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Tooth-to-Tail Greening

Energy and Climate Leadership and Policy Change at the Department of Defense

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Abstract: For decades, the U.S. government, in particular the Department of Defense (DOD), has struggled with the consequences of modern fuel-intensive military platforms. As awareness of climate change emerged at the end of the twentieth century, this environmental concern was added to such longstanding issues as fluctuating costs. This article examines a modern effort to reduce fuel consumption, and thereby climate impacts, through the congressionally mandated office of Operational Energy (OE). The creation and function of OE is reviewed and placed in context. It is argued that the strategy behind this office is markedly different than earlier “greening” efforts and significantly more aligned with the organizational culture of the DOD—and therefore more likely to effect institutional change.

Keywords: climate, energy, carbon footprint, security, military, green fleet, organizational culture, policy process

The 2008 election of Barack H. Obama marked a significant shift in American leadership on the issue of climate change. While his predecessor, President George W. Bush, had spoken out on the need to address the threat of global warming in 2001, 2002, and 2008, and launched programs to reduce air pollution and climate change, his Clear Skies and global climate

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change initiatives were widely perceived as failing to meaningfully address the scale of the climate change problem. President Bush's two terms have been described as an "eight-year sleep" on the issue of climate, which seems ever more apparent because of President Obama's initiatives.¹

In 2008, as a presidential candidate, Obama had campaigned under the overall theme of change, which included engagement on climate, and he entered office with a clear intention to address the issue, including discussing his commitment to action in his 2009 inaugural address.² His commitment to tackling climate change was demonstrated by the establishment of the Interagency Climate Change Adaptation Task Force in 2009. Moreover, Obama then presented a more comprehensive approach to the issue in the 2013 *President's Climate Action Plan*.³ While U.S. presidents have power over the executive branch, and can thereby influence federal agency behavior, Congress wields significant influence through its appropriations power. Congress, therefore, is able to participate in the formation of climate and energy policy, and affect the implementation of presidential initiatives.⁴ These are obvious distinctions within the federal system, yet implementing policy is more than just orders and funding. The agencies that receive policy direction also, in turn, add to the direction of policy in the process of implementation.

Engagement with the causes and consequences of climate change varied across the Bush and Obama administrations as well as across Congress, yet the Department of Defense (DOD) is a significant stakeholder and an important actor in this policy evolution. As the largest federal agency, the most trusted American public institution, the largest U.S. fuel consumer, and an emitter of CO₂ on par with small countries, the DOD was, and remains, a key variable in any efforts to engage effectively with either the causes or consequences of global climate change.⁵ This article will address efforts by both presidents and Congress to push the DOD to grapple with climate change and energy consumption.

In particular, this article will explore the emergence of an unusual approach to solving the complex set of problems associated with the climate-energy nexus, especially the establishment of Operational Energy (OE) within the Office of the Secretary of Defense at the Pentagon. The use of the term "climate-energy nexus" here refers to the increase in carbon dioxide and other heat-trapping gases in the earth's atmosphere produced by the combustion of carbon-based fuels, such as coal, petroleum, and natural gas. Any attempt to reduce atmospheric CO₂—and, thereby, decrease the likelihood of harmful climate change—will be centered around the current global dependence on carbon fuels, hence the "nexus." While efforts to reduce the intensity of fuel consumption at the DOD began during the energy crisis of the 1970s, and reappeared in the greening era of the 1990s, the OE office is unusual in

its climate-last approach to the climate-energy nexus.⁶ Rather than framing its challenge as primarily environmental, and focusing on climate change (or alternatively focusing on cost as in the 1970s), the OE office frames its work in terms of mission benefits flowing from reduced fuel intensity.

While a variety of policy efforts had, and continue, to push the DOD to engage with the effects of climate change on the modern threat environment and to dial back the intensity of carbon fuel use in installations, DOD operations had long been protected from environmentally minded legislation of any stripe per national security exemptions. In contrast, the OE office was established to focus on the operational improvements to mission outcomes that could be achieved through reductions in carbon fuel intensity. After a review of climate and energy efforts by President Obama and Congress, the genesis of the OE office will be explored, and the effectiveness of its approach to organizational change will be considered. With this in mind, it is clear that while external forces, such as the efforts emanating from the executive office and Congress, instigated change at the DOD, internal forces within that agency, were as important, if not more, to bringing climate change policy to various military Service branches on the operational level. It is further argued that the novel approach of the OE office to the complex climate-energy challenge has produced important mission benefits while effectively reframing the question of DOD engagement with climate change. This highly effective strategy reflects a keen sense of DOD and military organizational culture. It is clear that external forces, in particular the Congress and president (after 2009), forced a degree of change; yet, internal forces were equally, if not more, important in enacting meaningful change at the operational level within the Services.

Presidential Leadership

On 5 October 2009, Obama issued Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, that directed all federal agencies (including the DOD) to set and pursue sustainability goals. Agencies were then required to find ways to reduce greenhouse gas emissions, petroleum consumption, waste production, and water consumption as well as identify other sustainable practices. Of course, Obama's order did not apply to the operational side of DOD business, which includes "combat support, combat service support, tactical or relief operations, or training for such operations." Beyond EO 13514, in 2013, the president also directed federal agencies to purchase 20 percent of their energy needs in the form of renewable sources by 2020.⁷ Leadership by President Obama on the issue placed some pressure on DOD leaders to address climate and energy issues, although most specific mandates focused on installation energy and systems shoreside. Strategic guid-

ance, such as the *National Security Strategy* (NSS), did not strongly emphasize a military role in responding to climate change.

Despite any caveats, President Obama brought sweeping change from the executive branch to the Pentagon regarding climate change policy. While Secretary of Defense Robert M. Gates, who had been appointed by President Bush in 2006, stayed in office under Obama, new appointments arrived and were tasked to carry out Obama's initiatives. In particular, the new president appointed Raymond E. "Ray" Mabus to be the secretary of the Navy early in 2009. Mabus, previously serving as governor of Mississippi (1988–92) and ambassador to the Kingdom of Saudi Arabia (1994–96), is now the longest-serving secretary of the Navy since World War I and is considered responsible for the concept and drive behind the Navy's green fleet. He has been instrumental in the assimilation of Obama's climate change policies into the DOD.⁸ With a career in business, and firsthand experience of the complexities and compromises inherent in U.S. energy policy overseas, it is perhaps unsurprising that one of Secretary Mabus's key policy priorities has been reducing the dependence of the Navy and Marine Corps on petroleum. In particular, Mabus has been a highly visible and vocal proponent of the "Great Green Fleet" and associated biofuels programs aimed at replacing the Navy's use of petroleum fuels. Overall, Mabus has brought both change and controversy to the DOD, yet for those interested in climate change policy, his influence is important to understanding actual implementation of Obama's policies.⁹

