

VALUING NATIONAL SECURITY: CLIMATE CHANGE, THE MILITARY,
AND SOCIETY
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ABSTRACT

This Article proposes a hypothesis: By linking a reduction in reliance on fossil fuels to the value of promoting national security, what I have called the Military-Environmental Complex has the potential to change individual attitudes and beliefs, and therefore behavior and political debate, about energy use and climate change. Studies have shown that individuals with certain values or political ideologies are less likely to believe in the existence of scientific consensus about climate change, have positive attitudes toward addressing climate change as an urgent policy matter, and behave in ways that reduce energy use. Connecting climate change to national security risks and reduced fossil fuel use to strengthening the military can affect these individuals' attitudes, beliefs, and behavior in these arenas. In particular, two aspects of the Military-Environmental Complex can serve as potential drivers of change: first, the military's role as an unequivocal validator of climate science, and, second, its current efforts to value the true costs and benefits to its mission of energy conservation and increased use of renewables. Although not necessarily its goal, the Military-Environmental Complex thus has the potential to unleash important spillover effects in the sphere of values, behavior, and policy.

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INTRODUCTION

The military-industrial complex often evokes pejorative images of weapons manufacturers seeking to increase their profits by hammering the drumbeat of war.¹ Yet the interaction among the military, private industry, and the civilian world is far more nuanced.² There is a great deal of scholarship recognizing the crucial role the military has played, for example, in supporting the development of new technologies that have ultimately spilled over into civilian use, such as computers, the global positioning system, the Internet, and semiconductors.³ The U.S. Department of

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1. See, e.g., Dwight D. Eisenhower, U.S. President, Farewell Radio and Television Address to the American People (Jan. 17, 1961), in *PUB. PAPERS, 1960–61*, at 1035, 1038 (“In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex.”); H.C. ENGELBRECHT & F.C. HANIGHEN, *MERCHANTS OF DEATH: A STUDY OF THE INTERNATIONAL ARMAMENT INDUSTRY 140–54* (1934) (describing the role of private armaments suppliers and banks in driving the country to war); JAMES LEDBETTER, *UNWARRANTED INFLUENCE: DWIGHT D. EISENHOWER AND THE MILITARY INDUSTRIAL COMPLEX 6* (2011) (“[W]e can approximately define the military-industrial complex as a network of public and private forces that combine a profit motive with the planning and implementation of strategic policy. The overlap between private military contractors and the federal government is usually presumed to include, in addition to the military itself, areas of both the executive branch (Defense Department contracts and appointments of military contractors to government positions) and the legislative branch (lobbying by military contractors, campaign contributions, and the desire of members of Congress to protect and expand military spending that benefits their districts).”).
 2. See Sarah E. Light, *The Military-Environmental Complex*, 55 *B.C. L. REV.* 879, 884–88 (2014) (observing that the military has used both private financing and taxpayer funds to promote innovation in renewable energy generation by procuring existing civilian “clean energy” technology and supporting the development of new technology to military specifications).
 3. See, e.g., PAUL A.C. KOISTINEN, *THE MILITARY-INDUSTRIAL COMPLEX: A HISTORICAL PERSPECTIVE 14* (1980) (describing the historical roots of the military’s relationship with private industry); David C. Mowery, *Federal Policy and the Development of Semiconductors, Computer Hardware, and Computer Software: A Policy Model for Climate Change R&D?*, in *ACCELERATING ENERGY INNOVATION: INSIGHTS FROM MULTIPLE SECTORS*, 159, 169 (Rebecca M. Henderson & Richard G. Newell eds., 2011) (describing the role of the federal government in the financing of, and as a customer for, new technological developments); WAR, BUSINESS, AND AMERICAN SOCIETY: HISTORICAL PERSPECTIVES ON THE MILITARY-INDUSTRIAL COMPLEX (Benjamin Franklin Cooling, ed., 1977) (describing military-industrial cooperation in armaments and naval shipbuilding going back to the War of 1812); see generally PAUL N. EDWARDS, *THE CLOSED WORLD: COMPUTERS AND THE POLITICS OF DISCOURSE IN COLD WAR AMERICA* (1996); STUART W. LESLIE, *THE COLD WAR AND AMERICAN SCIENCE: THE MILITARY-INDUSTRIAL-ACADEMIC COMPLEX AT MIT AND STANFORD* (1994) (discussing how military technology needs prompted changes in American science and American universities

Defense (DoD) has also frequently adopted existing commercial or precommercial technology from the civilian world and adapted it to military uses—what one scholar has termed “spin-on” rather than “spin-off.”⁴ Military procurement aids in bringing precommercial technology to market by providing concentrated demand, operates as a kind of “prize” for private firms, can drive down prices for subsequent commercial users, and, under certain circumstances, can promote the dissemination of information about new technologies.⁵

More recent accounts of the DoD’s role in technology development have highlighted the military’s efforts to reduce demand for energy from fossil fuels and to develop renewable sources of energy for military use.⁶ These efforts have included providing Research and Development (R&D) funds to private firms to develop new technologies, procuring technology from the private sector, and relying on private sector financing—what I have

toward research that was militaristic in nature); JENNIFER S. LIGHT, FROM WARFARE TO WELFARE: DEFENSE INTELLECTUALS AND URBAN PROBLEMS IN COLD WAR AMERICA (2003) (describing how twentieth-century city planners and managers implemented technologies originally developed for the Cold War).

4. See, e.g., Jay Stowsky, *From Spin-Off to Spin-On: Redefining the Military’s Role in American Technology Development*, in THE HIGHEST STAKES: THE ECONOMIC FOUNDATIONS OF THE NEXT SECURITY SYSTEM 114, 114–15 (1992); Timothy Lenoire & Henry Lowood, *Theaters of War: The Military-Entertainment Complex*, in COLLECTION, LABORATORY, THEATER: SCENES OF KNOWLEDGE IN THE 17TH CENTURY 427, 427–28 (Helmar Schramm et al. eds., 2005) (noting postwar trend of military adoption of consumer and civilian technologies, especially in war games and simulations); Mowery, *supra* note 3, at 169 (“As nondefense demand for semiconductor components grew and came to dominate industry demand, defense-to-civilian technology ‘spillovers’ declined in significance and actually reversed in direction.”); *The Military-Consumer Complex: Military Technology Used to Filter Down to Consumers. Now It’s Going the Other Way*, THE ECONOMIST, Dec. 10, 2009, <http://www.economist.com/node/15065709>; Lenoire & Lowood, *supra*, at 444 (“Among the policies the new directives established [in 1994] was a move away from the historically based DoD reliance on contracting with segments of the US technology and industrial base dedicated to DoD requirements, moving instead by statutory preference toward the acquisition of commercial items, components, processes and practices. In the new mandated hierarchy of procurement acquisition, commercially available alternatives are to be considered first, while choice of a service-unique development program has the lowest priority in the hierarchy.”).
5. See, e.g., Mowery, *supra* note 3, at 165 (“[T]he prospect of large procurement contracts appears to have operated similarly to a prize, leading Texas Instruments to invest its own funds in the development of a product that met military requirements.”); Stowsky, *supra* note 4, at 117–21 (describing how military procurement provided a market for Bell Labs’ transistors, subsidized research, created infrastructure to support the new technology, and promoted information diffusion by requiring Bell Labs to hold conferences for industry, academia, and government about the technology).
6. See Light, *supra* note 2, at 884–86.

elsewhere termed the Military-Environmental Complex.⁷ Driving the military is its mission to “provide the military forces needed to deter war and protect the security of our country.”⁸ Wrapped into this overarching mission are many values, including promoting national security, increasing operational capability, promoting energy independence, reducing the cost in dollars and lives of relying on conventional petroleum resources, and reducing the likelihood of climate change-induced conflict.⁹ In light of the exceptional alignment between the military’s mission and its needs to reduce energy demand and develop renewable sources of energy, I have argued that the military has an important role to play in advancing technological solutions to the problem of climate change.¹⁰

Yet the military’s synergistic relationship with the civilian world has not been limited to the realm of technological innovation. Scholars have recognized the military’s role as a norm leader in arenas such as the racial integration of American society, and the importance of patriotic values in encouraging civilian recycling during World War II, among others.¹¹ These historical examples are important to understand because the problem of

7. *Id.*; see also *infra* Part III.

8. See U.S. DEPT OF DEF., STRATEGIC SUSTAINABILITY PERFORMANCE PLAN, at i (2010).

9. Light, *supra* note 2, at 884–88.

10. See *id.*

11. In the realm of desegregation, for example, President Harry Truman issued Executive Order 9981 on July 26, 1948, formally abolishing segregation in the military even while so-called Jim Crow laws were still widely in force in parts of America. Exec. Order No. 9981, 3 C.F.R. 722 (1943–1948). Several scholars have concluded that greater levels of contact between black and white soldiers within the U.S. military correlated with greater support for racial integration in civilian life. See, e.g., Samuel A. Stouffer et al., *The American Soldier: Adjustment During Army Life*, in 1 STUDIES IN SOCIAL PSYCHOLOGY IN WORLD WAR II 594–95 (Frederick Osborn et al. eds., 1949) (describing this “contact thesis” and providing support); John Sibley Butler & Kenneth L. Wilson, *The American Soldier Revisited: Race Relations and the Military*, 59 SOC. SCI. Q. 451, 465 (1975) (reaffirming the “contact thesis” by which integration within the military among people of different races, but equal rank and status, reduced negative racial attitudes before the U.S. Supreme Court’s 1954 *Brown v. Board of Education* decision); Charles C. Moskos, Jr., *Racial Integration in the Armed Forces*, 72 AM. J. SOC. 132, 139–40 (1966) (noting a significant increase in support for integration among both whites and African Americans in the U.S. military between 1943 and 1951, and suggesting that this radical shift was a precipitating factor in the civil rights movement in the United States); Ann E. Carlson, *Recycling Norms*, 89 CAL. L. REV. 1231, 1257–59 (2001) (describing government campaigns to encourage recycling for “patriotic” reasons during World War II as a key factor in the diffusion of recycling behavior). This is not to say that the U.S. military is always at the forefront of norms and values; there are examples that point in the other direction. But there are examples of such norm leadership to which analogies may be appropriate here.

climate change is not simply a failure of technology. Combatting climate change requires not only new technology, but also new behavior.¹² Thus, it is equally important to consider what values or other factors drive individual, governmental, and corporate behavior to address climate change as it is to consider how best to stimulate technological innovation.¹³ Social psychology, decision analysis, and climate change communication literature have contributed greatly to this debate by demonstrating that a number of factors, including values and political ideology, drive beliefs, attitudes, and behavior in the climate change context.¹⁴ This Article therefore takes the

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12. See Jeroen C.J.M. van den Bergh, *Environmental and Climate Innovation: Limitations, Policies and Prices*, 80 *TECH. FORECASTING & SOC. CHANGE* 11, 12 (2013) (“Virtually all economic studies, regardless of the particular model and assumptions used, show that the major part of the reduction of greenhouse gas emissions in the coming decades is unlikely to be realized through technological innovation. Instead, it will come from environmental regulation that alters consumer and producer decisions about environmentally relevant inputs and outputs. This in turn will cause changes in the production input structure and in the sector and demand structure of national economies.”); cf. DAVID OWEN, *THE CONUNDRUM: HOW SCIENTIFIC INNOVATION, INCREASED EFFICIENCY, AND GOOD INTENTIONS CAN MAKE OUR ENERGY AND CLIMATE PROBLEMS WORSE* (2012) (rejecting the notion that the problem of climate change can be solved by the typical consumer’s reaction, “Just tell me what to buy?” in light of data on feedback effects and unintended consequences of increased efficiency); S. Pacala & R. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years With Current Technologies*, 305 *SCI.* 968, 968–71 (2004) (arguing that multiple existing technologies can and should be employed to stabilize the atmospheric concentration of greenhouse gases below climate tipping points).
 13. Cf., e.g., Katrina Fischer Kuh, *Capturing Individual Harms*, 35 *HARV. ENVTL. L. REV.* 155, 166–80 (2011) (arguing that local policies targeting individuals’ behavior can help to combat climate change); Michael P. Vandenberg & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 *N.Y.U. L. REV.* 1673, 1675–77 (2007) (suggesting that the reduction of individuals’ carbon emissions can make a meaningful contribution to the effort to reduce the global risk of climate change).
 14. See, e.g., Dena M. Gromet et al., *Political Ideology Affects Energy-Efficiency Attitudes and Choices*, 110 *PROC. NAT’L ACAD. SCI. (PNAS)* 9314, 9314, 9316–18 (2013), available at <http://www.pnas.org/cgi/doi/10.1073/pnas.1218453110> (demonstrating a link between political ideology, defined as “a shared belief and value system through which people view and react to the world around them” and consumer decisions to purchase energy-efficient light bulbs); Dan M. Kahan et al., *Cultural Cognition of Scientific Consensus*, 14 *J. RISK RES.* 147, 169 (2011) (“When shown risk information (e.g., global temperatures are increasing) that [people] associate with a conclusion threatening to their cultural values (commerce must be constrained), individuals tend to react dismissively toward that information; however, when shown that the information in fact supports or is consistent with a conclusion that affirms their cultural values (society should rely more on nuclear power), such individuals are more likely to consider the information open-mindedly.”) (citations omitted); Anthony Leiserowitz, *Climate Change Risk Perception and Policy Preferences: The Role of Affect, Imagery, and Values*, 77 *CLIMATIC CHANGE* 45, 58–59, 62 (2006) [hereinafter Leiserowitz, *Climate Change Risk Perception*] (noting that while certain demographic variables affect risk

focus from the Military-Environmental Complex's role in supporting technological innovation to the role that it may play in shaping the debate over values and other factors that affect beliefs, attitudes, and behavior in the climate change context.

