environmental Protection Agency budget includes \$25 million to help states and the agency begin implementing the greenhouse gas reporting rule the agency finalized last year and new emissions regulations.
- More than \$2.7 billion in tax subsidies for the coal, oil, and gas industries were eliminated.

The U.S. followed through on the Copenhagen accord and reported its mitigation targets by January 31, 2010: “[i]n the range of 17%, in conformity with anticipated U.S. energy and climate legislation, recognizing that the final target will be reported to the Secretariat in light of enacted legislation.” A footnote adds: “The pathway set forth in pending legislation would entail a 30% reduction in 2025 and a 42% reduction in 2030, in line with the goal to reduce emissions 83% by 2050.”³⁷

28. <http://www.eenews.net/EEDaily/2010/04/29/1/>

29. <http://www.nytimes.com/2010/01/27/science/earth/27climate.html?scp=1&sq=lindsey%20graham%20cap%20and%20trade%20broder&st=cse>

30. <http://www.nytimes.com/2010/01/27/science/earth/27climate.html?scp=1&sq=lindsey%20graham%20cap%20and%20trade%20broder&st=cse>

31. <http://www.eenews.net/public/Greenwire/2010/02/03/2I>

32. <http://thehill.com/blogs/e2-wire/677-e2-wire/90797-summers-energy-and-climate-bill-a-top-white-house-2010-priority>

33. <http://www.eenews.net/eenewspm/2010/04/09/archive/1?terms=eileen+claussen>

34. http://switchboard.nrdc.org/blogs/fbeinecke/there_is_no_clean_coal_but_oba.html

35. http://globalwarming.house.gov/mediacenter/pressreleases_2008?id=0194#main_content

36. <http://motherjones.com/mojo/2010/02/obama-budget-scales-back-expectations-climate-bill>

In view of all of this, most funders and organizations including the Electrification Coalition expect that there are considerably greater prospects for sector specific clean energy legislation to pass than for a comprehensive cap and trade bill.

X. Funding Trends and Assessment of Future Opportunities, Risks and Possible Partnerships

While the latest trends shows a continued rise in funding in climate change philanthropy, relatively few foundations have a focus on climate and security. The field of climate security has been built over the last four to five years by a few funders, notably Rockefeller Brothers Fund, the Pew Charitable Trusts and to a lesser extent the Hewlett Foundation and the Energy Foundation through some small initiatives. However, the amounts of funding put into the area of climate security per se have been small, less than several million dollars in total.

Overall, the funders whom I spoke with believe that the research agenda has been well mapped out, and indeed our literature review shows considerable research going back a decade in this area. While there is no doubt a need for continued, high quality analysis and research, there are many organizations that are well positioned to build on their existing work, and indeed a four-day conference devoted to the research is to be held this June in Norway. Moreover, many governments, including the U.S. and the German governments, are funding research in this field.

Some important targeted work could be done in translating the research into action and working explicitly on the development of meaningful policies and bilateral or multilateral action post-Copenhagen. Almost no funder I spoke with was interested in funding more “circular” symposia or conferences, but rather they wanted to look at how this analysis could move a policy agenda forward.

Some experts in the field continue to focus on the following key trends:

- What we learned post-Copenhagen was that there was insufficient two-track work done to set the stage for meaningful negotiations. Distrust was high among negotiators because the groundwork had not been laid to understand and vet ideas, translate concerns, and provide a forum for better dialogue. This experience suggests the importance of this work going forward.

- There is little institutional knowledge about climate issues inside most high-level government agencies. Senior foreign policy leaders must become more knowledgeable about climate issues, but it is often seen as a less immediately pressing foreign policy priority.
- In the wake of Climate Gate, there will be a need for governments to reconfirm the basic climate science and to rebuild credibility.
- There continues to be a need for core funding to build the capacity of serious players who can bring together coalitions from the economic, health, and other sectors to make climate a higher priority. Not many players are conversant across climate and security, much less all the other connected dimensions.
- There is a lot of work being funded by governments on low carbon economies and adaptation but very little on building constituencies in certain key countries like India and the Eastern bloc.
- There is also a need to focus on long-term capacity building rather than short-term wins.
- The military is becoming a voice in the U.S. policy debate, but many are reluctant to be seen as too overt or partisan. They are unlikely at present to take too active a role in the debate, but there is a need to improve the communications of their views to the policy makers and the public. The issue has gained traction within the military, which has value in and of itself, even if not for short-term political consequences. Many funders are interested in the role that the military might play, for example, in supporting clean tech investments under DARPA.

A. U.S. TRENDS AND OPPORTUNITIES

The field of climate security is relatively young but not new, and there are a number of well established and respected players in the space, many of whom know each other and have worked well together. In the United States, several groups that are regularly cited are the CNA Corporation and the Center for New American Security (CNAS), both based in Washington, DC, with very well regarded leaders who have had substantial influence with the DOD. CNA founded a Military Advisory Board (MAB) that has garnered considerable visibility in Washington and plays an important role in the policy debate in this country. CNAS undertook a major risk scenario planning analysis that has been well received and instrumental in policy circles. Other think tanks, including the Woodrow Wilson Center and the

37. http://switchboard.nrdc.org/blogs/ddoniger/united_states_records_carbon_r.html

Brookings Institution, have also made contributions this area. E3G and Chatham House appear to be among the most significant and well-respected players in Europe, and E3G has a growing presence in the United States. In addition to these groups, there are many other organizations that have played a key role in the development of the policy debate and the research agenda.

A new key report funded by the Pew Charitable Trusts on energy issues within the military shows ways in which this issue has been embraced within the Department of Defense. The challenge for the future is now seen as how to engage the military in a more public way and expand their influence in senior government circles and in bilateral and multilateral discussions.

The work of Pew, RBF, BPC and others has focused on how to bring forward the voice of the military. Pew-funded polls repeatedly show that the national security frame polls well on climate issues, and indeed that in order to mobilize political will for greater action on climate change we need to reframe the debate. According to Pew, three emerging themes seem to resonate with the public: our national security is threatened by dependence on foreign oil, we can create jobs through clean energy, and our country needs to address climate issues more directly in order to compete with China in the global economic competitive world. Pew and the others named above have been working on how to engage the military as a messenger on the first message.

One major although controversial player in this effort is Operation Free, who works with recently returned Iraq veterans to publicize the issue of climate change and energy security. In the February 16, 2010 article “Climate Threat: Elevated,”³⁸ which highlights the Clean Energy, Jobs and Security Forum hosted by Operation Free and other national security groups, Amy Harder describes a recent shift in the climate change debate in the U.S. She points out that supporters of climate legislation like Operation Free have dropped the “save our planet, save our children’s future” argument and taken up a new campaign slogan, “stop climate change, stop buying oil - it’s a threat to national security.” There are two main points in this argument: first, buying foreign oil funnels money into the pockets of dictators and terrorist groups in the Middle East; second, allowing climate change to continue unmitigated will lead to severe environmental impacts that destabilize international governments, which will threaten homeland security or require U.S. intervention.

John Kerry presented the first line of argument on the Hill in January during the Clean Energy, Jobs and Security Forum. He explained, “Some of that money goes to Al Qaeda, goes to Hezbollah, goes to Hamas, finds its way into their charities, supports things that don’t help us one bit and allows those

countries a great big bye on responsibility.”

Not everyone believes that the message here is sufficiently nuanced, however, and many involved either as funders or experts are wary of the backlash that may come from making the issue overtly partisan or political. Some policy experts, including Christine Parthemore at the Center for New American Security (CNAS), are critical of linking instability to terrorism or national security threats. Geoff Dabelko of the Woodrow Wilson Center fears a backlash from hyperbole or overly attenuated links, much like the reaction we saw with Climate Gate.

In short, there are often highly divergent views of organizations working on how to engage with the military on climate issues. On the one hand, Truman and Operation Free and the American Security Project, which works closely with John Kerry, are working to use the security community to push pending legislation. Others like those from the Woodrow Wilson Center, CNAS and CSIS are hesitant to overpoliticize the issue. There is clear tension between those who are driven by a more short-term campaign mindset and those who are committed to the inherent value of the security community taking the issue on in a deeper and more lasting way. Some have even expressed the view that some of the short-term advocacy work may make the long-term policy work more difficult.

The challenges of getting the message right are manifold. Most funders indicated that there is often a gulf between civilian and environmental groups and the military on climate issues. Military leaders are often uncomfortable talking about climate issues, though less so on energy issues. There is often miscommunication if not mistrust between military and civilians on this point. Some environmental groups are very reluctant to “militarize” climate change. Many military leaders are also reluctant to become too political. Those who do speak openly are at risk of being seen as mere spokespeople for the left or environmental movement.

Thus, despite some early funding for military spokespeople to be a voice on climate change, many believe that their messages have not yet broken through to the more conservative policymakers who would listen to their concerns. This may be because there are still too few military leaders in the U.S. or elsewhere who are outspoken on these issues. It also may be that the issue is relatively newer than other security concerns, not as fully integrated in military academies’ curriculum, and not fully part of military training. It also may be the case that there simply has not been enough effort to encourage the military and other senior defense leadership to speak and write on these issues. Several commentators have suggested ideas about educating

38. Harder, Amy. “Climate Threat: Elevated.” *The National Journal*. February 16, 2010. <http://energytopic.nationaljournal.com/2010/02/climate-threat-elevated-story.php>

the military inside the academy or through other meetings with journalists and scholars, whether at the Monterey Institute or elsewhere. There could be money put toward creating the CNA Military Advisory Board as its own entity, with more resources to give it organizational strength. At present, only about thirteen retired generals are part of MAB. Among the ideas that could be explored would be a variety of ways in which the military could increase its presence in the debate, whether through increasing funding to educate military and particularly upcoming leaders, or through increasing opportunities to train more leaders.

E3G has convened a number of players in the security community in the United States to listen and help educate them further about climate issues and how to use a risk analysis approach in their thinking. A number of current representatives of the military as well as leading NGOs and academics have attended these roundtables, which began last fall. Another conference held in April explored the ideas of risk management. E3G has been funded by RBF to do this work and is also working with Pew. E3G has interest in seeing whether a Climate Security Summit might be created, which would be attended by and hosted by Jones and others from the Department of Defense. There have also been efforts to secure hearings on the Hill, though the current climate is hostile to most substantive hearings. Entirely apart from short term political issues, many are focused on changing the culture of the military, which controls a vast amount of the U.S. budget and has such a large carbon footprint, as a major goal in and of itself, particularly if the military can be engaged in supporting the development of clean technology through DARPA.

Almost everyone I spoke with believed that there is already considerable understanding and acceptance within most military circles of the complexity and variables in climate change forecasting and that the military is comfortable with the need for risk planning. Among the issues I repeatedly heard were that the military is concerned about how to raise their concerns with policy makers in an appropriate and thoughtful way but there is an equally growing impetus to become involved in the policy debate, particularly given that Congress has mandated the DOD to address the issue.

B. GLOBAL TRENDS AND OPPORTUNITIES

On the global stage, there also have been relatively fewer leaders who are well known spokespeople on the issues, several of whom are described above. They emphasize the need to reframe these issues, to work across sectors, and to broaden and deepen understanding on these issues within senior government circles. One key funding strategy could be to encourage more dialogue between international and U.S. military leaders on the topic, building on work done by E3G. For example, they have been

involved in briefing the UK Climate envoys in their recent visits with Biden, in meetings between European colleagues and meetings with Clinton and Obama. E3G and other observers have noted that in military to military interchanges between the United States and Europe, the military are quite aligned in their viewpoints.

E3G, Chatham House and GLOBE are regularly mentioned as organizations with a record of helping to broker dialogue on climate security and military issues globally. Nick Mabey and Bernice Lee both emphasized the need for better briefings within national military and foreign policy leadership circles, since the issues are relatively new to the defense and security players inside most foreign governments.

A number of funders emphasized that it is important to figure out how to marshal their arguments with the right people in any given political debate, bringing the academic side into hearing with serious policy makers. Neither ClimateWorks nor the Energy Foundation focus on this approach, preferring instead a sector-by-sector approach to reducing carbon in key countries, including Europe, China and India.

