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UNIVERSITY OF CALIFORNIA
SANTA CRUZ

**FIGHTING GREEN: HOW CONGRESS AND THE PENTAGON MAKE
DEFENSE POLICY**

A dissertation submitted in partial satisfaction
of the requirements for the degree of

DOCTOR OF PHILOSOPHY
in

POLITICS
with an emphasis in ENVIRONMENTAL STUDIES

by

KATHERINE BLAKELEY

December 2017

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FIGHTING GREEN: HOW CONGRESS AND THE PENTAGON MAKE DEFENSE POLICY

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Abstract

Fighting Green examines how Congress and the Pentagon make defense policy, using Congressional attempts to influence the Pentagon's use of energy between FY 2004 - FY 2013 as a lens. Congress' role in shaping military and defense policy falls into a lacuna between international relations and Americanists' studies of domestic policy. Far from abdicating its power and prerogatives, Congress in fact exerts substantial influence on defense policy through the annual defense policy bill, the National Defense Authorization Act (NDAA). The assured and routinized annual passage of the NDAA make it a vehicle for substantive oversight and policymaking by the Congressional defense committees and policy entrepreneurs, but this legislative action and oversight remains sub rosa, rather than triggering broader public debates of the problems and potential solutions.

The first half of this dissertation focuses on Congress and the unique legislative vehicle of the NDAA. Narrative case studies of the legislative history of selected provisions illustrate how defense policymaking functions in practice. Quantitative analysis of the origination, content, and success or failure of legislative provisions related to DOD's energy use provides a fuller analysis of how defense policymaking

works, its characteristics, and its limitations. Successful defense policymaking tends to be incremental, uncontroversial, advance a clear defense policy or national security interest, and not require appropriated funds, suggesting that what I term “small-bore defense policymaking” as a successful avenue for defense policymaking. The balance of power lies with the House and Senate Armed Services Committees members and their staffs, but the unique role of the NDAA as a will-pass bill increases the incentive for party leaders to add non-germane policy riders, in a modified inside-leadership game.

The second half of this dissertation follows the defense energy provisions from the prior chapters into the Pentagon, evaluating their implementation and ultimate impact, with implications for Congressional policymaking, the balance of power between Congress and the executive branch, the role of partisanship, and the scope of the defense bureaucracy to shape and attenuate Congressional policy actions.

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Introduction

In the public perception, Congress is a deeply dysfunctional, ineffectual institution, boasting public approval ratings that struggle to reach double-digits. In much of the foreign policy and national security literature, Congress struggles for relevance, unwilling or unable to lead, and overshadowed by a strong executive. In recent years, Congress has flat-out avoided questions of war and peace, refused to take up the debate about a new authorization for the use of military force.

This lack of apparent legislative effort in defense and other policy realms has led many observers to bemoan the “do-nothing” Congress. The current hyperpartisan gridlock makes real legislative action on these tough issues somewhere between unlikely and impossible.¹ However, focusing exclusively on these headliner issues overlooks the bread-and-butter defense policymaking that make up a substantial fraction of congressional defense policymaking. Congressional action on DOD energy issues and other defense policy topics demonstrates that Congress is still able to legislate on important national security matters out of the spotlight. How?

This dissertation finds that the must-pass National Defense Authorization Act gives Congress, in particular the House and Senate Armed Services Committees, the opportunity for substantive defense policy and oversight, with real impacts on the

¹ Christina Marcos, “A ‘Do-Nothing Congress’?” *Floor Action* (blog), *The Hill*, July 13, 2014, 10:30 a.m. EDT, <http://thehill.com/blogs/floor-action/212041-a-do-nothing-congress>; Peter R. Orszag, “A New Do-Nothing Congress,” *Bloomberg View*, November 4, 2014, 6:03 a.m. PST, <http://www.bloombergtview.com/articles/2014-11-04/a-new-do-nothing-congress>.

Pentagon. Not all policymaking will succeed – not all congressional policymaking is sound, and even sound policy faces difficult implementation hurdles within the Pentagon, the world’s largest bureaucracy. But this type of defense policymaking can have substantial cumulative impacts on the Pentagon, shaping our defense policy and the armed forces, and as such is an important topic of study.

The rhetorical politics of war and peace, the distributive politics of defense spending, and specific high-profile and highly partisan debates that most scholars have engaged with represent only a small fraction of actual defense policymaking. The routine substantive defense policy and oversight work done principally by the congressional defense committees is a major area of what Congress actually does in defense policy, but a minor thread in the literature. Pat Towell, arguing for a meaningful, and overlooked, congressional role in defense policymaking, briefly describes the creation of DOD’s childcare system, adjustments to the Army’s recruiting standards, and changes in how the Pentagon can report cost increases in weapons systems – all examples of defense committee policymaking that seemed minor but had a real impact on the Pentagon.²

In each case, a small cluster of members and/or staff of the House and Senate Armed Services Committees led the efforts. The annual National Defense Authorization Act allows substantial scope for congressional defense policymaking. The comet-like

² Pat Towell, “Congress and Defense,” in *Congress and the Politics of National Security*, ed. David P. Auerswald and Colton C. Campbell (Cambridge: Cambridge University Press, 2011), 71-99.

regularity and broad remit of the bill, compared to the chancy process of advancing a bill from scratch, make it a particularly attractive vehicle for oversight provisions and the particular interests of members of Congress. The gestation of these bills in the House and Senate Armed Services Committees provides the committees substantial and reliable leverage over the final products. For each of these examples, committee hearings helped to establish the scope of the issue and offer jumping-off points for congressional action. However, these problems were liminal only for a small group of interested members and staff and defense policy-watchers. There was no broad national realization of a pressing problem requiring urgent action. Rather, in each case, the problem was something identified by a handful of members of professional staff of the committees. And yet these changes potentially yield large-bore impacts on the Pentagon. In each case, the vehicle for this Congressional defense policy-making was the annual National Defense Authorization Act and its associated hearings.

These examples of Congress making defense policy suggest that legislators use the NDAA as a viable avenue for defense oversight and policymaking, and have substantial impacts on the Pentagon. However, despite some attention to defense appropriations act by scholars focused on the parochial interests of members, the NDAA and appropriations acts have been largely understudied as a forum for defense *policy making*.

This dissertation examines defense policymaking on energy issues in an attempt to identify and describe features that characterizes routine defense policymaking and oversight. Today, the U.S. military is the largest single purchaser and consumer of petroleum in the United States. The Air Force alone purchased over \$7.8 billion in fuel in FY 2010, just under \$21 million per day. The Pentagon as a whole spent more than \$17 billion on petroleum in FY2011. Over the last decade, the military, prompted by supply chain issues in Iraq and Afghanistan and the escalating and volatile cost of energy, began to prioritize energy efficiency and alternative sources of energy both at domestic bases and in the battlefield. Solar panels power generators on front lines, and tactical electronics run on energy-efficient auxiliary generators, instead of being powered by the fuel-guzzling engines of military vehicles. These changes illustrate the extent to which the Pentagon began to take the tactical, financial, and strategic vulnerabilities of their fuel use seriously, and develop and implement alternatives.

But despite the national security implications of the Pentagon's energy consumption, the force behind these changes didn't come from the Pentagon – it came from Congress. In recent years, Congress has quietly enacted a variety of provisions into law related to the Department of Defense's (DOD's) energy use. In 2006, Congress required that DOD get 25% of its electricity from renewable sources by 2025. In 2008, Congress mandated that DOD consider fuel efficiency in the acquisition of weapons systems and create a new office to coordinate energy initiatives across

DOD. Other sections have required that DOD consider energy efficiency in acquisitions, contracting, and logistics. Found primarily in the annual National Defense Authorization Act and accompanying committee reports, these provisions to increase the Pentagon's energy efficiency, bolster DOD's energy security and reduce overall energy consumption have been both effective and, with the notable exception of DOD's biofuel initiatives, uncontroversial. With muted partisan rancor, the Congress in general and the congressional defense committees in particular have actually been engaged in substantive oversight regarding the Pentagon's use of and reliance on energy, with real-world impacts on the Pentagon's energy use. Congressional support for a more energy-conscious DOD is counterintuitive in the face of increasingly bitter partisan divides over other national energy issues, from "drill, baby drill" to the rancorous finger pointing about federal support for green energy in the wake of the 2011 Solyndra bankruptcy.

How did this substantive congressional defense policy-making come about?

Congressionally-mandated DOD energy initiatives offer a strong case study of defense policymaking: without raising congressional hackles, multiple bipartisan provisions requiring significant organization and process-oriented changes to DOD use of energy, originating in both houses, have been enacted into statute. These provisions have yielded dividends in the form of greater attention to energy use and energy efficiency within DOD. The Air Force has bragged about saving \$1.2 billion

in fuel costs and \$300 million in utility costs in 2012.³ As a relatively new and topically coherent policy area, DOD energy policy provides a vehicle for evaluating this type of low-profile, relatively bipartisan congressional defense policymaking and oversight. Close narrative histories of selected provisions illustrate the contours of this type of policymaking in practice. Quantitative analysis of the origination, content, and success or failure of legislative provisions related to DOD's energy use provides a fuller illustration of how congressional defense policy works, what characterizes it, and what topics are viably tackled.

The first section of this dissertation focuses on Congress. Chapter 2 outlines the birth and evolution of the annual National Defense Authorization Act, and describes its role in defense policymaking. Chapter 3 delves into four specific examples of defense energy policymaking, drawing on interviews with key individuals involved to illuminate the motivations and efforts of congressional actors and how defense policy actually gets made. Chapter 4 is a quantitative examination of every proposed provision related to defense energy in the FY2004 – FY 2013 NDAAAs. It allows for deeper examination of how defense policy gets made, and what types of policies and approaches succeed or fail.

However, defense policymaking doesn't stop with Congress. The enactment of a provision in the NDAA or creation of a policy goal or requirement is no guarantee of

³ Air Force News Service, "Air Force Top Energy Expert Receives Prestigious Award," October 28, 2013, <http://www.af.mil/News/Article-Display/Article/467356/air-force-top-energy-expert-receives-prestigious-award/>.

its success. After all, outputs are not synonymous with outcomes. Additionally, defense policymaking via the NDAA is highly iterative, with Congress responding to the Pentagon's action or inaction. So how can Congress impress its will onto the Pentagon, the largest, most complex bureaucracy in the world?

This second section of the dissertation follows the defense energy provisions from the prior chapters into the Pentagon, evaluating their implementation and ultimate impact. Chapter 5 provides a historical view of the Pentagon's engagement with energy issues from the late 1970s to the early 2000s. Chapter 6 provides an overview of the shifts in the Pentagon's energy use, energy policy, and bureaucracy, and evaluates the extent to which those changes were the result of congressional action. It also describes the service's energy efforts and responses to legislative requirements. Finally, Chapter 7 traces the specific implementation and impacts of Congress' actions on the Pentagon's installation energy use, utilization of renewable energy, the operational energy office, and ability to consider the operational energy efficiency of weapons systems and platforms.

Literature Review

Examining military policy gives us the *how* that connects domestic decisions about security strategy and funding levels to the choices made in the realms of national security strategy and foreign policy.⁴ As Secretary of Defense Donald Rumsfeld testily argued during the Iraq War, “you go to war with the army you have, not the

⁴ Harvey M. Sapolsky, Eugene Gholz, and Caitlin Talmadge, *US Defense Politics: The Origins of Security Policy* (New York: Routledge, 2008).

army you might want or wish to have at a later time.”⁵ While this is *prima facie* correct, what Rumsfeld's re-direction overlooks is that the army you do have is a product of the army you wanted or wished to have as well as the policy and political processes that created and maintain the current US military. Military policy is both a guide to “the army [we] wanted ... to have” and the messy politics and divergent interests and ideas that play a role in forming it. The first half of this dissertation examines how military policy itself is made, focusing on the legislative vehicle of the National Defense Authorization Act, and how it is implemented by the Pentagon. Despite some additional focus on the role of the state and political leadership in the study of international relations, the domestic and political elements of military policy have remained largely unstudied.⁶ It is “too domestic for students of international relations and too foreign for students of American politics.”⁷ In 1992, Lindsay and Ripley lamented that political scientists paid scant attention to how Congress acts on foreign and defense policy, echoed in 1996 by Mayer and Khademian’s call for both political scientists and defense analysts to bring politics back in to the study of defense policy, and in 2001 by Johnson’s survey of Congress’ waning and waxing role and growing set of tools by which to steer foreign policy.⁸ Serious consideration

⁵ Donald Rumsfeld on *Wolf Blitzer Reports*, CNN, December 8, 2004.

⁶ Stephen M. Walt, “The Renaissance of Security Studies,” *International Studies Quarterly* 35, no. 2 (1991): 211-39.

⁷ Zegart, *Flawed by Design*, 3.

⁸ James M. Lindsay and Randall B. Ripley, “Foreign and Defense Policy in Congress: A Research Agenda for the 1990s,” *Legislative Studies Quarterly* 27, no. 3 (August 1992): 418; Kenneth R. Mayer and Anne M. Khademian, “Bringing Politics Back in: Defense Policy and the Theoretical Study of Institutions and Processes,” *Public Administration Review* 56, no. 2 (1996): 180-90; Robert David Johnson, “Congress and the Cold War,” *Journal of Cold War Studies* 3, no. 2 (Spring 2001): 76-100, and “Congress and U.S. Foreign Policy Before 9/11,” in *Congress and the Politics of National*

of the relationship of the military and civilian leadership within the field of civil-military relations has been predominantly neglected by civilian academics since Huntington's 1957 magnum opus and 1995 follow-up, with the exception of more recent works by Cohen and Feaver.⁹ This bi-directional blind spot leaves military policy the subject of relatively little research, though exceptions certainly exist.¹⁰

Including military policy as an important component of the domestic policy landscape does not require a shift in methodology on the part of Americanists, just an extension of their remit. In military policy, as in other policy realms, the major questions of the pathways of the policy process, the influence of interests, ideas and institutions, and questions of implementation and effectiveness remain the same. However, defining what military policy is also a non-trivial problem. Is it the politics within the armed services, or the politics of funding allocation and defense appropriations? Wirls

Security, eds. David P. Auerswald and Colton C. Campbell (Cambridge: Cambridge University Press, 2011), 18-44. Several works dealing with shifts in Congress' role in defense and foreign policy were published shortly before Lindsay and Ripley's article, principally Barry Blechman's *The Politics of National Security: Congress and U.S. Defense Policy* (Oxford: Oxford University Press, 1992), and Lindsay and Ripley's own *Congress Resurgent: Foreign and Defense Policy on Capitol Hill* (Ann Arbor: University of Michigan Press, 1993).

⁹ Huntington, *The Soldier and the State*; Samuel P. Huntington, "I. Reforming Civil-Military Relations," *Journal of Democracy* 6, no. 4 (1995): 9-17; Eliot A. Cohen, *Supreme Command: Soldiers, Statesmen, and Leadership in Wartime* (New York: Simon and Schuster, 2002); Peter D. Feaver, "Civil-Military Relations," *Annual Review of Political Science* 2, no. 1 (1999): 211-41, and *Armed Servants: Agency, Oversight, and Civil-Military Relations* (Cambridge, MA: Harvard University Press, 2009). For an exemplary, but dated review and critique of the field of civil-military relations writ large, see Peter D. Feaver, "The Civil-Military Problematique: Huntington, Janowitz, and the Question of Civilian Control," *Armed Forces and Society* 23, no. 2 (1996): 149-78.

¹⁰ These excellent exceptions include Wirls, *Irrational Security*; Douglas T. Stuart, *Creating the National Security State: A History of the Law That Transformed America* (Princeton, NJ: Princeton University Press, 2008); Zegart, *Flawed by Design*; Aaron L. Friedberg, *In the Shadow of the Garrison State: America's Anti-Statism and its Cold War Grand Strategy* (Princeton, NJ: Princeton University Press, 2000).

defines it as three levels, comprising “choices of strategy, resource commitment, and material components for the potential or actual employment of military force.”¹¹

Military and defense policy is distinguished from traditional domestic policy politics by a large, professionalized and influential defense bureaucracy, the reversal of traditional policy roles, with the executive “legislating” on strategic issues, greater insulation from Congress and traditional interest groups, a different calculus of the location and distribution of costs and benefits, greater international constraints and opportunities, more expansive federal and executive power, and much stronger ideologies associated with policy options, but these differences do not require a fundamentally different analytic approach.¹²

However, relatively few works cover military policy as a whole, or theorize about the broad trends in military policy drawing on the tools of American political development. Among them, Friedberg (2000), Zelizer (2009) and Wirls (1992, 2010) examine the political aspects and partisan fights within national security policymaking over the past decades, focusing on broader trends like the role of ideology in framing national security debates and the institutional logics of military

¹¹ Wirls, “Military Policy as an Arena of Public Policy,” 2; Durant and Diehl, “Agendas, Alternatives, and Public Policy.”

¹² Samuel P. Huntington, *The Soldier and the State: The Theory and Practice of Civil Military Relations* (Cambridge, MA: Harvard University Press, 1957); Samuel P. Huntington, *The Common Defense: Strategic Programs in National Politics* (New York: Columbia University Press, 1961); Amy B. Zegart, *Flawed by Design: The Evolution of the CIA, JCS and NSC* (Palo Alto, CA: Stanford University Press, 1999); Daniel Wirls, “Military Policy as an Arena of Public Policy” (Paper presented at the Annual Meeting of the American Political Science Association, Washington D.C., September 1-3, 2010, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1642621); Robert F. Durant and Paul F. Diehl, “Agendas, Alternatives, and Public Policy: Lessons from U.S. Foreign Policy,” *Journal of Public Policy* 9, no. 2 (1989): 179-205.

build-ups and spending. Zegart (1999), Stuart (2008), and Hogan (2000) probe the origins of the modern national security apparatus, focusing on the legal framework created by the 1947 National Security Act and the institutional fights in the executive and legislative branches.¹³

Like in other areas of politics, Congress is an important locus for defense policymaking. However, the academic treatment of defense issues and military policy in Congress tends to into four areas of focus: the balance of power between the legislature and executive on national security issues and war-making, the nuts and bolts of defense acquisitions and retail politics, detailed, historically informed narratives of specific policy battles, or primers on elements of national security or congressional process.

One strand of academic work focuses on the balance of power and influence between the Congress and the executive in matters of war and peace. Many scholars have argued that Congress has “abdicated” its responsibilities and prerogatives on war-making and important national security matters, pointing to the unwillingness or inability of Congress to seriously challenge growing executive power and prerogatives.¹⁴ Others have concluded that an oppositional Congress is able to exert at

¹³ Friedberg, *In the Shadow of the Garrison State*; Julian E. Zelizer, *Arsenal of Democracy: The Politics of National Security – From World War II to the War on Terrorism* (New York: Basic Books, 2010); Daniel Wirls, *Buildup: The Politics of Defense in the Reagan Era* (Ithaca, NY: Cornell University Press, 1992), and *Irrational Security*.

¹⁴ Louis Fisher, *Congressional Abdication on War and Spending* (College Station: Texas A&M Press, 2000), and *Presidential War Power*, 3rd ed. (Lawrence: University of Kansas Press, 2013); Barbara

least some influence on the use, scale, and duration of force employed abroad, or to curtail the scope of potential executive action via hearings and other public actions.¹⁵

Other scholars have attempted to theorize regarding eras of greater congressional influence or retreat in the face of executive actions, examining the role of public debate over the conflict, and re-looking at Congress' institutional tools to direct foreign policy.¹⁶ Taking a more matter of fact approach, Lindsay and Blechman have argued that "the Hill matters," and that Congress will and should continue to play a role in defense policy.¹⁷

Works in the second group have examined the histories of specific weapons systems or the patterns and domestic political battles of defense retail politics, including basing, acquisitions and spending. Sapolsky's close analysis of the origins and political and bureaucratic struggles over the Navy's Polaris missile system is one of the first, and finest, of this genre.¹⁸ Kurth provides an analysis of the pressures for

Hinckley, *Less Than Meets the Eye: Foreign Policy Making and the Myth of the Assertive Congress* (Chicago: University of Chicago Press, 1994).

¹⁵ William G. Howell and Jon C. Pevehouse, *While Dangers Gather: Congressional Checks on Presidential War Powers* (Princeton, NJ: Princeton University Press, 2007); Douglas L. Kriner, *After the Rubicon: Congress, Presidents, and the Politics of Waging War* (Chicago: University of Chicago Press, 2010).

¹⁶ James M. Lindsay, "Deference and Defiance: The Shifting Rhythms of Executive-Legislative Relations in Foreign Policy," *Presidential Studies Quarterly* 33 (2003): 530-46; William G. Howell, Saul P. Jackman, and Jon C. Rogowski, *The Wartime President: Executive Influence and the Nationalizing Politics of Threat* (Chicago: University of Chicago Press, 2013); Thomas Mann, *A Question of Balance: The President, the Congress, and Foreign Policy* (Washington, DC: Brookings Institution, 1990).

¹⁷ James M. Lindsay, "Congress and Foreign Policy: Why the Hill Matters," *Political Science Quarterly* 107, no. 4 (1992): 607-28; Barry M. Blechman, "The Congressional Role in U.S. Military Policy," *Political Science Quarterly* 106, no. 1 (Spring 1991): 17-32.

¹⁸ For further examples, see David H. Dunn, *The Politics of Threat: Minuteman Vulnerability in American National Security Policy* (London: Macmillan Press, 1997), and James Perry Stevenson, *The Pentagon Paradox: The Development of the F-18 Hornet* (Annapolis, MD: Naval Institute Press, 1993).

weapons procurement that is distinctly domestic in character. Rejecting strategic explanations for the procurement of weapons systems in his cases, he concludes that a large part of the rationale for their purchase comes from domestic economic pressure from arms manufacturers who would suffer if arms procurement dropped off sharply. Arnold's 1979 book and straightforward economic model of the impact of the interests of members of Congress on bureaucratic distribution of resources, including military installations and military civilian employment, and Adam's foundational 1981 book examining the political economy of the iron triangle between defense contractors, the Pentagon and the Congress kicked off a number of follow-on analyses of the nature, scope, and significance of parochial interests in defense contracting and defense spending.¹⁹

There has also been some scholarship on specific pitched episodes in national security policy and politics. Waller and Lindsey examine the heated congressional debates about U.S. nuclear weapons strategy and systems. Locher's tome is an exhaustive

¹⁹ R. Douglas Arnold, *Congress and the Bureaucracy: A Theory of Influence* (New Haven, CT: Yale University Press, 1979); Gordon Adams, *The Politics of Defense Contracting: The Iron Triangle* (New Brunswick, NJ: Transaction Books, 1982). For a brief selection of studies of defense parochialism, see Kenneth R. Mayer, *The Political Economy of Defense Contracting* (New Haven, CT: Yale University Press, 1991), and "Closing Military Bases (Finally): Solving Collective Dilemmas through Delegation," *Legislative Studies Quarterly* 20, no. 3 (1995): 393-413; Barry S. Rundquist and Thomas M. Carsey, *Congress and Defense Spending: The Distributive Politics of Military Procurement* (Norman: University of Oklahoma Press, 2002); and Jamie M. Morin, "Squaring the Pentagon: The Politics of Post-Cold War Defense Retrenchment" (PhD diss., Yale University, 2003). More recently, see Rebecca U. Thorpe, *The American Warfare State: The Domestic Politics of Military Spending* (Chicago, University of Chicago Press, 2014). In contrast to Arnold's model of Congressional appropriations as a dyadic relationship between the Congress and the bureaucracy, mediated principally by the congressional committees, coalitions, and rational bureaucratic self-interest, Kiewiet and McCubbins examine appropriations as a game-theoretic recurring struggle between the President and the Congress. See D. Roderick Kiewiet and Mathew D. McCubbins, "Appropriations Decisions as a Bilateral Bargaining Game between President and Congress," *Legislative Studies Quarterly* 10, no. 2 (May 1985): 181-201.

history the congressional and Pentagon bureaucratic battles over the enactment and implementation of the Goldwater-Nichols Act of 1986.²⁰

Finally, policy primers provide a useful orientation to the nuts and bolts of the players and the mechanisms. Sapolsky, Gholz and Talmadge illustrate the sheer number of factors that contribute to military policy, touching on inter-service rivalry, defense budget processes and the politics of defense appropriations, and the relationship of the military to contractors and arms manufacturers, among other central topics. While Adams and Williams take the position that money is a useful shortcut to describing policy priorities, they restrict themselves to describing the complex processes of the budgetary process, with only limited excursions into what these budgeting processes and mechanisms signify in terms of policy and national priorities. Similarly, Sarkesian, Williams and Cimbala describe the tangled network of decision-makers, agencies, the executive and Congress, providing a useful mental map about the interrelationships of national security agencies and authority.²¹

Congress plays an important role in defense policymaking, principally via provisions annual National Defense Authorization Act. It has been the source of substantive

²⁰ Douglas C. Waller, *Congress and the Nuclear Freeze: An Inside Look at the Politics of a Mass Movement* (Amherst: University of Massachusetts Press, 1987); James M. Lindsay, *Congress and Nuclear Weapons* (Baltimore, MD: Johns Hopkins University Press, 1991); Lochner, *Victory on the Potomac*.