This Article therefore proposes a hypothesis: By linking a reduction in fossil fuel use to the value of promoting national security, the Military-Environmental Complex has the potential to change individual attitudes and beliefs about climate change, and therefore behavior and political debate on energy use and climate policy.¹⁵ There are two particular aspects of the Military-Environmental Complex that can drive this change. The first is the military's role as an unequivocal validator of climate science.¹⁶ The second is the military's current effort to value the costs and intangible benefits to its national security mission of energy conservation and increasing its use of renewables.¹⁷ Together, these two factors have the potential to affect the attitudes of individuals who, because of their existing values or political ideologies, would not otherwise believe in the existence of a scientific consensus about climate change, the urgency of climate change policies, or the need to modify behavior to address climate change. Although not necessarily its goal, the Military-Environmental Complex

perceptions about climate change, "affect, imagery and values were stronger predictors" than all sociodemographic variables except political ideology); Edward W. Maibach et al., *Communication and Marketing as Climate Change-Intervention Assets: A Public Health Perspective*, 35 AM. J. PREV. MED. 488, 497 (2008) (discussing receptivity of different social groups to different messages about why to change behavior to mitigate climate change, and suggesting wisdom of selecting messages about climate change for target audiences based on values, including messages about the economic, energy independence, legacy, stewardship, religious, or nationalistic benefits of conservation based on target audience). In addition, recent scholarship on "choice architecture" suggests that the selection of default rules can have a significant impact on behavior with environmental consequences. See Cass R. Sunstein & Lucia A. Reisch, *Automatically Green: Behavioral Economics and Environmental Protection*, 38 Harv. Envtl. L. Rev. (forthcoming 2014) (manuscript at 5), *archived at* <http://perma.cc/GT2-2FWX> (arguing that "default rules are an important tool in the regulatory repertoire" and may be both more effective and cheaper than other options); RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* (2008).

15. Indeed, my preliminary testing of this hypothesis suggests that survey participants were significantly more likely to purchase renewable energy from their electric utility when exposed to the fact that the military has installed solar panels on military buildings and free-standing systems on military land, than when exposed to a control condition stating only that solar panel technology exists and can be installed on buildings and as free-standing systems.

16. See *infra* Part III.B.

17. See *infra* Part III.C.

thus has the potential to unleash important spillover effects in the sphere of values.¹⁸

Of course, there are risks in linking climate change policy with national security benefits. These include the potential to alienate those who already support climate change policy for purely environmental reasons. There is also the risk of alienating climate change deniers who may feel manipulated by such framing. Finally, there is a risk of undermining support and respect for the military among those who do not support its clean energy goals. The only published empirical study addressing the impact of a national security message in the climate change context, which focused exclusively on emotional (affective) responses to such a message, suggested that alienating deniers was a risk.¹⁹ But that study did not address the impact of these two facets of the Military-Environmental Complex on beliefs about scientific consensus regarding climate change, attitudes toward policy to address climate change, or behavior (individual, corporate, or governmental) in the climate change context.²⁰ Moreover, the study failed to isolate a national security frame from other frames, including economic growth, energy independence, and cost. Thus, this hypothesis merits further empirical study.

This Article proceeds in three Parts. Part I introduces the social psychology and climate change communication literature demonstrating that there is a link between individual values and political ideology on the one hand, and behavior and attitudes toward climate policy on the other. In Part II, I propose that focusing on the benefits of energy conservation to military capability, and of climate policy to national security—in essence,

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18. Despite such spillover not being the military's primary goal, there is certainly awareness of this potential—at least in the area of technology development, if not in the realm of values. See, e.g., RICHARD H. TRULY & ALVIN L. ALM, DEF. SCI. BD., REPORT OF THE DEFENSE SCIENCE BOARD ON MORE CAPABLE WARFIGHTING THROUGH REDUCED FUEL BURDEN 23 (2001) (“In areas where technology sponsored by DoD has set the pace, such as aircraft systems, development of advanced technologies could once again stimulate commercial spin-offs that would help make U.S. companies more competitive in foreign markets where efficiency is already highly valued.”).
 19. See Teresa A. Myers et al., *A Public Health Frame Arouses Hopeful Emotions About Climate Change, A Letter*, 113 CLIMATIC CHANGE 1105, 1105, 1110 (2012) [hereinafter Myers et al., *A Public Health Frame*]. The authors refer to such effects as “boomerang effects”—namely, effects that “strengthen[] prior beliefs.” Teresa A. Myers et al., *The Relationship Between Personal Experience and Belief in the Reality of Global Warming*, 3 NATURE CLIMATE CHANGE 343, 343 (2013) (internal quotation omitted).
 20. See Myers et al., *A Public Health Frame*, *supra* note 19, at 1105–11. I discuss this study and its limitations in greater depth *infra*, in Part II.

valuing national security—may drive behavioral changes in the climate change context. I suggest in Part II that the one published study in this arena has limitations that can be overcome in future empirical work. Part III sets forth two key facets of the Military-Environmental Complex that have the potential to harness these values in the debate over climate change policy. The Article concludes with the hypothesis that each of these factors may have significant spillover effects on individual beliefs in scientific consensus surrounding climate change, behavior surrounding energy use, and attitudes toward climate change policy. The Conclusion also addresses potential limitations of this approach.

I. FACTORS INFLUENCING BELIEFS, ATTITUDES, AND BEHAVIOR IN THE CLIMATE CHANGE CONTEXT

A growing literature on climate change communication argues that there is an “urgent need to influence people’s behavior—on a large scale or population basis” to address climate change through both mitigation and adaptation.²¹ Recent studies have shown that there are sharp divides in Americans’ perceptions about key issues, such as whether there is scientific consensus on climate change,²² how urgent a problem climate change should be on the American policy agenda,²³ as well as divergent attitudes toward different policy approaches to address it.²⁴

A. Americans’ Perceptions About Climate Change

In its most recent report, Working Group 1 of the Intergovernmental Panel on Climate Change (IPCC) concluded with 95 percent certainty that global climate change is caused by human activity (a conclusion that, of

21. See Maibach et al., *supra* note 14, at 489. Maibach et al., define “communication” in this context as “the production and exchange of information to inform, influence, or motivate individual, institutional, and public audiences . . .” *Id.* at 489. Thus, the literature on climate change communication is concerned with how issues relating to climate change and energy use are “framed” or “communicated” to members of the public, and what impact that frame has on receptivity to the message.

22. See, e.g., Kahan et al., *supra* note 14, at 167. My focus is on the United States, and the hypothesis applies only to the U.S. military. Whether a national security frame would affect beliefs, attitudes, or behavior outside of the United States is beyond the scope of this Article.

23. See Anthony A. Leiserowitz, *American Risk Perceptions: Is Climate Change Dangerous?*, 25 RISK ANALYSIS 1433, 1437–39, 1441 (2005) [hereinafter Leiserowitz, *American Risk Perceptions*].

24. Leiserowitz, *Climate Change Risk Perception*, *supra* note 14, at 58–59, 62.

course, presumes climate change is occurring).²⁵ But a 2013 survey by the Pew Research Center demonstrates that only 67 percent of Americans believe that there is “solid evidence” of “global warming.”²⁶ Moreover, partisan divisions are stark. Among Democrats, 84 percent believe that there is solid evidence of warming. In contrast, among Republicans the figure is only 46 percent.²⁷ There are further sharp divisions within the Republican camp—among “Tea Party” Republicans, the figure is 25 percent, while among non-Tea Party Republicans, the figure is 61 percent.²⁸ As to whether human activity is the most significant cause of climate change, there are equally sharp divides, with 64 percent of Democrats but only 23 percent of Republicans agreeing that global warming is “mostly because of human activity.”²⁹ Among Tea Party Republicans, only 9 percent believe that human activity is causing global warming, in contrast to 32 percent of non-Tea Party Republicans.³⁰

With respect to the urgency of climate change on the policy agenda, only 28 percent of Americans believe that addressing climate change should be a top policy priority for the government.³¹ In fact, Americans consistently rank global climate change among their lowest policy priorities.³² Even more striking, there is a 25-point difference in how highly Democrats (38 percent) and Republicans (13 percent) rank addressing climate change as a policy priority, with Independents (31 percent) closer to Democrats.³³ In contrast, 41 percent of Americans believe that

25. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), WORKING GROUP I, CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS 2–18 (2013), *available at* http://www.climatechange2013.org/images/uploads/WGIAR5_WGI-12Doc2b_FinalDraft_Chapter02.pdf.

26. PEW RES. CTR., GOP DEEPLY DIVIDED OVER CLIMATE CHANGE 1 (2013), *available at* <http://www.people-press.org/files/legacy-pdf/11-1-13%20Global%20Warming%20Release.pdf>. The relevant question was phrased in terms of the earth warming, rather than in terms of climate change. *Id.*

27. *Id.*

28. *Id.*

29. *Id.*

30. *Id.*

31. PEW RES. CTR., DEFICIT REDUCTION RISES ON PUBLIC’S AGENDA FOR OBAMA’S SECOND TERM: PUBLIC’S POLICY PRIORITIES SURVEY: 1994–2013 1 (2013), *available at* <http://www.people-press.org/files/legacy-pdf/01-24-13%20Prioritie%20Release.pdf>.

32. *Id.* A slightly larger percentage (45 percent) of Americans believe that “dealing with the nation’s energy problems should be a top [policy] priority,” with no partisan division between Republicans and Democrats on the issue (each 45 percent); but the study did not further analyze links between climate change and energy policy. *Id.* at 1–2.

33. *Id.* at 2.

“strengthening the military” should be a top policy priority.³⁴ But there is also partisan division (27 points) on this issue, as Republicans (58 percent) are more likely than Democrats (31 percent) to view this as a top priority, with Independents (38 percent) in the middle.³⁵

Moreover, of citizens of thirty-nine nations surveyed, Americans (40 percent) were far less likely than the median respondent from other nations (54 percent) to rank climate change as a “major threat to their countries.”³⁶ Among Americans, Democrats (55 percent) were far more likely than Republicans (22 percent) to “view climate change as a major threat.”³⁷

B. Values and Political Ideology Drive Beliefs, Attitudes, and Behavior

There is a rich theoretical and empirical literature in social psychology, cognitive psychology, and climate change communication that seeks to explain what factors drive individual attitudes and behaviors in the climate change context. For example, Dan Kahan et al. contend that the source of the disconnect between the actual consensus among climate scientists about anthropogenic climate change and the stark lack of consensus among Americans “is not that members of the public are unexposed or indifferent to what scientists say, but rather that they disagree about what scientists are telling them.”³⁸ Kahan posits that the “cultural cognition of expert consensus”—namely “the tendency of individuals to form risk perceptions that are congenial to their values”—can explain these divisions.³⁹ They demonstrate that there is a “strong correlation between individuals’ cultural values and their perceptions of scientific consensus on risks known to divide

34. *Id.* at 1.

35. *Id.* at 2. This gap fluctuated over time since January 2001. *Id.* at 6.

36. PEW RES. CTR., CLIMATE CHANGE AND FINANCIAL INSTABILITY SEEN AS TOP GLOBAL THREATS 1 (2013), *available at* <http://www.pewglobal.org/files/2013/06/Pew-Research-Center-Global-Attitudes-Project-Global-Threats-Report-FINAL-June-24-20131.pdf>.

37. CATHY BARKER, PEW RES. CTR., U.S. STANDS OUT AS AMONG THE LEAST CONCERNED ABOUT CLIMATE CHANGE 1 (2013), *available at* <http://www.pewresearch.org/fact-tank/2013/09/27/u-s-stands-out-as-among-the-least-concerned-about-climate-change> (noting partisan divide on perception of climate change as a “major threat”).