Before Mabus's green fleet received the most recent criticisms over costs, Obama's administration telegraphed its understanding of climate change as a security threat in its first NSS issued in 2010. Identifying climate change as the first of "key global challenges," the administration through the NSS called for action on reducing carbon emissions by cutting energy waste and adding renewable sources. In addition, the NSS flagged "new conflicts over refugees and resources" that will flow from climate disruptions as a major concern for the military, building an explicit connection between climate change and war-fighting.¹⁰

Congressional Leadership

While President Obama provided highly visible leadership on the broader issue of climate change, congressional leadership had been crucial to enacting meaningful change in several key policy areas, beginning during the latter part of the Bush administration. The president, as commander in chief, is the ultimate decision maker at DOD, yet Congress plays an important role in shaping defense policy through writing legislation, providing budget allocations, and holding hearings. The following section examines congressional leadership in

the climate-energy nexus through the annual defense appropriations bill—the National Defense Authorization Act (NDAA)—that provides budget-based prescriptions and other mandates to the DOD. Over the course of four NDAAAs (2007, 2008, 2009, and 2010), Congress forced the DOD to engage with climate change primarily along two tracks: (1) climate change as a factor shaping the external threat environment in which U.S. forces operate; and (2) as a consequence of carbon-fuel consumption intensity by both operational forces and DOD installations. An important third track of policy, however, emerged in the 2009 NDAA, which opened a new front in the effort to push DOD engagement with the climate-energy nexus. Rather than a “climate-first” approach, congressmen wrote into parts of the NDAA an “energy-first” approach that forced the DOD’s leadership to rethink the agency’s energy behavior for strategic reasons without any mention of climate change. Nonetheless, through the various NDAAAs, Congress demanded the DOD attend to both climate and energy as separate or combined issues.

Climate Change and the Modern Threat Environment

The 2008 NDAA contained language specifically directing the DOD to incorporate climate change into its *Quadrennial Defense Review* (QDR) and national security and defense strategies. Specifically, military planners were tasked with assessing the risks posed by climate change to DOD missions and the security of the United States. This language is attributed to the efforts of Senators John W. Warner and Hillary Rodham Clinton. The 2008 NDAA drew media attention for its requirement that the DOD consider the effects of climate change on “facilities, capabilities, and missions.”¹¹ This mandate was confined to the national security and national defense strategies and required the following QDR to consider the impact of climate change on DOD missions and capabilities.

The 2008 NDAA language mandating consideration of climate change resulted in the first appearance of that term in the 2010 QDR, which included a section on “Crafting a strategic approach to climate and energy.” Across nearly four pages, the section noted the changes to the physical environment triggered by a changing climate and acknowledged that these changes will shape the DOD’s “operating environment, roles, and missions.” In addition, the QDR emphasized effects of climate change on DOD installations, in particular low-lying coastal installations susceptible to harm from rising sea levels.¹² Thus, the leadership via the QDR attempted to link climate change to real, physical threats that would require a response by the DOD generally and the military more specifically. Through this language, the QDR reflected a moderated focus on the effects of climate change on the future threat environment as well as a very practical concern about the potential effects on valuable DOD property.

For example, Naval Station Norfolk, Virginia, is considered highly vulnerable to coastal flooding under most climate change scenarios.¹³

Climate Change and DOD Energy Intensity

Fuel is like oxygen to the modern military; any deprivation reduces effectiveness and may be quickly fatal. Much of U.S. grand strategy during the last century has centered on securing access to, and secure transport of, this key strategic material. During times of crises, as in the mid-1970s, the intensity—or efficiency of use—of fuel has been a subject of focus among military policy makers. An easy means, however, of improving the speed and power of a jet, or increasing the armor of a tank, is to feed its engine more fuel more quickly, increasing its energy intensity. Military platforms designed with acceleration, speed, maneuverability, or heavy armor in mind generally are not fuel-sipping machines. The apparent tradeoff between efficiency and effectiveness has meant regular focus on energy intensity topics in key national security and military documents. Therefore, sections on energy in the behemoth-size document that is the NDAA were not new. These provisions, however, generally were small in scope and addressed more limited energy-efficiency goals. For example, the 2008 NDAA contained language in Subtitle D, the energy security section, defining an alternatively fueled vehicle, providing for the use of energy efficient fixtures and bulbs, and requiring reporting on the use of renewable energy sources. Earlier NDAs contained similar provisions.¹⁴

“Energy-First”: The Operational Energy Concept

A substantive shift occurred with the passage of the 2009 NDAA.¹⁵ The sections on energy security contained new provisions and a dramatically broadened scope. While primarily focusing on new studies and reporting, this NDAA contained the kernel of what was to become a significant strategy for those seeking to reduce DOD consumption of petroleum. Congress ordered reports on operational energy management and strategy, the use of a fuel efficiency parameter in acquisition, the feasibility of using solar and wind energy to support expeditionary forces, the use of alternative and synthetic fuels by military users, and the risks of extended power outages posed by the aging U.S. grid. While climate change was not included in this section, the clear focus on reducing petroleum fuel use connected this legislative requirement to the climate-energy nexus through a surprising energy-first approach that left climate benefits of reduced fuel use unmentioned.¹⁶

These reports and studies ordered by Congress, per the 2009 legislation, pointed in interesting directions and marked a key departure from existing baselines regarding the externally driven engagement on climate-energy issues

by the DOD. Three notable lines of effort emerged in the 2009 NDAA that marked a significant change in policy. First, the concept of “operational energy” was introduced and defined as “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.”¹⁷ This new concept was given teeth by the following subsection, which connected the concept of operational energy to the beating heart of the military organization—the acquisition process. Second, by requiring the secretary of defense to develop and implement a fuel efficiency key performance parameter (KPP), the NDAA legislation opened a second potentially highly effective leverage point. KPPs are used early in the acquisition process, when an agency is developing the requirements for a given system. KPPs set markers out for the type of characteristics a system should contain, and defense industries are very attentive to these early signals of intent. The direction to develop a fuel efficiency KPP therefore created space to assess acquisitions on their fuel efficiency. Third, the NDAA’s subsection requiring a study on the feasibility of solar and wind energy to support expeditionary forces contained language that had great potential for a powerful effect on future implementation efforts. The secretary of defense was directed to study the potential of these alternative fuels “to reduce the fuel supply needed to provide electricity for expeditionary forces *and the extent to which such reduction will decrease the risk of casualties by reducing the number of convoys needed to supply fuel to forward operating locations.*”¹⁸ The origin and purpose of this important language will be addressed in later sections of this article, but clearly, the legislators’ choice of words was moving the DOD toward adopting greener techniques even in areas previously excluded due to readiness concerns.