²¹ Sam C. Sarkesian, John Allen Williams, and Stephen J. Cimbala, *US National Security: Policymakers, Processes, and Politics*, 4th ed. (Boulder, CO: Lynne Rienner Publishers, 2008); Sapolsky, Gholz, and Talmadge, *US Defense Politics*; Gordon Adams and Cindy Williams, *Buying National Security: How America Plans and Pays for its Global Role and Safety at Home* (New York: Routledge, 2010).

changes in defense policy, including major changes to the Pentagon's organizational structure, decisions about personnel policy and pay, and shaping defense acquisitions, as well as conducting a robust annual schedule of oversight hearings tied to the annual NDAA.

For example, Towell offers a rare examination of Congress' efforts to actually tackle substantive defense policymaking, describing the origins of the Military Child Care Act of 1989, enacted as Title XV of the FY1990. This act arose out of the concerns of five Congresswomen on the House Armed Services Committee (HASC) about the need for childcare by married servicemembers with children and working spouses. Hearings by the HASC Subcommittee on Personnel and Readiness about substandard DOD childcare emphasized their concerns and the need for policy action. Prior to 1985, childcare provided on DOD bases was largely provided through private organizations, such as Wives' Clubs, rather than formally through the Department of Defense. Where DOD did provide care, standards were inconsistent or lacking, with developmentally-appropriate care uneven, poor training and high turnover of care providers, limited access to care, and long waiting lists. The waiting lists in particular were a focus of congressional concern, perhaps because they were easily quantifiable and relatable.²² A contemporary New York Times article highlighted the 81,000 children on waiting lists for care.²³ After languishing as a stand-alone bill, the

²² Gail L. Zellman and Anne Johansen, *The Armed Services' Response to the Military Child Care Act* (Arlington, VA: The RAND Corporation, 1998).

²³ Julie Johnson, "Parents in the Armed Forces Face a Shortage of Child Care," *New York Times*, June 25, 1989.

Military Child Care Act of 1989 was smoothly incorporated into the FY1990 NDAA. Only seven sections long and without authorizing any funding, it significantly reformed DOD's childcare system despite initial DOD opposition, establishing the current subsidized care model, quickly improving childcare quality and making DOD the largest employer provider of childcare in the United States. As Zellman and Johansen note, the services mostly implemented the mandates of this bill swiftly, despite the lack of accompanying appropriations, and overall has been an "extremely effective" tool for improving childcare across DOD.

Congress has also acted to reign in the costs of weapons and systems. The legislative history of the Nunn-McCurdy Act, which created the automatic alert process at cost growth thresholds, as described by Schwartz (2010), is a good illustration of the process of effective defense policymaking. Representative McCurdy (D-OK), then Chairman of a special committee constituted within the House Armed Services Committee to examine weapons system cost growth, following a series of hearings, worked closely with Senator Nunn (D-GA) to enact weapons system cost growth reporting requirements into the annual NDAA. The statute now known as the Nunn-McCurdy Act was originally offered as a floor amendment by Senator Nunn during consideration of the FY1982 NDAA.²⁴ It required DOD to alert Congress if costs had grown more than 15%, with an explanation of the cause and actions taken to control further cost growth. If costs had grown more than 25%, the Secretary of Defense had

²⁴ Department of Defense Authorization Act, 1982, Pub. Law No. 97-86, § 917, 95 Stat. 1129 (1981), codified at 10 U.S.C. § 2433.

to assure Congress that the program was essential to national security, the cost growth was under control, and that there were no viable, cost-effective alternatives, or else Congress would effectively terminate the program by not appropriating any further funds for that program. Senator Nunn's amendment was adopted 94-0. Although the powerful conservative Senator Tower (R-TX), then Chairman of the Senate Armed Services Committee (SASC), opposed the amendment, he acknowledged that "this amendment is going to be adopted, because it is like motherhood. You cannot vote against motherhood or apple pie or all these other fine things." Senator Tower's reluctant acquiescence is a pithy recognition of the importance of broad palatability and common-sense appeal of successful defense policymaking. The legislative history following the initial amendment also illustrated Congress' preferences for incremental refinements. The FY1983, FY1985, FY1990 and FY1991 (combined), FY1993, FY2006, FY2007, FY2009 and FY2012 NDAAs, as well as the Federal Acquisitions Streamlining Act of 1994 and the Weapons Systems Reform Act of 2009,²⁵ have all tinkered with the reporting requirements, thresholds, and allowable comparisons. Overall, the continued legislative action demonstrates the value of the Nunn-McCurdy Act as Congress attempts to grapple with the enduring problem of weapons system cost growth. Although Nunn-McCurdy breaches have seldom

²⁵ Department of Defense Authorization Act, 1983, Pub. L. No. 97-252, § 1107, 96 Stat. 739 (1982); Department of Defense Authorization Act, 1985, Pub. L. No. 98-525, § 1242, 98 Stat. 2606 (1984); National Defense Authorization Act for Fiscal Years 1990 and 1991, Pub. L. No. 101-189, § 811, 103 Stat. 1490 (1989); National Defense Authorization Act for Fiscal Year 1993, Pub. L. No. 102-484, § 817, 106 Stat. 2454 (1992); National Defense Authorization Act for Fiscal Year 2006, Pub. L. No. 109-163, § 802, 119 Stat. 3367 (2006); John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 806, 120 Stat. 2315 (2006); Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417, 122 Stat. 4356 (2008); National Defense Authorization Act for Fiscal Year 2012, Pub. L. No. 112-81, § 812, 125 Stat. 1491 (2011); Pub. L. No. 103-355, § 3002, 108 Stat. 3328 (1994); Pub. L. No. 111-23, § 203, 123 Stat. 1722 (2009).

resulted in program cancellations, and remain a lagging rather than a leading indicator of cost growth problems, Congress views the Nunn-McCurdy Act as a valuable tool for increased congressional visibility into the problems of weapons systems acquisitions.

More recently, Congress enacted changes to servicemembers' retirement benefits, historically a very fraught effort that attracts intense lobbying.²⁶ Previously, members of the armed forces who served 20 years or more received a pension of 50% of their final three year's pay, with payments beginning immediately after retirement. However, due to this 20-year requirement, more than 80% of enlisted servicemembers and almost 50% of officers received no retirement benefits at all. This framing allowed Congress to adjust retirement benefits, reducing the pension level to 40%, but adding a new 401(k)-like plan, with a baseline government contribution of 2% and then matching up to 5% of servicemember's contributions. Although this was a reduction of the guaranteed benefit, current servicemembers were grandfathered in. Switching to this blended retirement benefit would mean that every servicemember would receive some retirement benefits, and the overall amount of retirement benefits would be greater for traditional retirees who retired after reaching the 20-year mark, when the pension kicks in.²⁷ By avoiding any negative impacts on

²⁶ For both scholarly and practical policy insight into this effort, see Alexis Lasselle Ross, "Legislating 'Military Entitlements': A Challenge to the Congressional Abdication Thesis" (PhD diss., George Mason University, 2015).

²⁷ Military Compensation and Retirement Modernization Commission, *Report of the Military Compensation and Retirement Modernization Commission, Final Report* (Arlington, VA: January 29, 2015), https://www.ngaus.org/sites/default/files/MCRMC%202015_0.pdf.

current servicemembers, the switch to a hybrid retirement benefit was accomplished fairly swiftly in the FY2016 NDAA, with limited controversy or pushback from interest groups or the Pentagon.²⁸

Similarly, Rep. Thornberry (R-TX), the Chairman of the House Armed Services Committee, and Sen. McCain (R-AZ), the Chairman of the Senate Armed Services Committee, have driven somewhat-competing changes to the defense acquisitions system via the NDAA. In three years' worth of incremental changes to the acquisition system, Rep. Thornberry has focused on speeding the time from need to actual procurement of an item, driving down costs by allowing more private-sector-like purchasing, increasing innovation, and streamlining the process.²⁹ Sen. McCain's changes have shifted greater authority and responsibility for acquisitions to the heads of the uniformed services, away from the Office of the Secretary of Defense, and re-organized the central acquisition bureaucracy.³⁰ In the past three years, Sen. McCain and Rep. Thornberry have fundamentally overhauled the defense

²⁸ Leo Shane III, "Obama Signs Defense Bill, Finalizing Military Retirement Overhaul," *Military Times*, November 25, 2015, <http://www.militarytimes.com/story/military/pentagon/2015/11/25/obama-ndaa-defense-bill-military-retirement-overhaul/76302160/>.

²⁹ Megan Eckstein, "Thornberry Announces Acquisition Reform Legislation," *USNI News*, March 23, 2015, <https://news.usni.org/2015/03/23/thornberry-announces-acquisition-reform-legislation>; Joe Gould, "Thornberry: Acquisition Reform Bill Aims at Innovation," *Defense News*, March 16, 2016, <https://www.defensenews.com/home/2016/03/16/thornberry-acquisition-reform-bill-aims-at-innovation/>; Otto Kreisher, "HASC Chair Thornberry Introduces Latest Defense Acquisition Reform Plan," May 18, 2017, <https://news.usni.org/2017/05/18/thornberry-introduces-defense-acquisition-reform-plan>.

³⁰ Austin Wright and Leigh Munsil, "McCain plan upends Pentagon rules," *Politico*, May 20, 2015, <https://www.politico.com/story/2015/05/john-mccain-plan-upends-pentagon-contracting-rules-118116>; Colin Clark and Sydney J. Freedberg Jr., "Pentagon's Top Acquisition Job Gone, Reshaped in Defense Policy Bill," *Breaking Defense*, November 29, 2016, <https://breakingdefense.com/2016/11/pentagons-top-acquisition-job-gone-reshaped-in-defense-policy-bill/>.

acquisitions system, with tremendous potential benefits (or consequences) for the military. And yet, there has been little public debate or even notice on Capitol Hill outside the defense committees and the defense press.

Beyond the creation of military policy, even fewer academics set out to evaluate military policy's real-world outcomes and effects. The question of nature and degree of congressional control over the bureaucracy has a robust scholarly tradition, but this field has largely left the Pentagon out of their analyses. Lacking any agreed-upon outcomes or measurements of success, military policy is particularly difficult to evaluate. A retired Army officer, Skoggs offers a scathing critique of the Army's failure to successfully lobby Congress, as compared to the relative success of the other services, but is a polemic oriented towards Army culture and the senior uniformed Army leadership, rather an interrogation of the congressional dimensions.³¹

Building off of the earlier insights of Mayhew and Fenno about the electoral, and thus constituency-driven, motivations of members of Congress, many scholars have explored the relationship between the Congress and the federal bureaucracy as a principal-agent problem.³² Arguing against the then-common perception that the

³¹ Stephen K. Scroggs, *Army Relations with Congress: Thick Armor, Dull Sword, Slow Horse* (Westport, CT: Praeger, 2000). Seventeen years later, the national security policymaker consensus is that the Army is still far behind the Navy and Air Force in effective lobbying of Congress.

³² David R. Mayhew, *Congress: The Electoral Connection* (New Haven, CT: Yale University Press, 1974); Richard F. Fenno Jr., *Home Style: House Members in Their Districts* (Boston: Little, Brown, 1978).

bureaucracy had run amok, scholars have convincingly demonstrated that Congress exerts substantial overt and covert power, or what Calvert, McCubbins and Weingast termed “active vs. latent control,” over the federal bureaucracy.³³ As Fiorina describes, Congress “has the formal power of life and death over the bureaucracy,” with the ability to abolish agencies, amend their jurisdictions, re-direct or reduce its annual appropriations, and investigate or otherwise sanction it.³⁴ Even when Congress is not exercising obvious oversight authorities, it retains substantial influence and prospective control over bureaucratic agencies.³⁵ Congressional influence need not be formal to be effective. The combination of the appointment of agency leaders acceptable to the powerful committee and subcommittee members in Congress, the imposition of agency administrative procedures designed to ensure that the agency take constituent and interest group equities into account in exercise of their allowed (and limited) bureaucratic discretion, backed by the alert mechanism of “fire alarms” and the threat of sanctions if agencies overstep their policy boundaries, create an efficient system for congressional oversight with little requirement for explicit (and time-consuming) oversight activity by Congress.³⁶ One major strand of scholarship

³³ Randall Calvert, Mathew D. McCubbins, and Barry R. Weingast, “A Theory of Political Control and Agency Discretion,” *American Journal of Political Science* 33, no. 3 (1989): 588-611. See Seymour Scher, “Conditions for Legislative Control,” *Journal of Politics* 25, no. 3 (1963): 526-51, for an early look at the propensity of Congressional committees to conduct classical oversight.

³⁴ Morris P. Fiorina, “Congressional Control of the Bureaucracy: A Mismatch of Incentives and Capabilities,” in *Congress Reconsidered*, 2nd ed., ed. Lawrence C. Dodd and Bruce I. Oppenheimer (Washington, DC: Congressional Quarterly Press, 1981), 332-48.

³⁵ Barry R. Weingast and Mark J. Moran, “Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission,” *Journal of Political Economy* 91, no. 5 (October 1983): 765-800.

³⁶ Seminal texts include Barry R. Weingast, “The Congressional-Bureaucratic System: A Principal Agent Perspective (with Applications to the SEC),” *Public Choice* 44, no. 1 (1984): 147-91; Mathew D. McCubbins and Thomas Schwartz, “Congressional Oversight Overlooked: Police Patrols Versus

on this question has focused on formal models of and empirical analyses for how and when legislative actors creating an agency have attempted to pre-emptively constrain the bureaucracy, with a particular focus on Congress mandating particular administrative structure or administrative procedures.³⁷ More recent scholarship expands the aperture of inquiry from a dyadic relationship between the Congress and an agency to incorporate institutional characteristics, additional players or legislative contexts, including the President and the committees as distinct from the legislature as a whole, state legislators, the broader political context, and impact of divided vs. unified legislatures, the relationship between legislative capacity and delegation, the role of transaction costs, and the impacts of policy disagreements between the actors.³⁸ Clinton, Lewis and Salin's impressive survey of thousands of federal

Fire Alarms," *American Journal of Political Science* 28, no. 1 (1984): 165-79; Calvert, McCubbins, and Weingast, "A Theory of Political Control."

³⁷ See, for example, Mathew D. McCubbins, Roger G. Noll, and Barry R. Weingast, "Administrative Procedures as Instruments of Political Control," *Journal of Law, Economics and Organization* 3 (1987): 243-77; Kathleen Bawn, "Political Control Versus Expertise: Congressional Choices about Administrative Procedures," *American Political Science Review* 89, no. 1 (1995): 62-73; Kathleen Bawn, "Choosing Strategies to Control the Bureaucracy: Statutory Constraints, Oversight, and the Committee System," *Journal of Law, Economics, and Organization* 13, no. 1 (April 1997): 101-26; Steven J. Balla, "Administrative Procedures and Political Control of the Bureaucracy," *American Political Science Review* 92, no. 3 (1998): 663-73.

³⁸ For selected examples, see John Ferejohn and Charles Shipan, "Congressional Influence on Bureaucracy," *Journal of Law, Economics and Organization* 6 (1990): 1-20; Arthur Lupia and Mathew D. McCubbins, "Learning from Oversight: Fire Alarms and Police Patrols Reconstructed," *Journal of Law, Economics, and Organization* 10, no. 1 (1994): 96-125; Craig Volden, "Delegating Power to Bureaucracies: Evidence from the States," *Journal of Law, Economics, and Organization* 18, no. 1 (April 2002): 187-220; John D. Huber and Charles R. Shipan, "The Costs of Control: Legislators, Agencies, and Transaction Costs," *Legislative Studies Quarterly* (2000): 25-52; John D. Huber, Charles R. Shipan, and Madelaine Pfahler, "Legislatures and Statutory Control of Bureaucracy," *American Journal of Political Science* 45, no. 2 (2001): 330-45; Charles R. Shipan, "Regulatory Regimes, Agency Actions, and the Conditional Nature of Congressional Influence," *American Political Science Review* 98, no. 3 (2004): 467-80; John D. Huber and Nolan McCarty, "Bureaucratic Capacity, Delegation, and Political Reform," *American Political Science Review* 98, no. 3 (2004): 481-94; Jason A. McDonald, "Agency Design and Postlegislative Influence over the Bureaucracy," *Political Research Quarterly* 60

bureaucrats allows some headway in closing the circle, tracing agency sentiments whether Congress or the President rules over individual agencies, and in what political and institutional contexts.³⁹

Much of the public policy research on bureaucracy, implementation, and the interrelationship between Congress and the bureaucracy tends to focus on either formal modeling or empirical tests on domestic agencies, particularly regulatory agencies. In part, this may stem from the domestic inclination of political science as a whole, and the study of public policy in particular. Regulatory agencies like the Security and Exchange Commission or the Federal Electoral Commission provide a more straightforward empirical arena – Congress can allow regulatory agencies varying latitude in shaping standards and mandates, the costs and benefits regulations are quantifiable (and have been mandated to be so), the promulgation and (non)enforcement of regulations is more traceable than in other policy arenas, and the interaction between the regulators and the regulated has its own rich scholarship of regulatory capture. The relatively higher number of both regulations and regulatory agencies also allows for more robust comparative case studies or quantitative work – particularly for the strand of the field engaged in formal modeling of the relationship between Congress and the bureaucracy rather than by close case studies or narrative histories. However, it is not clear that the theoretical underpinning that most of the

(2007): 683-95; Sean Gailmard, “Expertise, Subversion, and Bureaucratic Discretion,” *Journal of Law, Economics, and Organization* 18, no. 2 (October 2002): 536-55.

³⁹ Joshua D. Clinton, David E. Lewis, and Jennifer L. Selin, “Influencing the Bureaucracy: The Irony of Congressional Oversight,” *American Journal of Political Science* 58, no. 2 (2014): 387-401.

bureaucratic politics literature relies on – that of the congressional electoral interest in benefiting their constituencies, applies as well to the foreign affairs and military bureaucracies. While some benefits and their allocations, such as Arnold’s analysis of the geographic distribution of military installations and employment, and subsequent analyses of the geographic distribution of defense spending by Mayer, Rundquist and Carsey, Morin, and Thorpe, are highly quantifiable, these spending decisions comprise only a portion of overall military policy, and pecuniary benefits are but one of the bureaucratic outcomes sought by members of Congress, particularly those on the House and Senate Armed Services Committees.⁴⁰

Moreover, the bureaucratic implementation of policy is its own challenge, no matter how tractable the bureaucracy or how motivated bureaucrats may be in fulfilling congressional objectives.⁴¹ Durant provides a marvelous practitioner-oriented description of the pitfalls aspiring political appointees can face in implementing Presidential priorities.⁴²

This implementation challenge is magnified at least two-fold for the Pentagon. It is not only the largest civilian bureaucracy in the federal government, and one with a

⁴⁰ Mayer, *The Political Economy of Defense Contracting*; Mayer, “Closing Military Bases (Finally)”; Rundquist and Carsey, *Congress and Defense Spending*; Morin “Squaring the Pentagon”. More recently, see Thorpe, *The American Warfare State*.

⁴¹ For the foundational work on implementation, see Jeffrey L. Pressman and Aaron B. Wildavsky, *Implementation: How Great Expectations in Washington Are Dashed in Oakland: Or, Why It's Amazing That Federal Programs Work at All, This Being a Saga of the Economic Development Administration as Told by Two Sympathetic Observers Who Seek to Build Morals on a Foundation of Ruined Hopes* (Berkeley: University of California Press, 1973).

⁴² Robert F. Durant, “Getting Dirty-Minded: Implementing Presidential Policy Agendas Administratively,” *Public Administration Review* 69, no. 4 (2009): 569-85.

strong sense of mission, but also encompasses the parallel military bureaucracy within the Pentagon. When the military services' uniformed leadership sometimes acts as if the civilian service secretaries are impediments to be gone around or waited out, treating the Pentagon as a unitary actor is foolhardy. Rarely are there close studies of congressional attempts to implement specific policies, and even more rarely for the Pentagon.⁴³ In his book on the Pentagon's response to the Clinton-era imperatives to clean up hazardous waste at military bases and pollute less, Durant demonstrates the uphill battle faced by implementing even Presidential policy in the Pentagon.⁴⁴ The relative heft of the Pentagon's bureaucracy gives it a sometimes-dominant advantage in resisting congressional or executive initiatives.

The second half of this dissertation follows the defense energy provisions from the prior chapters into the Pentagon, evaluating their implementation and ultimate impact, with implications for Congressional policymaking, the balance of power between Congress and the executive branch, the role of partisanship, and the scope of the defense bureaucracy to shape and attenuate Congressional policy actions.

⁴³ Lochner, *Victory on the Potomac*, is the aforementioned exception.

⁴⁴ Robert F. Durant, *The Greening of the U.S. Military: Environmental Policy, National Security, and Organizational Change* (Washington, DC: Georgetown University Press, 2007).

Section I: Congress and Defense Policy-Making

Chapter 2: The National Defense Authorization Act and Defense Policymaking

The annual National Defense Authorization Act (NDAA) is the predominant vehicle for Congress to make defense policy. How did the annual NDAA emerge, and how did it become one of the most influential bills in the Congress?

Authorizations and Appropriations Bills

Every federal agency, program, or activity requires an authorization bill that sets out its statutory duties and obligations. Authorization bills also authorize the enactment of appropriations, and can set ceilings or specific time limits on the funding that can be appropriated. Appropriations bill actually fund the agencies, programs, and activities that have been authorized. All discretionary funding are subject to this two-step process.⁴⁵ While some may operate with indefinite authorization, others, like the Violence Against Women Act, were written to require periodic re-authorization. This authorization process initially evolved piecemeal. At the end of World War II, just 5% of programs had authorizations that were valid for specific fiscal years. However, over the following three decades, the number of agencies, programs, and activities that required annual or periodic reauthorization of their existence ballooned, driven by an increasing desire for congressional oversight, and a desire by the so-called “legislative committees” to wrest back power from the pre-eminent appropriations committees. The growth of annual authorizations bills was rapid, despite strong

⁴⁵ For mandatory spending, like the Medicare program, the authorization bill both authorizes the program and appropriates the funding.

concerns by the 1973 Joint Study Committee on Budget Control that pre-requisite annual authorizations bills would slow and obstruct the annual appropriations bills.⁴⁶

The Congressional Budget and Impoundment Control Act of 1974, which shifted the balance of budgetary power from the President to Congress, formalized the current congressional budget, authorizations, and appropriations processes. The authorizations bills fall under the jurisdiction of the regular standing committees of the House and Senate, while the appropriations bills are under the purview of the 12 subcommittees of the House and Senate Appropriations Committees. Under what is known as regular order, the House and Senate adopt a budget resolution setting an overall discretionary spending target for the upcoming fiscal year, with separate sub-allocation targets for the 12 appropriations subcommittees. Then, the subcommittees get to work, and each of the 12 appropriations bills are moved out of committee, voted on, conferenced, and enacted in time for the start of the next fiscal year on October 1st.⁴⁷

However, the platonic ideal of the regular order process has been observed far more in the breach.⁴⁸ Between FY 1977 and FY 2016, the full regular order process was successfully completed just four times, in FY 1977, FY 1989, FY 1995 and FY

⁴⁶ Louis Fisher, "Annual Authorizations: Durable Roadblocks to Biennial Budgeting." *Public Budgeting & Finance* 3, no. 1 (1983): 23-40.