38. Kahan et al., *supra* note 14, at 147–48.

39. *Id.* at 147–48 (“Cultural cognition refers to the tendency of individuals to fit their perceptions of risk and related factual beliefs to their shared moral evaluations of putatively dangerous activities. The *cultural cognition thesis* asserts that individuals are psychologically disposed to believe that behavior they (and their peers) find honorable is socially beneficial and behavior they find base socially detrimental.”) (citation omitted).

persons of opposing worldviews.”⁴⁰ Specifically, individuals holding “hierarchical and individualistic outlooks” disagreed significantly with individuals holding “egalitarian and communitarian outlooks” about whether there is expert consensus on climate change.⁴¹ Kahan et al. reason that the significant difference arises out of the “fit” between a hypothetical expert on the subject and “the position associated with the subjects’ cultural outlooks.”⁴²

Kahan et al.’s cultural cognition theory builds upon prior work in the area of the cultural theory of risk, which suggests:

Persons whose values are relatively hierarchical and individualistic will thus be skeptical of environmental risks, the widespread acceptance of which would justify restricting commerce and industry, activities that people with these values prize; persons with more egalitarian and communitarian values, in contrast, resent commerce and industry as forms of noxious self-seeking productive of unjust disparity, and thus readily accept that such activities are dangerous and worthy of regulation.⁴³

Kahan et al. conclude that the interaction between individual differences in values and certain psychological mechanisms, such as “affect, availability, biased assimilation, source credibility, or others—can nevertheless produce diametrically opposed risk perceptions in different people and indeed intense forms of polarization across groups of persons.”⁴⁴ Thus, it is essential to consider underlying values as drivers of beliefs, attitudes, and behavior with respect to climate policy.⁴⁵

40. *Id.* at 167.

41. *Id.*

42. *Id.*

43. *Id.* at 148 (citing M. DOUGLAS & A.B. WILDAVSKY, *RISK AND CULTURE: AN ESSAY ON THE SELECTION OF TECHNICAL AND ENVIRONMENTAL DANGERS* (1982)).

44. *Id.* at 148–49. “Affect” refers to emotional responses to a message. *Id.* The “availability heuristic” refers to the ability of individuals to recall information that is more readily available to them. Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 *SCI.* 1124, 1127–28 (1974). “Biased assimilation” is the “tendency individuals have to attend to information in a biased way that reinforces their priors and could lead them to form biased assessments of the authority and knowledge of putative experts in a manner that fits their predispositions.” Kahan et al., *supra* note 14, at 150. “Source credibility” is the idea that “[i]ndividuals more readily impute expert knowledge and trustworthiness to information sources whom they perceive as sharing their worldviews and deny the same to those whose worldviews they perceive as different from theirs.” *Id.* at 149–50 (citations omitted).

45. In addition, the labeling of options (for example, labeling an increase in cost as a “tax” or an “offset”) has been demonstrated to interact with political ideology in shaping behavior. *See*

This conclusion echoes work in the public health context, in which Maibach, Roser-Renouf, and Leiserowitz argue that scholars in the past shared a widespread view that a lack of accurate information was driving “misguided” or irrational behavior.⁴⁶ Thus, such scholars thought, the solution was to provide accurate information.⁴⁷ But Maibach, Roser-Renouf, and Leiserowitz posit that this view has been superseded by a recognition that “ecologic” factors—such as attributes of “people and place”—drive behavior.⁴⁸ Attributes of “people” include “individual-level factors (such as beliefs and skills), social network-level factors (such as behavioral modeling and social reinforcement), and group-, community-, or population-level factors (such as social norms and collective efficacy).”⁴⁹ Attributes of “place” include “the availability and cost of products and services, the attributes of physical structures, social structures (i.e., laws and policies), and the cultural and media messages in our communities.”⁵⁰

Beyond what accounts for the failure of Americans’ perceptions to reflect the scientific consensus on climate change are questions about what drives attitudes toward how urgently and with what policies to address climate change. Anthony Leiserowitz has argued that Americans generally consider climate change to be a “moderate risk,” in part because they tend to view climate change as having limited association to risks to local or human health (despite recognizing its more distant or nonhuman consequences).⁵¹ Leiserowitz contends that “whoever controls the definition of ‘dangerous’ climate change controls the rational solution to the problem,” because of the ability to link climate change “dangers” to risks that will drive individuals to change their behavior.⁵² Leiserowitz has further demonstrated that while certain demographic variables affect risk perceptions about climate change, “affect, imagery and values were stronger predictors” than all sociodemographic variables except political ideology.⁵³

One particularly interesting contribution of Leiserowitz’s scholarship is his explanation of what motivates climate change deniers. Leiserowitz

David J. Hardisty, Eric J. Johnson, & Elke U. Weber, *Dirty Word or Dirty World? Attribute Framing, Political Affiliation, and Query Theory*, 21 PSYCHOL. SCI. 86, 88 (2010).

46. Maibach et al., *supra* note 14, at 489.

47. *See id.*

48. *Id.* (“The ‘people and places’ framework is one example of an ecologic model.”).

49. *Id.* at 490.

50. *Id.*

51. Leiserowitz, *American Risk Perceptions*, *supra* note 23, at 1437–39.

52. *Id.* at 1441.

53. Leiserowitz, *Climate Change Risk Perception*, *supra* note 14, at 59, 62.

divides climate “naysayers” into those who believe that climate change is not a concern either because it is (a) natural, (b) the subject of “hype” or “hysteria” by the media and environmentalists, (c) based on doubtful or dubious science, (d) purely false, or (e) a conspiracy.⁵⁴ Recent studies show that there was a steady and statistically significant increase in “naysayer” associations with climate change from 2003–2010, with conspiracy theories dominating this category.⁵⁵ According to a study by Smith and Leiserowitz:

Associations with conspiracy theories (e.g., “the biggest scam in the world to date”) accounted for the largest portion of 2010 naysayer images with over 40% of total responses for this category. This was followed by flat denials that global warming exists (e.g., “there really is no such problem”), belief that global warming is natural (e.g., “it is a natural occurrence”), and references to media hype (e.g., “media is taking it way too far”). Finally, several respondents doubted the reliability of climate science (e.g., “unscientific theory”).⁵⁶

Perhaps not surprisingly, this study found that “party identification and political ideology were significantly correlated with global warming risk perception.”⁵⁷ The authors observed that “Democrats and those with liberal political views were associated with increased risk perception, whereas Republicans and those with a conservative political ideology were associated with decreased risk perception.”⁵⁸

But the association between values or political ideology and individual behavior in the climate change context is not uniformly positive. To the contrary, messages can likewise have a negative (repellant) impact on behavior. For example, Gromet et al. have recently demonstrated that individuals with more politically conservative ideology were less likely to purchase a compact fluorescent light bulb with a label that said “protect the environment” than the same light bulb with no label.⁵⁹ Their study demonstrates that while appeals to cost and energy independence tended to be less polarizing across ideological lines, appeals to environmental benefits

54. *Id.* at 55.

55. Nicholas Smith & Anthony Leiserowitz, *The Rise of Global Warming Skepticism: Exploring Affective Image Associations in the United States Over Time*, 32 RISK ANALYSIS 1021 1025–26 (2012).

56. *Id.* at 1026.

57. *Id.* at 1026–27.

58. *Id.*

59. Dena M. Gromet et al., *supra* note 14, at 9316–17.

tended to be polarizing, repelling participants with conservative ideologies. This polarization over the value individuals place on the different benefits of reducing energy use—cost, energy independence, and environmental benefits—is a significant factor in driving the ideological divide.⁶⁰

This research suggests that the common approach of using an environmental message to promote reduced energy use has the potential to backfire among those who do not value protecting the environment as highly as other goals.⁶¹ Gromet et al. are not alone in this assessment. Ted Nordhaus and Michael Shellenberger have likewise argued that by remaining overly “literal” in promoting environmental policies as antipollution measures, “liberal-issue groups have inhibited their ability to create the kinds of broad coalitions they need to achieve their goals,” and that they need to broaden their message to “create a politics capable of dealing with ecological crises.”⁶² Thus, “value”—defined by Gromet et al. as “the importance individuals place on an issue or concern, which can result in either attraction to or repulsion from associated targets”—is essential to explore in climate change communication.⁶³

C. Appealing to Values Beyond the Environment

These data about what shapes individual perceptions and behavior about climate change raise the essential questions of whether and how it is possible to change those perceptions and behavior by appealing to underlying values in a different way. Maibach, Roser-Renouf, and Leiserowitz have argued that “communication” and “social marketing” can influence behavioral changes in the climate context.⁶⁴ For example, communication-based strategies have successfully led to behavioral changes

60. *Id.* Gromet et al.’s study did not examine a national security frame.

61. *Id.* at 9317.

62. *See* TED NORDHAUS & MICHAEL SHELLENBERGER, *BREAK THROUGH: FROM THE DEATH OF ENVIRONMENTALISM TO THE POLITICS OF POSSIBILITY* 5 (2007).

63. Gromet et al., *supra* note 14, at 9314 (distinguishing “psychological” from “economic” value).

64. Maibach et al., *supra* note 14, at 489. “Communication is . . . the production and exchange of information to inform, influence, or motivate individual, institutional, and public audiences . . .” *Id.* “[S]ocial marketing [is] the development and distribution of products or services to influence behavior on a large scale for the purpose of societal benefit rather than commercial profit.” *Id.* The authors acknowledge the dearth of scholarship in this area, noting that most studies have focused either on “increasing household preparedness against natural disasters” or on “household energy use, recycling, surface transportation behavior, and purchase of ‘green’ products.” *Id.* at 490 (citation omitted).

such as reduced energy use by individuals in a number of contexts. Such strategic successes have included “customized recommendations” resulting from home energy audits, the provision of continuous data regarding energy use, the setting of energy-reduction goals, the use of “mass media to model behaviors,” and eco-labeling programs.⁶⁵ At the level of social networks, Maibach et al. note that programs using “block leaders” have successfully increased recycling behavior in their neighborhoods.⁶⁶

Maibach et al. acknowledge the relative scarcity of research on how to influence “place”-based strategies, but point to several examples of such efforts, including WalMart’s 2007 initiative to sell one million compact fluorescent light bulbs; movements seeking to add sidewalks and other features to neighborhoods to make them more walkable; interest groups advocating for a higher gasoline tax, a carbon tax, or a cap-and-trade program, any one of which would reduce consumption of fossil fuels; and media campaigns to reduce “consumeris[m]” of highly fossil-fuel dependent goods such as sport utility vehicles.⁶⁷ They note that combining interventions can be exponentially more effective than relying on single programs, in light of interaction effects.⁶⁸

Some scholars have argued that communication can influence only certain drivers of individual behavior, such as “values, attitudes, beliefs and personal norms,” but not the higher-level “institutional, economic and technologic drivers of behaviors (including laws and regulations, financial costs and rewards, available technology, and convenience).”⁶⁹ Maibach et al. contend, however, that “when focused appropriately, communication and marketing can be used to effect change among the institutional, economic, and technologic drivers of behavior” because they can influence the individuals who drive these larger societal institutions.⁷⁰ Thus, they argue, the distinction between “people” and “place” may ultimately collapse.⁷¹ Indeed, for attributes of place, “the ultimate target audiences . . . are the

65. *Id.* at 49, 499 nn.22–35. Related programs in the realm of what the authors call “marketing interventions” with demonstrated success at changing individual behavior include financial incentives to use energy-efficient appliances, so-called “green energy programs” whereby household electricity is provided through renewables under favorable contract terms, and programs providing incentives to use public transportation, walking, or cycling. *Id.* at 491.

66. *Id.*

67. *Id.* at 492.

68. *See id.* at 492–93.

69. *See, e.g., id.* at 493 (citation omitted).

70. *Id.*

71. *Id.*

people whose decisions control the attributes of place (e.g., elected officials).⁷² My hypothesis is that this approach is correct. For example, part of the challenge in the climate change context is to affect not only individual behavior but also corporate decisions and congressional support for climate change policies. Ultimately, the U.S. Congress is made up of individuals whose values and beliefs shape their willingness to support legislation to combat climate change. In other words, as Kenneth Shepsle has pointed out, Congress is a “They,” not an “It.”⁷³ The same is true of corporate actors—corporations act through individual agents and decisionmakers, often working collectively, but they are individuals nonetheless.

One challenge to effective communication involves determining which audience segment an individual falls into with respect to views on climate change.⁷⁴ Having determined the target group, it is possible to select a “frame” to describe the climate change problem that may resonate with particular audiences.⁷⁵ Indeed, Maibach et al. argue, “[t]here is no such thing as ‘the general public.’”⁷⁶ Put another way, “[a]udiences are most receptive to content that is consistent with their existing attitudes and beliefs; selective attention and avoidance make it less likely that inconsistent information will be received.”⁷⁷ Accordingly, it is essential to choose “message frames” for climate change decisionmaking that are consistent with the target group’s values:

Conservation messages, for example, can use an economic frame (*This is an excellent way to save money*); an energy independence frame (*This is a means for our country to free itself from dependence on*

72. *Id.* at 492.

73. Kenneth A. Shepsle, *Congress Is a “They,” Not an “It”: Legislative Intent as Oxymoron*, 12 INT’L REV. L. & ECON. 239, 254 (1992) (“Individuals have intentions and purpose and motives; collections of individuals do not. To pretend otherwise is fanciful.”).

74. See Edward W. Maibach et al., *Identifying Like-Minded Audiences for Global Warming Public Engagement Campaigns: An Audience Segmentation Analysis and Tool Development*, PLOS ONE, Mar. 2011, at 1, 1–2 (creating a tool to segment audience target groups into the Alarmed, Concerned, Cautious, Disengaged, Doubtful, and Dismissive).