According to Jiang Lin, Director of the China Sustainable Energy Program of the Energy Foundation, there could be some useful opportunities for track two diplomacy with China, but the right players need to be engaged and timing is essential. Lin says the issue of climate security has not been at the top of the security agenda in China, but there could be opportunities at the right moment if credible and critical U.S. military leaders could be identified to be messengers. Lin noted that the current status of affairs between China and the United States on cyber security was very “destructive and unhelpful” and that this was not good timing for such discussions, especially given the recent Taiwan arms deals. However, with the right players and at the right time, such exchanges might be of value.

XI. Conclusion

Climate security is an important subtopic of the climate funding area. While there are divergent views on short and long term strategies, it is clear that there will be value in continuing to engage many players from the broader security community in the debate, and in supporting important new dialogue in this area. The issue has recently gained increased visibility, but the number of funders and initiatives are still few. Thus, there exist many opportunities for partnerships to move the issue further into the mainstream agenda.

Appendix: Summaries of Key Research

ADELPHI RESEARCH

“Regional Security Implications of Climate Change: A Synopsis” by Achim Maas and Dennis Tänzler (January 2009).

http://www.adelphi-consult.com/Downloads/Adelphi_Scoping_Study_web.pdf

This synopsis, commissioned by the European Commission and funded by the German Federal Ministry for the Environment, Nature Protection and Reactor Safety, summarizes past studies on the regional security implications of climate change to inform the EU Roadmap process on climate change and international security. The majority of the studies focused on developing countries and used the average or median trends in climate change described in the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report as a baseline. Most of the global or regional studies come to the conclusion that climate change is likely to be a threat multiplier, which can erode socio-economic foundations, state institutions and stability. A number of country-centered studies suggested that many communities might be more adaptable than expected, as climate variability and extreme weather are already a fact of life there. However, a lack of capacity to anticipate climate change impacts and prepare for socio-economic consequences is still a major challenge in developing countries especially.

Other key findings emerged from the synopsis. Existing conflict zones, including the Sahel and Sub-Saharan Africa, are likely to persist and widen in geographic scope and intensity, requiring continued efforts in peacekeeping, humanitarian relief and development work. Social frictions will negatively impact state-society relations in Asia, Middle East, and North Africa (MENA). Regional instability in South and East Asia in particular can have wide repercussions due to the region’s increasing role in the global economy. Even more stable states such as those in Latin America and the Caribbean and Southern Africa can face increasing local conflicts over natural resources, particularly water. Finally, MENA as well as Central Asia and the South Caucasus are geopolitically charged regions, as is the increasingly ice-free Arctic because of its large untapped hydrocarbon reserves and other natural resources. Instability and crisis in these regions could trigger interventions by regional and global powers and can impair international efforts on adaptation and mitigation.

“Climate Change and Security: Challenges for German Development Cooperation” by Alexander Carius, Dennis Tänzler, and Achim Maas (April 2008). GTZ. Federal Ministry for Economic Cooperation and Development.

<http://www.gtz.de/de/dokumente/en-climate-security.pdf>

This report by Adelphi Consult, commissioned by the German Technical Cooperation (GTZ), explores both sectoral and regional connections between climate change, its effects and the resulting potentials for conflict and security risks. It also develops proposals for policy design and implementation for the German Development Cooperation. The findings of the report question whether global warming can be limited to the “safe level” of 2 degrees Celsius, as the concentration of greenhouse gases has already set in motion a degree of unavoidable climate change and the risk of unexpected feedback effects may further accelerate change. Thus the authors conclude that in addition to prevention, the need to adapt to unavoidable change will become ever more urgent. Already overstretched state institutions challenged with growing environmental stress will be limited in their adaptive capacity and also their capacity for peaceful conflict resolution. Conflict resolution can be expected to rely on increasing use of violence, and security risks from climate change are amplified by other global trends such as rising levels of resource consumption, population growth and urbanization.

The identified sectoral trends are declining water availability, severe agricultural crises driving migration to cities and increasing competition for fertile land, destroyed infrastructures caused by extreme events, sea-level rise triggering migration and associated tensions, competition over fossil energy sources, proliferation risks associated with nuclear power, adverse health effects and risks of political volatility in the growing concentration of cities in coastal regions, and additional overstretch of institutional governance structures in developing countries which weaken the performance of elementary state tasks and civil conflict transformation. Even without climate change, water availability will become the key problem of the Middle East and North Africa and, combined with growing populations and shrinking agricultural area, will lead to destabilization in Sub-Saharan Africa. The large number of violent conflicts and post-conflict countries with widespread governance insufficiencies and possible migration movements threatens the Sahel zone especially. Sea level rise challenges the coastal areas of West Africa, Asia and the Pacific. Bangladesh and Pakistan will be notably affected, as will be other states that are fragile or destabilized by internal disputes. Conflict in Latin America could potentially arise from uneven resource access combined with rapidly growing cities and declining governance capacities.

The report identifies three arenas of action for the German Development Cooperation in the coming months: the European Commission and the Council Secretariat's joint paper on climate and security provides an opportunity to agree on a common approach, the 2009-2010 work programme of the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC) working group on Fragile States and Conflict, Peace and Development Cooperation includes the theme of climate and security, and the United Nations Framework Convention on Climate Change (UNFCCC) negotiations present an opportunity to mainstream adaptation within the climate regime. The authors advise adaptation strategies with long-term planning and realignment, but which can be set on track within five to ten years. They identify a need to build capacity in conflict and risk analysis and in climate vulnerability assessment. They also argue that it is essential to link climate protection with questions of energy security and promote sustainable energy systems aimed at ending energy poverty and reducing resource competition. The authors emphasize the importance of building not just technical capacities, but legitimate governance structures through development-oriented civil society actors.

ADVISORY COUNCIL ON GLOBAL CHANGE (WBGU)

“Climate Change as a Security Risk” (2008) by Schubert et al. Advisory Council on Global Change (WBGU). http://www.wbgu.de/wbgu_jg2007_engl.pdf

WBGU examined the nature of environmental conflicts, main causes of war, and global climate trends in order to evaluate the probable impact climate change will have regionally, nationally, and internationally. WBGU found that sustained climate change would intensify current environmental problems, such as droughts, access to clean water, and soil quality. Additionally, new environmental problems are likely to occur, especially threatening coastal regions. Sustained climate change could lead to the loss of major ecosystems and environmental cycles. From a security standpoint, WBGU found various ways climate change could weaken international security.

Six key threats to international security and stability posed by sustained climate change:

1. *An increase in weak states* – Weak states are not only ill equipped to manage threats posed by climate change, but they are also likely to weaken further as a result of them. Additionally, WBGU warns against the creation of “failing sub regions” of multiple weak and failing states.

2. *A threat to global economic growth* – Sustained climate change will likely severely hinder economic growth by affecting infrastructure, water availability, production processes, and extreme weather events such as floods and storms.
3. *Increased gap between the main causes of climate change and those experiencing the most severe impact* – The equity gap between developed nations causing climate change and developing nations bearing the burden will continue to grow under sustained climate change, leading to questions of responsibility, rights, and problem solving.
4. *Questions of the legitimacy of industrialized nations* – WBGU predicts that without severe reductions, industrialized nations emitting large levels of CO₂ can be seen as knowingly causing human rights violations. If so, the legitimacy of these nations on a wide range of issues could be dramatically jeopardized.
5. *Forced migration* – Migration has already become a major international policy challenge, and sustained climate change will see a growing number of migration hotspots. Climate-driven migration will bring with it a bevy of ethical and practical dilemmas.
6. *Intensification of classic security issues* – Current failures to adequately address the growth of weak states and other key security issues demonstrate that current security policy already faces many obstacles. The growth of many of these problems due to sustained climate change will only further overextend scarce security policy resources.

In order to avert security threats posed by sustained climate change, WBGU recommends definitive climate policy action in the next 10-15 years. WBGU estimates that temperatures will rise by 2-7 degrees Celsius relative to the pre-industrial average. If climate policy can hold the rise in temperature to 2 degrees since pre-industrial levels, the climate-induced security threat would be minimized.

WBGU recommendations are broken into three categories. Initiatives 1-2 focus on avenues for transnational cooperation. Initiatives 3-5 aim to preventing sustained climate change. Initiatives 6-9 suggest adaptation strategies to prevent conflict.

Initiatives:

1. *Shaping global political change* – Look at ways to create multilateral cooperation and participation, especially through understanding the growing significance of China and India.
2. *Reforming the United Nations* – WGUB recommends three key pillars for reforming the UN. The first is to evaluate the

role and focus of the Security Council going forward, especially with regards to the principle of the “responsibility to protect.” The second is to strengthen the UN Environment Program (UNEP) both structurally and financially. The third is to create a high-level council on the environment within the UN system with the authority to guide policy.

3. *Ambitiously pursuing international climate policy* – WGBU advocates a 50% reduction in greenhouse gas emissions globally by 2050 compared to numbers in 1990, in order to achieve the goal of limiting surface air temperature change to 2 degrees Celsius above pre-industrial levels. Also, WGBU encourages more flexible adoption of the Kyoto Protocol going forward, accounting for the need to integrate industrializing nations.
4. *Transforming energy systems in the EU* – Strengthen the EU as a reduction leader by achieving Kyoto commitments and set new targets, improving the Energy Policy for Europe aiming towards sustainability, and expanding renewable energy use.
5. *Developing mitigation strategies through partnerships* – Integrate climate protection into poverty alleviation efforts, enter into decarbonization partnerships with industrializing nations to make simultaneous efforts at efficiency and sustainability, and cooperate within the G5+8.
6. *Supporting adaptation strategies for developing countries* – Avoid and prepare for water crises through education and reorientation of water management goals. Prepare developing countries’ agriculture sector by strengthening rural development, establishing compensation mechanisms for Low-Income Food-Deficit countries, and monitoring the farm import/export pattern. Promote disaster preparedness through land-use planning and integration with poverty alleviation efforts.
7. *Stabilizing fragile states and weak states that are additionally threatened by climate change* – Take the necessary steps to understand the role of climate change in weak states and their respective ability to handle climate-driven disasters.
8. *Managing migration through cooperation and further developing international law* – Develop strategies and plans for environmentally-driven migration, and integrate migration policy politically, especially the protection of climate-driven migrants in international law as international refugees.
9. *Expanding global information and early warning signs* – Systems should both provide timely information in advance of extreme events and model and evaluate past data.

CHATHAM HOUSE

“Managing the interlocking climate and energy resource challenges” by Bernice Lee. *International Affairs*, Volume 85 Issue 6, pp.1101-1116. November 2009.

<http://www.chathamhouse.org.uk/publications/ia/download/-/id/2426>

In this article, the Research Director for Energy, Environment and Resource Governance at Chatham House emphasizes how energy security, climate change and food and water concerns pose serious challenges to the management of international relations in an already turbulent world. She argues that these new developments and the corresponding risk management strategies will change the calculus of interests, powers and strategies for all actors, with significant impacts on the global political economy.

Lee claims that despite increased recognition of the need to manage resource security and the potential political fallouts, these interlocking issues are rarely considered in a systematic fashion by governments and industries. In the context of climate change, international cooperation offers the only option that can best serve even narrowly defined national interests. Lee proceeds to explore three dimensions relating to managing the risks of global climate change.

The first dimension is mapping the geophysical implications of global climate change. Environmental change and its impact on human societies—social structures, adaptive capacities and resource distribution—need to be further explored. With an average global temperature rise of 2 degrees Celsius over pre-industrial levels, reduced access to safe and reliable water supply will pose major challenges for agriculture and food security on all continents. Anticipated climate change impacts could have significant impacts on global fisheries resources, not least through disruptions of the food chain. Climate change induced migration could become yet another driver of future patterns of resource use.

Forecasts for the number of people having to move because of environmental degradation and climate change vary widely, ranging between 25 million and 1 billion, depending on which of the IPCC’s scenarios occurs. The need for comprehensive management and understanding is perhaps more apparent in energy than in any other area, due to the ubiquitous challenge of energy security. These interlocking climate, resource and development problems are increasingly understood as a key accelerator to the range of risks and vulnerabilities policymakers and citizens need to manage in the short, medium and long-term.