⁴⁷ For a procedural overview and recent divergences, see Walter J. Oleszek, *Congressional Procedures and the Policy Process*, 9th ed. (Washington, DC: CQ Press, 2013). For insights into the disputes between Congress and the Nixon administration that prompted the creation of the act, see Louis Fisher, *Presidential Spending Power* (Princeton, NJ: Princeton University Press, 1975).

⁴⁸ For additional perspective, see Nolan McCarty, "The Decline of Regular Order in Appropriations: Does It Matter?" in *Congress and Policy Making in the 21st Century*, ed. Jeffery A. Jenkins and Eric M. Patashnik (Cambridge: Cambridge University Press, 2016): 162-86; and Jonathan Woon and Sarah Anderson, "Political Bargaining and the Timing of Congressional Appropriations," *Legislative Studies Quarterly* 37, no. 4 (2012): 409-36.

1997.⁴⁹ Congress needs to appropriate funding to pay for government operations on an annual basis by the beginning of the fiscal year on October 1st – or risk a government shutdown. Since FY 1997, Congress has used 175 continuing resolutions (CRs), which continue the previous year’s funding level, adjusted for inflation, in order to complete the appropriations process. Since FY1977, these CRs have tended to take the place a greater number of the 12 regular appropriations bills, be enacted later into the fiscal year, and span a greater portion of fiscal year, including 15 full-year CRs. This trend reached an apex in the FY 2011 and FY2013 full-year CRs, which took the place of all 12 of the regular appropriations bills.⁵⁰ There have also been 18 ‘lapses’ in appropriations in this timeframe, including the 16-day government shutdown in 2013.⁵¹

While in theory every appropriation requires routine authorization, many programs have had their authorizations lapse as Congress has strayed ever-further from regular order.⁵² Although the creators of the authorization-appropriations process in the 1970s envisioned the authorizing committees conducting routine, orderly, and comprehensive review of the activities, purposes, and authorizations of appropriations of a department agency, or program, in practice this was unworkable. Committees

⁴⁹ James V. Saturno and Jessica Tollesup, *Continuing Resolutions: Overview of Components and Recent Practices* (CRS Report No. R42647) (Washington, DC: Congressional Research Service, 2016), <https://fas.org/sgp/crs/misc/R42647.pdf>.

⁵⁰ Saturno and Tollesup, *Continuing Resolutions*, 17.

⁵¹ Dylan Matthews, “Here Is Every Previous Government Shutdown, Why They Happened and How They Ended,” *Wonk Blog*, *Washington Post*, September 25, 2013, https://www.washingtonpost.com/news/wonk/wp/2013/09/25/here-is-every-previous-government-shutdown-why-they-happened-and-how-they-ended/?utm_term=.4051d4f81fc8.

⁵² Authorization in this context can refer either to the legislation that creates an agency, program, or activity, or to legislation that authorizes funding at certain levels or for a specified period of time.

created multi-year authorizations, required periodic re-authorization for smaller subsets of agencies, programs, or activities, and frequently let authorizations and authorizations of appropriations lapse.⁵³ The result is a fractured landscape of asynchronous re-authorizations of major programs, leading to infrequent, but pitched political battles over the purposes and aims of government programs, and tens of billions of dollars in previously-authorized appropriations that have had their authorization of appropriations lapse.⁵⁴ In their annual report on the latter, the Congressional Budget Office identified \$310 billion of appropriations for which the authorizations had expired for FY 2016 – a tremendous increase from the \$33.4 billion in appropriations lacking authorization in FY 1986. Programs funded in FY 2016, despite lacking authorization of appropriations, ranged from the minor (such as the Brown Tree Snake Control and Eradication Act of 2004 (P.L. 108-384), with some \$11.4 million of authorized appropriations in FY 2015, to major public policy programs, including the National Institutes of Health (with \$31 billion of FY 2016 appropriations), NASA (\$19 billion), programs authorized by the Foreign Relations

⁵³ Jessica Trollesup *Changes in the Purposes and Frequency of Authorizations of Appropriations* (CRS Report No. R43826) (Washington, DC: Congressional Research Service, 2015), <https://fas.org/sgp/crs/misc/R43862.pdf>. The original vision for Congressional authorization and appropriations recalls the police patrols described in Mathew D. McCubbins and Thomas Schwartz, “Congressional Oversight Overlooked: Police Patrols versus Fire Alarms.”

⁵⁴ Excellent close analysis of the political maneuvering and legislative play-by-play recaps of past reauthorization fights – for example, of the 1998 battle over to reauthorize the allocations of National Highway Trust Fund, can be found in pp. 207-208 of Chapter 8: Authorizing Legislation, of Allen Schick, *The Federal Budget: Politics, Policy, Process*, 3rd ed. Washington, D.C., Brookings Institute Press, 2007.

Reauthorization Act, FY 2003 (\$26 billion), and the Quality Housing and Work Responsibility Act of 1998 (\$26 billion).⁵⁵

The oversight of agencies enabled by reviewing their authorization bills has also suffered. For example, the Department of State, which is supposed to be re-authorized biannually, was re-authorized in December 2016 for the first time in 14 years.⁵⁶ The Highway Trust Fund was re-authorized for five years in late 2015, 10 years and 16 separate short-term extensions after the last comprehensive transportation bill.⁵⁷ The Foreign Assistance Act of 1961 was last reauthorized in 1985. Instead, myriad smaller foreign assistance programs, typically focused on initiatives for specific regions, countries, or aid sectors have proliferated in other authorization or appropriations bills.⁵⁸ Both the National Science Foundation and NASA were last authorized in 2010, with authorizations that ended after FY 2013, while the Federal Elections Commission hasn't been re-authorized since 1980 – and that was a one-paragraph bill authorizing \$9.4 million in appropriations.⁵⁹

⁵⁵ Congressional Budget Office, *Expired and Expiring Authorizations of Appropriations* (Washington, DC: United States Congress, January 13, 2017), <https://www.cbo.gov/sites/default/files/115th-congress-2017-2018/reports/52368-eeaasenate.pdf>

⁵⁶ Department of State Authorities Act, Fiscal Year 2017, Pub. L. No. 114-323, 130 Stat. 1905 (2016).

⁵⁷ Ashley Halsey III, “After weeks of negotiations, Congress finalizes 5-year transportation bill,” *The Washington Post*, December 1, 2015, https://www.washingtonpost.com/local/trafficandcommuting/after-weeks-of-negotiations-congress-finalizes-5-year-transportation-bill/2015/12/01/e86f1704-979a-11e5-94f0-9eeaff906ef3_story.html?utm_term=.43f21a276fc3

⁵⁸ Curt Tarnoff and Marian L. Lawson, *Foreign Aid: An Introduction to U.S. Programs and Policy* (CRS Report No. R40213) (Washington, DC: Congressional Research Service, 2016), <https://fas.org/sgp/crs/misc/R43862.pdf>.

⁵⁹ P.L. 96-253, “An Act to Authorize Appropriations for the Federal Election Commission for fiscal year 1981.”

In this splintered authorization landscape, with piecemeal congressional oversight over the executive, the annual National Defense Authorization Act, or NDAA, authorizing defense programs and funding for the following fiscal year, is a noteworthy anomaly. It has become one of the very few pieces of legislation that can be counted on to complete the cycle of legislation, from committee drafting and mark-ups, to floor consideration and amendments, to reconciliation between House and Senate versions during conference, to a Presidential signature. It might be the *only* policy bill that passes each year. Congress has passed the annual National Defense Authorization Act each fiscal year for the past 56 years, from its origin in 1962 through 2018. Although the annual passage of the NDAA is one of the few norms still observed by Congress, its passage has grown more difficult in recent years, leading to the use of unorthodox legislative maneuvers in order to secure its passage.⁶⁰ For example, the FY2013 NDAA was completed without a floor debate on the bill in the Senate, by conferencing the House-passed version of the bill with the SASC version, with each chamber then presented the final version of the bill for an up-or-down vote.⁶¹ However, despite the need for these unorthodox maneuvers to get to a final bill text, the final bills have continued to pass with supermajority margins in

⁶⁰ Barbara Sinclair has carefully documented the utilization and evolution of unorthodox procedures used to pass major legislation. See *Unorthodox Lawmaking: New Legislative Processes in the U.S. Congress*, 4th ed. (Washington, DC: CQ Press, 2011). The utilization of similarly unorthodox measures to pass the annual NDAA suggest either that the NDAA has become a major piece of legislation, possibly due to its growth and the inclusion of a broader range of provisions, or, that the increasing partisan polarization has made the passage of formerly routine legislation more difficult, or some combination of these factors.

⁶¹ For the FY2013 bill, H.R. 4310 became the final enacted bill, Pub. L. No. 112-239 (see <https://www.congress.gov/bill/112th-congress/house-bill/4310/all-actions-without-amendments>). For the FY2011 NDAA, H.R. 6523 became the final enacted bill (Pub. L. No. 111-383). The original House version of the FY2011 bill was H.R. 5136, while the Senate version was S. 3454.

the House and the Senate.⁶² The annual passage of the NDAA gives it a unique and privileged role among policy legislation overseeing the executive branch.

However, there is no statutory requirement that the NDAA or an analogous bill exist. House and Senate rules encourage the separation of authorization and appropriations bill by variously prohibiting appropriations for unauthorized programs, prohibiting policy language in a regular appropriations bill, and prohibiting appropriations in an authorization bill, but there are a number of exceptions.⁶³ Moreover, these prohibitions are in malleable House and Senate rules, rather than cemented into statute. Like other federal agencies, the Department of Defense could be the subject of intermittent authorization, or the occasional major policy bill, and otherwise suffer from congressional neglect.

Origins of the NDAA

The NDAA has its humble origin story in the so-called “Russell Amendment,” during Sen. Russell’s (D-GA) tenure as the Chairman of SASC (1955 – 1968). In the years following World War II, congressional oversight over defense lay with the

⁶² The NDAA has continued to pass by large margins in the past several years, despite heightened partisan differences in the legislature and Democratic threats to filibuster the Senate bill for the FY2017 and FY2016 NDAs. The FY2017 NDAA (Pub. L. No. 114-328, 130 Stat. 2000 (2016)) passed the House by 375-34, and the Senate by 92-7. The FY2016 NDAA (Pub. L. No. 114-92, 129 Stat. 726 (2015)) passed the House by 370-58, and the Senate by 91-3. The FY2015 NDAA (Pub. L. No. 113-291, 128 Stat. 3292 (2014)) passed the House by 300-119 (a surprisingly close margin, reflecting the opposition of about 45% of House Democrats and 30 House Republicans), and the Senate by 89-11. The FY2014 NDAA (Pub. L. No. 113-66, 127 Stat. 672 (2013)) passed the House by a voice vote, and the Senate by 84-15. The FY2013 NDAA (Pub. L. No. 112-239, 126 Stat. 1632 (2013)) passed the House by 315-107 (again reflecting nay votes by about 40% of House Democrats and 30 Republicans), and the Senate by 81-14.

⁶³ See Bill Heniff Jr., Overview of the Authorization-Appropriations Process (CRS Report No. RS20371)

(Washington, DC: Congressional Research Service, 2012), 2,
<https://www.senate.gov/CRSpubs/d2b1dc6f-4ed2-46ae-83ae-1e13b3e24150.pdf>.

appropriators, who wielded the power of the purse over the Pentagon. The House and Senate Armed Services committees were created by merging the Military Committee and the Naval Affairs Committees of the House and Senate, respectively, as part of the Legislative Reorganization Act of 1946. The newly-created Senate Armed Services Committee was quite active legislatively, reporting the Officer Personnel Act of 1947, the Selective Service Act of 1948, the Air Force Composition Act of 1948, the Uniform Code of Military Justice Act of 1950, the Universal Military Training Program Act of 1952, and the Armed Forces Reserve Act of 1952 out of committee. However, the Armed Services Committees' control over their traditional domains, the manpower and organization of the armed forces, was no longer "determin[ative] of basic defense policy."⁶⁴

The Armed Services Committees' lack of influence over the defense establishment was galling to its members. While the authorizing committees did set ceilings on defense purchases of aircraft and ships, as well as the numbers of officers in each service, these limits were both exceedingly vague and far higher than the military would realistically purchase. For example, in the Army and Air Force Authorization and Composition Act of 1950, Congress authorized the Secretary of the Air Force to procure "24,000 serviceable aircraft or 225,000 airframe tons ... as he may determine."⁶⁵ SASC itself noted, following the initial reporting of the bill out of

⁶⁴ Raymond H. Dawson, "Congressional Innovation and Intervention in Defense Policy: Legislative Authorization of Weapons Systems," *American Political Science Review* 56, no 1. (March 1962): 45.

⁶⁵ Gordon, "The Military Budget," 691, citing 10 U.S.C. § 8062, 9531. This phrase still persists into the current version of the U.S. Code, at 10 U.S.C. § 8062(f).

committee, “the Army will not reach its present authorized strength ... for approximately 9 years.”⁶⁶ In regards to shipbuilding, the Navy was “provided with enough tonnage ... to build ships for an untold number of years without any further authorization.”⁶⁷ As a means of expressing a policy position regarding the size, composition, and missions of the Air Force, these ceilings were useless. As Gordon (1961) discusses, the Armed Services Committees’ suffered from “technological obsolescence,” as their legislative purview over end strength and organizational issues, were “no longer the important determinations of the nation’s military power,” as weapons systems moved to the forefront.⁶⁸

Moreover, tensions between the authorizers and the appropriators (particularly in the House) increased, as substantive oversight power became increasingly concentrated in the appropriations committee and the authorizers became less and less relevant. During the defense budget hearings, the service secretaries and the senior uniformed officers of the armed services viewed testifying before HASC and SASC as “a bothersome, fruitless chore.”⁶⁹ By contrast, the hearings before the appropriators were considered a serious hurdle, at which the form, purpose and efficacy of programs would be seriously questioned.⁷⁰ At the same time, Congress was irritated by the

⁶⁶ Dawson, “Congressional Innovation,” 46, citing S. Rep. No. 81-933, at 2 (1949).

⁶⁷ Dawson, 46, citing 105 Cong. Rec. 13477 (1959).

⁶⁸ Bernard K. Gordon, “The Military Budget: Congressional Phase,” *Journal of Politics* 23, no. 4 (1961): 689-710.

⁶⁹ Gordon, “The Military Budget,” 693, citing an interview conducted with a Department of Defense official on July 14, 1960.

⁷⁰ Gordon, 693-95, citing interviews conducted with Department of Defense officials on August 3-5, 1960.

Pentagon's tendency to abruptly cancel or decrease funding for programs that they had advocated for during budget hearings mere months earlier, implicitly sidelining the appropriators.⁷¹

Against this background, Chairman Russell attempted to increase the power of the Senate Armed Services Committee in relation to both the Pentagon and the appropriators, against strong executive and defense establishment resistance. Senator Russell's eponymous amendment, section 412(b) of the Military Construction Authorization Act of 1960,⁷² was explicitly designed to increase the oversight power and re-establish the relevance of the House and Senate Armed Services committees in regards to the annual defense budget. As Senator Russell was at this time chair of both SASC and the Senate Appropriations Committee – Defense subcommittee (SAC-D), it is likely that he had further motivations beyond his own prominence. The brief provision read:

(b) No funds may be appropriated after December 31, 1960, to or for the use of any armed force of the United States for the procurement of aircraft, missiles, or naval vessels unless the appropriation of such funds has been authorized by legislation enacted after such date.

⁷¹ Gordon, 708.

⁷² Pub. L. No. 86-149, § 412(b), 73 Stat 322 (1959).

This required authorization of all aircraft, missiles, and naval vessels prior to the appropriation of funds became the seed of the modern NDAA. In both form and consequences, the “Russell Amendment” exemplifies a long tradition of congressional attempts to increase defense oversight and policymaking. From the contemporaneous interviews conducted with the principals of the Armed Services Committees, it is clear that Congress intended to do *something* to establish greater oversight, even if they were not sure precisely *what*, or what end form this oversight would take.⁷³

This authorization requirement, which threatened to upset the applecart of Pentagon-congressional relations as well as disrupt the status quo between the defense authorizers and appropriators, prompted immediate negative reactions by the Department of Defense, which resented greater congressional involvement, and President Eisenhower, who termed the new legislation “inappropriate.”⁷⁴ A veto of the bill was only avoided because the military construction authorizations of the rest of the bill were urgently needed.⁷⁵ Strenuous Pentagon opposition had diluted the original provision of the Senate bill once it moved into committee, removing required authorization of development and design programs from the original language in the

⁷³ Gordon, “The Military Budget,” 697, citing an interview with the House Armed Services Committee, August 5, 1960.

⁷⁴ Gordon, 696, citing *The New York Times*, January 17, 1961, 17.

⁷⁵ Herbert W. Stephens, “The Role of the Legislative Committees in the Appropriations Process: A Study Focused on the Armed Services Committees,” *Western Political Quarterly* 24, no. 1 (March 1971): 148.

SASC's version of the bill. After the bill was passed, opponents continued attempts to "invert" it, leaving the preeminence of the appropriations committees intact.⁷⁶

Contemporaneous justifications for Pentagon opposition ranged from the facile and self-interested to substantive points of concern. Doubts expressed privately included both more benign skepticism about the technological competence of the authorizing committees, who might be "snow[ed]" by services seeking hefty authorizations for specific weapons systems, and the burden on the armed forces, of a longer and more grueling gauntlet of congressional hearings and a slowed procurement process, as well as more existential fears that the services would have to coordinate on weapons systems procurement to a much greater extent,⁷⁷ and that Congress would reduce the Pentagon's prized autonomy.⁷⁸ The appropriators were also deeply resistant, acknowledging the provision's potential to decrease their influence in defense matters.⁷⁹ By contrast, Members and staffers on both the House and Senate Armed Services Committees were generally supportive, with Gordon reporting that all Members and staffers of HASC felt that this authority was "long overdue."⁸⁰

⁷⁶ Gordon, "The Military Budget," 706, citing an interview with White House officials, August 20, 1960.

⁷⁷ Gordon, 696-707, citing interviews with an official in the Office of an Assistant Secretary of Defense, August 1960, and an official in the Department of the Air Force, July 22, 1960.

⁷⁸ Dawson, "Congressional Innovation," 57.

⁷⁹ Gordon, "The Military Budget," 701, citing an interview with staffers from the House Appropriations Subcommittee on Defense, July 16, 1960.

⁸⁰ Gordon, 697, citing an interview with the House Armed Services Committee, August 5, 1960.

Despite the clear line-up of interests supporting and opposing the “Russell Amendment,” and the real fear by the defense establishment that it would disrupt the status quo, contemporary participants were unclear about what compliance with section 412(b) would entail and how this would continue to shape the defense process over the longer-term. In Gordon’s near-contemporaneous account, he speculated that the new authorization bill might amount to nothing more than more-thorough “posture” hearings before SASC and HASC, with the real “show” remaining before the appropriations subcommittees. He raised concerns about the level of policy and technical details that HASC and SASC were interested in, or capable of, legislating, and their interest in wading through the weighty “justification books,” or “j-books” of the President’s budget. He discounted the authorizers’ detailed involvement in and line-by-line authorization of the real estate requirements of the land-based missile defense systems during the annual Military Construction authorization bill following the passage of the Russell amendment. Overall, he appeared skeptical that the “Russell amendment” would lead to real change in the balance of congressional-Pentagon power.

Gordon, speculating in 1961 about the infant provision, had a hard time imagining the authorizers venturing past more specific procurement ceilings, perhaps defined in numbers of a type of aircraft, or dollar amounts for various categories of weapons. Gordon’s most far-reaching prediction was that the “Russell Amendment” would require Pentagon planners to coordinate weapons procurement between the services

prior to presenting a budget to Congress, working towards, as Rep. Kilday commented, “careful planning in the executive branch,” rather than the current practice of services competing for weapons systems procurement monies before the Congress with substantially similar programs or functions.⁸¹ Gordon’s skepticism regarding the future prominence of the Armed Services Committees was summed up by his belief that “it does not seem reasonable to expect that any lever other than dollars can serve as an effective instrument of congressional control.”⁸² Noting the extent to which prior legislative activities have left “defense policy . . . insulated from substantial, authorizing legislation,” and “not closely related to substantive legislation that defines the operating framework of policy,” Gordon argued that the introduction of an annual authorization requirement has given Congress, at best, “one more means of leverage.”⁸³

Dawson, writing two years after the enactment of the Russell Amendment, had a somewhat more optimistic view. More skeptical of appropriations as a potent instrument of congressional influence, he described the unwillingness of Congress to de-fund budget proposals, the overwhelming detail of the defense budget as obstructing effective oversight, and the wide powers to shift funds between funding accounts that the Pentagon enjoyed as limitations on the appropriators’ power. Writing in January 1960, Samuel Huntington also noted these problems with

⁸¹ Gordon, “The Military Budget,” 707.

⁸² Gordon, 707.

⁸³ Dawson, “Congressional Innovation,” 44-5.

congressional oversight via appropriations. He termed military funding requests for weapons programs “inviolable,” stating that

After World War II, except when confronted by similar competing programs, Congress never vetoed directly a major strategic program, a force-level recommendation or a major weapons system proposed by the Administration in power. Nor did Congress ever achieve this result, with one partial exception (the Navy's second nuclear carrier), through the failure to appropriate funds recommended by the Executive.⁸⁴

Dawson, in describing the close involvement of the authorizers in the reviewing land-based missile-defense real estate needs, provided an early example of the more robust oversight role that the armed services committees could take on by requiring weapons systems to be authorized as well as funded.⁸⁵ These included the heated 1956 authorization arguments over the *Nike* (Air Force) and *Talos* (Army) missile-defense systems, which culminated in the de-authorization of the *Talos* over President Eisenhower’s veto and the subsequent cancellation of the program by the Army. Dawson viewed the prospect of the Armed Services Committee staffers as overseeing any complete, periodic authorization of the military budget as “impractical.” However, he argued that the Armed Services Committee staffs’ annual review of major weapons programs enabled by Section 412(b), which at that time were considered to be the fundamental embodiment of national security strategy, could in practice allow for an annual review of basic defense policy and strategy.⁸⁶ Dawson hung his hopes on three points. He argues that the required authorization of weapons

⁸⁴ Samuel P. Huntington, “Strategic Planning and the Political Process,” *Foreign Affairs* 38, no. 2 (January 1960): 285-99

⁸⁵ Dawson, “Congressional Innovation,” 48-49.

⁸⁶ Dawson, 51.

systems gives the Armed Services Committees more access to the process of developing policy and strategy. He also hoped that the authorization would prove more focused than the necessarily-broad remit of the appropriators, who in having to fund, and review, the entirety of the armed forces become bogged down in “the irrelevant and transitory.” Dawson hoped that this remove would allow the authorizers to remain focused on strategic issues, such as the utility of various strategies, and the appropriate roles of the services. Finally, Dawson saw the expanded *knowledge* of the authorizers as a positive result, breaking the appropriator’s monopoly of defense expertise. While Dawson hedged his bets, noting that section 412(b) could be voided if it becomes too burdensome, he believed that it could fulfill a “vital need... [for] effective ... debate of strategic issues and choices.”⁸⁷

The Growth of the Early NDAA: 1961 – 1967

The 1961 Procurement Authorization was the first year’s ‘trial run’ of this authorization requirement, and was deliberately collegial, hewing closely to the administration’s procurement wishes. The sole exception was the authorizers’ commitment to a long-range bomber.⁸⁸ Perhaps intentionally, this inaugural authorization also mimicked the format of the defense appropriations bill, authorizing a broad ceiling for eight procurement categories, with more detailed numbers to be found in the committee reports. This pattern of keeping the detailed preferences in the committee reports rather than in the bill text largely persists today. However, the

⁸⁷ Dawson, 57.