In addition to the subsections discussed above, Congress also used the 2009 NDAA as a legislative tool to establish the position of director of operational energy, plans, and programs answering to the secretary and deputy secretaries within the Office of the Secretary of Defense (OSD).¹⁹ Furthermore, each Service secretary was directed to designate a senior official responsible for operational energy for that Service, to coordinate with the new director of OE, and to implement initiatives pursuant to the operational energy strategy.²⁰ According to one individual involved with the OE office, it was “not a particularly wanted office.” Therefore, it is perhaps not surprising that Section 902 was mentioned in an accompanying signing statement by President George W. Bush, which stated that 902 was among four sections that “purport to impose requirements that could inhibit the president’s ability to carry out his constitutional obligation.”²¹

The 2009 NDAA operational energy initiative was hinted at in the 2007 NDAA, when legislators during Bush’s last term set the policy of the DOD

“to improve the fuel efficiency of weapons platforms, consistent with mission requirements” and ordered a report to study the feasibility of designating a senior DOD official to implement this policy.²² The limitations, however, of this earlier language are clear. Later bills, in particular the 2009 and 2010 NDAA, contained much more specific direction with clearer measures for accountability. The 2010 act also contained a section under Title III, Operation and Maintenance (O&M) funds: “energy security.”²³ The sections contained here appropriated funds for a director of OE, and directed other funding and reporting on energy efficiency programs, fuel demand management, and the use of renewable fuels. Language from the influential 2009 NDAA also made its way into the 2010 QDR: “Energy efficiency can serve as a force multiplier, because it increases the range and endurance of forces in the field and can reduce the number of combat forces diverted to protect energy supply lines, which are vulnerable to both asymmetric and conventional attacks and disruptions.”²⁴ This sentence echoes the crucial idea, that reductions in energy use could benefit military operations, that appeared in the 2009 NDAA. The 2010 QDR went on to cite many of the actions resulting from the 2009 NDAA, such as the creation of an energy efficiency KPP and appointment of a director of OE.

Congress on Climate Change and the DOD

The preceding sections point to a significant effort from Congress to push the DOD to engage with both the causes and consequences of climate change over multiple budget cycles. By using the NDAA as a vehicle, congressional leaders placed the issue squarely on the table, imposing new requirements on the DOD and forcing direct change. The extent of the change implemented, and the degree to which compliance would be meaningful through culture change, cannot be determined simply from statutory language. Nevertheless, congressional lawmaking, accompanied by presidential efforts, can be understood as part of the process by which the DOD engaged with the causes and consequences of climate change. An important piece of the efforts noted above was the creation of the OE office at the DOD (in OSD), and the creation of a director for that office. Using this policy change as a case study, the following sections will explore the implementation of this change at the DOD.

An Inside View of Progress on Energy and Emissions

The preceding sections illustrate the significant “pushing” that came from Congress and the president to force change at the DOD on issues of climate change and energy. Internal efforts, however, also contributed to moving climate change and energy issues onto the DOD agenda. These efforts predated the Obama administration and even the 2008 NDAA that contained significant climate-related mandates from Congress. In fact, internal efforts to draw atten-

tion to the complex costs of petroleum in the DOD are a long-standing phenomenon that evolved dramatically around the turn of the twenty-first century. While some of this internal impetus grew out of environmental issue communities, the effort appears to have been primarily motivated by recognition of the operational costs of a heavy logistics burden on U.S. forces. The following section will analyze how the members of policy community in the DOD were able to leverage political events as a “policy window” that led to the 2009 and 2010 NDAAAs.

To understand how policy makers were able to lay the groundwork for the 2009–10 legislation, we will use John W. Kingdon’s policy window model, adapted and compressed to suit the case study at hand and the constraints of space. Kingdon conceptualizes the policy process by categorizing key players as “streams” and “entrepreneurs” and action in conjunction with temporal issues, or “policy windows.” In the most basic terms, policy problems exist and are studied by specialized communities inside and outside of government in ongoing *streams* and that these problems can suddenly come to the public attention through crises or by focusing events that briefly open a *policy window* for action. Also important to the process, *policy entrepreneurs* can connect these streams during windows to bring about policy change. While possibly oversimplified, using Kingdon’s model provides insight into how climate change and energy security topics came squarely within the DOD’s purview, in particular, to the creation of the OE office after the passage of the 2009 and 2010 NDAAAs.

Policy Streams: DOD Concerns about Fuel Costs

Using this analytic framework, it is possible to understand the 2009 and 2010 NDAAAs as the outcome, rather than the beginning, of long-standing efforts to address the climate-energy nexus at the DOD.²⁵ The following section will explore the long buildup to the 2009 and 2010 NDAAAs, and argue that the novel language and initiatives contained in this legislation resulted from years of action in the policy community that laid the foundation.

In particular, two reports from the Defense Science Board (DSB) provided early arguments for focusing on fuel efficiency as a path toward improved warfighting. In 2001, the first of these DSB reports was released. With an awkward title, *More Capable Warfighting through Reduced Fuel Burden*, it landed in May 2001, just a few months before the terror attacks of 11 September. In the wake of the 9/11 attacks, there was no time to focus on fuel efficiency. Nevertheless, the 2001 report laid out early markers that clearly informed later legislative developments and the work of the OE office. For example, the 2001 DSB report emphasized the “significant warfighting, logistics and cost benefits” of greater fuel efficiency. It also pointed directly to failures in the acquisition

and maintenance systems that masked the importance of fuel efficiency. Two points of failure in particular were noted: (1) by pricing fuel on wholesale refinery costs (at point of purchase) rather than calculating point of delivery costs (in-theater), the actual “end-to-end” cost of fuel remained hidden; and (2) fuel efficiency is neither factored into acquisition (through requirements) nor considered in performance assessments (through allocation processes). The 2001 report advocated for changes in these key systems to bring greater attention to the question of fuel efficiency, and argued that such attention would quickly drive the adoption of more efficient technologies into current and future DOD systems. While reducing the fuel burden of operational forces would sharply reduce the carbon footprint of the DOD, the DSB report did not use this argument or employ environmentally motivated factors, focusing entirely on the cost-saving and operational benefits of fuel efficiency.²⁶

Opening the Policy Window: Americans See the New Costs of Fuel

The wars in Iraq and Afghanistan, with their heavy casualty tolls from fuel convoy attacks, served as focusing events that opened policy space for reform. While the 2001 DSB report was overtaken by current events that focused public attention on terrorism, the fighting in Iraq and Afghanistan soon brought the spotlight back to fuel security. The frequency of attacks on U.S. fuel convoys provided a dramatic and highly visible human argument for reducing fuel consumption, which was made across media outlets as well as in policy circles. Marine Corps Lieutenant General James N. Mattis, commanding general of the 1st Marine Division in Iraq, telegraphed the message: “Unleash us from the tether of fuel.”²⁷

There were good reasons for Mattis’s comment, and the media heavily covered convoy attacks. The reporters at the *Los Angeles Times* covered the story of Keith M. “Matt” Maupin in detail, a soldier killed during a convoy attack, casting light on the fuel supply problem in Iraq, including the use of contractors. Robert Bryce at *The Atlantic* highlighted the challenging nature of the problem. Insurgent use of improvised explosive devices (IEDs) led to increases in vehicle armor, which decreased fuel efficiency and required more fuel convoys—opening additional opportunities for IED attacks.²⁸ As Dexter Filkins wrote in the *New York Times* in 2003, in Iraq, “the effort to supply American fighters at the front could be a battle itself.” Filkins noted that “the voraciousness of the modern military” meant that a 300-vehicle fuel and ammunition convoy carried only a few days’ supply, and constant attacks on convoys meant “a lot more fighting than [the U.S. military] bargained for.”²⁹ Media coverage of convoy attacks served to focus public and policy-maker attention on the issue of operational energy use and spurred policy change.