75. See Maibach et al., *supra* note 14, at 493 (noting that “[t]o reach . . . audiences effectively, campaigns must be targeted on the basis of audiences’ interests, values, and current behavioral patterns”); see generally Daniel Kahneman & Amos Tversky, *Choices, Values, and Frames*, 39 AM. PSYCHOLOGIST 341, 341–350 (1984) (same); Amos Tversky & Daniel Kahneman, *Rational Choice and the Framing of Decisions*, 59 J. Bus., S251, S251–S278 (1986) (discussing how “frames” can affect decisions, contrary to the invariance assumption of rational choice theory).

76. Maibach et al., *supra* note 14, at 493.

77. *Id.* at 497.

foreign oil); a legacy frame (*This is a way to protect our children's future*); a stewardship frame (*This is how I honor my moral obligation to protect the abiding wonders and mystery of life*); a religious frame (*This is a way to serve God by protecting his creation*); or a nationalist frame (*Innovative technology will keep our nation's economy strong*).⁷⁸

This list is of course not exhaustive, but it suggests that framing the message to target the underlying values of the decisionmaker is a way to shape behavior in the climate change context. Notably, a national security frame is absent from this list.

II. NATIONAL SECURITY AS A DRIVER OF DECISIONMAKING

I propose that focusing on the benefits of energy conservation to military capability, and of climate policy to national security—in essence, valuing national security—may serve this crucial role of swaying climate skeptics about the importance of changing behavior in the climate change context. The many aspects of national security—protecting soldiers' lives, enhancing military capability, and reducing the likelihood of climate-induced conflict—may resonate with certain target groups, particularly those with conservative political affiliation who otherwise might not support proactive policies to combat climate change but are highly supportive of strengthening the military.⁷⁹

The idea that ideology and values—particularly military support for a project—can drive decisionmaking has deep historical roots. For example, moving soldiers and supplies posed logistical challenges during the War of 1812, forcing the nation to reconsider the military's needs for roads and the federal government's role in both financing and constructing those roads.⁸⁰ The ability to label a road a “military” improvement was essential to receiving federal funding:

78. *Id.*

79. See PEW RES. CTR., *supra* notes 31–35 and accompanying text (noting that while Republicans are less likely than Democrats to believe in scientific consensus regarding climate change or see it as an urgent problem on the policy agenda, Republicans are more likely than Democrats to believe that “strengthening the military” should be a top policy priority).

80. See Thomas E. Kelly, *The Concrete Road to MIC: National Defense and Federal Highways*, in WAR, BUSINESS, AND AMERICAN SOCIETY: HISTORICAL PERSPECTIVES ON THE MILITARY-INDUSTRIAL COMPLEX, *supra* note 3, at 133, 134–35.

As long as a road could be termed a military road, [President] Madison and the Congress would approve its construction When road construction was labeled an internal improvement . . . Madison vetoed the measure even though Congress had passed it.⁸¹

President James Monroe likewise “approved only those roads which were described as strictly military.”⁸² A renewable energy project may thus be more likely to attract political support among military stakeholders like Congress and the President if that project is promoting a value like national security or military strength rather than the environment.⁸³

There are, of course, risks in this approach. Historical analogies to the military’s role in supporting the development of technology in the twentieth century are useful to help illustrate such risks. For example, Stowsky describes the risks of a “dual-use” approach to technological innovation in the case of the military’s Strategic Computing Initiative.⁸⁴ Recognizing that advances in technological development in the private sector had outpaced military-specific technologies, the military, in its Strategic Computing Initiative sought to create “generic knowledge based (or ‘artificial intelligence’) software and related data-processing approaches . . . [to] . . . allow computers to reason like human experts, to understand human speech, and to recognize objects with machine vision.”⁸⁵ There was extreme partisan division over support for the program.⁸⁶ Thus, “[i]n order to sell the program to Congress and to others within the Reagan Pentagon, [the

81. *Id.* at 135.

82. *Id.*

83. Appealing to the national security benefits of reducing energy demand or combating climate change is not the only method that holds this potential. For example, Matthew Nisbet has argued that E.O. Wilson’s proposed approach of appealing to religious values and morality also has the potential to cross ideological and partisan lines on the subject of climate change. See Matthew C. Nisbet, *Communicating Climate Change: Why Frames Matter for Public Engagement*, ENV’T MAG., Mar.–Apr. 2009, at 12, 21. Indeed, in May, 2014, Pope Francis delivered a speech arguing that people are “custodians of Creation” and that “If we destroy Creation, Creation will destroy us!” Andrew C. Revkin, *Pope Francis: ‘We Are Custodians of Creation,’* N.Y. Times, May 22, 2014, available at http://dotearth.blogs.nytimes.com/2014/05/22/pope-francis-we-are-custodians-of-creation/?_php=true&_type=blogs&_r=0.

84. See Stowsky, *supra* note 4, at 133–35.

85. *Id.* at 134.

86. See *id.* (noting that the Strategic Computing Initiative was “widely viewed as the U.S. government’s primary response to Japan’s ambitious Fifth Generation computer project and, as such, it quickly became mired in partisan bickering over the federal government’s appropriate role in the economy”).

Defense Advanced Research Projects Agency] chose purely military goals to drive further development of the technology.”⁸⁷ As a result of focusing on developing military-specific technologies, this program was less successful in spurring commercial spin-offs since development of these technologies occurred in the laboratories of military contractors, rather than in university or other research laboratories in which the technology was more likely to be diffused.⁸⁸ The same risk is present in attempting to rely on national security benefits in framing policy and behavior choices in the climate change context. Simply put, by focusing too closely on military goals, there is a risk that reducing fossil fuel use will be seen as uniquely beneficial to the military, rather than as having more widespread benefits to the civilian world.

In 2012, Myers, Nisbet, Maibach, and Leiserowitz published the results of a December 2010 study, in which they concluded that of three potential frames for the urgency of climate policy—public health, national security, or the environment—the public health frame was “the most likely to elicit emotional reactions consistent with support for climate change mitigation and adaptation.”⁸⁹ In contrast, they concluded that the national security frame could result in a “boomerang effect”—a risk that the subject feels manipulated by the message—“among audience segments already doubtful or dismissive of the issue, eliciting unintended feelings of anger.”⁹⁰ This study was limited to the “affective dimension” of communication,

87. *Id.*

88. *Id.* at 135.

89. Myers et al., *A Public Health Frame*, *supra* note 19, at 1105.

90. *Id.* Notably, some of the sentences identified by Myers et al. as having a “national security” frame actually incorporated multiple values, including national security, energy independence, cost, and economic strength. See Teresa A. Myers et al., *A Public Health Frame Arouses Hopeful Emotions About Climate Change, A Letter*, 113 CLIMATIC CHANGE 1105, app. at Table 4 (2012), available at <http://link.springer.com/article/10.1007%2Fs10584-012-0513-6> (scroll down to “Supplementary Material” folder; then follow “10584_2012_513_MOESM1_ESM.doc” hyperlink) (“And promoting cleaner forms of energy—such as solar and wind power—will drive down the cost of energy, both here and in poor nations that don't have abundant sources of energy, and help to limit global warming;” “Improving the energy efficiency of our homes, commercial buildings and factories will strengthen America's economy so that we can afford to keep America's military and national security strong;” and “Improving the energy efficiency of our cars, and the quality of our mass transportation options, will allow us to reduce our fossil fuel use and import less oil from foreign countries that are hostile to the United States and that support, in some cases, Al-Qaeda and other terrorists.”). It would be important to disaggregate these value frames from one another in any future work to isolate the impact of a national security frame.

meaning the ability of different frames to “elicit emotional reactions consistent with climate change mitigation and adaptation goals.”⁹¹ Subjects were asked to read one of three short messages about climate change, each framed in environmental, public health, or national security terms. They were then asked to identify which aspects of the message made them feel either hopeful or angry—emotions that have been linked to either willingness or unwillingness to act to combat climate change.⁹² The subjects were also identified as belonging to one of six audience segments—what Maibach et al. previously called Global Warming’s Six Americas: Alarmed, Concerned, Cautious, Disengaged (all of whom generally believe in anthropogenic climate change), Doubtful, and Dismissive (who generally do not believe in anthropogenic climate change).⁹³ This coding allowed the authors to disaggregate the emotional reactions within and across each segment for each frame. Controlling for segment, the national security message prompted the most anger of the three messages, including among the Doubtful and the Alarmed, while the public health frame elicited the most hope.⁹⁴ For example, the Doubtful and Dismissive segments reacted angrily to the following aspect of the national security message:

The most recent Quadrennial Defense Review—a national security report prepared every four years by the Pentagon for the U.S. Congress—concludes that global warming is a ‘key issue’ likely to harm U.S. national security in many ways. They also argue that efforts to limit global warming are a ‘win-win’ because they will reduce the risks of global warming and improve America’s national security.⁹⁵

The authors hypothesize that this effort to link climate change to national security—a subject important to the Doubtful and Dismissive segments—may have “boomeranged” and led them to feel manipulated instead:

[A]lthough emphasizing the national security implications of climate change has been assumed to be an effective strategy for

91. Myers et al., *A Public Health Frame*, *supra* note 19, at 1106.

92. *Id.* at 1108.

93. Maibach et al., *supra* note 74 (identifying six audience segments); ANTHONY LEISEROWITZ ET AL., YALE UNIV. & GEORGE MASON UNIV., GLOBAL WARMING’S SIX AMERICAS IN MARCH 2012 AND NOVEMBER 2011, AT 4–5 (2012), *available at* <http://environment.yale.edu/climate/files/Six-Americas-March-2012.pdf>.

94. Myers et al., *A Public Health Frame*, *supra* note 19, at 1109.

95. *Id.* at 1111.

engaging conservatives and other groups, our findings show that in this instance . . . the national security frame actually generated substantial anger among the Doubtful and Dismissive segments of the public, both of whom lean conservative in their political outlook.⁹⁶

They conclude that further study is warranted about the nature of the message, the identity of the messenger, and other factors.⁹⁷

This study suggests a number of important factors must be addressed in any future empirical work on the subject. First, “national security” is not a monolithic concept; it is instead multifaceted.⁹⁸ It is worth exploring which aspects of national security might affect beliefs, attitudes, and behavior in the climate change context and disaggregating them in any future study. I address these different aspects of national security below.

Second, the identity of the messenger may matter in light of “source credibility” concerns, as even Myers et al. acknowledge.⁹⁹ Myers et al.’s study delivered the message as a series of short paragraphs describing military interests. Delivering the message in an alternative way—for example, having a respected, highly ranked military leader in uniform speak to the research subjects by video—might change the outcome. It is worth exploring whether the identity of the messenger in this case would eliminate, reduce, or exacerbate any feelings of manipulation.

Third, although it is worthwhile to understand the affective dimension of this issue—the subjects’ emotional responses to different frames in the climate change context—this is an indirect way of predicting impact on beliefs, attitudes, and behavior. This is especially significant when direct study is possible. It is important to consider the direct impact of a national security frame on beliefs, attitudes, and behavior of individuals, corporate actors, and members of Congress. Such a study could explore the impact of such a frame on decisionmaking in an experiment more like the light bulb purchasing decision study authored by Gromet et al., in which behavior

96. *Id.* at 1109–10 (internal citation omitted); see also Jules Boykoff, *U.S. Military Goes to War With Climate Skeptics*, GUARDIAN (May 20, 2011), <http://www.guardian.co.uk/commentisfree/cifamerica/2011/may/20/climate-change-climate-change-scepticism>.

97. See Myers et al., *A Public Health Frame*, *supra* note 19, at 1111.

98. See *infra* Part III.

99. See Kahan et al., *supra* note 14 and accompanying text on source credibility; Myers et al., *A Public Health Frame*, *supra* note 19, at 1111.

(rather than affective response) is the dependent variable.¹⁰⁰ It would be worthwhile to study the impact of a national security frame on political decisionmaking, for example, to offer research subjects the opportunity to vote on a particular policy proposal, or to rank order policy proposals to combat climate change.

In order to understand why this hypothesis is worthwhile, and how to think about designing such a study, Part III seeks to unpack some of the complexity of the Military-Environmental Complex, as well as different aspects of national security that I propose to isolate.

III. THE MILITARY-ENVIRONMENTAL COMPLEX'S POTENTIAL IMPACT ON BELIEFS, ATTITUDES, AND BEHAVIOR

A deeper understanding of the Military-Environmental Complex is required to design a study that will test the impact of valuing national security on beliefs and attitudes toward climate policy, as well as behavior regarding energy consumption. This Part therefore explains how the military's mission is driving its needs to reduce demand and promote renewable sources of energy, how the military is acting as an unequivocal validator of climate science, and how these interests are forcing the military to think more critically about the costs and benefits to national security and its mission of reducing energy demand and increasing the use of renewables.