⁸⁸ Dawson, 54.

provisions in committee reports and other non-statutory indicators of legislative intent are commonly held to be “binding on the Department ... even though it is not in the law,” with changes requiring, “the concurrence of the committee,” although the funds are authorized and appropriated in a lump sum.⁸⁹

Throughout the 1960s, the now-annual authorization process gradually increased in scope and significance. Research, development, test and evaluation (RDT&E) programs came within the purview of the authorizers in 1962 and 1963 as a result of the B-70 bomber controversy, while “tracked combat vehicles” (tanks) were included in 1965. End-strength figures for the reserve forces were brought into the authorization process in 1967. In 1969 the committees’ procurement oversight was broadened to include all other weapons not already included (effectively, artillery, anti-aircraft weapons, and small arms.) In 1970, the authorizers were empowered to set end-strength levels for the active duty armed forces, giving them authorizing power over the all of the armed forces. Just operation and maintenance funds and the broad “other procurement” category remained the sole domain of the appropriators.⁹⁰ The scope of the authorizers also expanded in other ways. In response to sentiment among Armed Services members that the Pentagon had too much latitude over reprogramming authorized funding, during the FY1964 budget hearings the Armed Services Committees were given effective veto power over any Pentagon

⁸⁹ Dawson, 54, quoting an exchange between Rep. Kilday and Eugene M. Zuckert, the Secretary of the Air Force, during the House Committee on Armed Services Hearing on H.R. 6151, “Authorizing Appropriations for Aircraft, Missiles, and Naval Vessels for the Armed Forces,” printed in Committee Paper No. 10 (1961), 1533.

⁹⁰ Robert J. Art, “Congress and the Defense Budget: Enhancing Policy Oversight,” *Political Science Quarterly* 100, no. 2 (Summer 1985): 230.

reprogramming requests that touched on prior action by the authorizers. By the FY1970 defense budget, the authorizers had successfully gained annual authorization authority over nearly all of the weapons and systems the Pentagon buys, as well as over the personnel levels of the armed forces. This shift in committee power added another locus of power to the committee-centered “inside game” that characterized defense politics in the 1960s.⁹¹

House Appropriations Committee staffers anticipated that the authorizers would continue to expand their authority.⁹² Stephens’ interviews with appropriations staffers in 1967 and 1968 suggested, unsurprisingly, that there was “substantial resentment” at the “intrusion” of the Armed Services committees onto what had traditionally been the appropriators turf, and expectations that further encroachments were coming. By 1967, the power of the appropriators had already been significantly diluted. The authorized funding ceilings had become “real meaningful and tie[d] [the appropriators’] hands.” For the Pentagon, authorization, rather than appropriations, had become the must-clear hurdle for a program, as that was where the danger of a program being cut entirely was most acute.⁹³ The authorizers had significantly enhanced their powers *vis-a-vis* both the appropriators and the Pentagon via the ratchet of the authorizations process.

⁹¹ James M. Lindsay, “Congress and Defense Policy: 1961 to 1986,” *Armed Forces and Society* 13, no. 3 (1987): 371-401.

⁹² Stephens, “The Role of the Legislative Committees,” 146-62.

⁹³ Stephens, 159-61, citing interviews conducted with defense committee staffers in 1967 and 1968, and analysis of congressional action on the FY1962-FY1967 defense budgets.

Shift from Deference to Contention, 1967-1978

Between 1967-1974, amid significant public debate about the Vietnam War, Members of Congress were beginning to exercise greater oversight of the defense establishment, in what Lindsay has described as the shift to the “decentralized inside game.”⁹⁴ The authorization process became a key site of confrontation, as Armed Services Committee hearings and floor debates became high-profile venues for debates about the Vietnam War, the Anti-Ballistic Missile Treaty controversy, the appropriate size and scope of the Department of Defense vs. other national priorities, and oversight over weapons systems procurement.

While the appropriators, as Kanter described, were still playing a significant role in defense policy via a focus on RDT&E and the procurement of weapons systems, the authorizers had supplanted them as the major defense players on the hill.⁹⁵ Blackmon agreed, evaluating defense committee decisions on DOD programs, and concluding that the Senate Armed Services Committee exerted growing influence over DOD weapons programs. Laurance, in attempting to quantify the qualitative change in the congressional treatment of defense policy between 1947-1968 and 1968-1974, described the annual authorizations as “the process responding more readily to changing environment and impacts.”⁹⁶

⁹⁴ Lindsay, “Congress and Defense Policy,” 371-401.

⁹⁵ Arnold Kanter, *Defense Politics: A Budgetary Perspective* (Chicago: University of Chicago Press, 1979).

⁹⁶ Edward J. Laurance, “The Changing Role of Congress in Defense Policy-Making,” *Journal of Conflict Resolution* 20, no. 2 (June 1976): 236.

Several of the systemic changes characteristic of the increased congressional oversight in the 1968-1978 period were facilitated by the rise of the annual authorization bill, including the greater number of defense issues now subject to explicit congressional oversight, the more prominent role of committee and legislative debates over defense policy, the emergence of the Senate Armed Services committee in particular as a locus for defense policymaking, a greater number of hearings on defense issues, and the sharp rise in the significance and contentiousness of floor debate and amendments in the Senate version of the authorization bill.⁹⁷ The annual authorizations process of course cannot take full credit for these shifts, as the levels of congressional controversy and public acrimony over the many key defense issues of this time period would have found some institutional expression without the NDAA. However, the location of the HASC and SASC as the arena for these debates solidified the still-new annual authorization process as the annual authorization process as the key venue in which in which these debates over defense policy would occur.

While the major power over defense policy was still concentrated in the defense committees, the era of deference to the committee chair was over, as individual legislators on the committees were empowered to intervene in defense policy. Institutional changes, such as the greater responsibility and independence of subcommittees and the growth in professional staff, also facilitated defense

⁹⁷ Laurance, "The Changing Role of Congress," 245.

policymaking. In the 1970s, as part of the reorganization of the legislative committees, the staff of the House and Senate Armed Services Committees grew three-fold, from 10 each in 1947 to 28 and 30, respectively, in 1975. The staff of the House and Senate Appropriations Committees also grew three-fold, from 35 and 25, respectively, in 1947 to 84 and 72 in 1975.⁹⁸ Senator Stennis (D-MS), who chaired SASC from 1969 – 1980, also facilitated the broadening of committee expertise in defense policy, creating subcommittees on Research and Development and Tactical Air Power and allowing greater participation by SASC members in defense policy debates. Changes in the House, made possible by the House Subcommittee Bill of Rights in 1975, went much further. These changes to the House rules gave far more authority to the subcommittees, which previously had been treated as empty appendages of the parent committee. As a result of that shift in power, as Lindsay describes, by 1979 the NDAA was entirely marked up in subcommittees rather than in the full committee.⁹⁹

Defense Committees as Budgeteers or Policy Makers? 1978 – 1987

However, with national defense fading as the pre-eminent public issue after the conclusion of the Vietnam War, Art argues that the policy oversight that had been exercised by the Congress had begun to slide into “budgeteering” in the mid-1970s and into the 1980s. In his characterization, the four defense committees focused more on changes to the annual budget request than broader policy oversight. In effect,

⁹⁸ Art, “Congress and the Defense Budget,” 232, citing Harrison W. Fox Jr. and Susan Webb Hammond, *Congressional Staffs: The Invisible Force in American Lawmaking* (New York: Free Press, 1977), 169.

⁹⁹ Lindsay, “Congress and Defense Policy,” 380-81.

SASC and HASC were joining the appropriators in losing the forest for the trees. Meanwhile, the magnitude of effort required for the annual review and authorization of the defense budget crowded out any hope of more long-term or strategic policymaking.

In 1982 and 1983, respectively, the Operations and Maintenance (O&M) and Other Procurement accounts were brought into the annual authorizations process and under the purview of HASC and SASC.¹⁰⁰ An interview with a HASC staffer involved in requiring annual authorizations for the O&M and Other Procurement accounts makes it clear that their inclusion in the authorizations requirements was motivated by policy concerns about military readiness that were by then widespread. In the staffer's telling, "we [the House Armed Services Committee] deliberately went for annual authorizations of O&M... [Because] we realized that when you come to the end of the year, O&M is the 'billpayer.'"¹⁰¹ This lack of readiness hinges on budgetary details – the O&M accounts are more vulnerable to being cut by the appropriators as the appropriated monies are not tied to specific, long-term procurement plans, and cuts to O&M appropriations quickly lead to a corresponding fall in outlays. The staffer continues, "There are natural lobbyists for procurement and R&D, but no one was lobbying for readiness. Our theory was that ... we would create our own. Hence we set up the readiness subcommittee [of House Armed Services.]"¹⁰²

¹⁰⁰ Art, "Congress and the Defense Budget," 230.

¹⁰¹ Art, 231.

¹⁰² Art, 231.

While the inclusion of the O&M and Other Procurement accounts in the authorizers' remit was intended to protect readiness, an expression of a military policy goal, by the 1980s the ability of the annual defense authorization process to provide an institutional mechanism for serious or long-term defense policymaking was in serious doubt. The views of prominent members of Congress at the time, as captured by Art are revealing. Sen. Sam Nunn (D-GA), not yet Chairman of SASC, said that "the budget cycle drives the Congress ... [and] we don't have time to think about strategy." According to a SASC staffer, "From January through December, we are consumed by the annual budget. ... Tower [then Chairman], said to the committee in 1983: 'I want to see us get out of the details.' We tried but we got back into the 'weeds.'" The budgetary and programmatic details had taken center stage.

Things were no better at HASC, where one member bemoaned the lack of a real seapower strategy, lamenting that "all they talk about ... are ships and where they are going to build them." Another HASC staffer took a more systemic view, noting that the committee members' limited attention gets drawn to issues with constituencies or spent on the need to be reelected, leaving little time for "long term policy."¹⁰³ Art laments the lack of high strategy or defense policy in the authorization process. His interviewees among the HASC and SASC staff attribute this gap to a continued lack of interest in strategy by Members of Congress, despite the availability of the authorization process as a ready-made political vehicle.¹⁰⁴

¹⁰³ Art, 235.

¹⁰⁴ Art, 240-42 for discussion of the varied incentives of lawmakers in the defense realm.

However, this view overlooks the significant policy debates of this era that occurred as a result of the newly empowered House and Senate Armed Services Committees. Art himself cites the major debates over the tactical nuclear stockpile of NATO, the Strategic Arms Limitations Talks (SALT) hearings on the SALT II treaty, and the hearings on reorganizing the Pentagon (which would become the 1986 Goldwater-Nichols Act), all-important issues of “high” defense policy. Moreover, Art’s Cold War-era bias towards “high” and “strategic” defense policy prejudices him to overlook other significant examples of congressional influence over defense policy in the 1970s and early 1980s, including enabling sustaining the shift to the all-volunteer force, improving veterans’ benefits, sharp divergence about the role U.S. forces in NATO and South Korea, heated debates about nuclear weapons, including a “neutron bomb” and a mobile M-X ICBM, military pay raises and shifts in the benefits package, and changes to procurement policy.¹⁰⁵ This policy oversight was both enabled by, and enacted through, the annual defense authorization process.

The Modern NDAA: 1987 – Present

As congressional influence over defense continued to move from the committees to the Congress as a whole in the 1980s, the NDAA became a more prominent means of

¹⁰⁵ For an exhaustive history of the all-volunteer force, see Bernard Rosketer, *I Want You!: The Evolution of the All-Volunteer Force* (Santa Monica, CA: RAND Corporation, 2006). For selected highlights of the national security debates in Congress during this period, see “National Security 1974: Overview,” in *CQ Almanac* (Washington, DC: CQ-Roll Call Group), <https://library.cqpress.com/cqalmanac/document.php?id=cqal74-1221509>; “Foreign Policy/National Security 1977: Overview,” in *CQ Almanac* (Washington, DC: CQ-Roll Call Group), <https://library.cqpress.com/cqalmanac/document.php?id=cqal77-1202650>; “National Security 1979: Overview,” in *CQ Almanac* (Washington, DC: CQ-Roll Call Group), <http://library.cqpress.com/cqalmanac/document.php?id=cqal79-1185569>; and “Defense: 1983: Overview,” in *CQ Almanac* (Washington, DC: CQ-Roll Call Group), <https://library.cqpress.com/cqalmanac/document.php?id=cqal81-1172169>.

exerting congressional influence over defense policy for individual legislators. At the same time, the scope of the authorizations process allowed everyone to find an issue to invest themselves in.¹⁰⁶ Greater involvement by individual legislators and the politicization of defense policy, part of the shift to what Lindsay described as the ‘outside game’ ballooned the number of floor amendments the authorization bills faced, and increased the prospects for both pork and partisanship.¹⁰⁷ In Lindsay’s view, the democratization of defense policy that occurred in the 1980s also led Congress to debate a wider range of defense policy issues. For examples, Lindsay describes the 1985 debates over the MX, Minuteman, the Strategic Defense Initiative, antisatellite weapons, the stealth bomber, chemical weapons, and procurement reform.¹⁰⁸ However, all of these are canonical topics of defense policy, addressing the familiar topics of individual weapons systems and major treaties.

Sen. Nunn (D-GA), on assuming the chairmanship of SASC in 1987, continued the push for more policy oversight and less budgetary review.¹⁰⁹ The NDAA had become a perfect vehicle to enable this greater tendency for “political grandstanding,” as members became quick to pounce on pork and trending defense issues that “played well at home.”¹¹⁰ Nonetheless, the trends towards line-item authorization of the

¹⁰⁶ Lindsay, “Congress and Defense Policy,” 384.

¹⁰⁷ Lindsay, 385.

¹⁰⁸ Lindsay, 386.

¹⁰⁹ James M. Lindsay, “Congressional Oversight of the Department of Defense: Reconsidering the Conventional Wisdom,” *Armed Forces and Society* 17, no. 1 (Fall 1990): 27.

¹¹⁰ Lindsay, “Congress and Defense Policy,” 385, citing 131 Cong. Rec. S12341 (1985), and Thomas Crackel, “Pentagon Management Problems: Congress Shares the Blame,” Heritage Foundation Backgrounder 405 (Washington, DC: Heritage Foundation, January 1985), 3.

defense budget intensified in the 1980s and 1990s, gradually eroding the power of the defense appropriators, who eventually found their budget review playing second fiddle.¹¹¹

While the greater span of defense policy issues debated in this era must be considered a positive, the near-complete erosion of the previous era's deference to the decisions of the defense committees also imposed some costs. In particular, Michael West, a HASC staffer in the 1980s, described the circumspection that HASC had to exercise in its legislative proposals: "Whatever else the committee and its staff accomplish, they must draw up legislation that will be approved. Defeats on the floor ... must be avoided like the plague."¹¹² The greater and more public congressional fray over defense policy issues reduced members' stomach for tackling sustained policy oversight over controversial subjects, encouraging the proliferation of non-controversial defense policy.

The increased levels of partisanship in the contemporary Congress, combined with the status of the NDAA as one of the very few must-pass pieces of legislation may have shifted the balance of power back to the Armed Services Committees, but subject to the House and Senate leadership's control, in a modified inside-leadership

¹¹¹ Kenneth R. Mayer, "Patterns of Congressional Influence in Defense Contracting," in *Arms, Politics and the Economy: Historical and Contemporary Perspectives*, ed. Robert Higgs (Oakland, CA: The Independent Institute, 1990). The political power of the appropriators has fallen further since Mayer's comments. Following Sen. Inouye's death in December 2012, both Sen. Leahy and Sen. Harkin turned down the Chairmanship of the Senate Appropriations Committee.

¹¹² Lindsay, "Congress and Defense Policy," 387, citing Michael A. West, "The Role of Congress in the Defense Budget Process – A Positive View," *Naval War College Review*, 30 (May-June 1979): 89.

game. There is a still firmly-held tradition of bipartisan compromise and collaboration within the contemporary House and Senate Armed Services committees.¹¹³ This collaborative approach is seen in the NDAA's drafting, where the draft of the legislative text that is starting point of the subcommittee markup has to be supported by both the majority and minority members on the committee. While the Chairman's mark may have its own policy goals and provisions that are not shared by the whole committee, any controversial elements that arise from the subcommittee marks are held for consideration by the full committee.¹¹⁴

However, the recent partisan gulf has reduced the volume of other legislation considered and passed. Combined with the must-past status and inherently broad scope of the NDAA, legislative opportunism has widened the array of provisions that members of Congress, denied other avenues, will try and insert into the NDAA. At the same time, the leadership-aligned restrictive Rules Committee limitations on which amendments will be considered on the House floor sharply limits which amendments can be debated in the House. In the Senate, there is no equivalent amendment gatekeeper, but the bill can be debated under limited rules with a unanimous consent decree. Even under less restrictive debate rules, the floor manager for the bill can exercise enormous power over amendments by bundling them en bloc or filling the amendment tree to preclude a debate on minority party

¹¹³ This bipartisan collaboration remains strong in the contemporary committees, according to conversations with SASC and HASC members from both the minority and majority.

¹¹⁴ Interview with former HASC staffer, June 2016; interview with HASC staffer, May 2015; interview with HASC staffer, October 2014; Shogan, "Defense Authorization."

amendments.¹¹⁵ Of course, as mentioned above, Senate floor debate of the NDAA has occasionally been omitted entirely in favor of advancing a so-called ‘pre-conferenced’ version, hammered out by the Big Four (the Chairmen and Ranking Members of the HASC and SASC) and a conference committee-like group of legislators.

The tensions in this prospective inside-leadership game can be seen in one of the showdowns that nearly derailed the FY2017 and FY2016 NDAAAs. One of the most-debated provisions of these defense bills would specifically exclude the greater sage grouse from being listed as an endangered species. The provision, which drew wry headlines from defense journalists, was nominally included in the NDAA to protect the military’s training ranges, but more realistically related to the fears of restrictions on mining following an endangered species designation and a accompanying conservation plan. The actual connection to the military was spurious, with several Pentagon offices issuing letters demurring any impact to training or military ranges from the designation of the sage grouse as endangered.¹¹⁶ But as Rep. Adam Smith (D-WA), the ranking member of the House Armed Services Committee put it, “we have a vehicle that moves, so people try to latch everything onto it.”¹¹⁷ Interestingly, this legislative opportunism appears to be partially driven by House and Senate

¹¹⁵ Beth et al., “Leadership Tools.”

¹¹⁶ Ariel Wittenberg, “No Need for Sage Grouse Language in Authorization – Pentagon,” *Energy and Environment Daily*, April 27, 2016, <https://www.eenews.net/stories/1060036309>

¹¹⁷ Joe Gould, “Grouse About This: A Funny-Looking Bird is Holding Up Key National Defense Legislation,” *Defense News*, September 27, 2016, <http://www.defensenews.com/articles/sage-grouse-ndaa-holdup>.

leadership, rather than by any rank-and-file member of either party. In the sage grouse fight, HASC Chairman Mac Thornberry (R-TX) had included the sage grouse provision in the Chairman's mark of the draft bill, which remained in the bill through the NDAA's enactment by the House.¹¹⁸ Strong Democratic opposition and a veto threat from the Obama administration led the Republican members of the Big Four (the Chairmen and Ranking Members of the HASC and SASC) to scrap the sage grouse provision in the interest of getting the NDAA passed. However, the House Republican leadership insisted on the provision, delaying the final passage of the NDAA (ultimately the sage grouse language was dropped). As Rep. Thornberry said, "these decisions get made above my pay grade, as far as whether a bill can come back to the House without a sage grouse provision in it."¹¹⁹

NDAA Timeline & Process

Understanding the set of legislative actors and the typical NDAA process is a necessary prerequisite to understanding how Congress can legislate on important national security issues out of the spotlight, using the NDAA as a vehicle. The NDAA is kicked off by the submission of the President's budget to Congress. While the budget is nominally due the first Monday in February, in practice, the budget has been submitted as late as April. In addition, the Pentagon also submits desired draft NDAA language shortly after the submission of the President's Budget.

¹¹⁸ National Defense Authorization Act for Fiscal Year 2017, H.R. 4909, 115th Cong. § 2864 (Chairman's Mark, n.d.); H.R. 4909, § 2864 (as placed on Senate Calendar, May 26, 2016).

¹¹⁹ Gould, "Grouse About This."

Following the submission of the budget to Congress, the House Armed Services Committee (HASC) and the Senate Armed Services Committee (SASC), hold a series of hearings in preparation for that year's NDAA. By tradition, the first hearings center around the Pentagon as a whole, with the Secretary of Defense and the Chairman of the Joint Chiefs of Staff making the pilgrimage to the Hill to deliver their prepared testimony. Subsequent HASC and SASC committee and subcommittee hearings cover a predictable scope, holding hearings and receiving testimony on the budget requests of the Army, Navy, Air Force, Special Operations, and other DOD activities. This marathon of hearings (in 2013, the House Armed Services Committee scheduled 45 hearings between February and May) plays an important role in the NDAA process. In addition to providing the details and rationales behind the President's budget submission, the hearings allow the committees and staff to solicit the positions of the various military components on key issues for that year's NDAA, and gather information through hearing testimony, hearing questions and answers, and subsequent written answers to questions for the record. For example, in 2013, in addition to the annual hearings focusing on the budgets of components of the armed forces (e.g. "Fiscal Year 2014 National Defense Authorization Budget Request for Missile Defense Programs," "The Fiscal Year 2014 National Defense Authorization Budget Request from the Department of the Air Force"), there were several hearings focusing on the coming transition out of Afghanistan ("Recent Developments in Afghanistan," "Transitioning to Afghan Security Lead: Protecting Afghan Women?," "Transition in Afghanistan: Views of

Outside Experts,”) sequestration (“Impacts of a Continuing Resolution and Sequestration on Defense,” “The Impact of the Current Budget-Constrained Environment on Military End Strength,”) and servicemember mental health (“Mental Health Research,” “Update on Military Suicide Prevention”).

Before and during the hearing process, SASC and HASC committee staff work to draft the committee’s versions, or marks, of the NDAA. This drafting process offers an opportunity to write substantive portions of the eventual legislation, often concentrating on issues of major importance to the Chairs of the committee and subcommittees, or the individual committee members. Each subcommittee of HASC and SASC develops their own marks, which contain provisions that fall within that subcommittee’s jurisdiction. Each Chairman also offers his or her own “mark,” or draft of the legislation. In recent years, DOD energy issues have fallen under the jurisdiction of the Readiness Subcommittee in both the HASC and SASC.¹²⁰

In the HASC, building the components of the bill that that will be reported out to the full House entails approximately one week of subcommittee “mark-ups,” during which each of the various HASC subcommittees meet separately to consider their subcommittee’s mark. During these subcommittee marks, the members of the

¹²⁰ HASC subcommittees for the 115th Congress include Emerging Threats and Capabilities, Military Personnel, Oversight and Investigations, Readiness, Tactical Air and Land Forces, Seapower and Projection Forces, and Strategic Forces. SASC subcommittees for the 115th Congress are Airland, Cybersecurity, Emerging Threats and Capabilities, Personnel, Readiness and Management Support, Seapower, and Strategic Forces. Although the subcommittees are generally quite stable from Congress to Congress, new subcommittees are sometime created, while other can be dissolved. For example, the SASC subcommittee on cybersecurity was created in the 117th Congress (2017-2019).

subcommittee may offer legislative policy proposals to be included in the subcommittee mark. These subcommittee markups are often pro-forma sessions, as contentious issues have been either resolved during the drafting process or tabled until the full committee. The subcommittees also draft amendments to be offered “en block”/“en banc” [sic] as a package, by the subcommittee chairman during the full committee markup. These amendments must be vetted by both the minority and majority of a committee, and thus must be uncontroversial enough to gain consensus approval. The mark-up process demonstrates the power of the committee and subcommittee chairmen and ranking members, who exercise control over the content of the subcommittee marks and the subcommittee en block amendment packages.

The culmination of these subcommittee mark-ups is the full committee markup, typically a long day-into-night session sometime in May where the subcommittee marks, subcommittee amendment packages and an array of committee members’ amendments are melded into the version of the bill that will be voted on by the full House Armed Services Committee. Budgetary proposals may only be offered as amendments before the full committee. The subcommittee marks and groups of en block amendments are usually incorporated without any changes. Controversial amendments, particularly those that require a recorded vote, are usually pushed to the end in order to allow the uncontroversial provisions to be incorporated without dragging out the process. At the end of this marathon mark-up, the full committee

votes on their draft of the bill. Typically it passes by an overwhelming margin, and is then reported out to the House as a whole.