Joining the Streams: Policy Entrepreneurs and Enacting Change

In 2001, when the DSB issued its report, the policy window was not yet open, and could not be opened without the influence of policy entrepreneurs who could take advantage of their unique positions. Unearthing the significance of their actions and leadership is difficult using traditional sources due to the nature of the DOD employment structure as well as confidentiality. Thus, the author conducted a series of interviews to bring to light a greater understanding of the workings of the DOD generally and OE specifically. According to interviews done in 2013–14, the 2001 report generated only “mild interest.”³⁰ One of the interviewees, who at the time was a leading actor in DOD energy security issues, claimed responsibility for reviving the 2001 DSB report, by bringing it to light once again in 2006. According to this respondent, he discovered the report “sitting on the shelf” and called DSB to inquire about an update.³¹ This effort began in 2006, coinciding with the chartering of the DOD Energy Security Task Force, led by the DOD’s Acquisition, Technology, and Logistics (AT&L) office.

The second DSB report, with the attention-grabbing title *More Fight—Less Fuel*, was published in February 2008.³² Given the media climate that had focused scrutiny on fuel convoy attacks, this report received widespread attention. The relatively small number of individuals involved points to the existence of a tight policy community and specific policy entrepreneurs who played key roles in spearheading change.

The 2008 DSB report contains language and arguments that appear to be templates for the 2009 and 2010 NDAAAs. While outright lobbying by DOD employees is not permitted, it appears that the work of key policy entrepreneurs was effective in translating the expert recommendations of the policy community, contained in the 2008 DSB report, into actual legislation. Through this process, meaningful and substantive change was enacted. While this process took several years, and increasingly specific and forceful statutory language from Congress, it appears to be an example of collaborative work to create change within the large and complex DOD organization.

The policy community was not by any means confined to the DOD. Academic experts produced work arguing for reduced fuel use by the military housed under the DOD. The military community, in particular retired leaders, weighed in forcefully, using their access to media and their ability to influence opinion. In 2007, a group of retired generals and admirals issued a report through CNA’s Military Advisory Board titled *National Security and the Threat of Climate Change* that argued forcefully for climate-energy-security connections.³³

Several key players in the policy community around the climate-energy nexus, who can be considered policy entrepreneurs in the Kingdon model, had roots in earlier generations of environmental policy problems at DOD. These

connections appeared in the interviews conducted by the author. Respondents with extensive experience linked climate and energy efforts to earlier generations of institutional change at DOD. The line reached back to ozone; key individuals were working on ozone-related issues, which allowed for an easy transition into other environmental issues, such as base cleanup. In addition, ozone had an operational component, since some weapons-related chemicals contained ozone-harming components. Ozone, therefore, provided an early experience for key individuals, who developed an understanding that the ways DOD behavior harmed the environment also harmed DOD operations and produced health impacts among DOD personnel. The DOD participated in the Kyoto, Japan, climate negotiations; according to one respondent, the U.S. delegation may have been the only team with a military component.³⁴ This respondent drew a line from the Kyoto negotiations in 1992 to the 2001 DSB report. Moreover, this informant argued that the failure of the Kyoto Protocol led DSB authors to hold the report until the arrival of a new administration in early 2001, hoping for a clearer path to implementation.³⁵

This early phase of environmental interest in the DOD during the 1980s and 1990s centered around base cleanup, had produced an acrimonious and defensive relationship between employees in the DOD and the Environmental Protection Agency. The antipathy between the two agencies colored all environmental issues that came within their purview. The effects of litigation drove change in DOD behavior toward much more environmentally responsible directions.³⁶ Nonetheless, it created a defensive posture at DOD. As one respondent who had worked in DOD for several decades explained that the DOD's mission is not to be an environmental leader, "but [DOD] had to be on the forefront in order to protect our interests." The Pentagon had learned the hard way that "when you lose the NEPA [National Environmental Policy Act] suit," it "can be a mission stopper."³⁷ The DOD was "going to get litigated to death" and its leaders realized as an agency it had "got to get its act together."³⁸

In addition, the high cost of base cleanup became a dynamic affecting budgetary gravity. Efforts to reduce pollution and clean up DOD activities were linked to human safety at the DOD under President Bush, and environmental safety and health issues also were prioritized during the Bill Clinton administration. As a result, early framing of these issues revolved around environmental and pollution concerns. This framing eased acceptance by military leadership wary of environmentalism: "they all understand that in order to be an effective military and to conduct military operations if called upon, people have to be healthy."³⁹ Environmental safety concerns, like pollution, which created health hazards to military personnel thereby were framed as impinging upon combat readiness and the ability to effectively complete the mission.⁴⁰ This framing echoes the current OE approach and may be considered a template.

Implementation Factors: The Unique DOD Environment

The DOD is a unique federal agency, and interviews are a useful source of data about the complex and often opaque rules that govern it. But due to issues of attribution and institutional hierarchies, it is difficult to get the views of DOD leadership on record, which, in turn, defeats interested outsiders from analyzing DOD operations. Considering that, as we have seen here, several, high-level external forces combined with internal forces to create change in the DOD, it is essential that we understand how actors internal to the DOD embraced, rejected, or instigated change within this context. Off-record interviews enable thick description of the lived experience of key participants in the history described, an ethnographic approach supported by the literature on organizational culture.⁴¹ Headed by a presidential appointee, the secretary of defense, the DOD is comprised of the military Services (Army, Navy, Marines, and Air Force); along with members of the Joint Chiefs of Staff, who head the regional combatant commands; and the Office of the Secretary of Defense, which contains even more agencies (Defense Advanced Research Projects Agency, Defense Intelligence Agency, Defense Logistics Agency, etc.). The DOD is enormous: 1.3 million on active duty in the Services, 742,000 civilian personnel, with another 826,000 in National Guard and Reserve forces and more than 2 million retirees receiving benefits and services.⁴² Given this tremendous scale, and the inefficiencies that inevitably accrete in large systems, it is not surprising that many interview respondents underlined the importance of leadership to policy change as well as a variety of other internally and externally defined limitations on action discussed below.