Lee addresses managing the politics of transition in a reasonable and equitable manner. Effective action on climate change, such

as targets for emissions reductions, poses deep challenges to the existing power structures. The politics of fear around loss of competitiveness continues to dominate climate policy discussions, especially at the national level. To steer the world firmly onto a low-carbon development trajectory amounts to creating conditions for a new industrial revolution. The process is also likely to create new haves and have-nots. Imminent changes will play an increasing role in determining the global industrial structure, new producer–consumer relations, and ultimately the distribution of the benefits and the future of globalization. The following questions demand answers: What will the impacts be on key producer–consumer relationships from the global perspective? What are the geopolitical, social and political implications of potential land and maritime border changes resulting from climate change? Will the existing structures of power—in production, knowledge, financial and security terms—be able to respond to the threat of climate, energy, food and water concerns in an optimal manner?

Finally, Lee advocates international cooperation to hedge the risk of policy failure and inaction. The complexity of climate politics means that there is a realistic risk of policy failures. Nevertheless, Lee argues that international cooperation provides the best option for the global community to mitigate and adapt to climate change.

The conclusion is that more attention is needed to map the potentially multidimensional implications of policy instruments to address these interlocking challenges. In the context of climate change and resource depletion, international cooperation—together with solid national action—offers the only option that can best serve even narrowly defined national interests. Ensuring human security and peaceful relations among states in the decades to come will require short-term common action within the framework of long-term strategizing and visionary leadership as well as concerted efforts to deal head-on with worst case scenarios in our forecasting and policy planning.

“From constants to variables: how environmental change alters the geopolitical and geo-economic equation” by Cleo Paska. *International Affairs*, Volume 85 Issue 6, pp. 1143-1156. November 2009.
<http://www.chathamhouse.org.uk/publications/ia/download/-/id/2429>

In this article, the Associate Fellow for Energy, Environment and Resource Governance at Chatham House builds upon the premise that we are in an era in which planning constants, such as site stability and the location of fisheries, are now variables as a result of environmental change. The article looks at some areas where it is likely that environmental change will become a factor in the geopolitical and geo-economic equation, or

where climate change and shifting population and consumption patterns are already altering the foundations upon which we have built our physical and legal infrastructures. The goal is to contribute to defining some of these new variables so that they can be included in future assessments and help in avoiding worst-case outcomes.

New Challenges for the Military

Climate change—compounded by and compounding environmental change—can directly affect four of the five factors that must theoretically be considered before any military action: weather, terrain, discipline (including supply lines) and politics. Even the world’s strongest military, that of the United States, is not prepared to manage repeated major domestic environmental disasters. At present the National Guard is supposed to be trained for this task; however, as the response to Hurricane Katrina made clear, it cannot in its current form deliver on its own.

Recommendations:

- A good starting point would be to augment and properly equip the National Guard.
- Several nations, including India, are setting up dedicated military units trained and equipped almost exclusively for responding to natural disasters. This is something that the UK, and/or the EU, may also wish to consider.

Environmental Change and Unchanging Politics

The political linkages between property developers and government officials result in land development policies and initiatives that are at best ill advised in times of environmental stability but can become potentially dangerous in times of environmental change. This is seen in the way the U.S. Army Corps of Engineers is often deployed (i.e. to construct levees to build new housing in the area around New Orleans, rather than to protect existing built-up areas).

Recommendations:

- The skill and expertise of the Corps should be employed as an important part of the defense against the effects of environmental change.
- Long-term planning involving politically difficult decision-making is possible in democracies, but it requires an electorate accurately informed about both the dangers and feasible solutions. Consequently, there should be an extensive public education campaign combined with a viable resettlement plan so that doomed regions do not just get piecemeal cosmetic help or get abandoned.

Food (in)security

A range of environmental and economic factors is creating a potentially protracted crisis in agriculture. Extreme weather events are taking their toll and even the world's breadbaskets are having trouble.

Energy (in)security

Energy generation, extraction, refining and distribution require a sophisticated, interlinked, costly and, sometimes global, infrastructure. However, in many cases that infrastructure (which includes nuclear power reactors, power distributors, and oil and gas facilities) lies in areas that may become increasingly physically unstable as a result of changes in the environment.

Recommendations:

- At the moment, when planners perform an “environmental impact assessment,” almost always what is being assessed is how the construction would affect the existing environment, not how a changing environment might affect the construction; this must change.
- A way to cope with increasing variability is incorporating more decentralization, better-designed local energy sources (ideally renewable) and more redundancy into our energy systems.

International Law

While the effects of the new variables on physical infrastructure may be easier to see, the effects on legal infrastructure can be equally disruptive. One example is the UN Convention on the Law of the Sea, which presupposes that the coastline upon which all the measurements are based will not substantially change, which can no longer be assumed.

Recommendations:

- Existing laws, treaties, subsidies, regulations and other instruments should be re-examined to see if they resolve problems or exacerbate them in a time of environmental change.
- From now on, not only should agreements, laws, treaties and other documents be examined for legality, but they should also be assessed for their ability to adapt to the new variables.

The author concludes that many of the challenges described here can be overcome with sufficient research, planning, engineering, financing and political will. However, this is beyond

just adaptation; we need to *integrate* our new knowledge into all levels of our infrastructure, economies, laws and politics.

“Nuclear energy and proliferation risks: myths and realities in the Persian Gulf” by Ian Jackson. *International Affairs*, Volume 85 Issue 6, pp. 1157-1172. November 2009.
<http://www.chathamhouse.org.uk/publications/ia/download/-/id/2430>

This article by the nuclear energy consultant and Associate Fellow for Energy, Environment and Resource Governance at Chatham House considers the risks inherent to the coming expansion in the use of civil nuclear power among the world's developing economies, particularly in the Persian Gulf region. The author argues that the pursuit of nuclear energy technology as a climate-friendly energy solution comes at a security price. He discusses the myths and realities surrounding the diversion of civil nuclear energy programs for military use in the Persian Gulf region, and argues that proliferation of atomic weapons is a political choice, not a certain technical inevitability.

In pragmatic terms, it is unlikely that the technologies for nuclear power and nuclear weapons can be kept totally separate. They share too much overlapping scientific knowledge and their practitioners have similar skill sets in nuclear physics, radiochemistry and metallurgy. Realistically, the United Arab Emirates would probably gain sufficient domestic capability to weaponize its civil nuclear energy program within ten years. Iran probably already has the technical capability and merely awaits the production of sufficient enriched uranium for its bomb designs. But the establishment of civil nuclear energy programs can pose different levels of security risk depending on a country's foreign policy.

Jackson examines some policies for reducing security risks. The use of proliferation-resistant thorium rather than uranium as a nuclear fuel technology might significantly reduce the threat of plutonium weaponization in Arab states. The UAE nuclear energy model deserves the political support of western nations as the best compromise between nuclear energy expansion and nuclear security threats. Although the acceptability of nuclear waste disposal has often proved to be a controversial political problem, the political commitment of western governments to dispose of Arab nuclear waste is essential for the UAE nuclearization model to work. Further research may be helpful to optimize the UAE nuclear energy model for use by Arab states, validate the degree of buy-in by other GCC member countries, and understand the wider strategic impact of civil nuclear energy expansion across the Persian Gulf region.

CNA CORPORATION

“Powering America’s Defense: Energy and Risks to National Security” (May 2009).

<http://cna.org/nationalsecurity/energy/>

To follow up on their initial study, CNA’s Military Advisory Board produced a second report designed to better inform U.S. policymakers and the public about the impact of America’s energy choices on our national security policies. This new volume considers the security risks inherent in our current energy posture, energy choices the nation can make to enhance our national security, the impact of climate change on our energy choices and our national security, and the role that the Department of Defense can play in the nation’s approach to energy security and climate change. The issues explored are considered solely for their impact on America’s national security as viewed through the lens of the extensive military experience of the Military Advisory Board.

Key Findings:

Moving beyond recent studies on the dangers of imported oil, the report finds that fossil fuels and the nation’s fragile electricity grid pose significant security threats to the whole country and particularly the military. Current risks and security threats include:

- U.S. dependence on oil weakens international leverage, undermines foreign policy objectives, and entangles America with unstable or hostile regimes.
- Inefficient use and overreliance on oil burdens the military, undermines combat effectiveness, and exacts a huge price tag—in dollars and lives.
- U.S. dependence on fossil fuels undermines economic stability, which is critical to national security.
- A fragile domestic electricity grid makes our military installations and their critical infrastructure unnecessarily vulnerable to deliberate or accidental incident.

Looking forward, the report warns that continuing business as usual is perilous because of the converging national security risks of energy demand and climate change:

- The market for fossil fuels will be shaped by finite supplies and increasing demand. Continuing our heavy reliance on these fuels is a security risk.
- Regulatory frameworks driven by climate change concerns will increase the costs—both economic and geopolitical—of using carbon-based fuels.

- Destabilization driven by ongoing climate change can add significantly to the mission burden of the U.S. military in fragile regions of the world.

The report concludes that the national security planning processes have not been sufficiently responsive to the security impacts of our current energy posture. In the course of addressing its most serious energy challenges, the Department of Defense (DOD) can contribute to national solutions as a technological innovator, early adopter, and test-bed.

“Roadmap for Energy Security”:

- Priority 1: Energy security and climate change goals should be clearly integrated into national security and military planning processes.
- Priority 2: DOD should design and deploy systems to reduce the burden that inefficient energy use places on our troops as they engage overseas.
- Priority 3: DOD should understand its use of energy at all levels of operations. DOD should know its carbon footprint.
- Priority 4: DOD should transform its use of energy at installations through aggressive pursuit of energy efficiency, smart grid technologies, and electrification of its vehicle fleet.
- Priority 5: DOD should expand the adoption of distributed and renewable energy generation at its installations.
- Priority 6: DOD should transform its long-term operational energy posture through investments in low-carbon liquid fuels that satisfy military performance requirements.

“National Security and the Threat of Climate Change” (April 2007).

<http://securityandclimate.cna.org/report/>

Drawing upon the Military Advisory Board members’ advice, expertise and perspective, CNA writers and researchers compiled this landmark report. The report articulates the concept of climate change acting as a “threat multiplier” for instability in some of the most volatile regions of the world and identifies key challenges that must be planned for now if they are to be met effectively in the future. Specifically, the report evaluates the likely effects of climate change, including rising sea levels, increased desertification and limited availability of critical resources such as food, water and energy, and how those changes could trigger conflicts around the globe. It explores ways projected climate change in already fragile regions is exacerbating conditions that

contribute to failed states – the breeding grounds for humanitarian disasters, extremism and violence. It includes analysis of the implications for U.S. military planning over the next 30 to 40 years, which is the timeframe that coincides with future defense planning horizons and weapons system life cycles. The bottom line of the report is that "climate change, national security, and energy dependence are a related set of global challenges," and that the United States must take action to address the national security consequences of climate change.

Key findings:

1. Projected climate change poses a serious threat to America's national security.
2. Climate change acts as a threat multiplier for instability in some of the most volatile regions of the world. Projected climate change will seriously exacerbate already marginal living standards in many Asian, African, and Middle Eastern nations, causing widespread political instability where societal demands exceed the capacity of governments to cope and increasing the likelihood of failed states.
3. Projected climate change will add to tensions even in stable regions of the world.
4. Climate change, national security and energy dependence are related challenges.

Recommendations:

1. The national security consequences of climate change should be fully integrated into national security and national defense strategies (i.e. the National Intelligence Estimate, the National Security Strategy, the National Defense Strategy and the next Quadrennial Defense Review).
2. The U.S. should commit to a stronger national and international role to help stabilize climate changes at levels that will avoid significant disruption to global security and stability.
3. The U.S. should commit to global partnerships that help less developed nations build the capacity and resiliency to better manage climate impacts.
4. The Department of Defense (DOD) should enhance its operational capability by accelerating the adoption of improved business processes and innovative technologies that improve U.S. combat power through energy efficiency.

Given that many critical defense installations are located on the coast or on low-lying Pacific islands, the DOD should conduct an assessment of the impact on U.S. military installations worldwide of rising sea levels, extreme weather events, and other possible climate change impacts over the next 30 to 40 years.

CNAS

"Natural Security," working paper by Sharon Burke (June 2009). http://www.cnas.org/files/documents/publications/CNAS_Working_Paper_Natural_Security_SBurke_June2009_OnlineNEW_0.pdf

This concept paper is the starting point for the new program in "natural security" at CNAS, which realized that the challenges of national security and foreign policy implications of energy and climate change are linked to other natural resource challenges. For example, some of the proposed solutions to U.S. reliance on oil also have security consequences. Coal exacerbates climate change, corn-based ethanol has implications for global food prices and unrest, hybrid electric vehicles depend on minerals that are concentrated in just a few countries (Bolivia has more than 50 percent of global reserves of lithium), and solar photovoltaic panels require minerals such as gallium, for which the U.S. is 99 percent reliant on imports, including almost 40 percent from China.