In the HASC, this markup process is transparent. In recent years, the HASC website has devoted a section to the NDAA, which includes tools to track the progress of the NDAA through the committee and onto the floor. For example, for the markups for the FY2014 NDAA, the provided public tools and documents included the markup schedule, links to livestreams, and later, recorded videos, of each of the subcommittee and full committee markups, and preparatory material for each markup. The preparatory material included proposed legislative and committee report language, as well as explanations and notes on Committee intent for each section. For the FY2014 NDAA, the Readiness Subcommittee Markup material ran to 200 pages, including proposed legislative provisions with explanatory text, the legislative text of each provision, and proposed language and explanatory text for the accompanying committee report. For the full committee markup, the NDAA webpage also included information for members regarding offering amendments, a summary of all the amendments offered and their disposition, the full text of the en banc amendments and individual amendments offered, as well as the results of all the roll call votes on amendments.

The committee mark is followed by the associated committee report. In addition to describing the legislative sections in somewhat plainer terms, the committee report

frequently contains the expanded views of the committee regarding either a general policy question or a specific provision. It may suggest a particular outcome, or request a study or a briefing. While the committee report language is not binding, it is an important indicator of legislative intent, which the Pentagon prudently takes into consideration, giving it co-equal status with legislation in practical effect, if not in statute.

Following the HASC full committee markup, the NDAA is generally quickly taken up by the full House, with consideration the House floor. Amendments to be considered on the House floor must be pre-approved by the Rules Committee for germaneness, which greatly limits their number. Floor consideration of the NDAA can last anywhere from a few days to several weeks, depending on the controversies at hand, with members offering amendments as the appropriate section of the bill is reached. Following debate in 5-minute increments, amendments may be voted on either by voice vote or by a roll call vote. Floor consideration is the first direct opportunity for representatives who are not HASC members to offer commentary and amendments to the bill. As such, while many of the amendments are anodyne, in each year's NDAA there will often be a handful of more controversial, or even combative, amendments. While these debates may be very heated, as recent amendments regarding military detentions, sexual assault, and withdrawing from Afghanistan have been, they touch on only a smattering of provisions within the

NDAA. Despite fractious roll call votes on hot button amendments, the overall bill generally passes the House by a comfortable margin.

HASC generally holds its subcommittee and full committee markups in mid to late May, followed by House floor consideration of the bill shortly thereafter. Senate action on the NDAA typically follows the House consideration of its bill.

SASC markups generally commence in early June. (See Figure 1 for the typical timeline.) While HASC subcommittee and full committee markups are open to the public, and full records of amendments and votes made available, SASC markups have always been closed. While the committee must release the results of any roll call votes during markup (in accordance with Senate Rule XXVI 7(3)(b)), the debates, amendments, and non-roll call votes can remain secret. Staff preparations for the markup are also embargoed. While the nominal justification is concerns over national security, Shogan (2012) argues that more practical considerations prevail. Citing interviews with current and former SASC staffers, Shogan argues that the closed markup allows SASC staffers greater scope for candidness in discussion and pragmatism in compromise, freed from the scrutiny of the press, lobbyists and advocacy groups. However, proponents of openness have gained ground. The required committee vote to close has become less lopsided, and in 2011 Sen. McCaskill, Chairman of the Subcommittee on Readiness, began holding the Readiness subcommittee's markup in open session. As in the House, SASC generally

votes to report out the NDAA to the Senate floor by a comfortable margin, with the SASC Committee Report following shortly after the bill text.

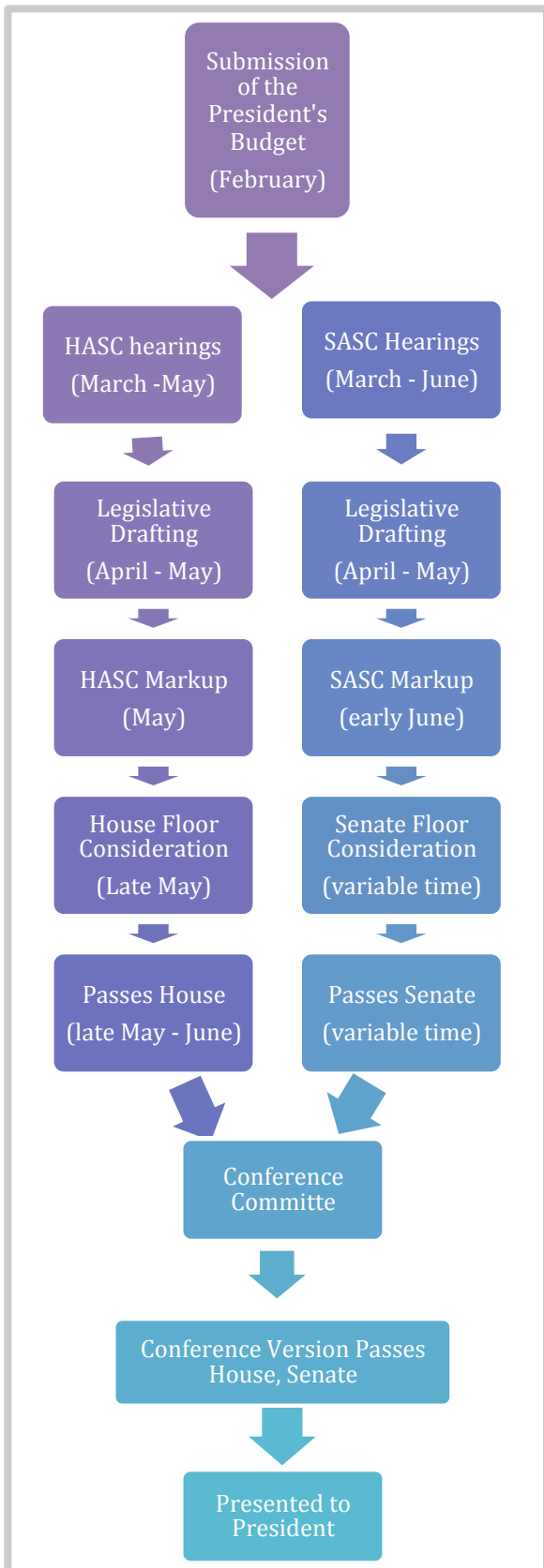
However, the lag between the SASC bill being reported out to the Senate as a whole and its consideration on the floor of the Senate is highly variable. In recent years, though the fiscal year ends at the end of September, the Senate has considered the NDAA as early as June and as late as December. Various obstacles can delay the consideration of the NDAA, including the lengthy August recess, campaign season, and other, more pressing legislative business (including, in recent years, a number of debates regarding government appropriations, the debt ceiling, and sequestration.) In one notable recent departure, the Senate did not have any floor consideration of the annual authorization bill for FY2013, instead receiving a ‘pre-conferenced’ version that both the Senate and the House had to vote on as-is, in order to ensure passage.

The scope and sweep of the NDAA, as well as the wide array of amendments that are offered during markups and floor consideration make the role of the committee chairs and ranking members very important in shaping the parameters of the bills. During the markup process, the subcommittee and committee chairs hold the power to determine what ends up in the marks, as well as to bundle amendments together into “blocks” which are nearly guaranteed passage. Once the bill reaches the floor, the committee chairman is the floor manager of the bill, and retains wide latitude to negotiate the bundling of amendments into blocks (the “manager’s package), require

a voice or recorded vote, and particularly on the Senate side, set the parameters of debate, or control which amendments will be allowed to be offered at all.

Following passage of the Senate version, it must be reconciled with the House bill via a conference committee. Conferees, appointed by the party leadership, are members on the respective defense committees, as well as selected other members on related committees. Unless specific provisions hold otherwise, conferees are required to broker a compromise on the areas of difference between the House and the Senate versions of the bill, and may not introduce new sections. Once conference negotiations are concluded, the final conference version is voted on by both the House and the Senate, and, if passed, presented to the President. While the NDAA has become an important piece of legislation, it remains a policy bill. Unlike the its annual companion appropriations bills, the Defense Appropriations Act and the Military Construction and Veterans' Administration Appropriations Act, the end-of-fiscal year deadline for the NDAA is more malleable.

Figure 1: Typical Timeline of House and Senate Action on the NDAA



The NDAA and Defense Policymaking

Various characteristics of the contemporary NDAA make it an attractive policy vehicle for legislators— both those who want to advance a policy agenda, as well as those who just want to be seen to be doing something. First, it is predictable. The NDAA process recurs annually, providing a guaranteed potential vehicle to include a legislative proposal in. Second, it is highly routinized – there are standard procedures for developing the subcommittee marks, en bloc amendment packages, committee markup amendments, and floor amendments. As Shogan notes, the annual consistency in the legislative hearing, markup, and floor actions process allows committee and professional staffers to gain familiarity and expertise with each year.¹²¹ Third, it is very broad in scope. While House rules typically require that floor amendments be germane to the bill being considered, the variety of areas touched by DOD makes this hurdle of germaneness easier to clear. The Senate has no such germaneness restrictions before cloture is invoked. As long as a problem is at least tangentially related to DOD, legislators can use the NDAA as a vehicle to address it. Fourth, it is large and complex, limiting legislators’ ability to review its provisions – provisions that aren’t *prima facie* controversial are unlikely to receive more than cursory scrutiny. Fifth, the threshold for an individual legislator to include a provision in the NDAA, particularly a committee member, is very low, especially compared introducing and advancing a new bill. Sixth, and related to its size and complexity, it is highly conserved. Absent strong and relatively organized

¹²¹ Colleen Shogan, “Defense Authorization: The Senate’s Last Best Hope” (Paper presented at the American Political Science Association Conference, Seattle, WA, September 1-4, 2011, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1900866), 17-18.

opposition, provisions are unlikely to be removed from a version of the bill as it evolves from the committees to the floor and to the final bill. The exception is for provisions on controversial topics, which may be challenged in committee or on the floor, and areas where the House and Senate versions disagree, in which case the conference committee will have to mediate between the two versions, may drop the controversial provision entirely. Finally, the NDAA is nearly guaranteed to be enacted into law. It is a must-pass bill in both the House and the Senate. Even when the NDAA faces a veto threat, the veto threat typically hinges on a small number of highly contested provisions. While the offending provisions may be amended, the vast majority of sections will be retained in the final enacted version of the bill. These characteristics have made the NDAA a favored vehicle for policymakers, and it has ballooned in size from its 1962 origins to the current sprawling size (the FY2013 NDAA, as enacted, runs to more than 650 pages).¹²² The length of the accompanying NDAA committee and conference reports has also grown steadily, mirroring the gradual expansion in the annual defense appropriations bill committee reports that Art documents.¹²³

The 56-year history of the NDAA has also expanded the set of tools that legislators can use to exert influence over the Pentagon. In addition to direct legislative action to create or amend a policy, the NDAA has also been used to shape defense policy more indirectly. Procedural provisions shift how the Department of Defense operates, and

¹²² National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, 126 Stat. 1632 (2013).

¹²³ Art, "Congress and the Defense Budget," 230.

mandated report can both shift DOD policy as well as signal close congressional attention to an issue. The NDAA also provides a forum and theatre for the other indirect means Lindsay and Ripley identify, such as signaling likely congressional reaction to the executive by including language in the accompanying committee reports, and shaping public opinion via the NDAA's precursor hearings.¹²⁴ Ross also identifies adjustments to authorized or appropriated funding, which can occur down to the specific line-items, and the real constraint of fixing policy minutia in statute, as direct tools of the committees. For the latter, Ross provides the compelling example of pharmacy and medical co-pays under the DOD health insurance plan, which Congress specifies to the penny.¹²⁵ Ross also notes that Congress also utilizes prohibitory language, which can tie the executive's hands on a certain action.¹²⁶ For example, the FY2017 NDAA prohibits DOD from spending any money to retire the A-10 Warthog close-air support plane, or from modernizing the *Ticonderoga*-class cruisers on the Navy's preferred schedule in order to maintain more cruisers at a time in the active Navy surface fleet.¹²⁷

The predictability of the annual NDAA incentivizes members of Congress, particularly those on the Armed Services Committee, to *plan* to engage in oversight and policymaking regarding national security policymaking and oversight of the Department of Defense, creating a defense policy and oversight demand signal.

¹²⁴ James M. Lindsay and Randall B. Ripley, "How Congress Influences Foreign and Defense Policy," *Bulletin of the American Academy of Arts and Sciences* 47, no. 6 (1994): 7-32.

¹²⁵ Alexis Lasselle Ross, "Legislating 'Military Entitlements': A Challenge to the Congressional Abdication Thesis" (PhD diss., George Mason University, 2015).

¹²⁶ Ross, "Legislating 'Military Entitlements,'" 24.

¹²⁷ National Defense Authorization Act for Fiscal Year 2017, Pub. L. No. 114-328, § 134, 130 Stat. 2037 (2016); § 1024, 130 Stat. 2389.

HASC and SASC are typically prestige appointments for legislators, and thus attract members who have strong policy interest in national security or who are trying to advance their institutional careers, in addition to legislators who may have strong constituency-driven interests in the committees' jurisdiction.¹²⁸ Whether Armed Services Committee membership is motivated by goods for their state or district, the prestige of committee appointment, or by a sincere policy interest, they must be seen by their constituents to be effective legislators.¹²⁹ Unlike other federal agencies, the regularity of the NDAA provides Congress with an accessible third option for

¹²⁸ Tim Groseclose and Charles Stewart III analyzed the apparent value of House and Senate committee seats from the 80th to the 102nd Congress, but there has been no recent update on how members of Congress value armed services committee seats. See Groseclose and Stewart, "The Value of Committee Seats in the House, 1947-91," *American Journal of Political Science* 42, no. 2 (1998): 453-74, and Stewart and Groseclose, "The Value of Committee Seats in the United States Senate, 1947-91," *American Journal of Political Science* 43, no. 3 (1999): 963-73. Anecdotally, members who represent districts or states with a large military presence are often members of the armed services committee.

¹²⁹ For a starting point on the literature of members of Congress' committee assignment motivations and committee organization, see Richard F. Fenno Jr., *Congressmen in Committees* (Boston: Little, Brown, 1973); Richard L. Hall, "Participation and Purpose in Committee Decision Making," *American Political Science Review* 81, no. 1 (1987): 105-27; and E. Scott Adler, "Constituency Characteristics and the 'Guardian' Model of Appropriations Subcommittees, 1959-1998," *American Journal of Political Science* 44, no. 1 (2000): 104-14. David R. Mayhew's, *Congress: the Electoral Connection* (New Haven: Yale University Press, 1974), which posited that re-election was the driving motivation of members of Congress, and identified credit-claiming as an important element in signaling to constituents, opened a rich vein of literature into the electoral motivations and behaviors of legislators. Anecdotally, while working as a defense analyst at the Congressional Research Service, during the NDAA cycle I would field several calls from military legislative assistants asking for ideas for amendments and policy their member of Congress could introduce for that year's bill. Gregory Wawro extends theories of Representatives' motivations to pursue legislative entrepreneurship and committee work in *Legislative Entrepreneurship in the U.S. House of Representatives* (Ann Arbor: University of Michigan Press, 2000), concluding that successful entrepreneurship helps legislators accrue institutional power in the House, in addition to exogenous re-election benefits or endogenous policy interests. Jonathan Woon ("Issue Attention and Legislative Proposals in the U.S. Senate," *Legislative Studies Quarterly* 34, no. 1 (2009): 29-54) finds that committee membership, driven by assignment or policy interest rather than a close constituency interest, is the greatest predictive factor for legislators' activity on an issue, while committee membership and committee leadership provide Senators more influence on an issue area. Regrettably, though his analysis examines legislator attention and efforts across nine issue areas (crime, employment, health care, agriculture, banking, communications, energy, trade, and transportation), Woon does not include either defense or national security as an issue area.

oversight, beyond the “fire alarms” installed within the agency bureaucracy or intermittent oversight “police patrols” by Congress.¹³⁰

Shogan, drawing on numerous interviews with Senate Armed Services’ committee staffers, attributes the near-guaranteed passage of the bill through the fractious Congress to, “a complex mixture of committee traditions, rules, processes, a robust hearing schedule, bipartisanship, professional staff relationships, floor strategy, and widely shared belief in the overall mission [of the Department of Defense].”¹³¹ While Shogan credits the annual passage of the NDAA to the bipartisan culture and strong working relationships of the committee staff, and the strongly formalized and routinized process known on the hill as the “NDAA cycle,” the size and scope of national security interests concerns of the United States and the Department of Defense as a bureaucracy also contribute to the existence of an annual policy bill. Put simply, the Department of Defense is the single largest government agency, comprising about half of domestic discretionary federal spending, with over 1.3 million active duty servicemembers, over 800,000 more servicemembers in the National Guard and Reserve, and about 750,000 civilian personnel. The defense industry employs another 1.1 million people.¹³² Moreover, with sufficient creativity, many policy provisions can be construed to impact national security, ranging from developments in Russia’s nuclear doctrine to the country of manufacture for Army

¹³⁰ Mathew D. McCubbins and Thomas Schwartz, “Congressional Oversight Overlooked: Police Patrols versus Fire Alarms.”

¹³¹ Shogan, “Defense Authorization.”

¹³² Aerospace Industries Association, *The Strength to Lift America: The State of the U.S. Aerospace and Defense Industry*, December 2016, http://www.aia-aerospace.org/wp-content/uploads/2016/12/AIA_StateOfIndusrtyReport_2016_V8.pdf.

recruits' athletic shoes.¹³³ The broad scope of national security and the Pentagon, combined with the expansive jurisdictional remit of the House and Senate Armed Services Committees, means there is abundant opportunity for defense policymaking and oversight of the Pentagon.¹³⁴

The NDAA's relatively low barrier to entry and annual recurrence means that it can be a forum for defining policy problems, as well as solving them. In Kingdon's terms, it can serve as the venue for the problem stream, as well as the solution stream.¹³⁵ Calls for reports or studies are a perennial favorite tool of legislators. While these provisions individually may not amount to much, they perform an important political function, allowing members to claim some credit for addressing a problem, and define the scope of a potential problem for later action. They can also perform a signaling function, flagging congressional interest in a topic for DOD. The annual NDAA cycle also incentivizes DOD to treat congressional concerns about an issue seriously in order to deflect more intrusive congressional policymaking in later years' bills. A concern that is noted in a sense of Congress statement in the

¹³³ The Barry Amendment, which requires DOD to purchase wholly American-made clothing and textiles, previously did not apply to footwear. However, after years of lobbying and Congressional effort, this loophole was closed in the FY2017 NDAA. See Michaela D. Platzer, *Defense Primer: The Barry and Kissell Amendments* (CRS Report No. IF10609) (Washington, DC: Congressional Research Service, 2017), <https://fas.org/sgp/crs/natsec/IF10609.pdf>.

¹³⁴ While issue monopolies within a single committee may be dead, the Armed Services Committees have the opposite privilege, of being able to claim that nearly anything or everything touches upon national security, and hence falls into the committees' jurisdiction. For more on issues of committee jurisdiction, see David C. King, *Turf Wars: How Congressional Committees Claim Jurisdiction* (Chicago: University of Chicago Press, 1997); and Bryan D. Jones, Frank R. Baumgartner, and Jeffery C. Talbert, "The Destruction of Issue Monopolies in Congress," *American Political Science Review* 87, no. 3 (1993): 657-71.

¹³⁵ John Kingdon, *Agendas, Alternatives, and Public Policies* (Boston: Brown, Little, 1984).

accompanying committee report today may be a mandated annual report in next year's bill, and a substantial, and binding or unpleasant (to DOD), policy change or prohibition the following year.

These characteristics make the NDAA a unique policy bill, and one that is less amendable to analysis using the traditional approaches of legislative scholars. A broad body of legislative scholarship focuses on understanding legislators' effectiveness or patterns of partisanship via bill sponsorship or co-sponsorship.¹³⁶

However, the NDAA is always introduced by the chairman of the House and Senate Armed Services committees, rendering the typical analysis of bill introduction and co-sponsorship not salient. The HASC and SASC have acknowledged jurisdiction over the bill, mooting battles or partisan maneuvering over which committees will be able to influence the bill.¹³⁷ Additionally, the NDAA is only partially subject to the

¹³⁶ For leading analyses of legislator effectiveness, see E. Scott Adler and John Wilkerson ("The Scope and Urgency of Legislation: Reconsidering Bill Success in the House of Representatives" (Paper presented at the Annual Meeting of the American Political Science Association, Washington, DC, September 1-4, 2005, <http://www.congressionalbills.org/APSA%202005%20%203.pdf>)), argue persuasively for incorporating the *type* of legislation into aggregations of legislator effectiveness, while Craig Volden and Alan E. Wiseman (*Legislative Effectiveness in the United States Congress* (Cambridge: Cambridge University Press, 2014)) propose an elegant model that weights the extent of legislator effectiveness by the degree of difficulty of achievement at each stage of legislation. For an introduction to scholarship on legislative co-sponsorship, see Wendy J. Schiller, "Senators as Political Entrepreneurs: Using Bill Sponsorship to Shape Legislative Agendas," *American Journal of Political Science* 39, no. 1 (1995): 186-203, and Daniel Kessler and Keith Krehbiel, "Dynamics of Cosponsorship," *American Political Science Review* 90, no. 3 (1996): 555-66. For a recent close analysis of trends in co-sponsorship, see Laurel Harbridge, *Is Bipartisanship Dead? Policy Agreement and Agenda-Setting in the House of Representatives* (Cambridge: Cambridge University Press, 2015).

¹³⁷ Kenneth A. Shepsle and Barry R. Weingast ("The Institutional Foundations of Committee Power," *American Political Science Review* 81, no. 1 (1987): 85-104) make a strong argument that it is committees' place in the legislative process that is the source of their power and influence. While committees can experience gradual erosion or expansion of their jurisdictions through bill referral precedents (see David C. King, "The Nature of Congressional Committee Jurisdictions," *American Political Science Review* 88, no. 1 (1994): 48-62), William Bendix ("Bypassing Congressional Committees: Parties, Panel Rosters, and Deliberative Processes," *Legislative Studies Quarterly* 41, no. 3 (2016): 687-714) makes a strong argument for the role of partisanship in shaping jurisdictions,

partisan tools of agenda control – it will not be “winnowed” by the committee chair.¹³⁸ The annual recurrence and must-pass status of the NDAA means that it will reach the floor. However, as for other bills, the House Rules committee does exert considerable influence in approving which amendments will be allowed to be offered on the House floor, and the bill is still subject to the full array of procedural maneuvers and gambits on the floor of the House and Senate.¹³⁹ The typical wide margins of final passage mean that analyzing legislators’ voting decisions based on roll-call votes on final passage of a bill will similarly be less analytically rewarding. Overall, these characteristics of the NDAA suggest that the HASC and SASC will be

finding that between 1989 and 2010 moderate committees, polarized committees, and committees with moderate chairs were often excluded from bill-writing, while extreme majority-party committees were not.

¹³⁸ Among the foundational texts on agenda control in the U.S. Congress is Gary W. Cox and Mathew D. McCubbins, *Legislative Leviathan: Party Government in the House* (Berkeley: University of California Press, 1993). This book originated the procedural cartel theory, which holds that legislators from one party band together to advance their common legislative and policy goals by ceding some of their prerogatives to a central party authority, including control over which bills reach the floor. Cox and McCubbins updated and extended this theory in *Setting the Agenda: Responsible Party Government in the U.S. House of Representatives* (Cambridge: Cambridge University Press, 2005). Sean Gailmard and Jeffery A. Jenkins extend this argument regarding negative agenda control to the Senate in “Negative Agenda Control in the Senate and House: Fingerprints of Majority Party Power,” *Journal of Politics* 69, no. 3 (2007): 689-700, while Jenkins and Nathan W. Monroe examine the nuances of the intra-majority party coalition and legislative benefits – and inducements – in “Buying Negative Agenda Control in the U.S. House,” *American Journal of Political Science* 56, no. 4 (2012): 897-912, and “Partisan Agenda-Control in the US House: A Theoretical Exploration,” *Journal of Theoretical Politics* 24, no. 4 (2012): 555-70. Glen S. Krutz characterized the committee chairman’s role in agenda control as “winnowing” in “Issues and Institutions: ‘Winnowing’ in the U.S. Congress,” *American Journal of Political Science* 49, no. 2 (2005): 313-26.