Leadership

Respondents repeatedly underscored the importance of leadership in driving change within the DOD. While leadership is not responsible for specific actions because DOD leaders, generally, are not implementing orders but rather delegating, leadership has “tremendous power” to shape the parameters of the discussion and set priorities on a particular topic.⁴³ “Leaders at the top can make a difference,” noted one interviewee. Similarly, another noted that leadership can be especially influential when “the building,” referring to the complex organization contained in the Pentagon, is not leaning toward the change mandated by the president, Congress, or internal actors. Conversely, leadership does not always create change. Some respondents expressed skepticism about top-down, “force-fed” implementation and the durability of such change.⁴⁴ Many respondents pointed specifically to Secretary Mabus’s spearheading of Navy biofuels programs as an example of leadership driving change, but in a manner likely to be ephemeral and that will not persist after he leaves office.⁴⁵ Thus, the interplay of elected officials, and politically motivated appointees, Service rep-

representatives, government service employees, and contractors can muddle the direction and source of leadership on such issues as climate change.

Requirements, Acquisitions, and Budgets

Moreover, as a part of these interviews, three “big processes” at DOD were identified as obstacles to change: requirements, acquisitions, and budget. As one respondent noted, “You are always fighting the people battle, [and] that’s part of the budget battle.”⁴⁶ It was important to get OE involved in these three big processes to create change. One respondent described how the Services initially had established OE “shops” in installations programs, which was the “wrong place” because those offices “knew nothing,” and “had no interest, understanding, or influence in critical areas.”⁴⁷ However, the OE office has recently been placed into an installations department at the DOD, although it is part of the broader AT&L office.⁴⁸ This finding—of the absolute importance of budgets and the flows of money—has been borne out by research into other areas of U.S. military organizational behavior by the author.

The DOD budgeting process frequently was discussed as affecting the conversation, and the budgetary system of the DOD created artificial pressures that result in inefficiencies. The DOD has an “infinite discount rate,” which is worse during wartime, so money is hard to find for long-term payoffs, which, in turn, affects acquisitions.⁴⁹ The acquisitions process was described as “mind-numbingly complicated” and “extremely bureaucratic,” designed primarily to avoid embarrassment.⁵⁰ As a result of public scandal relating to high-cost items, the acquisitions process was described as a defensive structure with rigid rules, which was very difficult to change or break into.⁵¹ As one respondent explained, the acquisitions process is “not always guided by reason,” but is “entirely fear-driven.”⁵² “You run into all kinds of acquisition-related problems,” one respondent concluded. Acquisitions programs are “like glaciers moving downhill,” remarked one respondent, and so it is easy to see how these internally and externally controlled mechanisms slow the pace of change within the DOD.⁵³

Interviewees also placed blame on other processes. Respondents noted that, during war games, energy never runs out. As a result, questions regarding the sourcing, and the consequences thereof, of fuel left unattended creates inertia on the topic of energy: “it is going to take something bad to push that [energy] envelope,” since there was a tendency to resist reworking a process that appeared not to be broken.⁵⁴ The sheer effectiveness of DOD logistics created unintentional resistance to reducing petroleum use, since operators were accustomed to always-available fuel, delivered by “the best logisticians in the world,” doing “miraculous” work.⁵⁵ The work of these logisticians was not linked closely to planning, but part of a separate process, “engineering over the wall.”⁵⁶ As a result, planners were able to assume the availability of fuel because

the logisticians made fuel a surmountable obstacle. As one respondent noted, the assumption was that “if I want fuel, I get it.”⁵⁷ Attention to the problem of energy only came if there were problems in acquiring it: “I care if I can’t get it.”⁵⁸ Consequently, one respondent asked rhetorically, when it comes to logistics, “what is our success hiding?”⁵⁹

Culture and Climate

Because acquisitions and logisticians made fuel available as needed to the Services, the climate-energy nexus received little attention. Yet cultural factors within the DOD played a role as well. According to a respondent involved in the second DSB report, climate was “not in the mix” when the report was written because the inclusion of this issue essentially would turn warfighters off. “If you’re going to sell something in the building, it’s got to be about warfighting.”⁶⁰ It was important to avoid giving the impression that operational energy advocates believed that “saving energy is more important than going fast.”⁶¹

Respondents underscored the unique culture of the military and the specific Services as well as perceptions that color their actions. The Army is “dumb,” the Air Force is “devious,” and the Navy is “defiant.”⁶² More important, as one respondent argued, each Service has preconceived notions about warfighting, driven by its missions and the platforms that it buys, and energy concerns needed to fit those platforms. In the Air Force, the fighter pilot and fighter jet is central to its mission; to the Army, the tank or the next ground combat system is of primary concern; and the Navy leadership generally looks to the next warship or carrier-based fighter; the Marines focus on the air-ground task force communication system.⁶³ Overall, respondents repeatedly underscored the importance of obtaining, not improving, weapons systems for the military: “If they [the DOD] only have a dollar to spend, they are going to spend it on a gun, not on making the gun better or easier to sustain,” concluded one respondent.⁶⁴ The DOD is “disaggregated,” with gaps between OSD and the Services, between the Services themselves, between combatant commands, and between bases. There is competition among DOD components as well: “Somebody’s ox has got to get gored” when new priorities emerge, meaning one stakeholder often loses funding when another stakeholder has an urgent need.⁶⁵

As each Service has longstanding culture, so does the DOD. The DOD, as an organization, is driven by “doctrine, policy, and SOP [standard operating procedure].”⁶⁶ A flurry of activity without institutionalization is seen many times at DOD, meaning that a new concept or focus may suddenly trend strongly, but would not generate institutional change and would therefore eventually wane and be forgotten.⁶⁷ At the Pentagon, there is a “warehouse full of lessons not learned,” as one respondent stated, and a “warehouse of lessons unlearned,” said another.⁶⁸ “People don’t pay attention to history,” remarked

another.⁶⁹ Respondents suggested that efforts to reduce DOD petroleum use began under President George H. W. Bush, were strongly pushed under the Clinton administration, and continued to some degree under President George W. Bush. Yet despite the length of the general effort, the episodic nature of attention and leadership on the topic produced little institutionalization. Issues of the day came and went, and each new emphasis brought efforts by many different stakeholders to link their particular work to the current issue du jour to boost attention and budget.⁷⁰ The broadness and malleability of “environment” made these waves of attention particularly vulnerable to linking and dispersion.

Insiders versus Outsiders

The division between DOD insiders and outside political appointees is significant in terms of how change is perceived and the value of that change. Respondents note both the obvious division between military and civilians and the differences between career civil service and political appointees. One noted, “Politics always trumps analysis.”⁷¹ Career civil service employees were essential to continuity, since they created and perpetuated institutional memory. In contrast, both military and political appointees rotated frequently. Political appointees “rotate fast and have their own agendas,” while the “military guys are going to move on so you can’t depend on them.”⁷²

Respondents with long-term Pentagon experience expressed concern about the effects of outsider pressure on energy and climate issues. As one insider put it, “Crusaders you always worried about,” or “zealots,” referring to the political appointees who dogmatically held to their agendas and pushed back when policies did not support their programs: “political appointees are where crusaders come from.”⁷³ The OE office was “not a particularly wanted office.”⁷⁴ Insiders could resist pressure through time-tested strategies: as one respondent said of Sharon Burke, the first assistant secretary of defense for OE, the DOD leadership would “yes her to death and slow-roll her.”⁷⁵ Slow-rolling is a often used strategy that enables Service-loyal military players (as well as career civil servants) to stymie short-lived political appointees, and within that the long-term military people can often wait out the people holding more short-term political positions.