Highlights:

- Conservation, water rights negotiations, and other environmental strategies can also complement national security strategies. For example, recovery in Afghanistan depends not only on military successes, but also on restoration of its severely degraded natural resources.
- Negotiations about climate change will be central to U.S.-China relations.
- The greatest security threats today are not necessarily military threats, although natural security may require a military response in cases such as disaster relief.
- Import dependence can become a strategic liability when sources of natural resources are highly concentrated, demand is rising, or substitutes are limited. In an example of resource rich nations' economic and political power, the presidents of Venezuela and Iran have explicitly linked energy wealth to their ability to counter U.S. foreign policy goals.

- Lack of reliable information on global supply chains and reserves-to-production ratios makes it difficult to know if the U.S. is actually vulnerable to supply disruptions of strategically important minerals. Energy supply chains are also physically vulnerable to sabotage, natural disasters, and disrepair.
- Concentration of supply can also be a “resource curse” for supplier nations, producing destabilizing problems such as corruption, depressed long-term growth, and armed rebellion.
- High consumption rates among more countries competing for limited strategic resources can lead to tension, mass migration, and even interstate conflict.
- The paper goes into more detail about how high consumption of energy, non-fuel minerals, water, and land and also consequences such as climate change and biodiversity loss can be threat multipliers in creating geostrategic pressure, instability, and disasters.

“A Strategy for American Power: Energy, Climate, and National Security,” report by Sharon Burke & Christine Parthemore (June 2008).

http://www.cnas.org/files/documents/publications/Burke_EnergyClimateNatlSecurity_June08.pdf

The key message of the report is that to win the energy war, the United States needs a comprehensive strategy to change both its supply of fuels and its demand. The energy it uses keeps its economy and security dependent on unstable and hostile states and vulnerable to natural disasters and the consequences of climate change. It needs to cut dependence on oil and greenhouse gas emissions and not make the mistake of addressing the two as separate issues, or else one will be improved only at the expense of the other. True energy security is defined as protecting the American way of life and future from the security, economic, and environmental risks associated with fossil fuels.

This report is part of the CNAS Solarium Strategy Series, which was named after President Eisenhower’s “Project Solarium”, undertaken in 1953 to develop a competitive strategy for the Cold War through inclusive debate and extensive analysis. On January 10, 2008, CNAS hosted Project Solarium II for Energy Security, two meetings sponsored by the Markle Foundation for experts from all sectors of society to discuss a more strategic approach to these energy challenges. CNAS identified four key barriers to progress: public opinion, politics, international factors, and economics. Four strategy papers on overcoming each of these barriers are included in the volume, organized into five chapters:

1. “A Strategy for American Power: Energy, Climate, and National Security” by Sharon Burke and Christine Parthemore
2. “Overcoming Political Barriers to Reform in Energy Policy” by Josh Busby
3. “Energy, Climate Change, and Public Opinion” by Christine Matthews
4. “The United States and the International Energy Barrier” by Amy Myers Jaffe
5. “Overcoming the Economic Barriers to Climate Change and Energy Security” by Jason Furman, Jason E. Bordoff, Manasi Deshpande, and Pascal J. Noel

Americans consume 22 million barrels of oil per day – 60 percent and increasingly more of which is imported from other countries, as U.S. domestic oil production has been in decline since 1970. Ninety-six percent of road transportation (approximately 242 million vehicles) and consequently every sector of the U.S. economy depend on petroleum products (gasoline and diesel). Most global oil suppliers are hostile to the United States, unstable, undemocratic, or corrupt, which puts global supplies at risk and drives up prices. All but one of the top ten holders of reserves in the world are considered to be failed states or in danger of becoming failed states, according to the Failed States Index. U.S. energy vulnerability is expected to increase as two-thirds of oil reserves are in the Middle East, the productivity of reserves is declining almost everywhere else, and global demand for oil is forecast to increase about 46 percent in the next 25 years. Public opinion polls show that for the first time, the public believes that dependence on foreign oil is the nation’s number one security threat. Electricity is the next largest fuel source in America but is 50 percent dependent on the top contributor to manmade greenhouse gas emissions – coal. At current rates of consumption, the United States has enough coal to last 200 years. Emissions have grown by 70 percent between 1970 and 2004 and will have to be cut dramatically (70 to 90 percent) over the next 40 years to avoid the worst effects of climate change.

The report asserts that a 70-40 strategy — cutting greenhouse gas emissions by 70 percent over 40 years — will change America’s fuel supply and its demand for fossil fuels. A 40-year timeframe is considered reasonable, comparable to the length of time it took a strategy of containment to succeed in the Cold War. However, the United States will have to make important gains early on and in the transportation sector. The U.S. needs to invest far more in innovations such as new fuel sources, electric cars, and carbon capture and sequestration.

Until investment in R&D produces major breakthroughs, diversification will be important, as reliance on any one source or supplier of energy makes the U.S. vulnerable. An investment in energy innovation is also an investment in our economic future and competitiveness, with new, high-quality jobs at home. Increasing domestic energy supplies other than coal and oil would also benefit the domestic economy (as oil accounts for 40 percent of the current trade deficit). Despite partisan differences on the merits of renewable energy sources versus increased drilling for oil versus nuclear energy, the U.S. may have to allow the private sector to expand all feasible domestic energy resources. Conservation, using energy more efficiently everywhere — in cars, with light bulbs, in buildings, and in power plants, is one domestic resource with no security or environmental downsides. Finally, attention needs to be paid to the protection of the energy infrastructure and prevention of crises such as terrorists' attacks on oil fields or power outages from natural disasters.

Making the strategy work requires strong presidential leadership in making America's energy security a top national priority. The United States should work in partnership with major oil-consuming nations, especially China. China should be invited to join the International Energy Agency (IEA) and be approached at a high diplomatic level. The president should also seek to improve relations with producers, such as Mexico — the United States' third largest supplier of oil. The U.S. should help Mexico improve its oil production efficiency and raise its export earnings.

The authors believe that either a market-based carbon cap and trade system or a carbon tax would establish an effective carbon price if implemented properly, so the choice comes down to which is most politically viable. Other methods of pricing the externalities would be to eliminate tax breaks to big oil companies and increase gas taxes. While Republicans tend to emphasize cutting down dependence on foreign oil and Democrats usually focus on lowering the risk of climate change, energy security should bridge the partisan divide. It is important to reach out to new energy security constituencies, improve the transparency of information on energy security and climate change, and invest in energy literacy. Energy security requires a national strategy, but it also requires leaders motivating the individual acts of millions of Americans.

“The Age of Consequences: The Foreign Policy and National Security Implications of Climate Change,” report by Kurt M. Campbell, Jay Gullledge, J.R. McNeill, John Podesta, Peter Ogden, Leon Fuerth, R. James Woolsey, Alexander T.J. Lennon, Julianne Smith, Richard Weitz, Derek Mix (November 2007). http://www.cnas.org/files/documents/publications/CSIS-CNAS_AgeofConsequences_November07.pdf

For the past year a diverse group of experts in climate science, foreign policy, political science, oceanography, history, and national security, under the direction of the Center for Strategic and International Studies (CSIS) and CNAS met regularly to consider the potential future foreign policy and national security implications of climate change. The group developed three potential future scenarios based on expected, severe, and catastrophic climate cases. They noted that most scientific predictions regarding climate change over the past two decades were consistently below the actual outcomes.

The expected climate change scenario, with an average global temperature increase of 1.3°C by 2040, generated national security implications including: heightened internal and cross-border tensions caused by large-scale migrations; conflict sparked by resource scarcity, particularly in the weak and failing states of Africa; increased disease proliferation, with economic consequences; and some geopolitical reordering as nations adjust to shifts in resources and prevalence of disease.

In the severe climate change scenario, with an average global temperature increase of 2.6°C by 2040, nations around the world will be overwhelmed by the scale of change and challenges such as pandemic disease, dramatic rise in migration, and changes in agricultural patterns and water availability. The flooding of coastal communities, especially in the Netherlands, the United States, South Asia, and China, will potentially challenge regional and national identities. Armed conflict over resources such as the Nile is likely, and nuclear war is a possibility.

The catastrophic scenario, with average global temperatures increasing by 5.6°C by 2100, is the most difficult to visualize, but illuminates strong connections between two great security threats— global climate change and international terrorism waged by Islamist extremists. Both threats are linked to energy use in the industrialized world, and the solutions to both depend on transforming the world, and especially America's, energy economy. The group argues that targeting only one of these threats is likely to exacerbate the other, while dealing with both together can provide important synergies.

While natural disasters in the past have generally been localized or abrupt, historical case studies may be predictive of future responses to crises. Natural disasters have tended to be divisive although sometimes unifying, provoke social and even international conflict, inflame religious turbulence, focus anger against migrants or minorities, and stir up blame against governments. Droughts and epidemic disease – both expected effects of climate change – have generally exacted the heaviest demographic and economic toll.

Any international agreement to limit carbon emissions will have significant geopolitical and economic consequences. For example, shifting to low-carbon fuels could lead to a diminished significance of the Middle East in global politics and greater role of natural gas-rich Russia. Expanded use of nuclear power would also generate major proliferation challenges. The rise of alternative energy sources such as biofuels could create new regions with strategic significance. A narrow definition of “national security” will not adequately account for ways in which state authorities might be overwhelmed by problems arising from consequences of climate change.

E3G (THIRD GENERATION ENVIRONMENTALISM)

“Down But Not Out?’ Reviving the EU’s Political Strategy After Copenhagen.”

This article declares that the real lesson of Copenhagen is that an active EU remains central to preventing catastrophic climate change, but the EU needs to match its political strategy to the geopolitical realities that Copenhagen revealed.

The weak reductions that countries put forward under the Copenhagen Accord put the emissions trajectory with, at minimum, a 3-40C future. They may also deliver less than expected, as many loopholes in the agreement have not been addressed, and there is no commitment to control growing emissions from international aviation and maritime transport. China and India have yet to decide that limiting climate change to below 20C is fundamentally in their national interest, and all major countries rejected the 1.50C goals put forward by Africa and the Small Islands States. The debate on defining a collective level of climate safety will only reopen with the next IPCC report in late 2013. The article urges national policy makers responsible for infrastructure, humanitarian and security planning to develop their future investment proposals based on a 3-40C future, which will increase short-term costs, but motivate more ambitious future action by making explicit the real consequences of this trajectory.

The article considers Copenhagen a failure of politics more than process. It claims that the negotiations were badly handled by everyone but these obstacles could have been overcome with real political will. Additionally, calculated obstructionism derailed moves towards a substantive outcome, and leaders in the U.S., China and India balanced their perceptions of the risk to economic development against the projected costs of climate change, and decided against radical and binding action. It criticizes the “bottom-up” voluntary pledging process, as countries need to have clear, binding and transparent commitments from others if they are going to go back and take on their domestic lobbies. The mismatch of expectations was the result of too much talking and too little listening between the major countries.

China overturned decades of the “peaceful rise” policy by splitting from the G77 group of developing countries, creating the BASIC block (including India, Brazil and South Africa, a group with wider geopolitical interests that have at least temporarily trumped their fundamentally different climate change positions), and marginalizing Africa and the Least Developed Countries from the decision making process. Countries that did want a binding Copenhagen deal also failed to organize into a viable coalition, despite last minute attempts by France and the UK to broker an EU-Africa alliance over climate finance. China generated a negative attitude from European policy makers more by the way it defended its interests – by blocking the process of negotiation – than by the nature of its substantive position to avoid binding commitments. The “G2” alliance between the U.S. and China was merely a moment of détente, which served their national political interests but cannot create action on the global stage.

The article points out that the elements of Europe’s power are unchanged, but Copenhagen has generated many emotional barriers to leadership. A key lesson though is that no one – especially not the U.S. – will deliver on European interests except Europe itself. Europe can act as a pathfinder in developing the elements of the low carbon economy; as an enabler of practical cooperation and other countries’ domestic action; and as a convener of a progressive political coalition to build an effective climate regime. It has succeeded when it worked in ways consistent with its soft power nature, and failed when it tried hard power threats. The UK and France back an active strategy, Poland and Italy seem opposed, and Germany still seems ambivalent following Copenhagen.