¹³⁹ For more on the role of the Rules Committee shaping the consideration of bills in the House, see Douglas Dion and John D. Huber, “Procedural Choice and the House Committee on Rules,” *Journal of Politics* 58, no. 1 (1996): 25-53; and Charles J. Finocchiaro and David W. Rohde, “War for the Floor: Partisan Theory and Agenda Control in the U.S. House of Representatives,” *Legislative Studies Quarterly* 33, no. 1 (2008): 35-61. For an outstanding compendium and analysis of the legislative procedures and gambits utilized to effect agenda control on the Senate floor, see Richard S. Beth, Valerie Heitshusen, Bill Heniff Jr., and Elizabeth Rybicki, “Leadership Tools for Managing the U.S. Senate” (Paper presented at the Annual Meeting of the American Political Science Association, Toronto, ON, September 3-6, 2009, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1450625).

particularly important in shaping the content of the NDAA, and function as the main locus for defense policymaking and oversight.

Overall, the development of the defense authorization process has been significant in re-ordering the relationship between the authorizers and the appropriators, and the Congress and the Pentagon. Quantitatively, the evidence for the authorizers' power comes in the increased numbers of and magnitude of congressional alterations to DOD budget items, more frequent and more significant Armed Services committee hearings, longer committee reports by both the authorizers and the appropriators, and longer and more contentious floor action on the annual authorizations and appropriations bills. Without a doubt, the annual authorization bill process has become a powerful institutional mechanism for congressional involvement in national defense matters.¹⁴⁰ However, ultimately congressional action on defense policy remains driven by congressional interest in defense policy, as either a means or an end in itself.¹⁴¹

¹⁴⁰ Art, "Congress and the Defense Budget," 238, citing Robert Bledsoe, "Congressional Committees and the Defense Budget: By the Numbers" (Washington, DC: Roosevelt Center for the Study of Public Policy, Spring 1983); Jamie M. Morin, "Squaring the Pentagon: The Politics of Post-Cold War Defense Retrenchment" (PhD diss., Yale University, 2003); Laurance, "The Changing Role of Congress," 245; Lindsay, "Congress and Defense Policy," 373.

¹⁴¹ Art, "Congress and the Defense Budget," 241.

Chapter 3: How Congress Makes Defense Policy – Four Defense Energy Case Studies

Introduction

The growth of the NDAA as the preferred vehicle for defense policymaking, as discussed in the previous chapter, makes it a ripe topic of study. In order to more cleanly trace the various legislative threads, this dissertation uses the single issue area of the Pentagon's use of energy as the lens through which to examine defense policymaking in Congress.

Congressional interest in how the Pentagon uses energy – whether gasoline, aviation fuel, bunker oil, electricity, coal, or steam – began in 1974 following the OPEC oil embargo, when DOD and other federal agencies were required to reduce energy use by 15% within two years.¹⁴² However, after the short-term crisis eased, the topic of the Pentagon's energy use faded from both public and congressional interest for about 30 years. In the mid-2000s, defense energy re-emerged as a policy area for congressional policy-making, with a sharp increase in the number of sections dealing with DOD energy issues proposed and enacted in the annual defense policy bill.

There are a number of potential factors motivating greater congressional action. The

¹⁴² Federal Energy Administration Act of 1974 (Pub. L. No. 93-275, 88 Stat. 96 (1974)), which passed soon after the OPEC oil embargo, contained a variety of provisions related to federal energy conservation. These provisions formalized the Federal Energy Management Program (FEMP), which was chartered by Presidential order on June 29, 1973, and tasked with reducing federal government energy use by 7% in FY1974 and by 15% in FY1975 from a FY1973 baseline. In FY1974, DOD reduced its energy use by 25% under the auspices of the newly-created Directorate for Energy Plans and Conservation, part of the office of the Assistant Secretary for Installations and Logistics, according to the Federal Energy Management Program (Office of Energy Conservation and Environment, *FY1974: First Annual Report* (Washington, DC: Federal Energy Administration, December 1974), 8).

wars in Iraq and Afghanistan had thrown the human and logistical toll of the Pentagon's prodigious appetite for energy, especially liquid petroleum fuels, into the congressional spotlight. The looming problem of global climate change was coming into sharper focus. At the same time, the viability and cost-effectiveness of alternative energy technologies, especially for generating electricity, was increasing exponentially. Within the annual NDAA process, the Armed Services Committees began to take up the Pentagon's energy demands as an area requiring both policymaking and oversight.

A brisk flurry of congressional action saw the creation of the Director of the Office of Operational Energy Plans and Programs at the Assistant Secretary level, reporting directly to the Secretary of Defense.¹⁴³ Requirements for facility energy efficiency have continued to tighten, leading to a goal that DOD (and other federal agencies) reduce its facility energy usage by 30% by FY2015 and source 25% of its power from renewable sources by 2025.¹⁴⁴ Energy security at installations has also received sustained congressional attention, principally through requirements for various reports. Through additional reporting requirements, the annual energy management report has become a valuable tool for evaluating DOD's facility energy initiatives. "Operational energy" – the energy DOD uses to fight and train – became a broadly

¹⁴³ The Director of the Operational Energy Plans and Programs office was elevated to the Assistant Secretary level by the FY2011 NDAA (Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, § 901, 124 Stat. 4317 (2011)).

¹⁴⁴ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 431, 121 Stat. 1607 (2007); John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 2852, 120 Stat. 2496 (2006).

accepted concept in Congress, with consistent support for DOD efforts to improve operational energy efficiency in the HASC and SASC committee reports associated with the NDAA.

This chapter, drawing from interviews with congressional staff and former members of Congress, delves into the goals, aims, and legislative process for four sets of legislative efforts, chosen to illustrate the spectrum of congressional policymaking on defense energy:

- A provision advanced by the Chair and Ranking Member of a Subcommittee on the House Armed Services committee that would have required nuclear propulsion for all new Navy ships over a certain tonnage;
- A handful of provisions advanced by House Armed Committee staff to force the Department of Defense to consider tactical energy use as a core planning and operational priority through bureaucratic re-organization;
- A stand-alone bill that would require an array of energy-efficiency measures across the domains of operational and installation energy, introduced by a Representative and a handful of Senators on their chamber's armed services committee; and
- Near-annual efforts to exempt DOD's fuel purchases from a requirement that alternative fuels not be more carbon-intensive than conventional fuels, advanced by a variety of House and Senate Republicans.

By illustrating the specific qualitative narrative and legislative history behind a representative subset of legislative provisions, this chapter will be able to shed light on core questions around the exercise of defense policymaking in practice:

- What has motivated these congressional actors to advance legislative provisions?
- What actors are able to advance defense policy through the National Defense Authorization Act (NDAA)?
- How have these legislative efforts succeeded or failed?
- What different legislative paths have they taken, and what does this illustrate about the avenues of defense policymaking?

I use these qualitative narrative case studies to illustrate what types of defense policies and types of policymaking approaches succeed in Congress.

Nuclear-Powered Surface Combatants

American submarines and aircraft carriers are already exclusively nuclear-powered. In the mid 2000s, Reps. Roscoe Bartlett (R-MD) and Gene Taylor (D-MS) became advocates of requiring that other large surface combatants, including cruisers, destroyers, and amphibious assault ships, also be nuclear-powered. As the Chairman and Ranking Member of the House Armed Services Committee Seapower Subcommittee, both Rep. Bartlett and Rep. Taylor were superbly positioned to see their vision of a nuclear-powered surface fleet become reality. Their efforts provide a

clear view into how even relatively powerful Subcommittee chairmen have to hew to the NDAA process, the importance of tying their efforts to improved national security, and the difficulties of implementation.

Rep. Bartlett, who lost his seat in 2012, was a strong believer in the need for more renewable energy sources. He was driven by what he saw as the clear inevitability of running out of oil resources, characterizing the current depletion of oil without a plan to transition to renewables as “intergenerational theft.” A former engineer in the Navy, Bartlett recalled being deeply impressed by a 1957 speech by Admiral Rickover, the father of the nuclear Navy, as well as by President Carter’s exhortations to use less energy in the 1970s. In Congress, Rep. Bartlett tried tirelessly to rouse his colleagues, giving the same speech about Peak Oil on the (usually empty) House floor over 50 times, by his own estimation, founding the Peak Oil Caucus in 2005, and joining the Defense Energy Security Caucus.¹⁴⁵ Although aware of his outsider status (“Most republican colleagues in the house thought I was somewhat weird for my position on energy”), Rep. Bartlett was deeply concerned that others in Congress didn’t share his sense of urgency. He attributed his lack of support from his colleagues to their lack of knowledge, expressing the optimistic hope that “if they took the time [to understand], they would be more supportive, but they just don’t know.” However, in the same conversation, he was contemptuous of his Republican colleagues’ unwillingness to even consider the problems posed by peak oil or the

¹⁴⁵ Rep. Roscoe Bartlett in interview with the author, October 2014.

merits of conservation and renewable energy sources. Bartlett recalled a conversation about efficiency he had had with a Republican colleague. The Republican has finally exclaimed, “enough of this ridiculousness! We’re a nation of consumers, we’ve gotta buy a big car, fill it with gas, and go on vacation.” Bartlett was deeply frustrated with this head-in-the sand stance – as he said, “I’m a *very* conservative Republican, but I’m not an *idiot*.”¹⁴⁶

Often seen as a kook, particularly after his primary focus switched to the dangers of an Electromagnetic Pulse (EMP) attack on the national grid, Rep. Bartlett nevertheless remained a tireless, if one-note advocate of reducing the nation and the military’s reliance on oil.¹⁴⁷ From his perspective, the military was shortsightedly focused on the costs related to oil (Cushing crude peaked at over \$145/barrel in July 2008), rather than the strategic considerations.¹⁴⁸ In the foreign policy realm, Bartlett was troubled over the close relationship between the US and Saudi Arabia. As he described it, “Saudi Arabia, their government, represents everything we despise, but we’re the best of friends. But we depend on them. They have oil we need, and they’re happy to sell it to us.”¹⁴⁹ He also cited the critical, and often overlooked

¹⁴⁶ Bartlett, interview. Emphasis in the original.

¹⁴⁷ See, for example, Jason Koebler, “The Congressman Who Went Off the Grid,” *Politico Magazine*, January 3, 2014, <http://www.politico.com/magazine/story/2014/01/roscoe-bartlett-congressman-off-the-grid-101720?paginate=false>; and Ben Pershing, “Survivalist Roscoe Bartlett Prepares for Future in Doubt,” *Washington Post*, August 12, 2012, https://www.washingtonpost.com/local/md-politics/the-survivalist-roscoe-bartlett-prepares-for-a-threatened-future/2012/08/17/040e76c6-dda9-11e1-8e43-4a3c4375504a_story.html.

¹⁴⁸ U.S. Energy Information Administration (EIA), “Cushing, OK WTI Spot Price FOB” (web page), <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=D> (updated September 27, 2017).

¹⁴⁹ Bartlett, interview.

strategic imperative that oil played in World War II. Japan's fear that the United States would cut off their oil imports contributed to their decision to preemptively attack at Pearl Harbor, while Hitler opened up the Eastern Front with Russia prematurely in 1942 in order to access Caspian Basin oil with the main goal of the oilfields at Baku, as Germany's demand was outstripping their ability to produce fuel from coal via the Fischer-Tropsch process and limited access to imports.¹⁵⁰

In Congress, Rep. Bartlett was the Chair or Ranking Member of the Seapower Subcommittee of the House Armed Services Committee for a long portion of his 12-term congressional career, alternating roles with his friend and colleague Rep. Gene Taylor, (D-MS) as control of the House went back and forth. In addition to his role on the Seapower Subcommittee Rep. Taylor had also been on the HASC Readiness committee. In his words, Rep. Taylor and Rep. Bartlett "agreed on almost everything," but particularly about the military's vulnerability to disruption in their fuel supplies.¹⁵¹ Rep. Taylor highlighted four particular points that made him aware of the military's fuel vulnerability: times when steaming hours had to be cut back due to budget shortfalls, the attack on the USS Cole when it was docked in Yemen to refuel in 2000, the oil, gas and power disruptions in his home state following Hurricane Katrina in 2005, and the clear vulnerability of the fuel convoys in Afghanistan. In our conversation, Rep. Taylor also recalled being "almost appalled"

¹⁵⁰ Bartlett's claims are discussed at length by World War II military historians, among them Scott D. Sagan in "From Deterrence to Coercion to War: The Road to Pearl Harbor," in *The Limits of Coercive Diplomacy*, 2nd ed., ed. Alexander L. George and William E. Simons (Boulder, CO: Westview Press, 1994), 57-90, and Joel Hayward in "Hitler's Quest for Oil: The Impact of Economic Considerations on Military Strategy, 1941-42," *Journal of Strategic Studies* 18, no. 4 (1995): 94-135.

¹⁵¹ Rep. Gene Taylor in interview with the author, September 2014.

that the United States military had had to rely on “about 90” chartered foreign-flagged ships to refuel the battle fleet in the Gulf War.¹⁵² Both also emphasized the military benefit of surface combatants not needing to be refueled. As Rep. Taylor put it, “The DDG-51 is the greatest destroyer in the world. It protects the [nuclear-powered] carriers, but it runs out of fuel every three days. Opponents can wait it out, and there are only two oilers in the Pacific.”¹⁵³

Rep. Taylor and Rep. Bartlett focused on ships – as the Chair and Ranking Member of the Seapower Subcommittee, it was squarely within their jurisdiction. Both Rep. Bartlett and Rep. Taylor also cited the availability of alternate means of production for Navy ships, with the nuclear-powered carrier serving as Exhibit A. In their minds, with the technology available, there was little reason not to move forward. Indeed, the Navy had built a total of 9 nuclear-powered ships in 5 designs in the 1970s, driven by a desire to provide the nuclear-powered aircraft carriers escort ships that were also nuclear-powered, enabling them to have a similar range and speed rather than needing to stop or slow for refueling. Nuclear propulsion of major combat vehicles was actually required by the FY1975 NDAA. However, this nuclear mandate for surface ships was short-lived. Procurement of nuclear-powered surface combatants, other than aircraft carriers, stopped in the late 1970s out of a desire to

¹⁵² Taylor, interview.

¹⁵³ Taylor, interview.

reduce procurement costs, and the nuclear mandate was repealed in the FY1979 NDAA. All 9 of these nuclear-powered cruisers were retired in the late 1990s.¹⁵⁴

A HASC staffer who was involved in energy issues during this time frame described bringing Rep. Bartlett to meet with Naval Reactors, the office responsible for the Navy's nuclear propulsion, in 2003 or 2004. According to the staffers' recollection, he was "trying to show Rep. Bartlett that there is not the logistics problem with nukes [that there is with oil]. Nuke propulsion has less of a logistics tail. Oil, you need hundreds of thousands of gallons, plus tankers, the tankers' needs, etc.." ¹⁵⁵ This visit appears to have sparked Rep. Bartlett's interest in nuclear-powered combatants. Rep. Bartlett (or his staff) got the ball rolling in 2005 by asking for Naval Reactors (responsible for the nuclear propulsion of the aircraft carriers and submarines) to conduct a study comparing the total life-cycle costs of nuclear vs. conventionally powered large-deck amphibious assault ships and surface combatants. In 2006, a section of the FY2006 NDAA required the Navy to do a more detailed cost analysis of the costs incorporation of alternate propulsion systems, including nuclear, of surface and amphibious combat vehicles, as well as when the lifecycle costs of nuclear powered ships would be lower than of conventional oil-powered ships. This study found that nuclear propulsion would add about \$600 million each to the procurement cost of a small surface combatant, \$700-800 million to the cost of each

¹⁵⁴ Ronald O'Rourke, *Navy Nuclear-Powered Surface Ships: Background, Issues, and Options for Congress* (Washington, DC: Congressional Research Service, September 29, 2010), <https://www.fas.org/sgp/crs/weapons/RL33946.pdf>. The FY1975 NDAA (Pub. L. No. 93-365, § 801, 88 Stat. 408 (1974)) established the nuclear mandate for surface combatants, while the FY1979 NDAA (Pub. L. No. 95-485, § 810, 92 Stat. 1623 (1978)) replaced the mandate with a statement on Navy shipbuilding policy that did not mandate nuclear propulsion.

¹⁵⁵ Interview with House Armed Services Committee (HASC) staffer, November 2014.

medium surface combatant, and \$800 million to the procurement costs of amphibious assault ships. The Operation and Maintenance cost savings from avoiding fuel costs would vary depending on the actual operational tempo of the ship and projections of how much fuel it would burn. If crude oil cost \$74 per barrel, mandating nuclear propulsion would increase the total lifecycle costs of the ship by between 17-37% for small surface combatants, 0-10% for medium surface combatants, and 7-8 % for amphibious assault ships.¹⁵⁶ Although the benefits of a faster transit time and the ability to remain on station without interruptions in the mission for refueling were outside of the scope of the study, quantifying the additional lifecycle costs allows for a debate over how much the potential operational benefits of nuclear-powered surface combatants could be worth. The Navy was also required to consider nuclear propulsion in the official Analysis of Alternatives for the next-generation cruiser program, the CG(X).

Reps. Bartlett and Taylor built on this study in the next year's NDAA. The House-reported version of the FY2008 bill included a provision that would mandate that all future submarines, aircraft carriers, and large surface combatants that would be part of a carrier strike group or sea base, be nuclear-powered.¹⁵⁷ The accompanying HASC report, filed May 11, 2007, gave further detail of the HASC's intentions and directly referred to the prior year's report:

¹⁵⁶ O'Rourke, Navy Nuclear-Powered Surface Ships, 9-10.

¹⁵⁷ National Defense Authorization Act for Fiscal Year 2008, H.R. 1585, 110th Cong. § 1012 (as reported in House, May 11, 2007).

The committee believes that the mobility, endurance, and electric power generation capability of nuclear powered warships is essential to the next generation of Navy cruisers. The Navy's report to Congress on alternative propulsion methods for surface combatants and amphibious warfare ships, required by section 130 of the National Defense Authorization Act for Fiscal Year 2006 (Pub. L. No. 109-163), indicated that the total lifecycle cost for medium-sized nuclear surface combatants is equivalent to conventionally powered ships.

The committee believes that the primary escort vessels for the Navy's fleet of aircraft carriers should have the same speed and endurance capability as the aircraft carrier. The committee also notes that surface combatants with nuclear propulsion systems would be more capable during independent operations because there would be no need for underway fuel replenishment.¹⁵⁸

Neither Rep. Bartlett nor Rep. Taylor could recall the precise legislative maneuvering that led to the inclusion of Sec. 1012 in the HASC mark of the FY2008 NDAA.

However, it is highly likely that they were able to use the 2006 study to persuade any skeptics on the committee or head off broader opposition from the House floor. In particular, the HASC committee report's interpretation of the study's cost estimates leans heavily on that conclusion that nuclear power *could* be cost-neutral. While this

¹⁵⁸ O'Rourke, *Navy Nuclear-Powered Surface Ships*, 25, citing House Armed Services Comm., National Defense Authorization Act for Fiscal Year 2008, H.R. Rep. No. 110-146, at 387 (2007).

is a generous interpretation of the actual study's result, it is likely that the much greater procurement cost of nuclear surface combatants would be an obvious rebuttal to the nuclear-propulsion mandate. Even if the lifecycle costs were equal, nuclear-powered ships would have a much greater up-front procurement cost, requiring either a commensurate increase in the Navy's shipbuilding budget on the hope of longer-term Operation and Maintenance savings over the expected three decades of the ships' service lives, or keeping the shipbuilding budget constant and re-allocating resources from other shipbuilding projects. Neither option would be palatable when it came to actually appropriating funds. In particular, the latter option would require adjustments, perhaps significant, to the Navy's annual 30-year shipbuilding plan. These issues were discussed at length in the conference report language on the final bill, which also provided directive language to the Navy on implementation. The language noted that the next opportunity for the Navy to include nuclear propulsion on a medium surface combatant was the CG(X) program to replace the Navy's cruisers. But with a planned contract award in FY2011, time was short. The FY2008 conference language required the Navy to submit a report with the FY2009 budget request, detailing what a nuclear-powered CG(X) (A CGN(X)) would require. The considerations included: impact on the hull design, including displacement and manning; additional costs for design and development; impact on the ship construction and delivery timetable; costs with certifying the shipyards that work on

conventional surface combatants; impacts on the Navy's 30-year shipbuilding plan; other impacts; and possible risks of pursuing a nuclear cruiser.¹⁵⁹

In the FY2009 NDAA, the HASC expanded the nuclear-propulsion mandate to include all amphibious assault and amphibious command ships whose tonnage exceeds 15,000.¹⁶⁰ The accompanying report language moves beyond the nuclear carrier strike group as a rationale, arguing that "the future naval force should not be reliant on the availability of fossil fuel for fleet operations. Removing the need for access to fossil fuel sources significantly multiplies the effectiveness of the entire battle force and eliminates the dependence on foreign nation support of deployed naval forces."¹⁶¹ With no supporting or opposing provision in the Senate bill, this House section was incorporated into the final enacted law.¹⁶²

Meanwhile, the Navy's CG(X) program was hitting delays, nuclear-propulsion or no. In the next year's FY2009 NDAA, the Senate version noted that the Analysis of Alternatives, a necessary pre-condition for moving forward with any acquisition decisions, "targeted for September 2007, would slip into 2009."¹⁶³ Without an agreed-upon set of requirements, the program activities set out by the FY2009 budget

¹⁵⁹ O'Rourke, *Navy Nuclear-Powered Surface Ships*, 26-27, citing H.R. Rep. No. 110-477, at 984-986 (2007) (Conf. Rep.). The conference report repeated this language from the committee's report (H.R. Rep. No. 110-146, at 387).

¹⁶⁰ Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, H.R. 5658, 110th Cong. § 1013 (as reported by the House Armed Services Comm., May 16, 2008).

¹⁶¹ O'Rourke, *Navy Nuclear-Powered Surface Ships*, 23, citing House Armed Services Comm., Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, H.R. Rept. No. 110-652 pt. 1, at 428-429 (2008).

¹⁶² Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417, § 1015, 122 Stat. 4586 (2008). The Senate bill was S. 3001.

¹⁶³ O'Rourke, *Navy Nuclear-Powered Surface Ships*, 23, citing Senate Armed Services Comm., National Defense Authorization Act For Fiscal Year 2009, S. Rep. No. 110-335, at 195 (2008).

request was deemed unrealistic. Accordingly, the Senate recommended holding the appropriate budget line items for the CG(X) program steady at FY2008 levels, rather than funding the \$120.9 m increase requested in the FY2009 budget submission.

The HASC proponents of nuclear power, namely Rep. Bartlett and Rep. Taylor, remained undeterred. The committee report accompanying the FY2010 NDAA reiterated the committee's commitment to nuclear-powered surface combatants in general, and an integrated nuclear power system for the CG(X) in particular.¹⁶⁴ Not resting on their laurels, the House mark of the FY2010 NDAA also included a requirement that the Navy study the potential use of liquid thorium reactors in Navy surface combatants.¹⁶⁵ However, the Senate was beginning to stir. In the FY2007, FY2008, and FY2009 NDAs, the HASC provisions had met with resounding silence from the Senate Armed Services Committee. According to Rep. Bartlett and Taylor's recollections, Sen. Levin, the senior Democrat on SASC, had been supportive of their goals. Sen. McCain had been less supportive, but hadn't opposed them. In the FY2010 NDAA, in 2009, the Senate version included a section that would have repealed the nuclear-powered surface combatant requirement. The accompanying committee report cites concerns about cost and technological feasibility. The report describes the increased cost of nuclear propulsion a burden on the Navy, "already having too much difficulty meeting the goal of a 313-ship fleet." It also is skeptical of the cost and schedule growth problems of using nuclear

¹⁶⁴ O'Rourke, 19, citing House Armed Services Comm., National Defense Authorization Act for Fiscal Year 2010, H.R. Rep. No. 111-166, at 72-75 (2009).