A. Values Driving the Military-Environmental Complex

The Military-Environmental Complex is the military's extensive undertaking to improve its sustainable energy use and reduce demand for conventional energy resources both on the battlefield and in permanent installations, in which the DoD's interests are intertwined with those of members of Congress, the President, and the private sector.¹⁰¹ In the Military-Environmental Complex, multiple forces drive the military, including Congressional mandates, Presidential executive orders, the private sector's desire for a high-volume customer for existing technology, and the private sector's need for funding to develop new technology. But the single most important driver is the military's mission to "provide the military forces

100. See Gromet et al., *supra* note 14.

101. Light, *supra* note 2, at 884.

needed to deter war and protect the security of our country.”¹⁰² It is this mission-related goal above all others, including cost, energy independence, and protecting the environment, that is driving the military’s current innovation in the sustainable energy arena.¹⁰³

The military’s internal motivation to reduce energy demand and develop renewables stems largely from its multiple roles—as war fighter, as defender of national security, as the nation’s largest landlord, and as a manager of vast landholdings.¹⁰⁴ In each of these roles, the need to reduce energy demand and find alternative sources of energy is paramount. For example, in military combat operations in Iraq and Afghanistan, thousands of soldiers have been killed guarding fuel convoys.¹⁰⁵ Any effort to reduce the number of convoys by limiting operational energy consumption can directly reduce the number of casualties.¹⁰⁶ Reduction of petroleum consumption in operations can come from use of existing technologies, such as better insulated tents at forward operating bases to reduce generator and HVAC use. It can also come from generating solar or other renewable energy onsite rather than transporting fuel by convoy to those bases. It can come from the development of new technologies, such as improving the batteries soldiers must carry in ways that reduce their weight and volume. Finally, it can come from behavioral changes, induced through better information, such as incorporating systems to monitor and reduce energy consumption.¹⁰⁷

Similarly, in the military’s role as landlord, in which it manages more than 500 installations in the United States and overseas, covering

102. See U.S. DEP’T OF DEF., STRATEGIC SUSTAINABILITY PERFORMANCE PLAN, at i (2010).

103. Light, *supra* note 2, at 880, 893–95. Protecting the environment is not wholly irrelevant, however. See, e.g., TRULY & ALM, *supra* note 18, at 21 (noting in Defense Science Board Report the potential benefits of greater fuel efficiency in the form of reduced greenhouse gas emissions).

104. Light, *supra* note 2, at 893–95.

105. U.S. DEP’T OF DEF., ENERGY FOR THE WARFIGHTER: OPERATIONAL ENERGY STRATEGY 4–5 (2011).

106. Operational energy is “the energy required for training, moving, and sustaining military forces and weapons platforms for military operations. The term includes energy used by tactical power systems and generators and weapons platforms.” 10 U.S.C. § 2924(5) (2012). In contrast, “facility energy” is “energy needed to power fixed installations and non-tactical vehicles.” *Id.* Facility energy is also at times referred to as “installation energy.”

107. See Light, *supra* note 2, at 902–06.

approximately 2.3 billion square feet of building space,¹⁰⁸ the military is concerned with reducing energy use and developing renewable sources of energy. One major concern is to ensure a constant supply of electricity to military installations and insulate itself from disruptions to the public electricity grid.¹⁰⁹ Whether caused by attack, climate change, or ordinary weather events, disruptions to the grid could have a devastating impact on the military's ability to protect the country and train its forces for combat.¹¹⁰ Recognizing this concern, the military has deployed existing technologies to reduce energy use, such as lighting retrofits, more efficient heating and cooling systems, and more energy-efficient windows, energy management control systems, and smarter roofs.¹¹¹

In addition, the military has been working with the private sector to generate new sources of renewable energy on military lands by using its statutory Power Purchase Agreement (PPA) authority.¹¹² These Agreements—which can last for up to thirty years—are contracts for the “provision and operation of energy production facilities on real property under the Secretary's jurisdiction or on private property and the purchase of energy produced from such facilities.”¹¹³ Under such PPAs, the DoD purchases the energy and provides the land, but private firms finance, build, and own the generating equipment. This long-term authorization is essential to provide incentives for private financiers to invest in these renewable projects, where high initial capital costs can only be recouped if

108. *Id.* at 891–92. This physical footprint is three times the size of Wal-Mart's, and six times that of the General Services Administration (GSA). U.S. DEP'T OF DEF., ANNUAL ENERGY MANAGEMENT REPORT: FISCAL YEAR 2011 4 (2012) [hereinafter DoD AEMR FY 2011]. The DoD also manages approximately 28 million acres of land in the United States. Press Release, U.S. Dep't of Def., Interior and Defense Departments Join Forces to Promote Renewable Energy on Federal Lands (Aug. 6, 2012), *available at* <http://www.defense.gov/releases/release.aspx?releaseid=15498>; Amy L. Stein, *Renewable Energy Through Agency Action*, 84 U. COLO. L. REV. 651, 708 (2013).

109. Light, *supra* note 2, at 894 (discussing military concerns over disruptions to electricity grid).

110. U.S. DEP'T OF DEF., STRATEGIC SUSTAINABILITY PERFORMANCE PLAN I-1 to I-7 (2012) [hereinafter DoD SSPP (2012)], *available at* http://www.acq.osd.mil/ie/download/green_energy/dod_sustainability/2012/DoD%20SSPP%20FY12-FINAL.PDF.

111. DoD AEMR FY 2011, *supra* note 108, at 14.

112. *See* 10 U.S.C. § 2922a(a) (2012).

113. *Id.* This specific authorization by Congress is necessary to avoid violating the Anti-Deficiency Act, which prohibits the obligation of funds in excess of an appropriation without authorization. *See* 31 U.S.C. § 1341 (2012); Geraldine E. Edens et al., *Government Purchasing of Efficient Products and Renewable Energy*, in *THE LAW OF CLEAN ENERGY: EFFICIENCY AND RENEWABLES* 117, 123 (Michael B. Gerrard, ed., 2011).

they are amortized over a sufficiently long time horizon.¹¹⁴ Pursuant to this unique statutory PPA authority, the military is harnessing private sector funding to develop new renewable generation facilities on military lands.¹¹⁵ For example, the Navy has entered into a twenty-year PPA to construct a 13.8 megawatt photovoltaic array at the Naval Air Weapons Station China Lake, which began construction in January 2012.¹¹⁶ This array will be the Navy's largest photovoltaic array. The array is being designed, built, and will be operated by a private solar firm, with the facilities owned by a private entity.¹¹⁷ The Army has similarly issued requests for proposals for thirty-year solar, wind, geothermal and biomass generation PPAs at several military installations around the country through its Energy Initiatives Task Force (EITF) program.¹¹⁸ On November 22, 2013, for example, the EITF issued a Notice of Intent to Award letter to build an 18.6 megawatt solar project at Fort Detrick in Maryland.¹¹⁹

114. Light, *supra* note 2, at 929–32 ; *cf.* Howard C. Kunreuther & Erwann O. Michel-Kerjan, *Market and Government Failure in Insuring and Mitigating Natural Catastrophes: How Long-Term Contracts Can Help*, in PUBLIC INSURANCE AND PRIVATE MARKETS 130–31, (Jeffrey R. Brown, ed., 2010) (advocating long-term insurance instruments in order to provide the right incentives to invest in upfront capital costs to counteract individual “myopia” about the long-term risks of climate change).

115. Light, *supra* note 2, at 931.

116. DoD SSPP (2012), *supra* note 110, at ES-4; Light *supra* note 2, at 938.

117. DoD SSPP (2012), *supra* note 110, at ES-4.

118. Light, *supra* note 2, at 929–32 (discussing EITF); Press Release, U.S. Army Corps of Engineers, Army Awards Final Technology for Renewable and Alternative Energy [Multiple Award Task Order Contract (MATOC)] (Sept. 23, 2013), <http://www.armyeitf.com/index.php/component/content/article/67-news/procurement/12-biomass-matoc-awards>; Press Release, U.S. Army Corps of Engineers, Army Awards Third Technology, Wind, Under \$7 Billion Renewable Energy MATOC (Sept. 9, 2013), <http://www.armyeitf.com/index.php/component/content/article/67-news/procurement/3-matoc-award-wind>; Press Release, U.S. Army Corps of Engineers, Army Awards Second Technology Under \$7 Billion Renewable Energy MATOC (Aug. 27, 2013), <http://www.armyeitf.com/index.php/component/content/article/67-news/procurement/6-matoc-award-solar>; Press Release, U.S. Army Corps of Engineers, Army MATOC—First Awards Under \$7 Billion Renewable Energy Contract (May 3, 2013), <http://www.armyeitf.com/index.php/component/content/article/67-news/procurement/5-matoc-award-geothermal>; Press Release, U.S. Army Corps of Engineers, Small Business Receives Last Contract for Geothermal Technology Under MATOC (Sept. 17, 2013), <http://www.armyeitf.com/index.php/component/content/article/67-news/procurement/11-matoc-award-geothermal2>.

119. *EITF Project Hits Important Milestone*, ENERGY INITIATIVES TASK FORCE, http://armyeitf.com/index.php/component/content/article/67-news/procurement/15-detrick-noi?utm_source=NewsAlert&utm_medium=email&utm_term=DetrickNOI&utm_content=title&utm_campaign=DetrickNOIAlert (last visited Mar. 12, 2014); *Fort Detrick, Maryland*:

Finally, the military has awarded R&D funds to support the development of new technologies and processes such as smart microgrids and energy monitoring software.¹²⁰ For example, since 2009, among other programs, the DoD's Installation Energy Test Bed Initiative has annually awarded funds to private firms, universities, national laboratories, and other organizations on a competitive basis for projects to manage facility energy.¹²¹ In 2013, projects receiving military funding included a battery energy storage system, a microgrid control system, a data-center liquid-cooling system, high-concentration photovoltaics, a waste gasification system, technology that can reduce air-conditioner energy use through measuring operational energy efficiency, and a roof asset management system.¹²² With these programs, the military is currently a crucial player in supporting the development and adoption of new and existing technologies to reduce energy use and promote renewables through long-term and short-term strategies. These large-scale investments in sustainable practices and technologies by the U.S. military hold great promise for the environment and the climate.

B. The Military as Validator of Climate Science: Redefining National Security

To determine the impact of a “national security” message on behavior in the climate change context, it is essential to understand the many facets of national security. National security is a “classic public good: it is too costly

18.6 MW Solar PV, ENERGY INITIATIVE TASK FORCE (Nov. 2013), http://armyeitf.com/downloads/Fort%20Detrick_EITF%20Fact%20Sheet.pdf.

120. DoD AEMR FY 2011, *supra* note 108, at 49–52 (noting existence of demonstration projects at Fort Bliss, TX (Lockheed Martin), Twentynine Palms, CA (General Electric's advanced microgrid system), Los Angeles Air Force Base (Lawrence Berkeley National Laboratory), and elsewhere); *see also* *Microgrid Study: Energy Security for DoD Installations*, STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (Sept. 10, 2012), <http://www.serdp.org/News-and-Events/News-Announcements/Program-News/DoD-study-finds-microgrids-offer-improved-energy-security-for-DoD-installations>.
121. *New Installation Energy and Water Technology Demonstrations Announced for FY 2013*, STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (Dec. 13, 2012), <http://www.serdp.org/News-and-Events/News-Announcements/Program-News/New-installation-energy-and-water-technology-demonstrations-announced-for-FY-2013>; *Installation Energy Test Bed*, STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM, <http://www.serdp.org/Featured-Initiatives/Installation-Energy> (last visited Mar. 14, 2014).
122. *New Installation Energy and Water Technology Demonstrations Announced for FY 2013*, *supra* note 121.

and unwieldy for individuals to provide for themselves, and it is impossible to exclude individuals from enjoying it once it is provided.¹²³ National security is therefore like clean air or clean water: public environmental goods that benefit all to the exclusion of none, but for which individuals do not wish to pay directly.¹²⁴ The concept of national security is multifaceted, rather than monolithic. National security unquestionably incorporates the concept of defending the United States against military attack.¹²⁵ Yet in tracing the historical evolution of the concept of “national security,” political scientists and historians have argued that the definition has shifted over time from a focus on purely military/strategic concerns to a recognition in the postwar era that political and economic development can be equally destabilizing and thus must be part of the concept as well.¹²⁶

Scholars and policy experts have begun to incorporate environmental concerns into the concept. One has labeled the environment as the “national-security issue of the twenty-first century.”¹²⁷ Another has argued that sustainable development, including sustainable energy use, is a fundamental component of not only national security but global security, and that U.S. policy should shift to recognize the broader, more global conception of security that goes beyond mere nation-centric, military-dominated visions.¹²⁸ A group of sixteen retired Generals and Admirals from the Army, Navy, Air Force and U.S. Marine Corps recently issued a report calling climate change a major national security threat, and arguing that the United States has not done enough to address the threat since its

123. BARRY S. RUNDQUIST & THOMAS M. CARSEY, CONGRESS AND DEFENSE SPENDING: THE DISTRIBUTIVE POLITICS OF MILITARY PROCUREMENT 7 (2002).

124. Cf. W. Michael Hanemann, *Valuing the Environment Through Contingent Valuation*, 8 J. ECON. PERSP. 19 (1994), reprinted in ECONOMICS OF THE ENVIRONMENT: SELECTED READINGS 148 (Robert N. Stavins ed., 6th ed. 2012).

125. See Sanford E. Gaines, *Sustainable Development and National Security*, 30 WM. & MARY ENVTL. L. & POL'Y REV. 321, 345 (2006) (citing Ronald Reagan, President of the United States, Address to the Nation on National Security (Feb. 26, 1986), available at http://reagan2020.us/speeches/address_on_national_security.asp; Ronald Reagan, President of the United States, Address to the Nation on National Security (Mar. 23, 1983), available at <http://teachingamericanhistory.org/library/index.asp?document=730>).