Recommendations for the EU include accelerating action on the low carbon transition, building elements of a new UN regime based on parts of the Copenhagen Accord, testing the appetite for an interim agreement, and strengthening the fundamental

political foundations for future action. Polling repeatedly shows that the European public sees the EU as essential to solving external problems like climate and energy security. Europe's relevance as a political grouping will depend on its competence in delivering these public goods for its citizens.

“Targets, Foundations and Transformation: Benchmarks for a Successful Copenhagen Agreement” E3G Briefing (December 2009)

From a “climate realist” perspective Copenhagen must lay an effective foundation for the next stage of global decarbonization by agreeing a framework that is sustainable and scalable, credible to investors, and transformational. Copenhagen must keep open the option of a below 20C future by limiting emissions, laying the foundations of a sustainable climate regime and building economic momentum for fundamental changes. A new adaptation regime must effectively protect the most vulnerable from the worst impacts of climate change by improving country and community resilience.

The success of Copenhagen cannot be gauged by adding up the tons of carbon it may save, or arguments over different ways of estimating reductions will cloud public understanding of the real implications of the agreement. Planned cuts in developed countries are not large enough to offset the continued rise in emissions in countries such as China and India. Many developing countries are actually nearer the necessary trajectory than developed nations, especially some emerging economies such as Mexico. The economic recession has dramatically lowered developed countries emissions making it feasible for them to increase their emission reduction targets without increasing costs. In fact, a strong push on low carbon investment at this part of the economic cycle would be an efficient way to create jobs and help drive economic recovery. The EU should drive this process by moving immediately to a 30% target with the option of increasing its target to 40% if other countries improve their offers.

A set of benchmarks for a successful agreement include: agreement on 2030 convergence of developed country emissions, additional actions from China and India, tight rules on LULUCF and surplus AAUs, limits on international transportation emissions, and a review of mitigation and financial commitments in 2015.

The Copenhagen Agreement should start detailed work on innovative mitigation finance, which will come through a mixture of expanded carbon markets and leveraged public finance and will need to be of the order of \$30-70 billion per year from 2012 onwards.

Foundations of a sustainable climate regime rest on three inter-linked but distinct pillars: legally binding agreement(s); mandatory reporting systems; and compliance systems, which invoke subsequent consequences. These elements constitute a hierarchy and not all will apply to all countries or all commitments.

While trade sanctions could be used as a last resort for “rogue” countries that consistently refuse to meet their international obligations, they should not become a standard part of the climate change regime. In both the US and EU there are proposals to use “border adjustments” to deal with competitiveness concerns in energy intensive domestic industries. Extensive empirical research shows these measures are neither economically necessary nor politically effective in driving global agreement.

Marginal increases in efficiency and the use of low carbon energy are not enough to move the world onto a below 20C trajectory. To be consistent with the latest science, by 2050 the global energy economy will need to be essentially carbon-neutral, with any remaining atmospheric space reserved for agriculture, defence (the US military uses 1% of national energy) and perhaps aviation. Developing countries should be incentivised to move quickly to implementing transformational low carbon growth strategies, but there is currently no mature economic model for decarbonization.

Even if all policies deliver their full potential, moving the global economy onto a 20C trajectory will require an acceleration of technology development and diffusion far beyond current levels. Enhanced collaboration on critical low carbon technologies will be vital to meet climate change goals, and this implies significant change in existing innovation policies.

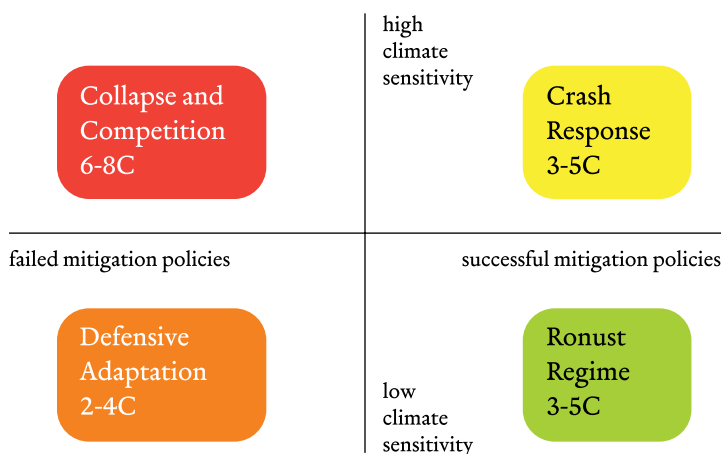
Intellectual Property Rights (IPRs) are the most politically contentious area of the technology negotiations. The US, EU and other developed countries have strongly advocated that IPRs should not be discussed under the UNFCCC, and much industry lobbying has been focused on this issue. However, developing countries have put forward proposals for the use of existing flexibilities under the WTO Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement, and the creation of new flexibilities. To diffuse the political tensions Parties could agree to a set of core principles to guide cooperation in this area based on the overarching principle that IPR must be protected in order that it can then be shared to achieve climate goals.

“What does the Security Community Need from a Global Climate Regime?” E3G Briefing by Nick Mabey (November 2009)

The briefing states that there is a growing consensus on climate

security challenges, but it is mostly based on medium impact scenarios. They do not cover the full range of future climate change risks and do not reflect the most recent research. Failing to consider worst-case scenarios, which are largely inevitable under current momentum economic behavior, is as dangerous for climate change as it is for terrorist attacks.

Outline Climate Security Scenarios; 2100 outcomes for a 20C target



Even the most optimistic scenario for successful mitigation sees critical limits exceeded under a high climate sensitivity scenario (“Crash Response”). The high level of international cooperation implied by this scenario suggests that there would be coordinated action to both lower emissions and deal with climate change impacts. This is not true in the scenarios where climate mitigation policies – and hence global cooperation - fail and countries fall back on defensive adaptation in the low climate sensitivity case, or aggressive competition for resources in the high sensitivity case.

While the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol remains the capstone of the global climate regime, a mature regime will also require strong action at other levels. For example, nuclear proliferation agreements need to be strengthened to mitigate negative security impacts of any major increase in global nuclear power build. International and regional cooperation will be needed to ensure resource management treaties on maritime boundaries, fisheries, and international rivers are resilient to climate change.

The security community can help by “stress testing” the climate regime, which has not been rigorously scrutinized like other international security regimes on arms control and WMD proliferation. Initial risk management analysis of climate change suggests the following areas should be prioritized: stronger mitigation goals, climate regime resilience, contingency “crash

mitigation” programs, systematic monitoring of key climate tipping points, monitoring and modeling “perfect storm” climate impacts, increased resilience in international resource management regimes, and improved cooperation on preventive and humanitarian intervention.

“Development, Climate Change and Security: Final Report to DFID,” by Nick Mabey (E3G) & Justin Mundy (FCO/DFID)

This study is a proposal of tools and systems for the UK Department for International Development (DFID) and HMG (Her Majesty’s Government) to mobilize strategic responses to the medium and long-term impact of energy security, resource scarcity, and climate change on development and security. The report contains three sections: the first analyzes the medium to long-term risks of the above impacts, the second maps the work already done on the links between security/development and climate change inside and outside of HMG, and the third identifies gaps in the existing analysis and proposed future work for DFID and HMG. It concludes that building effective analysis in this area will remain fragmented in the near term and will be a long-term process, that the best short-term approach is to engage in case studies of particular regions, and that there is need for investment to build an external community of analysts looking at the combined economic and stability impacts of climate change.

Levels of climate and energy security analysis:

1. Geo-strategic issues – for example, how EU/Russia relations US/China relations will be impacted, or how China is aiming to secure its energy security objectives through relationships with Africa and Latin America.
2. Strategic planning – how other objectives, such as anti-terrorism or poverty reduction, will be impacted.
3. Capability planning – how changes in resource prices and climate change will affect UK military assets or development projects and impact equipment and capability for future military and humanitarian operations. This section also describes a framework for analyzing these concerns: risk analysis, threat analysis, effectiveness analysis (options for action) and political context (how broader diplomatic concerns might impact policy response).

Work already being done:

- Inside HMG: stability assessments over 2 and 5 year horizons, energy risk matrices, climate security assessments, climate change modeling, financial instability assessments.

- Outside HMG by at least 10 well-known multilateral institutions and NGOs, mainly: IPCC reports, climate change vulnerability assessments from the World Bank, and mapping of climate impacts.

Gaps in the response system:

1. There is no obvious cross-government location where assessment of climate change, energy security, resource scarcity, and development can feed into the process.
2. There is little analysis on the impact of various policy options. For example, how are measures to improve resource management actually reducing conflict risks?

Recommendations for future work include:

- DFID should take the lead on this issue in HMG.
- Cross-government discussions should be carried out within the existing resources and conflict group.
- Initial HMG work should focus on the EU strategy for the Caucasus/Central Asia, where the Germans are already active in the area of environment and security.
- Bring together external experts to map and monitor impacts/
- Invest in baseline data on conflict and crisis through the SwissPeace FAST system.
- Build an economic model looking at short, medium, and long-term impacts of energy security, resource scarcity and climate change.

“E3G Programme Areas 2010-2011.” November 2009.

This report summarizes E3G’s past activities and lays out its goals for 2010/2011. All of E3G’s activities are focused on accelerating the transition to a global low carbon economy and managing the consequences of unavoidable climate change and resource scarcity. These activities can be grouped into four programs:

1. European Coal and Climate – focused on decarbonization in the European power sector and heavy industry
2. A Global Deal – previously targeted at a COP15 outcome and working for an international agreement on climate change
3. EU-China – working to develop Low Carbon Technology

and Investment Development Zones (LCTIDZs) in China

4. Climate Security – to bring climate security analysis to the security community to drive future investment decisions

European Coal and Climate

E3G has worked since 2006 to ensure agreement and financing (6-8 billion Euros) for up to 12 coal power plant demonstration projects with carbon capture and sequestration to be built in Europe starting in 2015.

In 2010/2011 E3G aims to build a constituency of European leaders to drive full decarbonization of the EU power sector by 2035, construction of an EU “supergrid” and large-scale demonstration of smart grid technologies. E3G also aims to shift at least 30 percent of the EU budget to support EU low carbon infrastructure, innovation and international cooperation during the 2011/2012 budget negotiations, and to develop new market and financing models for large-scale generation, infrastructure and energy efficiency retrofit in key countries including the UK, the Netherlands and Germany.

Global Deal

E3G’s activities here were all closely tied to the December 2009 conference in Copenhagen. E3G brought together a civil society coalition that formed the Global Campaign for Climate Action, which has over \$10 million in funding. E3G also worked with the UK and German governments, the Most Vulnerable Countries group, and non-government actors such as Tony Blair, Project Catalyst and Greenpeace to develop their Copenhagen strategies. E3G also brought together a cross-sectoral coalition with The Climate Group and Avaaz to support European leadership at the conference.

E3G is considered a thought leader in civil society on technology development and transfer. The organization has engaged in informal diplomacy efforts to form a consensus on these issues. A paper on this subject written in conjunction with Chatham House has formed the basis of further work with the Office of Tony Blair and Nordic Council.

Plans for 2010/2011 include: supporting the conclusion of a UN climate agreement, supporting commitments to low carbon R&D by 2020, establishing a new global technology development institution, gaining agreement on a global CCS action plan with at least 250 million Euros and at least 4 demonstration projects in developing countries starting in 2015, and developing best practice models for low carbon growth strategies and national technology strategies, and implementing these with at least 5 progressive countries/regions.

EU-China

Since 2007, E3G has driven an initiative to develop Low Carbon Technology and Investment Development Zones (LCTIDZs) in China and has pilot studies under way in four provinces. In 2009 E3G signed a Memorandum of Understanding (MoU) with the Chinese Ministry of Commerce to develop these zones, launched first in Nanjing in November 2009 with the European Commission, German, French, and UK governments.

In 2010/2011, E3G plans to support the Nanjing LCTIDZ with 300-500 million Euros of new investment and to create 2-3 new LCTIDZs, working with the EU and the Chinese government to create an intellectual property rights (IPR) regime that allows for technology transfer.