Criticism Emerges

Some criticism of the OE office emerged in interviews. “They don’t have a clue,” one respondent argued, suggesting that the OE office was hung up on day-to-day tasks.⁷⁶ The ability to resupply and provide maintenance on alternative energy systems was identified as a weakness that should have been solved by the office with the task of managing “operational energy.”

The Energy/Environmental Security Theory Context

The sections above sketch out several different lines of effort, all advancing the incorporation of climate change and energy concerns within DOD activities. It is important to recognize and differentiate the subcomponents of this broad effort to assess motives and gauge effectiveness. Several axes exist: the divide between operational and nonoperational missions and systems; and the divide between the effects of climate change on DOD activities versus the effects of DOD activities on climate change.

The rapidity with which climate change was sucked into contemporary security discourse reflected the complexity and broadness of security studies in the twenty-first century, as well as the scale of the climate change problem itself. Scholarship on the connections between climate and security flourished to such an extent that one paper in 2010 queried if climate change was “The Hottest Issue in Security Studies?”⁷⁷ The new nature of warfare played a key role in emphasizing the role of energy in warfare. As one respondent described, the earlier generation of logistics relied on the “little ship in a big ocean” model, whereby logistics support to forward operators was protected from adversaries by the intrinsic nature of the spaces involved. In the modern era, adversaries are focusing primarily on soft targets, such as logistics, and employ more advanced technology. In addition, as energy intensity has increased, the logistics burden is larger, creating a bigger footprint and greater visibility.

Efforts to reduce the impacts of DOD activities on the environment, broadly speaking, date back to the 1970s. As climate change emerged on the policy agenda, it was included in efforts, generally led by the Democratic Party, to “green” the DOD.⁷⁸ These efforts were directed at the nonoperational side of DOD activities. Climate change poses a threat to DOD installations at home (and abroad), in particular those in low-lying coastal locations.⁷⁹ For example, Norfolk, Virginia; Camp Lejeune, North Carolina; and other sites are vulnerable to sea-level rise and flooding. The 2010 QDR, and associated efforts, were aimed at incorporating consideration of the impacts of climate change on DOD activities, and addressed both operational and nonoperational activities. Climate change may change the threat environment in which DOD missions emerge, for example, by increasing instability, compounding the factors that give rise to conflict and displacing people.

The connection between climate change and the modern security environment was made explicit in the 2010 QDR, but rode on a wave of scholarship that provided impetus and a supporting body of thought to propel new security assessments into the Pentagon. An early paper by Jon Barnett attempted to “systematically” lay out the range of security-related impacts of climate change.⁸⁰ Barnett included displacement of populations due to rising sea levels, increasing instability in fragile states where scarcity of food and water, along

with extreme weather and spreading disease, may contribute to conflict, and the stressful economic costs of climate adaptation in his list of security considerations. Later work by Barnett amplified and refined these arguments.⁸¹

Work by military scholars also provides insights to the connections between energy intensity, efficiency, and military effectiveness. Ryan Umstattd's work, for example, informed by his Air Force experience, is a helpful introduction to the complicated question of energy use at DOD. While providing a contemporary academic analysis that supported the QDR and NDAA efforts—highlighting the payoff from energy efficiency at DOD—Umstattd provided an historical analysis tracking DOD expenditures on energy, as well as patterns of consumption. He also noted the unique forces shaping DOD energy behavior: it is “in the business of delivering military effectiveness.” Nevertheless, Umstattd held that military effectiveness is not necessarily sacrificed by pursuing energy efficiency. Stacy Closson provides similar analysis and a useful summary of policy evolution on the subject in a clear and accessible set of tables.⁸²

Conclusions

Effecting institutional change in an organization as large, as powerful, and as unique as the Department of Defense always has been daunting. When it comes to unconventional security threats, such as climate change, the challenge is significant. The nexus between climate change and carbon-based fuels—the lifeblood of the modern military—makes attempts to engage with climate even more perilous. Earlier efforts to “green” the DOD have received mixed assessment, and respondents interviewed for this research reinforced this ambiguity by underscoring the negative reception given to environmentally focused policy efforts.⁸³ The focus here is on the Operational Energy office, which took a mission-first approach to inculcating organizational change relating to fuel and energy—and by extension, climate.

While producing the same outcomes—reducing petroleum use, increasing alternative energy use, shrinking DOD's carbon footprint, and boosting the development of alternative energy technology—the OE office was stood up on an entirely different premise than earlier generations of environmentally focused policy changes. The genesis for OE came from the in-theater liabilities of fuel dependence: attacks on fuel convoys, the need for refueling stops, and physical ties to supply depots.

OE is a special case. Military operations are protected from greening efforts due to their special national priority—the mission comes first. Therefore, greening efforts, including obligations to reduce the climate footprint of DOD activities, excluded operational activities. While climate change increasingly was incorporated into DOD activity, climate considerations did not reach to the operational side. Efforts to incorporate climate threats into DOD planning and

strategy took an entirely different approach to increasing awareness of climate change at the DOD. By emphasizing the threat posed by climate change, including the impact of climate change on conflict and insecurity abroad as well as the impact on DOD installations, this effort touched both operational and nonoperational sides of DOD.

Connecting the alternative energy idea to the tactical and strategic problem was the key insight of those advocating for operational energy. In this, the connection to “green” was a liability rather than a motivation. As one key leader in the office argued, “Pretend oil is free.”⁸⁴ The vulnerability of supply lines is still a problem, because forces are diverted to protect vulnerable fuel supply lines. The smaller these supply lines can be shrunk, the fewer troops must be diverted from the primary mission. By framing petroleum use as a warfighting problem, and “solving military problems,” the OE office kept the focus on operational effectiveness.⁸⁵ This argument, entirely devoid of problematic frames of environmentalism or cost-cutting, was a powerful insight that has re-focused long-standing efforts into a more successful and organizationally well-aligned direction. By working within the established organizational culture of the DOD, which prioritizes the operational mission before all else, the strategy behind the OE office aligned with the organization rather than taking a disruptive approach. As one respondent put it, the DOD has a “culture of more mass”—the OE office may be changing this culture from tooth to tail with its novel focus on the “sustainability of the fight.”⁸⁶ However, another respondent noted that “every system in the pipeline” is more energy-intensive than what is currently in use, underscoring the critical point that energy demand by the DOD in coming decades will continue to be a significant issue to both warfighting and climate change.⁸⁷