126. Mary Margaret Evans et al., *The Changing Definition of National Security*, in ENVIRONMENT AND SECURITY: DISCOURSES AND PRACTICES 11–16 (Miriam R. Lowi & Brian R. Shaw eds., 2000).

127. Robert D. Kaplan, *The Coming Anarchy: How Scarcity, Crime, Overpopulation, Tribalism, and Disease are Rapidly Destroying the Social Fabric of Our Planet*, 273 ATLANTIC MONTHLY 44, 52 (1994); see also Jessica Tuchman Mathews, *Redefining Security*, 68 FOREIGN AFF. 162 (1989).

128. Gaines, *supra* note 125, at 323–24.

first report in 2007.¹²⁹ In contrast, the so-called “orthodox” view contends that any focus on sustainability serves as a “distraction from military preparedness.”¹³⁰

The DoD’s description of national security has evolved over time to incorporate the destabilizing role of climate change. In contrast to sharp partisan divisions over the existence of a scientific consensus regarding climate change,¹³¹ the DoD is an unequivocal validator of climate science.¹³² In February of 2010, the DoD explicitly drew this link between climate change and national security for the first time in its Quadrennial Defense Review Report:

[C]limate change will shape the operating environment, roles, and missions that we undertake Assessments conducted by the intelligence community indicate that climate change could have significant geopolitical impacts around the world, contributing to poverty, environmental degradation, and the further weakening of fragile governments. Climate change will contribute to food and water scarcity, will increase the spread of disease, and may spur or exacerbate mass migration. While climate change alone does not cause conflict, it may act as an accelerant of instability or conflict, placing a burden to respond on civilian institutions and militaries around the world

Second, DoD will need to adjust to the impacts of climate change on our facilities and military capabilities DoD’s operational

129. CNA Military Advisory Board, *National Security and the Accelerating Risks of Climate Change 2* (Alexandria, VA: CNA Corporation, 2014) (“In many areas, the projected impacts of climate change will be more than threat multipliers; they will serve as catalysts for instability and conflict.”); CNA CORP., NATIONAL SECURITY AND THE THREAT OF CLIMATE CHANGE 1 (2007) (“Climate change can act as a *threat multiplier* for instability in some of the most volatile regions of the world, and it presents significant national security challenges for the United States.”) (emphasis added).

130. Gaines, *supra* note 125, at 333 (citing Eric K. Stern, *The Case for Comprehensive Security, in* CONTESTED GROUNDS: SECURITY AND CONFLICT IN THE NEW ENVIRONMENTAL POLITICS 127, 138–40 (Daniel H. Deudney & Richard A. Matthew eds., 1999)). Other critics include the “globalist” perspective, which remains concerned with focusing too narrowly on a single nation’s interest rather than the overall interest of the global community, and the “reformist” perspective, which argues that underlying social and economic inequities rather than mere scarce resources must be considered a major underlying cause of dislocation and loss of security. For a thorough discussion of these views, see *id.* at 333–38.

131. See *supra* Part I.

132. Light, *supra* note 2, at 39–42.

readiness hinges on continued access to land, air, and sea training and test space.¹³³

Reiterating this point in its most recent Quadrennial Defense Review Report in 2014, the DoD explained its perspective that climate change has the potential to serve as a “threat multiplier,” creating instability in light of changing environmental realities.¹³⁴ Examples of emerging arenas of conflict include newly opened shipping lanes in the Arctic Ocean and conflict over increasingly scarce natural resources such as water.¹³⁵ The DoD does not hedge in this regard. Thus, it is worth exploring whether the military’s role as a validator of climate science affects perceptions about the existence of scientific consensus about climate change among individuals with more conservative political ideologies. Such individuals tend to have higher rates of climate-science skepticism, but also greater support for the military as an institution.¹³⁶

The DoD’s role as validator of climate science has not been uncontroversial. Both the press and certain members of Congress have criticized the DoD, questioning whether the military should be concerned about climate change and reducing its fossil fuel use.¹³⁷ Thus, it is essential

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133. U.S. DEP’T OF DEF., QUADRENNIAL DEFENSE REVIEW REPORT 84–85 (2010), available at http://www.defense.gov/qdr/images/QDR_as_of_12Feb10_1000.pdf.
134. U.S. DEP’T OF DEF., QUADRENNIAL DEFENSE REVIEW REPORT 8 (2014), available at http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf; CNA Military Advisory Board (2014), *supra* note 129, at 2; CNA CORP. (2007), *supra* note 129, at 1.
135. See, e.g., Andrew E. Kramer, *Russia Preparing Patrols of Arctic Shipping Lanes*, N.Y. TIMES, Sept. 15, 2013, at A8; Brad Plumer, *Drought Helped Cause Syria’s War. Will Climate Change Bring More Like It?*, WASH. POST (Sept. 10, 2013); CNA Military Advisory Board (2014), *supra* note 129, at 17–20 (discussing national security risks of increased access to the Arctic).
136. Determining whether individuals with conservative values and ideologies feel anger in response to a national security frame is a different inquiry from asking whether such a frame affects beliefs about whether a consensus exists about climate science. See *supra* Part II.
137. See Light, *supra* note 2, at 919–21; Editorial, *Panetta’s Next War—Defense Secretary Targets ‘Climate Change,’* WASH. TIMES, May 8, 2012, at B02; Caroline May, *Federal Government Spent Nearly \$70 Billion on ‘Climate Change Activities’ Since 2008*, DAILY CALLER (May 17, 2012, 6:13 PM), <http://dailycaller.com/2012/05/17/federal-government-spent-nearly-70-billion-on-climate-change-activities-since-2008>; Hope Hodge, *Inhofe Delivers Senate Floor Takedown of Military ‘Green’ Agenda*, HUMAN EVENTS (May 18, 2012, 6:20 PM), <http://www.humanevents.com/2012/05/18/inhofe-delivers-senate-floor-takedown-of-military-green-agenda>; <http://news.investors.com/ibd-editorials/051812-612092-defense-billions-to-fight-climate-change-.htm#ixzz2UDoHggEi>; Editorial, *Billions for Climate, Not One More Cent for Defense*, INVESTORS.COM (May 18, 2012, 7:00 PM), <http://news.investors.com/ibd-editorials/051812-612092-defense-billions-to-fight-climate-change-.htm?ven=rss>; Richard Butrick, *Panetta Uses Military Budget to Prop up Green Energy Firms*, AM. THINKER (May 21, 2012), http://www.americanthinker.com/blog/2012/05/panetta_uses_military_budget_to_prop_up

to understand that framing climate change policy as a matter of national security is also likely to be controversial. Any empirical study must confront this controversy head-on in order to determine the circumstances under which it may be reduced or eliminated.

C. Valuing the Costs and Benefits to its Mission of Energy Efficiency and Conservation

There is a second aspect of “national security” that may affect behavior—perhaps at the corporate or institutional level—and is thus also worth exploring. Specifically, from the DoD’s perspective, there are many hidden costs to fossil fuel use. Because of these costs, reducing military energy use can act as a “force multiplier”—missions can go farther without refueling, running generators, or bringing fuel convoys to the battlefield.¹³⁸ According to Army logistics estimates, “[w]ithout sustainable supplies of fuel and drinking water, the Army cannot perform its missions. About 50% of the load carried by supply convoys in theaters of operation is fuel, and

[_green_energy_firms.html#ixzz2UDlyMWYv](#). Such criticisms have also come in the form of attempted riders to the annual National Defense Authorization Act, such as this recent one purporting to prohibit the military from addressing climate change:

None of the funds authorized to be appropriated or otherwise made available by this Act may be used to implement the U.S. Global Change Research Program National Climate Assessment, the Intergovernmental Panel on Climate Change's Fifth Assessment Report, the United Nation's Agenda 21 sustainable development plan, or the May 2013 Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866.

See Proposed Amendment to H.R. 4435, offered by Congressman McKinley of West Virginia, <http://amendments-rules.house.gov/amendments/MCCLIMATE51914080929929.pdf>.

138. *See* Memorandum of Understanding Between U.S. Department of Energy and U.S. Department of Defense Concerning Cooperation in a Strategic Partnership to Enhance Energy Security 2 (2010), *available at* <http://energy.gov/sites/prod/files/edg/media/Enhance-Energy-Security-MOU.pdf> (“Energy efficiency can serve as a *force multiplier*, increasing the range and endurance of forces in the field while reducing the number of combat forces diverted to protect energy supply lines, as well as reducing long-term energy costs.”) (emphasis added). As General John Allen explained in December of 2011, “Operational energy . . . is about improving combat effectiveness. It’s about increasing our forces’ endurance, being more lethal, and reducing the number of men and women risking their lives moving fuel.” U.S. DEPT OF DEF., ENERGY INVESTMENTS FOR MILITARY OPERATIONS: FOR FISCAL YEAR 2013 (2012), *available at* http://energy.defense.gov/Portals/25/Documents/Reports/20120815_FY13_OE_Budget_Cert_Report.pdf.

about 20% is drinking water.”¹³⁹ The ability to reduce these consumption figures may have tangible effects that strengthen the military’s ability to fulfill its national security mission.

The military operates within a paradigm of cost-effectiveness analysis and cost-benefit analysis.¹⁴⁰ In light of this framework, the DoD is currently engaged in an effort to value accurately both the true costs of energy use, as well as the benefits to its mission and national security of reduced energy consumption and increased use of renewables.¹⁴¹ Valuing costs and

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139. ARMY ENVIRONMENTAL POLICY INSTITUTE, SUSTAIN THE MISSION PROJECT: ENERGY AND WATER COSTING METHODOLOGY AND DECISION SUPPORT TOOL: FINAL TECHNICAL REPORT vii (2008) [hereinafter SUSTAIN THE MISSION PROJECT-2], available at http://www.aepi.army.mil/docs/whatsnew/SMP2_Final_Technical_Report.pdf.
140. Each time the military confronts a decision regarding what technology or process to adopt, or whether to invest in particular infrastructure as part of its military construction budget, the military must undertake some form of cost-benefit or cost-effectiveness analysis. Cost-benefit analysis (CBA) is appropriate when the military is determining whether it should undertake a program at all and requires placing a value on both benefits and costs. Cost-effectiveness analysis (CEA), in contrast, is used when the military is attempting to make choices about how to proceed within a fixed budget and compares the costs of two programs or systems with the same benefits. In cost-effectiveness analysis, there is no requirement to quantify benefits, as long as the benefits of each option are expressed in the same units. Cf., *Circular A-4*, OFFICE OF MGMT. & BUDGET, (Sept. 17, 2003), http://www.whitehouse.gov/omb/circulars_a004_a-4 [hereinafter *Circular A-4*]. Cost analysis has deep roots in military decisionmaking. See generally E.S. QUADE, A HISTORY OF COST-EFFECTIVENESS (1971) (describing military roots of cost-effectiveness analysis), available at <http://www.rand.org/content/dam/rand/pubs/papers/2006/P4557.pdf>; Exec. Order No. 13,514, 3 C.F.R. 248 (2009) (requiring cost analysis by federal agencies); ROBERT M. GATES, DEP’T OF DEF., MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS: CONSIDERATION OF COSTS IN DoD DECISION-MAKING (2010) (describing Secretary of Defense’s August 9, 2010 directive that any new proposal, initiative, program or policy within the DoD be accompanied by a cost estimate). In addition, each service within the DoD—the Army, Air Force, and Navy—has developed its own internal guidance on cost analysis. See U.S. DEP’T OF THE ARMY, U.S. ARMY COST-BENEFIT ANALYSIS GUIDE (3d ed. 2013), available at <http://asafm.army.mil/Documents/OfficeDocuments/CostEconomics/guidances/cba-gd.pdf>; U.S. DEP’T OF THE AIR FORCE, AIR FORCE MANUAL 65-506, ECONOMIC ANALYSIS (2011), available at <http://www.acq.osd.mil/dpap/ccap/cc/jcchb/Files/FormsPubsRegs/Pubs/AFMAN65-506.pdf>; U.S. DEP’T OF THE NAVY, P07-006, DEPARTMENT OF THE NAVY GUIDE FOR DEVELOPING PERFORMANCE BASED LOGISTICS BUSINESS CASE ANALYSES (2007), available at <https://acc.dau.mil/adl/en-US/180078/file/31603/Navy%20PBL%20BCA%20GUIDE%20signed%206%20Nov%2007.pdf>. The U.S. Marine Corps is an operating unit within the U.S. Navy and is thus covered by Navy policies. See *U.S. Navy Organization: An Overview*, U.S. DEP’T OF THE NAVY, <http://www.navy.mil/navydata/organization/org-over.asp> (last updated Nov. 28, 2006).
141. A full discussion of the advantages and limitations of cost analysis is outside the scope of this Article. For favorable views, see generally RICHARD REVESZ & MICHAEL LIVERMORE, RETAKING RATIONALITY 10 (2008) [hereinafter REVESZ & LIVERMORE, RETAKING

intangible benefits is crucial to the military's ability to justify clean or renewable energy projects in the current decisionmaking environment in which cost-benefit and cost-effectiveness analysis are the dominant paradigm.¹⁴² This is especially true because traditional models of return on investment do not adequately capture intangible benefits to the environment of sustainable energy use, whether the energy user is governmental or corporate.¹⁴³