Climate Security

Past work has included: turning the concept of climate security into common knowledge, participating in the 2007 UN Security Council debates on climate change, preparing the EU climate security strategies in 2007 and 2008, and discussions with the U.S. on climate impacts relevant to the National Intelligence Council and the Quadrennial Defense Review.

In 2010/2011, E3G aims to: develop an agenda for the needs of the security community to help form global climate discussions, support security sector pressure in the U.S. and Europe for a binding agreement, develop a new EU strategy towards Russia which incorporates resource management issues, and support trans-Atlantic cooperation on a joint climate security agenda, especially on international resource management and the joint development of new tools to guide adaptation investment in vulnerable regions.

“Tackling Worst Case Scenarios: Developing a risk management approach to delivering climate security” by Nick Mabey (November 2009)

In this report Mabey proposes a risk management approach as the decision-making framework countries should use to plan protective measures against the security impacts of the worst case scenarios in climate change (a combination of climate policy failure and worst case scenario science). He defines the approach as a structural and quantitative assessment of several factors: the magnitude of key risks, potential strategies for addressing them, identifying who bears the risk and which organizations or individuals are best placed to manage this risk, and reassigning risk management responsibilities to prevent this risk. An example of this would be identifying the magnitude

of a possible terrorist attack and hardening targets and defense systems to prevent this risk. Mabey explains that the approach is a good fit for addressing climate change because it prepares in advance against a risk characterized by high uncertainties of timing and magnitude and preempts the need for “defensive” policy or other violent responses to the impacts of climate change.

A risk management approach would have the following elements: a definition of risks (scenario, impacts, reversibility), estimate of the likelihood of the risk, proposed monitoring strategies, description of current risk management strategies in place, and possible alternative risk management strategies. The report includes tables detailing these categories for a comprehensive list of climate change impacts.

Mabey not only proposes a framework, but also isolates high probability risks that decision makers will have to take into account, such as the need to minimize the risk of triggering tipping point effects (e.g. melting of the Antarctic ice sheet) and the need for a rapid greenhouse gas reduction program in the next few decades that would require contingency planning (rendered possible by geo-engineering solutions). It is also crucial to examine the risks of failures in mitigation policy, such as complacency or unrealistic expectations of energy efficient technology advancements. Mabey recommends increased cooperative international R&D development as a vital risk management tool.

The report suggests that a major goal of identifying these scenarios and risks is to fill the need to sensitize decision makers to the reality of different scenarios and provide analysis that allows them to prioritize. It lays out the features of the worst-case scenario for uncontrolled climate change post-2030: large-scale sub-national social breakdown inside major countries such as China and India; inter-state tension or conflict over borders, water supply and migration; and livelihoods untenable for hundreds of million of people in Africa and Asia.

Mabey also distinguishes between short-term and long-term security planning. Short-term risk analysis should focus on emergency events that drive instability, while longer-term analysis should consider the compounding effects of multiple shocks and the need to design comprehensive and not fragmented management responses.

It is not a cost-benefit analysis of the critical policy measures to be taken, but rather a clear framework for decision-makers to use to understand the real security threats they face and their best options to address the risks. Options might include isolating (disease quarantines), buffering (flood controls, adaptation R&D), reacting (crop adaptation, geo-engineering), mitigating

(UNFCCC energy sector decarbonization), or capturing/containing (coercive tropical forest management, arable land grabs, environmental refugee management). The security community must be involved in developing these assessments in order to consider the practicality of these approaches.

Core areas for risk management strategies:

- *Monitoring risks* – defining climate security objectives for varying science-based scenarios, developing up-to-date monitoring and analysis of critical risks at local, regional, national, and global levels
- *Reducing risks* – investing in technology and infrastructure programmes and a verifiable system for monitoring mitigation
- *Managing risks* – stronger international cooperation on trans-boundary issues, build effective shared approaches to response in conflict prone areas
- Other recommendations include creating a transatlantic agreement on how to handle key security related policy issues inside and outside the UNFCCC framework (trans-boundary water management, border issues, framework for handling rights and responsibilities for environmental refugees), bilateral energy security and technology cooperation agreements, and bilateral cooperation on developing new analytical tools.

Mabey focuses on the importance of presenting policymakers with a clear understanding of the security consequences of worst-case climate change scenarios and the need to present clear priorities for targeted actions. The presentation draws comprehensive tables of climate security scenarios for security actors, and considers the options available to policymakers to manage the security risks of climate change. It also outlines the production schedule for a full risk management report to be published early this month.

“Europe in the World: Political choices for security and prosperity,” by Tom Burke and Nick Mabey (December 2006)

This pamphlet describes globalization and the new political context and challenges it presents in the 21st century. It also reviews Europe’s experience as a successful microcosm of globalization (unhindered by massive worker or industry flight, with increasing social and environmental standards despite reducing trade barriers within the EU). It also sets an ambitious agenda for changes to European policy and politics, intended to galvanize European leadership in bringing together world leaders to create common policy goals focused on climate

and energy security that maintain security and prosperity in a globalized world.

The authors call for Europe to build better international governance laws and for institutions to better manage and redistribute resources in a way that protects the environment and closes the gap between nations. After two world wars, Europe has already learned that some share of economic growth must be reinvested in environmental and social programs in order to maintain the pattern of prosperity and security in the long run. This is a lesson that Europe can highlight to the international community as it adapts to a new global leadership.

The pamphlet reviews the history of Europe’s transition to a union of states, from the 1951 European Coal and Steel Community to the European Economic Community to the European Union, which has a shared policy institutions and objectives. The authors assert that Europe’s financial stability, enduring social compact and strong environmental governance equip the European community with the strength to cope with the structural changes necessary to lead in a world with shifting international relations, climate instability and resource constraints.

Burke and Mabey reiterate that bilateral relations with China are critical to achieving climate security. They claim that the success of Europe is interlinked with the success of China, and therefore it is logical that Europe should engage with China, especially through soft power diplomacy. This will require practicing what the EU preaches: installing low carbon technologies, working with China to discover new energy efficient and advanced coal technologies, developing biofuels and ultra fuel efficient vehicles as well as the roll-out of renewables, and developing a trade policy framework that removes tariff barriers. The authors also suggest that Europe should look for a way to bring China into the European Emissions Trading Scheme (ETS). If these precautions are not taken, China will continue to build the estimated 600 new coal fired power plants by 2030, which will add about 60 gigatonnes of carbon to the atmosphere (about a third of the world total amount added since the beginning of the Industrial Revolution).

To achieve a common global policy in contrast to the traditional division of domestic and foreign policy, Europe should redefine its measures of success using social and environmental indicators rather than GDP growth, plan more for intergenerational cooperation, make energy security and climate security central to policy efforts, invest in fostering a successful, climate and energy-secure China, and shift budget expenditures away from food security and toward climate and energy security.

INSTITUTE FOR ENVIRONMENTAL SECURITY

“Climate Change and the Military: The State of the Debate.”

Tom Spencer, Nick Mabey, et al. Institute for Environmental Security. Draft 2nd Edition (December 2009). Prepared for the IES Military Advisory Council.

The Institute for Environmental Security (IES) prepared this summary of recent developments in the discussion of climate change and security document to inform their council of international military experts (“IES Military Advisory Council”), who promote ambitious military climate security planning. This document contains a timeline outlining the history of the discussion on climate change and security, a list of government and think tank leaders in the field, and list of key papers that have framed the issue. The authors argue that military planning and interventions, such as promoting large-scale investment in low carbon technology and developing early warning systems that identify the onset of climate “tipping points,” will be necessary to manage global resource management conflicts exacerbated by climate change. Spencer and Mabey discuss recent developments in climate science that inform their identification of major security threats and make recommendations for the security community. They also give basic background information describing the connection between climate change and security.

Timeline of the climate and energy security discussion:

- The debate became concrete in April 2007 when the Center for Naval Analyses (CNA) released a report from their Military Advisory Board, National Security & the Threat of Climate Change.
- The Center for New American Security (CNAS), Brahma Chelaney, and the Swedish Defense Agency published influential papers the same year.
- The European Union “Solana Report” to the European Council provided the basis for European responses, and Nick Mabey’s paper published by RUSI in 2008 added to the debate.
- Among others, the UN Security Council, the European Council, NATO, the Swedish Presidency, and IES have all held conferences on climate change and security between 2007 and 2010.
- The UN gave increased legitimacy to the debate by passing a resolution and publishing a report on climate change in 2009.
- At the U.S.-hosted Major Economies Forum on Climate Change in April 2009, U.S. Secretary of State Clinton opened the first meeting with a speech on climate security.

- A plethora of articles on climate security came out during the summer and fall of 2009 in the context of the U.S. debate on a domestic climate bill.

The report calls for security sector actors to be a part of the solution to climate change, warning that failure to prepare for worst case climate scenarios is as dangerous as ignoring the risks of events with uncertain probability but high impact, such as terrorism or nuclear weapons proliferation. (As a side note, the threat of eco-terrorism against new airports and power stations is growing, and even Osama Bin Laden has spoken against the inequities of climate change.) Necessary preventative actions will include developing agreements on transnational resource management (especially of waterways and fisheries), seizing the opportunity to lower geo-political tensions over fossil fuel reserves by urging investment in low carbon technology and infrastructure deployment, developing “early warning” climate monitoring systems to reduce the surprise element of abrupt climate change, developing integrated science/economic risk and war-gaming scenarios, and reducing the climate impact of security actors’ own operations. The author notes that Europe, a leader in these efforts, still only spends approximately 0.5 percent of its defense budget on climate change. Estimates of the necessary expenditure to achieve the desired level of security are equal to current spending on the war on terror, or in a crash response to abrupt climate change, to investment put into the Apollo Programme.

Other recommendations include: developing a flexible IPR regime, focusing on establishing cooperative relationships with energy consuming countries rather than producing countries, strengthening nuclear proliferation mechanisms and determining in advance the rights of environmental refugees. Work in delta regions such as Bangladesh, Nigeria, and Egypt is critical.

The urgent timeframe set for these changes results from the new warnings on “tipping points” in updated climate science reports since the 4th IPCC Assessment Report in 2007. Feedback effects of certain events could cause abrupt changes in climate conditions that would present a problem of much larger magnitude and urgency than gradual climate change. For example, if the Greenland ice sheet were to completely melt, sea level could rise up to 20 feet. Melting of the summer sea ice in the Arctic and accelerated melting of the Greenland ice sheet are some of the most visible signs of accelerated global warming in recent years. Other critical climate feedback effects that are accelerating climate change include the increased release of methane (a greenhouse gas even more potent than carbon dioxide) from land and oceans as arctic permafrost melts and waters warm. These effects will also generate socio-political tensions, notably, tension over naval and merchant access to the Arctic Sea as the ice melts.

Existing programs developing early warning systems or “strategic environmental intelligence” include work done by the Global Energy and Environmental Strategic Ecosystem (GlobalEESE) – sponsored by the US Department of Energy, and the Global Futures Forum (GFF) – sponsored by the DOE and the U.S. Department of State. SECURENV is the equivalent project in the European Union.

INTERNATIONAL ALERT

“Climate Change, Conflict, & Fragility: Understanding the linkages, shaping effective responses” by Dan Smith & Janani Vivekananda (Nov 2009)

http://www.international-alert.org/press/Climate_change_conflict_and_fragility_Nov09.pdf

While policy discussions about the consequences of climate change are beginning to acknowledge the conflict and security implications, discussions focus on how much money should be available for responding to climate change and how the money should be controlled. The report laments the little attention paid to harmonizing adaptation with development or the dangers of it going astray in fragile and conflict-ridden states. It argues that the problems of development, adaptation and peacebuilding are interlinked and the policy responses must be integrated. The paper outlines the climate-conflict interlinkages and the challenges in responding to the challenges they present. It establishes an overall goal of international policy on adaptation as helping people in developing countries, even those with fragile states or conflict risk, adapt to climate change.

The paper makes eight policy recommendations:

1. Adaptation needs to be conflict sensitive, taking into account power distribution, social order, and the needs of the people.
2. Peacebuilding needs to be climate-proof, anticipating the effects of climate change.
3. Shifts towards a low-carbon economy must be supportive of development and peace, in contrast with the rapid move to biofuels.
4. Poor countries’ social capacity to understand and manage climate and conflict risks must be strengthened.
5. Greater efforts are needed to cope with climate-related migration.