Notes

1. George W. Bush, “President Announces Clear Skies and Global Climate Change Initiatives” (speech, National Oceanic and Atmospheric Administration, Silver Spring, MD, 14 February 2002), <http://georgewbush-whitehouse.archives.gov/news/releases/2002/02/20020214-5.html>; John Byrne et al., “American Policy Conflict in the Greenhouse: Divergent Trends in Federal, Regional, State, and Local Green Energy and Climate Change Policy,” *Energy Policy* 35, no. 9 (2007): 4555–73, doi:10.1016/j.enpol.2007.02.028; Paul G. Harris, “Beyond Bush: Environmental Politics and Prospects for U.S. Climate Policy,” *Energy Policy*, 37 (2009): 966–71, doi:10.1016/j.enpol.2008.10.042; and “Your Inbox, Mr. President,” *Nature* 457 (2009): 258–61, doi:10.1038/457258a.
2. John M. Broder, “Obama Affirms Climate Change Goals,” *New York Times*, 18 November 2008, http://www.nytimes.com/2008/11/19/us/politics/19climate.html?_r=0; and Macon Phillips, “President Barack Obama’s Inaugural Address,” *White House* (blog), 21 January 2009, <https://www.whitehouse.gov/blog/2009/01/21/president-barack-obamas-inaugural-address>.
3. President Obama’s efforts on climate change are varied and diverse, and reach far beyond the limited scope of this paper. A comprehensive introduction to his climate change agenda can be found online. See also Executive Office of the President, *The*

- President's Climate Action Plan* (Washington, DC: White House, 2013); and Jane A. Leggett, *President Obama's Climate Action Plan* (Washington, DC: Congressional Research Service, 2014).
4. Congressional electoral cycles also created policy dynamics frequently operating out of step with presidential administrations, such as the 2006 election that brought a Democratic majority to the House and erased the Republican majority in the Senate, placing Congress at odds with the Republican president, or such as the 2012 election that caused the reverse.
5. Kristine E. Blackwell, *The Department of Defense: Reducing Its Reliance on Fossil-based Aviation Fuel—Issues for Congress* (Washington, DC: Congressional Research Service, 2007).
6. For further information on greening, see Robert F. Durant, *The Greening of the U.S. Military: Environmental Policy, National Security, and Organizational Change* (Washington, DC: Georgetown University Press, 2007).
7. *Federal Leadership in Environmental, Energy, and Economic Performance*, EO 13514 (Washington, DC: White House, 2009), 14; and “Presidential Memorandum—Federal Leadership on Energy Management,” White House, 5 December 2013.
8. “Energy,” U.S. Navy: Energy, Environment and Climate Change, <http://greenfleet.DODlive.mil/energy/>.
9. “Ray Mabus,” U.S. Navy, Secretary of the Navy, http://www.navy.mil/navybio_ldr.asp?id=505; Meghann Meyers, “Navy Deploys First Biofuel-powered Great Green Fleet to Asia-Pacific,” *Navy Times*, 20 January 2016, <http://www.navytimes.com/story/military/2016/01/20/stennis-strike-group-sets-sail-10-percent-beef-fat-fuel-blend/79054624/>; and David Alexander, “Amidst Drop in Oil Prices, Navy Deploys ‘Great Green Fleet,’” Reuters, 19 January 2016, <http://www.reuters.com/article/us-usa-defense-greenfleet-idUSKCN0UY09U>.
10. Executive Office of the President, *National Security Strategy* (Washington, DC: White House, 2010), 47.
11. National Defense Authorization Act for Fiscal Year 2008, Pub. L. No. 110-181, Section 951(a) (2008); Amy Hader, “Former Sen. Warner Ties Climate to Security,” *National Journal* (blog), American Security Project, 3 February 2010, <http://www.americansecurityproject.org/former-sen-warner-ties-climate-to-security/>; and John M. Broder, “Climate Change Seen as Threat to U.S. Security,” *New York Times*, 8 August 2009.
12. *Quadrennial Defense Review Report* (Washington, DC: DOD, 2010), 84–85.
13. See Yuki Noguchi, “As Sea Levels Rise, Norfolk Is Sinking and Planning,” NPR, 24 June 2014, <http://www.npr.org/2014/06/24/324891517/as-sea-levels-rise-norfolk-is-sinking-and-planning>.
14. National Defense Authorization Act for Fiscal Year 2008; and John Warner National Defense Authorization Act for Fiscal Year 2007, H. R. 5122, 109th Cong. (2006).
15. Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417 (2008).
16. *Ibid.*, Sections 331, 332, 333, 334, 335.
17. *Ibid.*, III(D)(331)(a)(4).
18. *Ibid.*, III(D)(333)(b)(1). Emphasis added by author.
19. *Ibid.*, Section 902(a–c).
20. *Ibid.*, Section 902(d)(2).
21. It should be noted that NDAA’s are generally passed at the start of the federal fiscal year (October) for the following year. Therefore, the 2009 NDAA was signed by President Bush in the final months of his administration in late 2008. “Statement on Signing the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009,” *Weekly Compilation of Presidential Documents* 44, no. 41 (20 October 2008), 1346.
22. John Warner National Defense Authorization Act for Fiscal Year 2007, Section 360.
23. National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, III(D) Section 331-335 (2009).
24. *Quadrennial Defense Review Report*, 87.
25. The following section relies on data from a series of interviews conducted by the author with individuals involved, directly and indirectly, in the OE office. The in-

interviews were conducted in 2012–13. Interviews were conducted off the record to permit respondents to speak freely on sensitive political issues. Respondents' views were captured to the greatest extent possible through careful and detailed note taking during each session. Interviews were unstructured, and generally lasted one to three hours. A snowball approach was used to identify respondents. While the interviews were extensive, covering topics that included climate change, patterns of fuel use, including alternative fuels and the culture surrounding fuel, and organizational change within DOD, the following section will present information specific to this paper's main topic: the OE office.