1. Calculating the True Costs of Energy Use to the Mission

Congress has been active in setting energy reduction targets for the military.¹⁴⁴ In this sphere, Congress has directed the Secretary of Defense to

RATIONALITY]; Michael Adler & Eric Posner, *Rethinking Cost-Benefit Analysis*, 109 YALE L.J. 165 (1999); Michael A. Livermore & Richard L. Revesz, *Regulatory Review, Capture, and Agency Inaction*, 101 GEO. L.J. 1337, 1361–73 (2013), for an argument that cost-benefit analysis reduces the likelihood of regulatory capture; Eric A. Posner, *Transfer Regulations and Cost-Effectiveness Analysis*, 53 DUKE L.J. 1067 (2003); James Salzman, *Valuing Ecosystem Services*, 24 ECOLOGY L.Q. 887, 899 (1997) [hereinafter Salzman, *Valuing Ecosystem Services*], for arguments supporting CBA but noting its limitations. For critiques of cost-benefit analysis, see generally Frank Ackerman & Lisa Heinzerling, *Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection*, 150 U. PA. L. REV. 1553, (2002), for discussions criticizing cost-benefit analysis; Hope M. Babcock, *Putting a Price on Whales to Save Them: What do Morals Have to Do With It?*, 43 ENVTL. L. 1, (2013); Jerry Hausman, *Contingent Valuation: From Dubious to Hopeless*, 26 J. OF ECON. PERSP. 43, (2012); Michael J. Sandel, *What Money Can't Buy: The Moral Limits of Markets*, Tanner Lecture Delivered at Brasenose College, Oxford (May 11 & 12, 1998), in THE TANNER LECTURES ON HUMAN VALUES 89, (1997–1998), for discussions of how the moral importance of goods can be degraded by market valuation and exchange; Amartya Sen, *Environmental Evaluation and Social Choice: Contingent Valuation and the Market Analogy*, 46 The Japanese Econ. Rev. 23, 23–29 (1995), for an argument that individuals behave differently in markets as compared to the public sphere; Laurence H. Tribe, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, 83 YALE L.J. 1315, 1329–31 (1974), for a critique of CBA's focus on human well-being as opposed to other goals. It is beyond the scope of this paper to resolve these debates, but it is essential to recognize the challenges they pose for any effort to value intangibles.

142. See Dep't of the Army, Memorandum for Principal Officials Headquarters re: Cost-Benefit Analysis to Support Army Enterprise Decision Making 3 (Dec. 30, 2009) (noting that preparing a cost-benefit analysis identifying costs, benefits, who will pay the bill, and downstream effects of a funding decision will “enable us to make better resource-informed decisions and will contribute to the Army's overall mission effectiveness”), available at <http://asafm.army.mil/Documents/OfficeDocuments/CostEconomics/guidances/cba-gd.pdf>.
143. Cf., e.g., A. Gunasekaran et al., *A Model for Investment Justification in Information Technology Projects*, 21 INT'L. J. INFO. MGMT. 349, 360 (2001) (arguing that the financial concept of return on investment does not adequately capture intangible benefits to business strategy).
144. Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, 10 U.S.C. § 2911 (2012); see also Siddhartha M. Velandy, *The Green Arms Race: Reorienting the*

develop “energy performance goals” and an Energy Performance Master Plan, which must incorporate “[m]etrics to track annual progress in meeting energy performance goals.”¹⁴⁵ In developing such goals and a plan, the Secretary is required to rely on certain “special considerations,” including opportunities to reduce current and future energy consumption, to implement conservation and efficiency measures, to develop alternative energy sources, to reduce costs, to benefit from economies of scale, and the “value of the use of renewable energy sources.”¹⁴⁶ The Secretary is required to implement only those available measures that both “demonstrate an economic return on the investment” and “are supported by the special considerations” noted above.¹⁴⁷ Thus, Congress has directed the DoD to implement energy conservation measures that promote the “value” of the use of renewable energy sources.

In keeping with these broader goals, in the National Defense Authorization Act for Fiscal Year 2009, Congress mandated that the DoD employ a new metric called the “fully burdened cost of fuel.”¹⁴⁸ This new metric requires the DoD to account for its energy and fuel use in the planning, requirements development, and acquisition processes. The term “fully burdened cost of fuel” is defined as: “the commodity price for fuel plus the total cost of all personnel and assets required to move and, when necessary, protect the fuel from the point at which the fuel is received from the commercial supplier to the point of use.”¹⁴⁹ In the past, in contrast, the Defense Logistics Agency supplied the military with fuel at standard prices per region of delivery, regardless of how much it actually cost to deliver the fuel.

In 2010, the Pew Center for Climate Change noted that “[i]n Iraq, the Marines have found that 90 percent of fuel is used for combat support, and only 10 percent is used for operations.”¹⁵⁰ The fully burdened cost of fuel is

Discussions on Climate Change, Energy Policy and National Security, 3 HARV. NAT'L SEC. J. 309, 330 (2012) (enumerating three of the Defense Authorization Act of 2009's requirements for energy reduction).

145. 10 U.S.C. § 2911(a)–(b).

146. *Id.* § 2911(c).

147. *Id.* § 2911(d).

148. Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417, § 332, 122 Stat. 4420, *amended by* Pub. L. No. 111-383, § 1075(e)(5), 124 Stat. 4374 (2011).

149. *Id.*

150. THE PEW PROJECT ON NAT'L SEC., ENERGY & CLIMATE, REENERGIZING AMERICA'S DEFENSE: HOW THE ARMED FORCES ARE STEPPING FORWARD TO COMBAT

far higher when fuel is transported by aircraft, and when transported to the theater of war, than the price at the pump that the DoD has used in the past. The Pew Center has stated that estimates “range from two to 20 times the pump price for aerial refueling, to hundreds of dollars a gallon when delivered to a forward area. In that scenario, some estimates run as high as \$400 a gallon.”¹⁵¹

The requirement to study the fully burdened cost of fuel addressed a longstanding need in the DoD to avoid a problem of split incentives. In 2001, at the request of the Under Secretary of Defense (Acquisition, Technology and Logistics), the Defense Science Board Task Force on Improving Fuel Efficiency of Weapons Platforms identified a significant market failure: “warfighting, logistics and cost benefits occur when weapons systems are made more fuel efficient, [yet] these benefits are not valued or emphasized in the DoD requirements and acquisition processes.”¹⁵² The Task Force noted that the DoD’s failure to incorporate the true cost of delivering fuel to the “ultimate consumer” into its decisionmaking biased that process against fuel-efficient platforms by inaccurately suggesting that the “logistical cost of delivering fuel to platforms is considered free.”¹⁵³

The Task Force identified a “split incentive” in that commanders who actually used technologies in the field were not required to account for fuel consumption, and that commanders who reduced energy costs might have their budgets cut in the following year because support costs and

CLIMATE CHANGE AND IMPROVE THE U.S. ENERGY POSTURE 9 (2010) (citations omitted).

151. *Id.*

152. TRULY & ALM, *supra* note 18, at ES-2–ES-5. The Defense Science Board is a “Federal Advisory Committee established to provide independent advice to the Secretary of Defense” but is not part of the DoD itself. *Id.* at 2. In noting this failure, the Task Force contrasted the private sector’s use of metrics that require consideration of both input and output for energy. *Id.* at ES-3.

153. *Id.* at ES-2–ES-3. The Report further noted that the difficulty of quantifying benefits of fuel efficiency affects not only military decisionmaking, but decisionmaking throughout the economy. *Id.* at 11. In March 2008, a representative of the Office of the Deputy Under Secretary of Defense for Acquisition and Technology, Chris DiPetto, echoed this concern, stating: “Historically, the Department has treated energy, whether from petroleum-based fuels or electricity, as a cheap commodity, reliably supplied by our highly professional and capable logistics community, via our air tankers, our tanker trucks, our Navy oilers and our installation engineers.” Chris DiPetto, Office of the Deputy Under Secretary of Defense (Acquisition & Technology) Testimony Before the U.S. House Committee on Armed Services Readiness Subcommittee 3 (Mar. 13, 2008) (transcript available at <http://www.dod.gov/dodgc/olc/docs/testDipetto080313.pdf>).

acquisitions were not adequately linked.¹⁵⁴ The Task Force recommended that the DoD eliminate “subsidized fuel pricing” by incorporating the “true cost of delivered fuel” into planning, acquisition, and requirements processes to create proper incentives “to introduce fuel efficiency” into decisionmaking at all stages of planning.¹⁵⁵ But by 2008 the Defense Science Board Task Force on DoD Energy concluded that the recommendations from the 2001 report had not been implemented.¹⁵⁶ In addition, the Task Force recognized that installations—not merely operations—constituted a source of potential instability relating to energy use, as most installations used commercial power grids for electricity generation, and those grids were subject to disruptions.¹⁵⁷ The Task Force noted that the DoD lacked a “unifying vision” regarding operational energy use because “no one is in charge.”¹⁵⁸ Thus, the Task Force reiterated the 2001 recommendation to use the fully burdened cost of fuel and other metrics to better integrate true costs of energy into planning. The Task Force supplemented this with other recommendations, including increasing investment in efficient platforms “commensurate with their operational and financial value,” and reducing risk at installations by insulating them from the commercial grid.¹⁵⁹

As Chris DiPetto of the Office of the Deputy Under Secretary of Defense (Acquisition & Technology) testified before Congress, properly valuing “the financial costs of delivering fuel to the operator” would significantly “open up” investment and acquisition processes:

Technologies that are cost-prohibitive (on a life-cycle costing basis) at \$3.04 a gallon for JP-8 military grade fuel may suddenly look like a bargain at \$42 a gallon, which is the fully burdened price for JP-8 coming from a tanker aircraft, including the depreciation of those assets.¹⁶⁰

Thus, measuring the true “costs” of fuel use has the potential to change military decisions about which technologies to adopt.

Potential civilian spillover effects of the military’s efforts to incorporate the fully burdened cost of fuel into its decisionmaking, as well as some of the

154. TRULY & ALM, *supra* note 18, at ES-4.

155. *Id.*

156. U.S. DEPT. OF DEF., REPORT OF THE DEFENSE SCIENCE BOARD TASK FORCE ON DOD ENERGY STRATEGY: “MORE FIGHT—LESS FUEL,” at ES-3 (2008).

157. *Id.* at ES-4.

158. *Id.* at ES-4.

159. *Id.* at ES-6–ES-10.

160. DiPetto, *supra* note 153, at 8.

findings of the Task Forces, warrant further study. While it may be more attenuated to examine the impact of the DoD's efforts to utilize the fully burdened cost of fuel on individual beliefs or behavior, it is worth exploring what impact such a frame may have on corporate or institutional decisionmaking and attitudes toward climate policy options. It may be worth framing certain policy approaches to reducing fossil fuel use by describing the impact of the failure to address the split incentives problem in the military. For example, a civilian analogue to the military's efforts to remove this split incentive was Mayor Michael Bloomberg's efforts to promote hybrid taxis in the City of New York by shifting "fuel costs from taxi drivers, who currently pay for fuel, to fleet owners, who currently make vehicle purchasing decisions without the need to internalize fuel costs."¹⁶¹ Private firms may face the same split incentives problem if they fail to implement coordination strategies across offices or departments relating to energy use. Certain business firms including Microsoft and Disney have levied internal "carbon fees" on individual business units within the firm in order to address this split incentives problem and force the emitters of carbon to internalize the true cost of their emissions.¹⁶² It would be worth exploring whether either individual voting behavior or corporate decisionmaking (in support of such policies and programs to incorporate the civilian equivalent of the fully burdened cost of fuel), would be affected by descriptions of how the military is confronting the same problems.

As the East Coast blackout of 2003 demonstrated, risks to installations from a failure to insulate the electric grid from interference likewise affect civilians. Branches falling on power lines caused the blackout that led to the loss of power in eight states and parts of Canada, affecting approximately 50 million people for two days.¹⁶³ Modernizing the electric grid—or rendering it smarter—and promoting renewable energy generation, can reduce fossil fuel use and greenhouse gas emissions, and improve reliability for civilians as

161. *Metro. Taxicab Bd. of Trade v. City of New York*, 615 F.3d 152, 154–56 (2d Cir. 2010), *cert. denied*, 131 S.Ct. 1569 (2011) (describing program). The Second Circuit struck down the program as preempted by the federal Energy Policy and Conservation Act of 1975, 49 U.S.C. §§ 32901–32919 (EPCA). *Metro. Taxicab*, 615 F.3d at 156–58.