¹⁶⁵ National Defense Authorization Act for Fiscal Year 2010, H.R. 2647, 111th Cong. § 246 (as reported by the House Armed Services Comm., June 18, 2009).

propulsion on smaller ships.¹⁶⁶ These cost and acquisition concerns have the hallmarks of Sen. McCain, then the ranking member on SASC, and a frequent and vociferous critic of DOD on acquisition issues. Nevertheless, in the conference report, the Senate receded, allowing the nuclear propulsion requirement for surface combatants to stand.¹⁶⁷ The Senate conferees did quash Rep. Bartlett and Rep. Taylor's study on using liquid thorium nuclear reactors in surface combatants, making the well-taken point that "molten salt reactors are inherently corrosive to metals," such as ships.¹⁶⁸

The CG(X) program was cancelled in the FY2011 budget, in February 2010 in favor of building more Arleigh Burke Flight III destroyers. The cancellation of the CG(X) meant that there was no longer any obvious opportunity to expand the use of nuclear power in the surface fleet, beyond its use in aircraft carriers. The future evolution of the Navy surface combatant fleet is just beginning, with the Navy's new fleet structure assessment completed in early 2017. While the Navy is grappling with a host of issues in this study, including the problem of networking ships, sensors, and strikers together, missile defense, and new capabilities like laser weapons, nuclear propulsion for surface ships appears to be definitively off the table. With both Rep. Bartlett and Rep. Taylor no longer in Congress, this requirement seems likely to quietly fade away, having accomplished nothing.

¹⁶⁶ O'Rourke, *Navy Nuclear-Powered Surface Ships*, 21, citing Senate Armed Services Comm., National Defense Authorization Act For Fiscal Year 2010, S. Rep. No. 111-35, at 170 (2009).

¹⁶⁷ O'Rourke, 22-23, citing H.R. Rep. No. 111-288, at 822 (2009) (Conf. Rep.).

¹⁶⁸ H.R. Rep. No. 111-288, at 708.

Although there is no prospect of a nuclear-powered surface combatant on the horizon, Rep. Bartlett was sanguine about the overall arc of their efforts, and expressed his firm belief that future Navy surface combatants would have nuclear propulsion. Rep. Taylor also saw mandating nuclear propulsion for surface ships as one of a small handful of times that the Congress has made a significant positive impact on DOD's operations during his time in office. On the broader question of DOD energy, Rep. Bartlett predicted that the issue would fade out of view. As he put it, the "urgent always takes precedence over the important in Congress."¹⁶⁹ Perhaps self-important, Rep. Bartlett didn't see anyone else in Congress as taking up the mantle of DOD energy. He also predicted that the Pentagon's interest would wane, outside the pressing issues of war-time logistics and record-high oil prices.

Despite the lack of impact, this provision still offers several lessons about defense policymaking. First and foremost, this example illustrates how provisions can make it into the subcommittee or committee mark of the bill. Once there, they stand an excellent chance of being remaining in the bill's permutations into the final bill and enacted law. As Rep. Bartlett recalled, "to get things in the bill, you just have to have people not actively oppose it. When people looked at it [the provision to require that surface combatants have nuclear propulsion], they thought that it wouldn't be bad to get something like that in [the bill]."¹⁷⁰

¹⁶⁹ Bartlett, interview.

¹⁷⁰ Bartlett, interview.

Second, it illustrates the importance of strong working relationships in getting provisions into the mark and carving out space for your issues. Rep. Bartlett and Rep. Taylor coordinated with the chairman and ranking member of the Readiness subcommittee, Rep. Forbes (R-VA) and Rep. Ortiz (D-TX), even organizing a Readiness subcommittee hearing on ship fuel issues – a somewhat unusual accommodation from the Readiness subcommittee. A HASC committee staffer who was involved in energy issues during this period described the overall tone of the committee as congenial. As the staffer described, the Readiness committee chair and ranking member didn't have to zealously guard their prerogatives or fear that Rep. Bartlett and Rep. Taylor were trying to usurp them. Not driven by energy issues but not opposed, they let Rep. Bartlett and Rep. Taylor take the lead, without ceding their purview or their preeminence in other issues.¹⁷¹ Both Rep. Bartlett and Rep. Taylor separately emphasized their collegiality with their colleagues and their close working relationship with each other as key to their success. Rep. Bartlett described it as more of a professional courtesy in an area where their jurisdictions overlapped than a necessary hoop to jump, recalling Reps. Forbes and Ortiz as being largely distant from his and Rep. Taylor's effort.¹⁷² Rep. Taylor was more sensitive to the role jurisdiction plays, emphasizing that any of the 435 members of Congress could be a potential opponent, but that reaching out as a matter of courtesy could have a big impact. As he quipped, "There were a few giants in the house, like Murtha. The

¹⁷¹ Interview with HASC staffer, November 2014. Rep. Hefley (R-CO), Rep. Ortiz (D-TX), and later Rep. Forbes (R-VA) were the chairmen and ranking member of the Readiness subcommittee during this timeframe.

¹⁷² Bartlett, interview.

mere mortals get things done with cooperation.”¹⁷³ But even so, these provisions “stayed in [their] lane,” by focusing on ship propulsion.

Third, this example also illustrates how independently the House and the Senate committees generally operate. As Rep. Bartlett joked, “those two bodies could be 1,000 miles apart. The Senate could be in Idaho or something.”¹⁷⁴ While Rep. Bartlett recalled Sen. Tom Udall and Sen. Mark Udall as both being interested in defense energy issues, there was no effort to coordinate a legislative strategy with potential allies on SASC.

Fourth, this example demonstrates the power of position vis-a-vis the NDAA process. As Chair and Ranking member of the relevant subcommittee in their own right, it is not clear to what extent Reps. Bartlett and Taylor needed the approval or the acquiescence of their subcommittee members. As the chair and ranking member in turn of their shared subcommittee, Reps. Bartlett and Taylor were able to include their provision in their subcommittee’s mark of the NDAA on their own authority. Their relationship with the rest of the subcommittees was cordial and collaborative, although not necessary to include their language in their committee’s mark, it did help build support and stave off opposition.

¹⁷³ Taylor, interview. Rep. Murtha (D-PA) was a famously influential and deal-making defense hawk. Murtha’s formidable ability to advance his legislative priorities is described by Margaret Shapiro, “Murtha Quietly Becomes a House Legend,” *Washington Post*, November 26, 1985, <https://www.washingtonpost.com/archive/politics/1985/11/26/murtha-quietly-becomes-a-house-legend/bf720535-6a94-4f8a-9010-ea09e38dabea/>.

¹⁷⁴ Bartlett, interview.

Finally, it illustrates that there is almost always someone higher up the food chain that has to buy into your idea. As one personal staffer recalled, you first had to convince the professional staff, then the committee leadership.¹⁷⁵ Although Rep. Bartlett and Rep. Taylor were the authorities within the Seapower subcommittee, they still had to win the approval of the “Big 4” – the chair and ranking member of the HASC and SASC. The amount of legislative freedom others on the committee had was largely determined by the chairman. As the HASC committee staffer recalled, the working atmosphere within the committee ranged from a pragmatic focus on what they viewed as key problems, a more ecumenical, delegated approach, to a more “vindictive” personal approach.¹⁷⁶ Rep. Bartlett and Taylor needed the approval of the HASC and SASC chair and ranking member partly in order prevent those in the Navy who opposed the nuclear propulsion provisions from finding a powerful ally on the hill to block the sections. This was not a trivial concern – both Rep. Bartlett and Rep. Taylor recalled support from the Navy’s nuclear community, but fierce opposition from Navy brass, partly due to the greater capital costs and the impact building nuclear-powered surface ships would have on the Navy’s shipbuilding. But more significantly, opposition of any one of the Big 4 could have effectively vetoed their provision if they weren’t supportive, or supportive enough. Fortunately for Rep. Bartlett and Rep. Taylor, the Big 4 in 2008 – Rep. Ike Skelton (D-MO), the chairman of HASC, Rep. Duncan Hunter (R-CA), the ranking member, Sen. Carl Levin (D-

¹⁷⁵ Interview with personal staff of a member active on energy issues in HASC, August 2014.

¹⁷⁶ Interview with HASC staffer, November 2014.

MI), the SASC Chairman, and Rep. John McCain (R-AZ), were either strongly supportive or neutral towards Rep. Bartlett and Taylor's provision.

Operational Energy

A small handful of HASC staffers were convinced that the Pentagon needed someone in the building to transform the way it thought about and used energy. In the FY2009 NDAA, drafted in spring 2008, section 902 created what was meant to be a powerful new office in the Office of the Secretary of Defense, the Director of Operational Energy Plans and Programs, under only the Secretary and Deputy Secretary of Defense. The Director of Operational Energy Plans and Programs was inspired by the position of the Director of Operational Test and Evaluation, which oversaw all of DOD's testing of weapons systems and often provides a realistic pin to burst the service's optimism about the capabilities and delivery schedule of weapons systems. The Office of Operational Energy Plans and Programs was given authority over all DOD activities that touched operational energy, ranging from the services' energy activities, energy demands in the acquisitions process, and RDT&E investments. The office was also charged with "the establishment and maintenance of a department-wide transformational strategy for operational energy," with "near-term, mid-term, and long-term goals, performance metrics . . . and a plan for implementation of the strategy." To give the Office of Operational Energy Plans and Programs teeth, the provision also required that it certify the budgets of each of the services as adequate or inadequate to execute the operational energy strategy. The services were to comply, naming a senior official in each services to coordinate with the Director of

Operational Energy Plans and Programs (OEPP) and giving OEPP the results of all studies and initiatives and any data or records the Director needed to carry out their duties. The intent of Congress was clear: DOD used far too much fuel in the field, and the human, tactical, strategic and financial costs of getting it there were too high. In the accompanying report language, HASC emphasized that non-installation energy accounted for 75% of DOD's total energy use, and raised concerns about the "heavy logistical burden imposed by fuel."¹⁷⁷ In the view of Congress, DOD was not able or willing to coordinate its various internal bureaucracies in order to focus on the problem of energy, and so Congress would act for the Pentagon.

This new concept of operational energy was defined in the same bill as "the energy required for training, moving, and sustaining military forces and weapons platforms for military operation, ... includ[ing] energy used by tactical power systems and generators and weapons platforms."¹⁷⁸ Other sections in the FY2009 NDAA put the tactical use of energy in the foreground, gathering information on DOD's energy use and pushing the department towards greater efficiency. Section 331 required an annual Operational Energy Strategy report, detailing DOD's operational energy use and expenditures over the previous five years, forecasts for the next two years, and a detailed accounting of each initiative related to reducing DOD's operational energy demand. Section 332 called for the development of a methodology for including energy demand as a key performance parameter, i.e. an essential criteria in the

¹⁷⁷ House Armed Services Comm., Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, H.R. Rept. No. 110-652 pt. 1, at 409 (2008).

¹⁷⁸ Pub. L. No. 110-417, § 902, 122 Stat. 4564 (2008).

acquisition process. It required DOD to develop a metric to weight energy use and the additional costs and logistics needs of transporting the fuel a system would need. Finally, Section 333 mandated a study on the ability to generate electricity via wind and solar for expeditionary forces, such as the troops then stationed in remote outposts in Afghanistan, rather than relying on trucked-in fuel for generators.

The Office of Operational Energy Plans and Programs was the brainchild of a small handful of HASC staffers, assisted by a few dedicated Pentagon officials, who were convinced only an office inside the Pentagon's byzantine bureaucracy, endowed with real administrative power, would be able to make inroads into shifting the Pentagon's energy culture and use. But how did a few committee staffers finagle the creation of a powerful Pentagon office, apparently under the radar? Several of the individuals involved agreed to speak with me about their work on these provisions, both on and off the record.

According to several staffers, one element enabling this stream of legislative activity was 2006 elections, which flipped control of the House of Representatives to the Democrats.

One staffer was deeply committed to energy issues as a key priority, not only for the Pentagon, but for the nation as a whole, viewing the failure to pursue alternative energy as a "moon shot" after the terrorist attacks of September 11, 2001, as a huge missed opportunity. In this staffer's view, the Republicans on the HASC "didn't give

a shit” about energy. When the Democrats took over the majority, they “had to figure out how to speak about conservation in a way that speaks to the national security implications” in order to marshal Republican support for their efforts.¹⁷⁹ As part and parcel of this switch in majority control, the Democratic professional staffers on the House Armed Services committee were far more empowered than they had been in the minority, and were able to focus on DOD’s energy use as a legislative priority.

Another staffer recalled having the opportunity to make energy their particular area of focus, and frame the key issues related to DOD’s use of energy and the ways Congress could act on these problems once the Democrats took the majority. In this staffer’s view, the service’s needs for energy were being overlooked in the acquisition process, leading to great costs, both in dollars and in lives. Moreover, per this staffer, the services themselves saw energy as an opportunity space, implementing a wide array of energy initiatives, like the Air Force’s synthetic fuels program, but with little coordination, prioritization, or oversight. Absent a national energy policy, DOD, as the largest consumer in the U.S., could potentially have a large influence. The myriad of service initiatives provided an implicit avenue for congressional action and oversight, while the spiking fuel costs required direct action from Congress, in the form of emergency supplemental appropriations funding for the Pentagon.¹⁸⁰

¹⁷⁹ Interview with HASC staffer, October 2014.

¹⁸⁰ Interview with HASC staffer, May 2015.

Despite the strong partisan feelings expressed by one particular staffer, the constraints of the committee system mandated that the provisions put forward as part of the committee marks have strong bipartisan support. Indeed, a small team of Republican and Democratic HASC staffers worked diligently as a team to tackle operational energy as a core policy area of the readiness subcommittee.¹⁸¹ Shared bipartisan concern about the risks troops faced in bringing fuel to the front lines in Iraq and Afghanistan, and conviction that this fuel burden could be reduced, united the Democratic and Republican HASC staffers involved.¹⁸² Another Democratic staffer intimately involved recalled the establishment of the Operational Energy Plans and Programs office as “for the most part, ... a very bipartisan process.” That provision, “was the chairman’s mark in subcommittee, which meant that it was agreed to by both majority and minority.”¹⁸³ In effect, while the office could be a Democratic initiative, enabled by Democratic control of the House and majority status on the HASC, it had to have bipartisan support from the Republican professional staff to advance out of the subcommittee mark as part of the NDAA.

However, this small nucleus of committee staffers still had to build bipartisan support for the establishment of the Operational Energy Plans and Programs Office and the concept of operational energy among the HASC committee members, particularly those on the Readiness subcommittee. In many ways, the staffers involved laid the legislative groundwork themselves. Although there had been a Defense Science

¹⁸¹ Interviews with HASC staffers, May 2015; June 2016.

¹⁸² Interviews with HASC staffers, October 2014; May 2015; June 2016.

¹⁸³ Interview with HASC staffer, May 2015.

Board report on the operational benefits of reducing DOD's energy use in 2001,¹⁸⁴ it hadn't made much of an impact. (The report's principal author, Tom Morehouse, acknowledged as much in an interview.¹⁸⁵)

A hearing on September 26, 2006 held jointly by the Terrorism, Unconventional Threats and Capabilities subcommittee and the Readiness subcommittees, of the House Armed Services committee, while the Republicans were in the majority, illuminates the consensus thinking about the risks of DOD's current energy use when the Pentagon's energy use began to be a focus of HASC's legislative attention. The hearing was a broad survey of DOD's efforts to increase their energy efficiency and pursue alternative energy investments, from alternative fuels to greater efficiency in building systems. The Chairman of the Terrorism, Unconventional Threats and Capabilities subcommittee, Rep. Jim Saxton (R-NJ), framed the hearing as part of Congress' oversight responsibility, evaluating DOD's investments in alternative energy and energy efficiency. Rep. Hefley (R-CO), the Chairman of the Readiness subcommittee, highlighted the operational demands and the financial costs of DOD's fuel use, mentioning the often-cited figure that the Air Force's costs go up by \$600 million annually for every \$10/barrel increase in oil prices. Finally, Rep. Solomon Ortiz (D-TX), the Ranking Member of the readiness subcommittee, focused on the link between energy security and national security. Despite these different, and

¹⁸⁴ Richard H. Truly and Alvin L. Alm, *More Capable Warfighting through Reduced Fuel Burden* (Washington, DC: Defense Science Board, May 2001), <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392666>.

¹⁸⁵ Tom Morehouse in interview with the author, January 2015.

partisanly-inflected positions, each member of Congress was able to find a slice of interest in DOD's energy use. Overall, the Members of Congress at the hearing were remarkably collaborative, interested, and supportive of DOD's efforts. As then-Rep. Mark Udall (D-CO) put it, "I have never seen in my eight years on the Hill so much interest in this [DOD energy] across party lines."¹⁸⁶ Despite the generous expressions of support for DOD's energy efforts made by each of the 15 Representatives in attendance (7 Republicans and 8 Democrats), this hearing failed to make much of an impact, according to a staffer. What was missing was a consensus understanding of the operational risks of DOD's current energy use, and the potential benefits of greater fuel efficiency and alternative technologies.

As that staffer put it, this effort to build support among HASC members and staffers spanned, "an entire year or more," with "one hearing one year, one hearing next year." A hearing held in March 2008, just before the HASC NDAA markup, offered the staffers the opportunity to frame DOD's current tactical use of energy as a problem. A second, in March 2009, focused more narrowly on the problems with DOD's reliance on fuels in the battlespace. In addition, they were able to utilize the momentum and political pressures of external events. Staffers specifically cited the casualties associated with fuel convoys in Iraq and Afghanistan and the fuel price

¹⁸⁶ Alternative Energy and Energy Efficiency Programs of the Department of Defense: Joint Hearing Before the Terrorism Unconventional Threats and Capabilities Subcommittee Meeting Jointly with Readiness Subcommittee of the Committee on Armed Services, House of Representatives, 109th Cong., H.A.S.C. No. 109-127 (September 26, 2006).

spike in early 2008 that led to commanders to cut back on steaming hours, and flying hours as their fuel budgets ran out as advancing the political conversation.

In order to frame the problem of DOD's tactical energy use, and outline solutions, the staffers worked with the legislative agencies, the Congressional Research Service (CRS) and the Government Accountability Office to lay the groundwork for legislative activity.¹⁸⁷ A CRS report on reducing DOD's reliance on fossil-based aviation fuel was published in March 2007. In addition to describing various initiatives DOD could take, and their pros and cons, it outlines six options for Congress, including the establishment of a DOD Office of Energy Security in order to enable greater bureaucratic organization and focus on energy security issues.¹⁸⁸ The HASC subcommittee on readiness also commissioned two GAO reports on DOD's mobility fuel efforts, driven by these staffers. Requesting a GAO report on a particular area, often framed to support particular solutions, is a common legislative tactic to define the problem and potential solutions. As an independent, non-partisan legislative agency whose analyses are based on months of research and transparent methodology, GAO reports can carry more weight than the proposals of individual members. In effect, a GAO report can enter a set of facts or a problem into the

¹⁸⁷ Interviews with HASC staffers, May 2015; June 2016.

¹⁸⁸ Kristine E. Blackwell, *The Department of Defense: Reducing its Dependence on Fossil-Based Aviation Fuel – Issues for Congress* (CRS Report No. RL34062) (Washington, DC: Congressional Research Service, June 15, 2007), <https://www.fas.org/sgp/crs/natsec/RL34062.pdf>. The other five options for Congress are: mandate fuel efficiency in aircraft, mandate fuel efficiency as a consideration in new DOD acquisitions, allow DOD to enter into contracts for synthetic fuels that are longer than five years, direct DOD to allocate more funding to R&D on alternative aviation fuels, and mandate some level of alternative aviation fuel use.

collective record. Moreover, GAO reports include specific recommendations, with which the audited agency, in this case the Department of Defense, may either reject, partially concur with, or concur with. Eliciting the concurrence or partial concurrency of the target agency can also be valuable ammunition for those trying to take action on an issue. Specifically, in the first report, completed in March 2008, the subcommittee asked GAO to “(1) identify key departmental and military service efforts that have been undertaken to reduce demand for mobility energy and (2) assess the extent to which DOD has established an overarching organizational framework to guide and oversee these efforts.”¹⁸⁹ The primary author of this GAO study, William Solis, the director of the defense management and capabilities section of GAO, was also asked to testify about the flaws in DOD’s current mobility energy approach.¹⁹⁰ The second GAO report, published in February 2009, focused on DOD’s ability to reduce fuel demand at forward-deployed locations, such as forward operating bases in Afghanistan.¹⁹¹ As before, the HASC Readiness subcommittee also asked the primary author, again William Solis, to testify at a hearing.¹⁹² One

¹⁸⁹ Government Accountability Office, *Overarching Organizational Framework Needed to Guide and Oversee Energy Reduction Efforts for Military Operations* (GAO-08-426) (Washington, DC: U.S. Government Accountability Office, March 2008), <http://www.gao.gov/assets/280/273697.pdf>. Each GAO report identifies the requesting office or committee, if applicable, and what the terms of reference for the study were.

¹⁹⁰ William M. Solis, *Defense Management: Overarching Organizational Framework Could Improve DOD’s Management of Energy Reduction Efforts for Military Operations, Testimony Before the House Armed Services Committee, Readiness Subcommittee* (GAO-08-523T) (Washington, DC: U.S. Government Accountability Office, March 2008), <http://www.gao.gov/assets/120/119405.pdf>.

¹⁹¹ GAO, *Defense Management: DOD Needs to Increase Attention on Fuel Demand Management at Forward-Deployed Locations* (GAO-09-300) (Washington, DC: U.S. Government Accountability Office, February 2009), <http://www.gao.gov/assets/290/286363.pdf>.

¹⁹² William M. Solis, *Defense Management: Increased Attention on Fuel Demand Management at DOD’s Forward-Deployed Locations Could Reduce Operational Risks and Costs, Testimony Before the House Armed Services Committee, Readiness Subcommittee* (GAO-09-388T) (Washington, DC: U.S. Government Accountability Office, March 2009), <http://www.gao.gov/new.items/d09388t.pdf>.

staffer closely involved recalled that a photo of a miles-long fuel convoy in Afghanistan reproduced in the 2009 GAO report, caused members to focus on operational energy, including “members you wouldn’t think would support it, like Rep. Duncan Hunter (R-CA).”¹⁹³ (See Figure 2).

*Figure 2: Three-Mile Backup of Fuel Delivery Trucks and Other Supply Vehicles Inside Afghanistan along the Northern Passage from Pakistan (February 2007)*¹⁹⁴



The March 2008 hearing focused far more aggressively on the operational risks of the Pentagon’s current energy use, as well as the potential operational benefits of greater

Specifically Solis (Director of the GAO’s Defense Management and Capabilities Section) testified before the committee about the recently completed GAO report cited above, *DOD Needs to Increase Attention on Fuel Demand Management*.

¹⁹³ Interview with former HASC staffer, June 2016.