6. Institutions responsible for climate change adaptation must be structured to maximize the participation of ordinary people and build accountable and transparent public institutions.
7. Development policy-making and strategic planning need to integrate with climate adaptation planning.
8. A large-scale systematic study of the likely costs of adaptation, including the social and political dimensions as well as the economic, is required.

“A Climate of Conflict: The links between climate change, peace and war” by Dan Smith & Janani Vivekananda (Nov 2007).

http://www.international-alert.org/pdf/A_Climate_Of_Conflict.pdf.

The report states that those hardest hit by climate change will be people living in poverty in unstable states with poor governance. The four key elements of risk are: political instability, economic weakness, food insecurity and large-scale migration. The report identified 46 countries, home to 2.7 billion people, at risk of violent conflict and an additional 56, with a total population of 1.2 billion, facing a high risk of instability as a result of climate change. For most of these states, the situation cannot be made safe solely by reducing carbon emissions worldwide and mitigating climate change but requires adaptation. International cooperation is needed to support countries that face both climate change and violent conflict and lack the will or the capacity to adequately handle adaptation, which is estimated to cost \$10-40 billion. The resources available at the time amounted to a few hundred million dollars. Instead of a top-down approach that would alienate local communities, the authors advocate an approach based on peacebuilding that clearly communicates the hard science of climate change and involves local knowledge to figure out the best mode of adaptation. They claim that peacebuilding and adaptation are the unified solution to the double-headed problem of climate change and violent conflict and involve the same kinds of dialogue, social engagement, and requirement of inclusivity and transparency from governments. A society that can handle one problem well is better equipped for the other. Climate change could even bridge divides and induce cooperation against this common threat. Finally, while adaptation must be made conflict-sensitive, peacebuilding and development must also be made climate-sensitive.

The report puts forward twelve recommendations for addressing climate change in fragile states:

1. Move conflict and climate change higher up the international political agenda.
2. Research the indirect local consequences of climate change.
3. Develop and spread research competence.
4. Improve knowledge and generate policy through dialogue.
5. Prioritize adaptation over mitigation in fragile states.
6. Develop the right institutional context: good governance for climate change.
7. Prepare to manage migration.
8. Ensure National Adaptation Plans of Action are conflict-sensitive.
9. Climate-proof peacebuilding and development.
10. Engage the private sector.
11. Link together international frameworks of action.
12. Promote regional cooperation on adaptation.

INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT

“Rising Temperatures, Rising Tensions” by Brown Oli and Alec Crawford (2009)

Climate change presents six major threats:

1. Climate change may increase competition for scarce water resources, complicating peace agreements.
2. Climate change may intensify food insecurity, thereby raising the stakes for the return or retention of occupied land.
3. Climate change may hinder economic growth, thereby worsening poverty and social instability.
4. Climate change may lead to destabilizing forced migration and increased tensions over existing refugee populations.
5. Perceptions of resources shrinking as a result of climate change could increase the militarization of strategic natural resources.

6. Inaction on climate change may lead to growing resentment and distrust of the West (and Israel) by Arab nations.

Four strategies for conflict prevention in a changing climate:

1. Fostering a culture of conservation.
2. Adapting to the impacts of climate change.
3. Avoiding dangerous climate change.
4. Enabling regional cooperation and international engagement.

Specific problems/needs identified:

- There are tremendous opportunity costs of high levels of military spending...Israel spends nearly 10 percent of its annual GDP on the military, which limits resources for fighting climate change.
- Countries are not collaborating on research or sharing national data to establish a baseline from which to judge change and assess vulnerability of resources, which encourages expensive, national-level projects (instead of for example a water grid between countries)

Recommendations:

- Provide a non-partisan forum for sharing data on climate change among the countries in the region.
- Encourage regional organizations like the Arab League and mechanisms such as Euro-Med and the ENP to strengthen their conflict prevention and peacebuilding mechanisms and ensure that an understanding of foreseeable climate change is integrated into their strategies.
- Encourage cooperative water management and energy links among countries and communities in the region.

Facts:

- The Middle East and North Africa (MENA) sub-region is the world’s most water scarce.
- Jordan, Israel and the occupied Palestine territory (OPT) all fall well below the accepted threshold for water scarcity of 1,000 cubic meters per person per year. According to the IPCC, Israel has natural renewable water resources of 265 cubic meters, Jordan 169, and OPT 90.
- The division of waters of the Euphrates River between Turkey, Syria and Iraq is already contentious and could become more so with climate change.

- A severe drought across the region in 2007/2008 provided a taste of what could happen in the future. In Syria, wheat harvest was less than half of previous years, production of chickpeas and barley fell by a third on average, cattle populations declined to 600,000 from one million, the olive harvest fell to 17,000 tons from 40,000 tons the previous year.
- A high proportion of water in the Middle East is trans-boundary.
- Under moderate temperature increases, some analysts predict that the Euphrates River could shrink by 30 percent and the Jordan River by 80 percent by 2100.

“Climate Change and Security in Africa (A Study for the Nordic-African Foreign Ministers Meeting)” by Oli Brown and Alec Crawford (March 2009)

The report states that Africa is “almost universally seen as the continent most at risk of climate-induced conflict- a function of the continent’s reliance on climate-dependent sectors (such as rain-fed agriculture) and its history of resource, ethnic and political conflict.” It also references the “Africa Commission Report on the Challenge of Climate Change” (2008), which recommends certain actions on adaptation. This report also describes climate change as a threat multiplier. It is one of the many factors that impact the probability of armed conflict, along with poverty levels, natural resource endowments, population characteristics, ethnic and religious fractionalization, education levels, geography, and previous conflict. Climate change stops being just a development challenge and becomes a real security threat when governance, conflict management, and regional diplomacy are underprepared to address the impacts. This is especially difficult in regions with high poverty rates.

Three factors will determine whether or not climate change tips a nation from security to insecurity:

1. Structural conditions (the extent and speed of climate change)
2. Institutional capacity (the ability of countries and communities to adapt to those changes)
3. Responsiveness (how individuals, communities and governments react to the challenges that arise)

Four strategies to address the security challenges of climate change:

1. Improve projections and predictions of climate change in Africa. There is a need for more research to better understand the interaction between climate change and conflict, as well as more investment in climate data and analysis capabilities on the continent (such as investments in weather stations, in human resources and in capacity for meteorology). International cooperation on the provision of climate information is important, as are research agendas that are inclusive of determining migratory flows, vulnerability assessments, and conflict risks
2. Minimize dangerous climate change. Facilitate the shift in global energy production, invest in clean energy projects, provide support for avoided deforestation, and support the provision of clean energy in Africa through technology transfer.
3. Adapt to the impact of climate change. Build the capacity of national governments by ensuring better water management, promoting agricultural development and developing more effective disaster management and early warning systems. Provide substantial and predictable financial support from development partners to help meet the additional costs of adaptation, including the development of early warning systems. Undertake climate sensitive urban planning and climate-resilient infrastructure (e.g. drainage, housing, transport systems, etc.). Generate better adaptive strategies at the local level and share best practices. Educate women on adaptive strategies, as they are those primarily involved in agricultural production. Ensure that adaptation strategies are conflict sensitive and do not crowd out other development concerns.
4. Integrate climate change into all relevant levels of governance. Adopt regional mechanisms and national adaptation programmes of action.

Facts:

- More than 30 percent of the world’s refugees and internally displaced people are housed by African countries.
- One-third of the African population already lives in drought-prone areas. Six of the 10 largest cities in Africa are located on the coast.
- The Sahel in Northern Africa is particularly at risk to migratory pressure: it is estimated that between 2025 and 2050 the population of North Africa will increase by around 50 million.

MCKINSEY & COMPANY

McKinsey's Climate Change Special Initiative (CCSI) focuses on the following areas: energy efficiency, water, land use, clean tech, and sustainability transformation.

Energy Efficiency

The four most recent energy efficiency reports show opportunities for increasing the energy efficiency of supply chains, propose solutions for non-transportation energy efficiency in the United States, recommend an efficiency metric for data centers, and highlight the work of Amory Lovins, who argues that market forces and not regulation will play the key role in promoting more energy efficient consumption.

Water

CCSI water reports recommend that businesses and government collaborate to develop effective water management technologies, demonstrate the economic necessity and profitability of water conservation by businesses, and chart competing demand for water resources in the future.

Land Use

Land use research recommends that biofuel companies develop entry strategies as soon as possible. It also explores challenges to the growth of Brazil's ethanol industry.

Clean Tech

McKinsey's clean technology reports compare the prospects of competing technologies, argue that a clean-tech partnership between the U.S. and China is essential to the success of clean technology, examine the future of the electric car and battery industries, look at market dynamics in China and India, and model the future economic attractiveness of investments in wind and solar.

Sustainability Transformation

Notably, the sustainability transformation research includes a February 2008 survey result that most executives think climate change matters for their companies, few have taken action, but most are optimistic about the possibilities.

[“Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?” \(2007\).](#)

McKinsey's first GHG abatement cost curve report in 2007 focused on U.S. abatement opportunities. The major findings

were that abatement opportunities are widely spread across the economy. For example, carbon capture for coal-fired power plant offers less than 11 percent of total abatement potential, and the largest sector (power generation) only accounts for one-third of total abatement potential. Also, up to 40 percent of abatement could be achieved at negative costs, meaning they would generate positive economic returns over their lifecycle, and abatement potentials and costs vary across different regions, so for example the Southern U.S. States could reduce almost three times more megatons of CO₂ at the low cost of less than \$50 per ton than the Northeast.

McKinsey summarizes the top five options for reduction, including (listed in order from lowest to highest cost options) improving energy efficiency in buildings and appliances, increasing fuel efficiency in vehicles and reducing the carbon intensity of transportation fuels, increasing efficiency in energy-intensive industries, expanding carbon sinks (forest stocks, improving soil management practices), and reducing the carbon intensity of electric power production through added renewable and nuclear capacity, improved efficiency and CCS.

The report recommends that U.S. climate policy pursue energy efficiency and negative cost options quickly and accelerate development of low-carbon infrastructure.

[“Pathways to a Low-Carbon Economy” \(Version 2 of the global greenhouse gas abatement cost curve, January 2009\)](#)

The 2009 analysis for this report was carried out with the support of ten global companies and organizations: The Carbon Trust, ClimateWorks, Enel, Entergy, Holcim, Honeywell, Shell, Vattenfall, Volvo, and the World Wildlife Fund (WWF). It “assessed more than 200 GHG abatement opportunities across 10 major sectors and 21 world regions between now and 2030.” The study results show the GHG mitigation potential and costs of each of those possible abatement opportunities in different regions and different sectors, and also lay out implementation scenarios of how emissions reductions could occur.

Findings include the following: the potential to reduce GHG emissions and contain warming below 2 degrees C is possible, abatement opportunities are in three groups of technical measures: energy efficiency, low-carbon energy supply, and carbon sinks, a strong policy framework will be necessary to reduce emissions, although costs and investments seem manageable at a global level, individual sectors are likely to struggle, and if action is delayed more than 10 years, the 2 degree target will be impossible to reach.

biofuels, create a program that would provide tax credits, low interest loans, and grants to support the installation of alternative fuel pumps, and require that most new vehicles be flex fuel capable by 2012.

ROYAL UNITED SERVICES INSTITUTE (RUSI)

“Climate-Related Impacts on National Security in Mexico and Central America” by Shiloh Fetzek (October 2009)

The report points out that the severity of the impacts of climate change will depend on the adaptive capacity of governments. The current effects of climate change include higher temperatures, more intense rainfalls, variability in water supply, decrease in agricultural yields due to shorter growing seasons and lower rainfall, erosion of coastal areas and flooding, increased risk of vector-borne disease infection, and future coral bleaching events. Population growth adds additional stress to these resources. In Mexico it is estimated that around 40% of potable water and 50% of water used in agriculture is lost due to infrastructure issues such as leakages and irrigation over long distances. Challenges to integrated water management systems include institutional capacity, infrastructure construction and maintenance, and contamination, in addition to physical water scarcity. In coastal zones, the increase in floods and erosion will cause salinization of aquifers and destruction of coastal infrastructure, including fishing and tourism industries.