162. See generally Sarah E. Light, *Markets Within Markets* (work in progress) (on file with author).

163. James Barron, *The Blackout of 2003: The Overview*, N.Y. TIMES, Aug. 15, 2003, <http://www.nytimes.com/2003/08/15/nyregion/blackout-2003-overview-power-surge-blacks-northeast-hitting-cities-8-states.html?pagewanted=all&src=pm>; JR Minkel, *The 2003 Northeast Blackout—Five Years Later*, SCI. AM., Aug. 13, 2008, <http://www.scientificamerican.com/article.cfm?id=2003-blackout-five-years-later>.

well as the military.¹⁶⁴ It would thus be worth exploring whether drawing an analogy to the national security implications of failure to modernize the grid might affect behavior and support for policies to improve smart grid technology and infrastructure, and to increase renewable generation capacity.

2. Realizing Intangible Benefits of Reduced Fossil Fuel Use

In addition to incorporating the true costs of energy use, the military is likewise trying to place a value on intangible benefits of reducing fuel use, including improved national security, enhanced mission capability, fewer lives lost guarding fuel convoys, increased range and endurance, and insulation from attacks on the electric grid.¹⁶⁵ The Defense Science Board Task Force enumerated such positive impacts on warfighting of reduced energy demand to include increased “stealth;” decreased time to “assemble an overwhelming force;” increased commander flexibility; the ability to

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164. See, e.g., MICHAEL JUNG & PETER YEUNG, SILVER SPRING NETWORKS, CONNECTING SMART GRID AND CLIMATE CHANGE 7–10 (2011), available at http://www.smartgrid.gov/sites/default/files/doc/files/Connecting_Smart_Grid_Climate_Change_201106.pdf.
165. Goldberg Productions, Marstel Day & Darden School of Business, *The Business Case for Sustainability in the U.S. Army* (March 2013) (on file with author) [hereinafter “Business Case for Sustainability”] (discussing concept of “mission return on investment”). In other contexts, scholars have called such impacts simply “enhanced capability” or impact on the “future fighting force.” See ALBERT SCJARRETTA ET AL., CTR. FOR TECH. & NAT’L SEC. POLICY, NAT’L DEF. UNIV., A METHODOLOGY FOR ASSESSING THE MILITARY BENEFITS OF SCIENCE AND TECHNOLOGY INVESTMENTS 2–3 (2008) (proposing methodology to measure impact of DoD Science and Technology policy and investment on military capabilities, though not specifically in the climate change context). The military’s efforts to value intangible benefits are likewise similar to civilian analogues such as valuation of ecosystem services. Cf. Thompson, *supra* note 83, at 463 (describing challenges in valuing environmental intangibles such as ecosystem services); James Salzman et al., *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN. ENVTL. L.J. 309, 309–320 (2001) [Salzman et al., *Protecting Ecosystem Services*] (same); Salzman, *Valuing Ecosystem Services*, *supra* note 141, at 899 (same). In the ecosystem services context, Thompson is cautiously optimistic about the potential for economic valuation to aid in convincing environmental skeptics, without necessarily eliminating “current political polarization over environmental measures.” Barton H. Thompson, Jr., *Ecosystem Services & Natural Capital: Reconceiving Environmental Management*, 17 N.Y.U. ENVTL. L.J. 460, 470 (2008). The ability to value intangibles, such as the national security benefits of investment in renewable energy and reduced demand, is not a panacea. It alone cannot resolve “structural political obstacles” to such investments. *Id.* (noting that the concept of ecosystem services will not remove such obstacles as “the concentrated opposition of major interest groups such as mining, development, and agriculture”).

travel faster and farther with “reduced weight and smaller logistics tails that improve platform agility, loiter, and flexibility; decreased risk of attacks on supply lines; and fewer refueling operations and less logistics planning.”¹⁶⁶ For example, the Army Research Lab, using a tool called Force Analysis Simulation of Theater Administrative and Logistics Support, estimates that “if the Abrams tank were 50% more fuel efficient, the Desert Storm buildup would have taken 20% less time.”¹⁶⁷

One important reason to try to place a value on intangibles such as national security is to force policymakers to take that value into account in choosing among alternative policies or programs.¹⁶⁸ The risk of failing to place a monetary value on public goods such as national security is that when policymakers are choosing among alternative courses of action, the benefits to human well-being are systematically undervalued, as compared to benefits and costs that can more easily be monetized.¹⁶⁹ Academics and policymakers have therefore argued that a better understanding of the values of intangibles (such as in the analogous arena of ecosystem services) will bring about greater levels of investment by firms, governments, and individuals.¹⁷⁰ The same is true for national security benefits of reduced energy use.¹⁷¹

166. TRULY & ALM, *supra* note 18, at 10. The Report also notes that increased efficiency in weapons platforms may have an impact on sales of weapons to foreign nations that value fuel efficiency more highly than the United States. *See id.*

167. *Id.* at 13.

168. *Cf.* Thompson, *supra* note 83, at 462 (arguing that policymakers would take the intangible benefits of ecosystems services into account if forced to quantify them). Another reason to attempt to value intangibles is to permit the creation of markets in such goods, such as in wetlands mitigation banks. *See* Salzman, *Valuing Ecosystem Services*, *supra* note 141, at 892.

169. *Cf.* Salzman et al., *Protecting Ecosystem Services*, *supra* note 165, at 311–12 (noting that the failure to value intangible environmental benefits can lead to policymaking that is not fully informed); Salzman, *Valuing Ecosystem Services*, *supra* note 141, at 888 (“Despite their obvious importance to our well-being, recognition of ecosystem services and the roles they play rarely enters policy debates or public discussion.”).

170. Thompson, *supra* note 83, at 475. Thompson argues that the purpose of valuing ecosystem services is “to encourage people to think of conservation as a ‘private good’ that benefits them as any other good or service might and in which they should invest,” in contrast to their current thinking about ecosystems as a “‘public good’ that should be supported by governmental funding or private donations because it is the environmentally ‘correct’ thing to do.” *Id.*

171. This link between national security and efficient energy use has not gone unnoticed. For example, one scholar has argued that reduced energy consumption and better management of energy inputs by the military can provoke a green arms race by providing tactical advantages to those nations who most effectively transition away from fossil fuels. Velandy, *supra* note 144, at 310–11. In *The Prize*, energy expert Daniel Yergin likewise documented the essential role of strategic use of oil and energy in achieving military dominance. *See*

Second, as discussed above, attempting to value intangibles such as national security can also improve environmental policy, business management, or military decisionmaking by putting forth an underlying value that “appeals to a broader cross-section of society, particularly those more attuned to the economy than the environment.”¹⁷²

Third, in the energy efficiency context, existing regulations fail to fully internalize the negative environmental externalities of conventional energy sources such as coal or petroleum, or artificially low cost of inputs such as water. This provides yet another rationale for trying to place a value on intangibles such as benefits to national security of reduced energy consumption. If the military wants to undertake a project that requires new infrastructure—for example, the construction of a water treatment facility to permit the military to use reclaimed water rather than potable water for irrigation—the cost of potable water may be so low that such a project may not be justifiable. But if it were possible to quantify the national security benefits from an ability to reclaim water, then perhaps the cost-benefit analysis might come out differently.¹⁷³ This likewise has spillover implications in the civilian realm—if corporate managers or individuals fail to value the real costs of energy use, or intangible benefits of greater energy efficiency, cost-benefit analysis for capital improvements may come out differently.

Thus, these other facets of national security—including the military’s recognition of the true costs of energy use, and the ability of energy efficiency and conservation to enhance military capability—should be part of future empirical analysis. This is especially worthwhile in light of data suggesting that segments of the population that are less enthusiastic about prioritizing climate change policy are more enthusiastic about strengthening the military.

generally DANIEL YERGIN, *THE PRIZE: THE EPIC QUEST FOR OIL, MONEY & POWER* (2008).

172. Thompson, *supra* note 83, at 461 (discussing analogous context of ecosystem services).

173. Numerous methods exist to “monetize ecosystem services that provide direct market value, non-market use value, or non-use values.” *Id.* at 472. *See also* REVESZ & LIVERMORE, *RETAKING RATIONALITY*, *supra* note 141, at 9–21, 119–30; Salzman, *Valuing Ecosystem Services*, *supra* note 141, at 895. Such non-market techniques include “[c]ontingent valuation (CV),” which is sometimes referred to as “willingness-to-pay . . .” *Id.* A detailed discussion of the methodology that the DoD should use to measure intangible benefits to national security or its mission is beyond the scope of this paper.

CONCLUSION: BROADER IMPLICATIONS OF VALUING NATIONAL SECURITY

Valuing national security has the potential to affect decisionmaking beyond the military context. National security and military interests have a long history as drivers of political decisionmaking as well as individual behavior. To extrapolate to the clean energy context from the experience of nineteenth century road building, reliance on the synergy between the military's interests and energy conservation may provide a rationale for those who otherwise might not support investment in clean energy technology solely to support environmental goals. Thus, "valuing" national security has two important meanings. The first refers to the efforts by the military to place a value on costs and intangible benefits to national security of energy use. The second refers to the recognition that national security and enhancing military strength, as a value, may affect debates over climate change policy as well as individual behavior surrounding energy use.

As shown above, the military has played a crucial role as validator of climate science in the debates over climate change. Given the striking divisions among Americans in their perceptions of climate change, notwithstanding strong expert consensus on the subject, it is worth further empirical study to determine whether the military's role in this regard may affect individual attitudes about expert consensus. In addition, it is worth exploring whether a national security frame that addresses strengthening the military and saving soldiers' lives would drive greater support among more politically conservative individuals for policies to address climate change.

Finally, it is worth examining whether any aspect of the Military-Environmental Complex has the potential to shape individual behavior to reduce energy use.¹⁷⁶ Unlike the case of the compact fluorescent bulb

176. Though it is outside the scope of this paper, in light of the lessons of the military's norm leadership in racial integration, it is worth exploring whether former members of the military—who actually lived under conditions in which their energy use affected their own lives as well as of those serving alongside them—have different behaviors regarding energy use, or attitudes toward climate change policy, when they return home, compared with members of the population as a whole. *Cf., e.g.,* Stouffer et al., *supra* note 11, at 594–95 (finding that greater levels of contact between white and black soldiers in the U.S. military correlated with greater support for racial integration); Butler & Wilson, *supra* note 11, at 465 (arguing that when individuals of different races but equal rank are in constant contact, there is a “a decrease in negative attitudes[,] as “all tasks within the military require a great deal of cooperation and are intimate, prolonged and cover a wide range of activities[.]” and concluding that “the authority structure of the military has set a norm that legitimates favorable racial contact”); Moskos, *supra* note 11, at 139–40, 145–46 (noting significant

purchasing decision, it may be more difficult to link individual purchasing decisions with strengthening the military. Perhaps collective action by multiple users can help to drive down prices for military consumers of new technology. Or alternatively, perhaps recognizing the costs and benefits to the military of fossil fuel use can drive additional political support for renewable portfolio standards.¹⁷⁷

It is important to recognize, however, that there are risks in relying on nonenvironmental values to promote interest in climate change policy. For example, in 2003, two climate policy experts expressed support for a “new Apollo project . . . [incorporating] major investment in clean energy jobs, research and development, infrastructure, and transit, with the goal of achieving energy independence” with the aim of winning over “blue collar swing voters and Reagan Democrats” in battleground states while “excit[ing] the high-tech creative class at the same time.”¹⁷⁸ While the proposal received endorsements from the business community, unions, and national environmental organizations,

[e]nvironmental lobbyists told us that while they supported Apollo’s vision, they would do nothing to support it in concrete ways, either in Congress or during the 2004 election. Those of us who had created Apollo had made the decision to focus on jobs and energy independence, because they were far higher priorities among voters than stopping global warming. In particular, we discovered that investment in clean-energy jobs, to get free of oil, was more popular with voters than talk of global warming, clean air, and regulation. But environmental leaders thought our nonenvironmental and nonregulatory focus was a vice, not a virtue.¹⁷⁹

increase in support for integration among both whites and African Americans in the military between 1943 and 1951 and suggesting that this radical shift was a precipitating factor of the civil rights movement in the United States).

177. Renewable portfolio standards are requirements, usually under state law, that electric utilities generate a set percentage of power through renewable energy sources, in order to encourage the development of renewable generation. *See generally* J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1523 (2007) (describing state renewable portfolio standards); Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 ECOLOGY L.Q. 183, 212 (2005) (describing the same).

178. NORDHAUS & SHELLERBERGER, *supra* note 62, at 8.

179. *Id.* at 9.

This story is consistent with the stories told both by Gromet et al. and Myers et al., whose studies suggested that both environmental and national security frames could alienate conservatives and have unintended repellant effects on their attitudes about climate change. It is important to determine whether this national security frame would alienate either liberals or conservatives. Preliminary testing suggests that even liberals are more likely to engage in behavior that reduces fossil fuel use when exposed to the military's example of using renewable energy generation.¹⁸⁰ Determining whether any so-called “boomerang” effect (if it exists in this context) is larger or smaller than the effect on conservatives demonstrated in Gromet et al.'s study could have important policy implications.

As I have suggested above, the military has been a leader among government agencies in recognizing the costs of fossil fuel use and benefits of reducing demand to its national security mission. Thus, it is worth determining exactly what impact the value of national security can have on the climate policy debate. My examination of the question here indicates that “valuing national security” in a manner that includes climate change as a serious strategic military concern may contribute to changing public opinion over time in the United States.

180. *See supra* note 15.