26. Office of the Under Secretary of Defense for Acquisition and Technology, *More Capable Warfighting through Reduced Fuel Burden* (Washington, DC: Report of the Defense Science Board, 2001).
27. A. M. Andrews et al., *Future Fuels* (Arlington, VA: Naval Research Advisory Committee, 2006), 3.
28. See, for example, Christopher Helman, "For U.S. Military, More Oil Means More Death," *Forbes*, 11 November 2009; Anna Mulrine, "U.S. Military Eyes Alarming Spike in Attacks on Key Supply Convoys into Afghanistan," *U.S. News & World Report*, 22 December 2008; Robert Bryce, "Gas Pains," *The Atlantic*, May 2005, <http://www.theatlantic.com/magazine/archive/2005/05/gas-pains/303897/>; "Cargo Flights Rise Due to Convoy Attacks," *CNN World*, 14 December 2004; Rick Atkinson, "Left of Boom: The Struggle to Defeat Roadside Bombs," *Washington Post*, 30 September 2007; and T. Christian Miller, "Halliburton Suspends Some Iraq Supply Convoys," *Los Angeles Times*, 13 April 2004; T. Christian Miller, "Iraq Convoy Was Sent Out Despite Threat," *Los Angeles Times*, 3 September 2007.
29. Dexter Filkins, "A Nation at War: In the Field/Central Iraq; Endless Supply Convoy Is Frustrated Endlessly," *New York Times*, 28 March 2003.
30. Author interview with DOD contact, 9 December 2013, hereafter DOD interview, 9 December 2013.
31. Author interview with DOD contact, 13 November 2013, hereafter DOD interview, November 2013.
32. Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, *More Fight—Less Fuel* (Washington, DC: Defense Science Board Task Force on DOD Energy Strategy, 2008).
33. *National Security and the Threat of Climate Change* (Alexandria, VA: CNA Military Advisory Board, 2007); and *National Security and the Accelerating Risks of Climate Change* (Alexandria, VA: CNA Military Advisory Board, 2014).
34. Author interview with DOD contact, 11 December 2013, hereafter DOD interview, 11 December 2013.
35. Ibid.
36. See, Durant, *The Greening of the U.S. Military*.
37. Author interview with DOD contact, 5 July 2013, hereafter DOD interview, July 2013.
38. Author interview with DOD contact, 5 August 2013, hereafter DOD interview, August 2013.
39. DOD interview, July 2013.
40. Ibid.
41. Viviane Sergi and Anette Hallin, "Thick Performances, Not Just Thick Descriptions: The Processual Nature of Doing Qualitative Research," *Qualitative Research in Organizations and Management: An International Journal* 6, no. 2 (2011): 191–208; Karen Golden-Biddle and Hayagreeva Rao, "Breaches in the Boardroom: Organizational Identity and Conflicts of Commitment in a Nonprofit Organization," *Organization Science* 8, no. 6 (1997): 593–611; Thomas Ahrens and Massimiliano Mollona, "Organisational Control as Cultural Practice—A Shopfloor Ethnography of a Sheffield Steel Mill," *Accounting, Organizations and Society* 32 no. 4 (2007): 305–31. For more information on "thick description," see Joseph G. Ponterotto, "Brief Note on the Origins, Evolution, and Meaning of the Qualitative Research Concept 'Thick Description,'" *Qualitative Report* 11, no. 3 (2006): 538–49.

42. See, "About the Department of Defense (DoD)," DOD, <http://www.defense.gov/About-DoD>.
43. DOD interview, 9 December 2013.
44. DOD interview, November 2013.
45. Ibid.
46. DOD interview, August 2013.
47. Author interview with DOD contact, 7 January 2014, hereafter DOD interview, January 2014.
48. OE is housed within the Office of the Assistant Secretary of Defense for Energy, Installations, and Environment.
49. DOD interview, November 2013. For this discussion, the current moment is infinitely more important than the future; for example, in wartime, one would obviously choose 1 helicopter today rather than even 100 helicopters in 10 years.
50. Author interview with DOD contact, 17 April 2013.
51. Some readers may remember the procurement scandals of the 1980s, which were later disputed. Yet the discussion of malfeasance in government spending generally made better headlines than explanations of the complexities of the acquisitions process. See, for example, Jack Smith, "\$37 Screws, a \$7,622 Coffee Maker, \$640 Toilet Seats: Suppliers to Our Military Just Won't Be Oversold," *Los Angeles Times*, 30 July 1986, http://articles.latimes.com/1986-07-30/news/vw-18804_1_nut; and Sydney J. Freedberg Jr., "The Myth of the \$600 Hammer," *Government Executive*, 7 December 1998, <http://www.govexec.com/federal-news/1998/12/the-myth-of-the-600-hammer/5271/>. More recent scandals, such as those related to the General Services Administration (GSA) and the so-called Fat Leonard case, does not help ease the minds of taxpayers or dissuade journalists from exposing the wrongdoing of the few amid a much larger, functional system. See Josh Hicks and Lisa Rein, "In GSA's Las Vegas Scandal, an Indictment," *Washington Post*, 25 September 2014, <https://www.washingtonpost.com/news/federal-eye/wp/2014/09/25/federal-grand-jury-indicts-former-gsa-official-on-charges-of-fraud/>; and Craig Whitlock, "The Man Who Seduced the 7th Fleet," *Washington Post*, 27 May 2016, <http://www.washingtonpost.com/sf/investigative/wp/2016/05/27/fat-leonard/>.
52. DOD interview, November 2013.
53. DOD interview, January 2014.
54. Author interview with DOD contact, 18 April 2013.
55. Author interview with DOD contact, 5 June 2013.
56. Ibid.
57. DOD interview, August 2013.
58. Ibid.
59. Ibid.
60. DOD interview, November 2013.
61. Ibid.
62. Ibid. For further reading on military Service culture, see Carl H. Builder, *The Masks of War: American Military Styles in Strategy and Analysis* (Baltimore: Johns Hopkins University Press, 1989).
63. Ibid.
64. DOD interview, January 2014.
65. DOD interview, November 2013.
66. DOD interview, 17 April 2013.
67. Ibid.
68. Ibid.; and DOD interview, August 2013.
69. DOD interview, July 2013.
70. DOD interview, June 2013.
71. Ibid.
72. Ibid.
73. DOD interview, November 2013.
74. DOD interview, January 2014.

75. DOD interview, November 2013. Multiple sources discussed “slow-rolling.” See DOD interview, January 2014.
76. DOD interview, August 2013.
77. Rymn J. Parsons, “Climate Change: The Hottest Issue in Security Studies?,” *Risk, Hazards, and Crisis in Public Policy* 1, no. 1 (2010): 87–116, doi:10.2202/1944-4079.1023.
78. Durant, *The Greening of the U.S. Military*.
79. Rebecca Pincus, “Survey: Resource Footprints and Environmental Security at DoD Installations,” in *Sustainable Cities and Military Installations*, ed. Igor Linkov (Dordrecht, Netherlands: Springer, 2013).
80. Jon Barnett, “Security and Climate Change,” *Global Environmental Change* 13, no. 1 (2003): 7–17, doi:10.1016/j.polgeo.2007.03.003.
81. Jon Barnett, “Climate Change, Human Security and Violent Conflict,” *Political Geography* 26, no. 6 (2007): 639–55, doi:10.1016/j.polgeo.2007.03.003.
82. Ryan J. Umstattd, “Future Energy Efficiency Improvements within the U.S. Department of Defense: Incentives and Barriers,” *Energy Policy* 37, no. 8 (2009): 2870–80, doi:10.1016/j.enpol.2009.03.003; and Stacy Closson, “The Military and Energy: Moving the United States beyond Oil,” *Energy Policy*, no. 61 (2013): 306–16, doi:10.1016/j.enpol.2013.05.102.
83. See Durant, *The Greening of the U.S. Military*.
84. DOD interview, June 2013.
85. Ibid.
86. DOD interview, July 2013.
87. DOD interview, January 2014.