There are many social and political implications of climate change. Meeting basic needs will become more difficult, particularly for vulnerable fishing and agricultural populations. Climate change will result in a 10-40% reduction in the production of rice, black beans and corn in 2030. Those unemployed by climate change may turn to work that is worse for the environment, such as overfishing or deforestation, or worse for social stability, engaging in illicit economic activity that increase crime rates. Social tensions will increase as perceptions about ownership may fuel conflict, and some groups may be excluded in choosing adaptation measures such as irrigation planning, which could increase social unrest. Government resources will be stressed as they face the demand for disaster response and recovery, limiting money available for longer-term priorities including health and education, which will increase the population's vulnerability to future climate events. Food assistance and insurance payouts when crops fail will further drain budgets and foster dissatisfaction with government. Extreme weather events cause disasters that result in unemployment, destruction of harvest income, and productive infrastructure. “Risk management has been a priority for Central American and Mexican governments, and all countries have a national bureau

for disaster prevention. However, none of Central American governments have special funds for disaster recovery.” When a disaster occurs, the delay in funds and weakness of local governments who receive the responsibility to rebuild is a big challenge and can increase security issues. Security communities (police, military) may not have adequate resources to respond to disasters. Rising ocean temperatures may cause fish populations to migrate and cause trans-boundary tensions between fisherman following migrating stocks. This has been observed as the Belize Coast Guard has deterred Guatemalan and Honduran fishing vessels from operating in their Exclusive Economic Zone (EEZ). Most migration is likely to be internal and not permanent. Migration can also be seen as an adaptation strategy and not a failure. Diversifying incomes by seeking work elsewhere can be an efficient response and also conflict avoidance mechanism.

Water supply impacts in 2030, by country:

- Guatemala: Reduced precipitation in the north will accelerate silt build up in streams, which will reduce water supply for irrigation. Increased precipitation in southern Guatemala will cause losses in vegetable, fruits, and grain production. Both effects will cause losses in agricultural production and subsequent loss of income (lower GDP) from exports sales.
- Honduras: Increased flooding and drought will compromise irrigation systems and electrical energy generation.
- Costa Rica: Changes in the water cycle will impact the use of water for hydropower generation, irrigation, and sewer systems.
- Panama: Increased agricultural costs, food prices, decline in trade and the quality of maritime services in the Panama Canal.

Sea Level Rise Impacts in 2020, by country:

- Belize: Cultural agricultural land may become salinated and sea level rise may cause inland migration of more than 55% of the population.
- Honduras: Extensive deforestation intensifies the effect of hurricanes, resulting in more disastrous flooding.
- Costa Rica: The worst-case scenario projects sea level rise of 1 meter by 2100, which would inundate 90% of the residential sector.
- Panama: Increased flooding, loss of shoreline, decline in replenishment of aquifers, increased saltwater intrusion, increased erosion, expansion of permanently flooded areas

and increased wave action in bays and tributaries. Social and economic impacts due to loss of investments in infrastructure, or the increased costs of maintenance.

WOODROW WILSON INTERNATIONAL CENTER FOR SCHOLARS

Environmental Change and Security Program Report (2008-2009)

The report warns against overselling the links between climate change and violent conflict, arguing that climate change is neither a necessary nor sufficient cause of conflict. Population growth does not directly cause security problems, but population distortions (e.g. if the population is too young, too old, too urbanized, or growing too fast) make it difficult for governing bodies to maintain political stability. The fastest growing countries from 2000-2005 were: UAE, Sierra Leone, Eritrea, Afghanistan, Kuwait, Chad, Palestine, Niger, Burundi, Burkina Faso, Benin, and Uganda. Future growth will especially affect Muslim nations. Some researchers are using climate change as a cause for promoting increased family planning assistance to developing countries. But slowing population growth will likely only play a limited role in alleviating the impacts of climate change. The real problems to be addressed are the unsustainable patterns of production and consumption.

Resource scarcity increases the risk of violent conflict, a risk that climate change will exacerbate and accelerate. More specifically, land degradation, freshwater availability, and population density and change have influenced conflict in the past and will be strongly affected by climate change. A literature review of climate and security research highlights two processes that lead to resource scarcity and conflict. First, rising temperatures, precipitation anomalies, and extreme weather events will aggravate environmental degradation and cause resource scarcity. Secondly, rising sea levels and extreme weather events such as storms and floods will force migration and potentially create higher population pressures on resources in the destination areas, leading to competition over resources. Better land and soil management could prevent the worst effects on agricultural output. In examining potential water conflict, the report finds that territory in 145 nations falls within international river basins. Research from the University of Oregon shows that the rate of cooperation is far greater than the incidence of acute conflict over these shared water resources. Most of those disputes occurred between Israel and one of its neighbors. Outside of the Middle East, researchers found only 5 violent events in the last 50 years. Water cooperation forges personal connections between countries, as demonstrated by the water and sanitation

projects Friends of the Earth Middle East conducts in Israel, Jordan, and Palestine.

Climate refugees are often economic refugees, leaving an area because their work has become unprofitable. The term is inappropriate because many “refugees” will be internally displaced and won’t cross a national boundary. “The more nuanced conflict work now being done focuses on how environmental scarcity or abundance can exacerbate more proximate causes of conflict such as ethnic difference or relative deprivation.” Further migration research sources: The Center for American Progress has written a piece “Climate Refugees: Global Warming Will Spur Migration”, and the International Peace Academy analyzed “Climate Change and Conflict: The Migration Link.”

Environmental Change and Security Program Report (2006-2007)

The report identifies access to natural resources, political conflicts, religious conflicts, and domestic conflicts as causes of larger conflicts. In the study area, the major cause of conflict (54 percent) was due to competition for natural resources, largely competition for land and water between livelihood groups. For example, sedentary farmers think the pastoralists should not be allowed to use the farmers’ wells, while pastoralists want farmers to plant crops away from cattle paths. The report suggests areas for action and recommendations for development agencies on approaches to environmental cooperation that best facilitate peacebuilding. It recounts that “most of the research that establishes a link between environmental degradation and violent conflict focuses on two solutions: reducing the pressure on resources on which people are economically dependent; and strengthening the institutional capacities to respond to environmental challenges.”

The report looks at the Sahel region, where predictions of climate change vary widely. Recent climate-related conflicts in the area have occurred among the Turkana and the Maasai of Kenya, and the Borana and Degodia in Ethiopia. Conflict there is caused not only by climate change, but the interaction of social, economic and political factors. For example, overcultivation and low fertilization is causing soil to lose productivity and produce less despite increased demand for food, due to high population growth and urbanization. In northern Nigeria, recurring droughts have become more intense and destructive, exacerbating conflict. Indigenous institutions that originally handled these conflicts are failing because of the imposition of Western culture and norms. Addressing the problem will require revitalizing the indigenous institutions.

Illustrative cases of environmental cooperation include: water cooperation in Central Asia and the Middle East (Friends of the Earth Middle East, Good Water Neighbors project), cooperation in nature conservation in the southern Caucasus (pilot project funded by the governments of Germany and Liechtenstein to transfer mountain partnership experiences to the southern Caucasus region by establishing cross-border alliance of mountain villages in Azerbaijan, Armenia, Georgia, and the Russian Federation) and southern Africa (Peace Park Foundation - Transfrontier Conservation areas, SADC), and Central America's Trifinio Plan. The report also highlights the Environment and Security Initiative (ENVSEC), which proposes solutions for impending environmental conflicts and identifies opportunities for environmental cooperation. It integrates stakeholders outside the environmental policy field, including the security and foreign policy community.

The absence of a comparative research project of previous case studies and actual cooperation projects in water and nature conservation is a major limitation. The report argues that we must fill this obvious gap and make the findings available to policymakers. Within development agencies, knowledge about conservation projects and conflict management is not transparent or accessible. Suggested initiatives include holding joint seminars for senior management and involving environmental experts in formulating sectoral strategies in conflict prevention programs. To test the thesis of environmental peacemaking, prominent examples such as FOEME's Good Water Neighbors project would need substantial political and financial backing to identify lessons learned and feed into policy planning.

Dan Smith and Shruti Mehrotra speaking on Climate of Conflict (June 10, 2009)

http://www.wilsoncenter.org/index.cfm?topic_id=1413&categoryid=7EA8E463-01AC-956A-84EBA106D2C62DF5&fuseaction=topics.events_item_topics&event_id=536413

<http://www.wilsoncenter.org/ondemand/index.cfm?fuseaction=home.play&mediaid=7F3F9489-060C-F469-E25DAB2E2FE8447D>

In an interview at the Woodrow Wilson International Center for Scholars with its Environmental Change and Security Program Director Geoff Debelko, International Alert Secretary General Dan Smith and colleague Shruti Mehrotra provided an update on the climate-conflict arguments and called for better trilateral dialogue and collaboration among climate, development and peacebuilding communities. Dan Smith asserted that adaptation and peacebuilding are very closely related and advocates for a combination of the two. He explained that regardless of mitigation efforts, adaptation - or coping with climate change - still needs to be understood and embraced by communities in a bottom-up process with top-down strategy and international funding. Smith argued that mitigation strategies should also be conflict-sensitive. He observed that armed conflicts are produced by the interaction of many different variables and referred to climate change as another major variable or as a "threat multiplier." Smith also brings up key points from International Alert's report, which identified 46 countries, with a combined population of 2.7 billion people, as at risk of conflict arising from climate change consequences.

Following Smith's interview, Shruti Mehrotra, Senior Consultant at International Alert, addressed the major challenges of adaptation funding, which may require not \$100 billion, but possibly \$150 or \$200 billion. But she also warned that spending a lot of money does not guarantee effectiveness, as the mechanisms currently being discussed do not take into account the experience and knowledge that the international development community has accumulated. She described the current discourse as following a "polluter pays" principle demanding that the developed world pay for all of the damages caused. Mehrotra argues that the debate has become about money when it should be about how to implement complicated and socially based adaptation actions from the ground up. She also predicted that Copenhagen would not provide a detailed deal, but an overarching framework.

Other Key Resources

The Monitor Group

Gabriel Kaspar leads a team at the Monitor Institute currently compiling a tool that seeks to track the funding flows of a number of leading climate change foundations.

Monitor has published several reports in the field:

“An Abrupt Climate Change Scenario and Its Implications for United States National Security”

<http://www.gbn.com/articles/pdfs/AbruptClimateChangeFebruary2004.pdf>

“Impacts of Climate Change: A System Vulnerability Approach to Consider the Potential Impacts of a Mid/Upper GHG Emissions Scenario”

http://www.gbn.com/articles/pdfs/GBN_ImpactsofClimateChange_whitepaper.pdf

Frances Wood is the Head of Climate Security in the UK Foreign and Commonwealth Office (FCO). She leads a small team in London and a network of attaches to broaden and deepen the global debate on the security implications of climate change. E-mail: Frances.Wood@fco.gov.uk

Rear Admiral Neil Morisetti is the Climate and Energy Security Envoy of the UK Ministry of Defence and Foreign and Commonwealth Office. He is working closely with Ms. Wood, and they have funded a range of country level studies in conjunction with institutes.

Discussing his role as Envoy: <http://www.youtube.com/watch?v=xxym9MeAxYI>

Discussion for 100 Voices 100 Days: <http://www.youtube.com/watch?v=IQXAmLKVwgA>

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List of Interviewees

Austin, Greg - East West Institute

Bailey, Jessica - Rockefeller Brothers Fund

Brown, Page - The Climate and Security Funders Group

Cator, Morrey - Cator Communications

Cuttino, Phyllis - The Pew Charitable Trusts

Dabelko, Geoff - The Woodrow Wilson Center

Fletcher, Edmund - The Children’s Investment Fund (UK)

Gardiner, David - David Gardiner Research

Hamilton, Heather – Connect U.S.

Lee, Bernice - Chatham House (UK)

Lin, Jiang - The Energy Foundation

Mabey, Nick - E3G

McCormack, Brigid - Climate Works

McNeely, Ash - The Pew Charitable Trusts

Mroz, John - East West Institute

Robertshaw, Allison - The Zennstrom Philanthropies

Ryan, Joseph - The William and Flora Hewlett Foundation

Sagan, Scott - Freeman Spogli Center, Stanford University

Silverthorne, Katherine – E3G

Smith, Ted - Independent Consultant and former head of the Climate and Security Funders Group

Steinbach, Thomas - The William and Flora Hewlett Foundation

Youman, Nancy - The Open Society Institute / George Soros