¹⁹⁴ GAO, *Overarching Organizational Framework*, 6. Photo credit: Headquarters, U.S. Marine Corps (Arlington, VA: U.S. Marine Corps, February 2007).

energy conservation and versatility, than the September 2006 hearing had.¹⁹⁵ William Solis, the principal author of the commissioned GAO report about DOD's energy efforts, testified that, "DOD's current approach to mobility energy lacks (1) a single executive-level OSD official who is accountable for mobility energy matters, (2) a comprehensive strategic plan for mobility energy, and (3) an effective mechanism to provide for communication and coordination of mobility energy efforts among OSD and the military services as well as leadership and accountability over each military service's efforts," – a strong rationale for creating the Operational Energy Plans and Programs office, with an empowered director. The March 2008 also focused on a 2008 Defense Science Board (DSB) report, "Less Fuel, More Fight," on which Tom Morehouse was again a lead contributor. Among the recommendations was the suggestion that DOD needed a comprehensive energy strategy for deployed systems and a senior energy official empowered to implement it.¹⁹⁶

Around the time of the March 2008 hearing, Tom Morehouse recalled that he and Chris DiPetto, then in the Office of the Director for Defense Research and Engineering, and on the task force for the 2008 report, went to the hill several times to talk to HASC members and staff. Generally, Morehouse recalled that when he and DiPetto discussed energy needs and logistical risks, they got "bipartisan, bicameral

¹⁹⁵ *Department of Defense Energy Posture: Hearing Before the Readiness Subcommittee of the Committee in Armed Services, House of Representatives, 110th Cong., H.A.S.C. No. 110-134 (March 13, 2008).*

¹⁹⁶ Defense Science Board, *Report of the Defense Science Board Task Force on DoD Energy Strategy, More Fight - Less Fuel* (Washington, DC: Defense Science Board, February 2008), 68, <http://www.acq.osd.mil/dsb/reports/ADA477619.pdf>.

support. ... No-one at a perceptual level really disagreed.” In particular, Morehouse recalled strong interest from several staffers who would be instrumental in shaping the legislation that created the Office of Operational Plans and Programs, as well as strong interest from Rep. Ortiz (D-TX), then chair of the Readiness subcommittee. A staffer closely involved in DOD energy efforts at the time described the impact congressional delegations to Iraq and Afghanistan had in shaping the bipartisan concerns of the members, including the risks the troops faced in guarding these fuel convoys and the weight and sheer numbers of disposable batteries troops at forward outposts had to carry to power essential electronics on patrol. One staffer recalled Rep. Ortiz (D-TX), then the Chair of the Readiness Subcommittee, as “astounded” that the physical burden on the troops.¹⁹⁷

The provision creating the Office of Operational Energy Plans and Programs appeared in the Readiness subcommittee’s mark of the FY2009 NDAA in May 2008. The inclusion this new office in the committee’s mark, although customarily drafted by the staff, nevertheless required the support of the members of the subcommittee, especially the Chairman and the ranking member. This is where the diligent cultivation of members’ support by the HASC staffers paid off. In the Chairman’s summary of the HASC mark of the FY2009 NDAA, Chairman Ike Skelton (D-MO) highlighted the creation of the position of Director, Operational Plans and Programs, noting that, “a February 2008 Defense Science Board report concluded that DOD has

¹⁹⁷ Interview with HASC staffer, June 2016.

failed to establish and meet operational energy goals due to lack of leadership.”¹⁹⁸

The HASC committee report on the reported bill also flagged the creation of the Director for Operational Energy Plans and Programs, noting that Deputy Secretary of Defense had included energy as one of the top 25 transformational challenges and “the challenges in achieving this transformational vision.”¹⁹⁹

According to a staffer intimately involved in creating the position of Director of Operational Plans and Programs, their intent was to design an office with “enough influence and enough authority that they wouldn’t get lost in DOD.”²⁰⁰ The staffers involved knew that authority in the DOD bureaucracy was critical, and intended for the position to have a direct reporting line to the Deputy Secretary and Secretary of Defense – enough authority to be able to move a recalcitrant and fragmented department forward on mobility energy issues. In many ways, the Director of Operational Energy Plans and Programs was modeled after the position of the Director of Operational Test and Evaluation DOT&E. An independent organization, separate by design from the office of the Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L), DOT&E was the exclusive authority and responsibility for all operational testing and evaluation of weapons systems to confirm operational effectiveness and suitability in combat, providing independent

¹⁹⁸ House Armed Services Comm., *H.R. 5658: FY2009 National Defense Authorization Act Summary*, May 28, 2008, <https://web.archive.org/web/20080528201052/http://armedservices.house.gov/pdfs/fy09ndaa/FINAL051508.pdf>.

¹⁹⁹ House Armed Services Comm., *H.R. Rept. No. 110-652 pt. 1*, at 408-409 (2008).

²⁰⁰ Interview with HASC staffer, May 2015.

assessments, separate from the services'. In order to ensure that DOT&E would have sufficient authority to avoid getting steamrolled by the services or AT&L, DOT&E reports directly to the Secretary of Defense and Congress. OEPP was endowed with a similar reporting authority.

In tandem with the creation of the OEPP office, the FY2009 NDAA also mandated the creation of an operational energy report and strategy.²⁰¹ Like the OEPP office, the idea for this report originated with the HASC staff. Despite the problems in-theater with DOD's fuel use, there was little to no data on how much fuel DOD actually used, and no systematic collection or analysis of the data that did exist. A ready point of comparison was the Department of Defense Annual Energy Management Report assembled by the Deputy Under Secretary of Defense for Installations and Energy, which ran to some 200 pages detailing DOD's electricity, natural gas, steam, water, and coal usage. Financially, there was little incentive for DOD to worry about how much fuel it used, as the fuel costs were paid out of the very general operation and maintenance accounts, and funded through supplemental war funding in any case. Part of the hope with the operational energy report was that highlighting the scope of DOD's use of fuel would motivate offices within DOD to consider energy demands when making decisions about new systems.²⁰²

²⁰¹ Pub. L. No. 110-417, § 331, 122 Stat. 4419 (2008).

²⁰² Interview with HASC staffer, June 2016.

Relatedly, several HASC members, including Rep. Bartlett (R-MD), were concerned about the volume of fuel and logistics needs weapons systems required, and the extent to which those needs simply weren't factors in the acquisition process. The operational energy report would be a starting point to enumerate what those needs were, to allow Congress and supportive offices and individuals within DOD to make a fuel-burdened analysis possible for future systems.²⁰³ Section 332 of the HASC bill required consideration of the fuel logistics support needs in the requirements process, requiring the inclusion of fuel efficiency, specifically the fully-burdened cost of fuel, as a key performance parameter in the requirements development process and the analysis of alternatives, in which key decisions on future weapons systems are made. This section also required DOD to complete an implementation plan within 180 days, and be implemented within 3 years.²⁰⁴ The OEPP office was intended to be the senior position whose responsibility these efforts would be – someone to bring these issues to the table when decisions were being made.²⁰⁵

In the staffers' recollections, the creation of the Director of Operational Energy Plans and Programs was entirely staff-driven. When asked about the degree of involvement of members on HASC, they described Rep. Ortiz (D-TX) and Rep. Forbes (R-VA) as supportive and familiar with the provisions, as well as Rep. Taylor (D-MS). To include the provisions creating this office and empowering it with the ability to craft and operational energy strategy and certify the service's energy investments as

²⁰³ Interview with HASC staffer, June 2016.

²⁰⁴ H.R. 5658, 110th Cong. § 332 (as reported by the House Armed Services Comm., May 16, 2008).

²⁰⁵ Interview with HASC staffer, June 2016.

sufficient, the staffers described presenting the idea and the legislative language to the members of the readiness subcommittee, who would then vote on it. Several times, the staffer emphasized the bipartisan support necessary to have these provisions included in the chairman's mark, noting that these provisions weren't controversial, a perspective supported by another staffer who was intimately involved.²⁰⁶ Another staffer involved concurred that this effort had been purely a staff initiative.²⁰⁷ While this effort might have been principally driven by a small handful of HASC staffers, both Republican and Democrat, others closely involved in DOD energy issues in the HASC during this time period also didn't view it as a partisan effort. In discussing the OEPP, both Begtrup and McKeon, Rep. Giffords' staffers, emphasized that the law containing the provision was signed into law by President Bush, ascribing to it Presidential support that it almost certainly did not have.²⁰⁸ More realistically, the creation of the OEPP office operational in the HASC Readiness mark was a strong

²⁰⁶ Interviews with HASC staffers, May 2015; June 2016.

²⁰⁷ Interview with HASC staffer, October 2014.

²⁰⁸ Gavi Begtrup and Ryan McKeon in interview with the author, October 2015. However, their recall of the partisan history of this section must be considered suspect. In the interview, they described President Bush as reluctant to implement this provision or to fill the position of Director of OEPP. They attributed this reluctance to the position and office's creation in the final months of the Bush administration, and given its potential significance and impact, an office that would more appropriately be stood up by the next administration, due to opposition by President Bush. But in the actual signing statement on the FY2009 NDAA (Pub. L. No. 110-417, 122 Stat. 4356 (2008)), President Bush specifically calls out the provision creating the Director of Operational Energy plans and Programs (§ 902), as well as three other sections (851, 902, 1211(2), and 1508(b)) as "purport[ing] to impose requirements that could inhibit the President's ability to carry out his constitutional obligations to take care that the laws be faithfully executed, to protect national security, to conduct diplomatic negotiations, to supervise the executive branch, to appoint officers of the United States, and to execute his authority as Commander in Chief. The executive branch shall continue to construe such provisions in a manner consistent with the constitutional authority and obligations of the President." The other three sections specifically mentioned in the brief signing statement mandated the creation of the Commission on Wartime Contracting in Iraq and Afghanistan, prohibited the use of any funds authorized by that bill to exercise U.S. control Iraq's oil resources, and directed the U.S. government to ensure that the Iraqi Security Forces were paid for using Iraqi funds (George W. Bush, *Presidential Statement on Signing the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009*, 44 Weekly Comp. Pres. Doc. 1346 (October 14, 2008)).

indicator that the provision had strong bipartisan support within the committee. Moreover, this focus on operational energy within HASC received general acquiescence in the conference committee, with no opposition from the Senate, passing easily into the final enacted bill.²⁰⁹

The OEPP office was already running into strong headwinds within DOD. Reflecting on the creation of the office, a key staffer notes that it's difficult, bureaucratically, to create a new office, as you necessarily pull some areas or responsibilities that people considered theirs, and putting it somewhere else. "You have to take some turf, or pull some turf to someone else."²¹⁰ Another staffer involved noted opposition within AT&L, as they felt that this new office would circumscribe or dilute their authority. This staffer also described as DOD fighting the new office "kicking and screaming."²¹¹ The office's congressional creators and advocates tried to establish the office's authority more firmly. In the FY2010 bill, OEPP received authorization of \$5 million to stand up the office. As the key staffer recalled, they created the office, but didn't have funding for it in 2008. We "probably should have started with funding for it."²¹² As in many other realms, money is power. Another would have tried harder to get senior uniformed officials like the service chiefs to advocate for the importance of operational energy and this office.²¹³ Section 903 also forcefully clarified the authorities and reporting structure of the director of OEPP, stating that

²⁰⁹ Interview with HASC staffer, June 2016.

²¹⁰ Interview with HASC staffer, May 2015.

²¹¹ Interview with HASC staffer, June 2016.

²¹² Interview with HASC staffer, May 2015.

²¹³ Interview with HASC staffer, June 2016.

the director's role was to "provide leadership, conduct oversight, and be accountable for operational energy plans and programs in the Department of Defense and the Army, Navy, Air Force, and Marine Corps." It continued, stating that "Congress envisioned that the Director would have a direct line of communication with the Secretary of Defense and the Deputy Secretary of Defense, including participation in the Deputy's Advisory Working Group," rejecting DOD's intent to establish the OEPP office "as administratively reporting to the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L))" and having reporting authority to the Secretary of Defense only through that under secretary.²¹⁴ DOD's efforts to avoid creating a powerful independent office can also be seen in their written responses to the 2008 GAO report, where they "partially concur[ed] with GAO's recommendations to establish an executive-level official with sufficient resources and funding to guide DOD mobility energy policy, reduce mobility energy demand, guide DOD business practices (principally acquisition decisions) to include energy as a consideration, and lead DOD's potential transformation from petroleum to alternative fuels."²¹⁵ While DOD acknowledged that, "in principle, the Department concurs that there is a need to view and manage DOD energy supply and demand challenges in a new, holistic manner," in practice they argued strongly that the existing bureaucracy within the Under Secretary of Defense for Acquisition and Logistics was already fit for the task.²¹⁶

²¹⁴ National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, § 331, 123 Stat. 2257 (2009); § 902, 123 Stat. 2423.

²¹⁵ GAO, *Overarching Organizational Framework*, 40.

²¹⁶ GAO, 40-42.

Despite DOD's resistance, Sharon Burke was nominated to be the inaugural Director of the Operational Energy Plans and Programs Office on December 11, 2009 (a year and a half after the office's creation), and confirmed by the Senate by voice vote on June 22, 2010.²¹⁷ In parallel, , the Director of OEPP was re-designated as an Assistant Secretary of Defense (ASD(OEPP)) in the FY2011 NDAA in a further effort to emphasize the position's broad authority, although the position had been created at the Assistant Secretary level, although without the Assistant Secretary Title, at the same rank as a 3-star general.²¹⁸ At the same time, the operational energy advocates in Congress required further data gathering and reports about DOD's operational energy use. In FY2010, they had required a report on how demand for fuel is managed at forward-deployed locations, and in FY2011 an expansion of the existing energy conservation requirements, including concrete metrics for goals and a plan to reach them.²¹⁹ The FY2011 NDAA also took aim at the defense acquisition system, with two sections that required review of the defense acquisition system to see if it was able to adequately meet the requirements of the energy efficiency of weapons systems already in statute.²²⁰

These efforts to gather data on how much operational energy DOD was actually using and to tackle energy use at the so-called "pointy end of the spear," where the costs

²¹⁷ P.N.1270 – Sharon E. Burke – Department of Defense.
<https://www.congress.gov/nomination/111th-congress/1270>

²¹⁸ Pub. L. No. 111-383, § 901.

²¹⁹ Pub. L. No. 111-84, § 333, 123 Stat. 2258 (2009); Pub. L. No. 111-383, § 2832, 124 Stat. 4468.

²²⁰ Pub. L. No. 111-383, § 864, 124 Stat. 4295; § 2548, 124 Stat. 4289.

and risks are highest, continued in the FY2012 and FY2013 NDAs. One provision required DOD to report on efforts to reduce need for fuel that was delivered by convoy in conflict zones, while another mandated considering the lifecycle costs – including energy – of any expeditionary shelters, like tents. A more significant section mandated that DOD consider energy efficiency and demand reduction in logistics support contracts in contingencies. In modern warfare, where much of the logistics and many of the personnel may be supplied by private contractors, the provision addressed a previously overlooked gap in DOD’s energy use in war. Another section required that the Joint Chiefs of Staff designate a senior official for operational energy to work with OEPP.

Although these staffers succeeded in creating the Office of Operational Energy Plans and Programs, its overall impact and longevity now appears uncertain (as discussed in more detail in Chapter 7). Looking back at their efforts, a principal staffer involved said that “whatever happens with OEPP office ... the Department and the services have done great work in incorporating operational energy into the fabric of the organization.”²²¹ Another, more wistful, felt that the legislation had been “a good starting point,” and that “if the department had embraced it, it would have been very effective,” but concluded that absent the forcing function of the conflicts in Iraq and Afghanistan, the window of opportunity had largely closed. Nevertheless, they were

²²¹ Interview with HASC staffer, May 2015.

hopeful that the focus on energy would still have lasting impact.²²² Another staffer, less centrally involved, noted that the “care and feeding” of OEPP had been degraded. Although OEPP had succeeded in drawing attention, initiative, and money to the problem of DOD’s demand for operational energy, this staffer was concerned about DOD’s ability and willingness to sustain the effort. As they noted, DOD is a very slow bureaucracy. The effort to focus DOD’s attention on their energy use began back in 2007, and you’re “*starting* to see the fruits of these efforts now. (emphasis in the original). The tactical imperative might disappear. The money incentives might get [energy] savings. ... But if you can’t get short-term savings, it [the focus on energy efficiency] will disappear.”²²³ This staffer also predicted that the budgetary impacts of the restrictions on government defense and non-defense spending imposed by the Budget Control Act of 2011, popularly known as the sequester, would undermine the nascent energy efforts. As they put it, DOD “will eat the seed corn. How am I going to make ends meet? Screw the future. Why should I care about the future if I am worried in the present.”²²⁴ This short-term view of energy use related by this staffer was precisely the attitude and practices that the effort to create and establish operational energy as a touchstone in the Pentagon was designed to combat. The creation of OEPP illustrates several dynamics of defense policymaking within the HASC and SASC.

²²² Interview with HASC staffer, June 2016.

²²³ Interview with HASC staffer, October 2014.

²²⁴ Interview with HASC staffer, October 2014.

First, it demonstrates just how much freedom staffers on the relevant committees can have to conceive of and develop legislative policy ideas, as long as they have the buy-in or at least tacit support of the committee leadership. OEPP was created by a small group of staffers on HASC, who worked the committee process through hearings, socializing their ideas, and getting the legislative language included in the readiness committee mark very ably. One striking aspect is how small this circle was. In an interview, a former staffer for the Senate Armed Services Committee who had worked on energy-related issues during this time period accurately pegged the creation of OEPP the product of likely a few staffers working with a few people in DOD.²²⁵

Secondly, it illuminates the array of tools and stratagems that canny staffers or members of Congress have to drive congressional attention, and hopefully action, on a pet issue. The staffers described how they steadily built a case for congressional action on DOD's energy use, requesting reports from GAO, CRS, and DOD. Then, those reports provided grist for hearings on issues related to DOD's use of energy. The hearings provided a forum to showcase DOD's current practices of energy use as a problem, introduce further testimony on the issue, and raise its salience for members of the committee. The staffers' role on the HASC enabled them to cultivate DOD energy as a problem stream. Unlike the classic Kingdonian formulation of the problem stream, DOD energy had to be recognized as a problem by only a handful of legislators in order to justify congressional action.

²²⁵ Interview with SASC staffer, March 2016.

Another surprising element is how much the House and Senate work autonomously and without coordination, even when it involves the creation of a new senior official. The same SASC staffer recalled the creation of OEPP as “kind of a surprise. It had become law before I ever even knew about it..... a shock to me actually.”²²⁶ Casey Howard, Sen. Udall’s MLA at the time, and closely involved in other DOD energy issues like DODESA (discussed above), was also out of the loop on the OEPP. He didn’t recall being involved in, or really aware of, the creation and evolution of the HASC’s OEPP efforts while they were underway between 2008 and 2013, even though he was coordinating with other House staffers on DODESA.²²⁷ This lack of coordination is made possible because of the process of reconciling the House and Senate bills. In practice, conferencing of the House and Senate enacted bills typically involves the majority and minority staff directors of each committee, rather than a broader slate of stakeholders, despite the appointment of large formal conference committees of Representatives and Senators. In general, provisions make it through conference unless there is a strong objection. Provisions related to OEPP were only ever in the HASC and House versions of the NDAA. Without any provisions in the Senate bill, there was no reason for the SASC staffer to have been involved. As the staffer put it: “You’re doing your own thing. It’s a 600-page bill.”²²⁸

Overall, these operational energy efforts illustrate the powerful perch of the HASC and SASC in drafting the NDAA, and the chancy nature and relative paucity of

²²⁶ Interview with SASC staffer, March 2016.

²²⁷ Casey Howard in interview with the author, August 2015.

²²⁸ Interview with SASC staffer, March 2016.

review or oversight other members or committees can exercise over the contents of the bill. A HASC staffer closely involved with the operational energy office efforts described the HASC staffers' positions as "trying to spark a serious conversation about energy within DOD."²²⁹ To that end, the HASC had taken an aggressive position on operational energy within the markup, expecting that this would have to be an initial negotiating position, and that it would be amended and altered in the negotiation process with the Senate bill [which had no parallel provision] and in the conference process. Instead, contrary to the HASC staffers' expectations, there was essentially no negotiation or discussion of these operational energy-related provisions in the conference process for the original FY2009 bill, and no pushback or expressions of concern from DOD. As the staffer put it, "no one had strong feelings when it [the Operational Energy Plans and Programs position] was created."²³⁰ Legislative provisions that were intended to foster a debate about the Pentagon's use of energy and serve as an initial negotiating position instead sailed through the NDAA cycle, leading to the swift and under-the-radar creation of a potentially powerful new Pentagon office. Legislators who are not on the committee have even less situational awareness of the bill's content, and sharply limited opportunities to alter the bill. The sweeping length of the bill, the typically short window between the HASC markup and the floor consideration in the House, and the restrictive oversight on floor amendments make changing the NDAA as reported by the HASC difficult. In the Senate, the floor debate is more wide-ranging, but offering an amendment is no

²²⁹ Interview with HASC staffer, June 2016.

²³⁰ Interview with HASC staffer, June 2016.

guarantee that it will be taken up for a vote. In recent years, the basic legislative process step of floor consideration in the Senate has also been skipped in favor of a rush to pass a pre-conferenced bill to meet legislative deadlines. This procedural compression has left the HASC and SASC, in combination with the majority leadership, the custodians of the annual NDAA bill. This may represent a return to a modified inside game – a topic worthy of further study.

The Department of Defense Energy Security Act

With its sweeping name, the Department of Defense Energy Security Act sounds as if it should have been the principal vehicle for any DOD energy-related legislative activity. Its commonly used acronym, DODESA (pronounced Doh-DES-ah), is considerably less inspiring. However, like most pieces of stand-alone legislation, the Department of Defense Energy Security Act of 2010 appeared to go nowhere. Introduced in the House by Rep. Gabrielle Giffords (D-AZ) on May 12, 2010, the bill was referred to the House Armed Services Committee, referred again to the Readiness Subcommittee on June 18, 2010, and then died, never to be seen again. It rated just a brief mention by an energy & climate trade publication, which closely tracks any energy- or environment-related activity in Congress.²³¹

As outcomes go, ignominious referral to the committee of jurisdiction followed by a determined forgetfulness that the bill exists is the most common fate for bills introduced by regular members of Congress. The smooth path from a bill to a law

²³¹ Dina Fine Maron, “Rep. Giffords to Introduce Pentagon Energy Bill,” *Energy and Environment Daily*, May 12, 2010, <http://www.eenews.net/eedaily/stories/90870>.

outlined by Schoolhouse Rock has been more of a fantasy than a reality for 99+% of all bills introduced in any given Congress. Over the timespan of this study, 2003-2013, corresponding to the 108th, 109th, 110th, 111th, and 112th Congresses, an average of 3.4% of introduced bills became enacted laws. An average of 88% of all introduced bills died – some after introduction, some after being referred to a committee of jurisdictions, and fewer after being reported out by a committee. (The remaining 9% were resolutions, which are non-binding and express a policy sentiment or address a matter of internal organization of the Congress.)²³² Even for bills that end up as enacted law, the textbook path is growing less common, while partisan struggling and procedural high-wire work become the norm rather than the rare exception.²³³

The Senate version of DODESA, introduced by Sen. Udall (D-CO), and co-sponsored by the moderate Democrats Sen. Bennett (D-CO), Sen. Schumer (D-NY), Sen. Lehey (D-VT), and Sen. Udall (D-NM, Sen. Tom Udall (D-CO)'s cousin) disappeared even more quickly. After being introduced on July 14, 2010, it failed to even be referred to the committee of jurisdiction, the Senate Armed Services Committee. Both the House and Senate bills, a thin 19 pages with wide margins and large font, running to just 11 sections, seemed dead on arrival.

²³² Govtrack.us, “Bills by Final Status” (web page), Civic Impulse, LLC, <https://www.govtrack.us/congress/bills/statistics> (accessed September 30, 2017).

²³³ For detailed insight into this new norm, particularly for major, high-stakes legislation, see Barbara Sinclair, *Unorthodox Lawmaking: New Legislative Processes in the U.S. Congress*, 4th ed. (Washington, DC: CQ Press, 2011).

Not quite. That modest little bill, sponsored by a third-term House Democrat from Arizona and 5 moderate Democrats in the Senate, ended up with 6 of its 10 sections included in either the HASC or SASC version of the FY2011 National Defense Authorization Act, whose markup was near-contemporaneous with Rep. Giffords' introduction of DODESA in the House. Ultimately, DOESA 2010 ended up with 4 of its 10 provisions enacted into law in the FY2011 NDAA. Its more robust successor, the Department of Defense Energy Security Act of 2011, got 11 of its 18 provisions enacted into the FY2012 National Defense Authorization Act. How?

The ten provisions of DODESA 2010 hit several areas within DOD's energy use: alternative energy, installation energy, and operational energy. Four provisions were too sweeping, unwieldy or otherwise unpalatable to the NDAA gatekeepers, and were left on the cutting room floor. One unsuccessful provision would have mandated that DOD convert all of its non-tactical vehicle fleet to hybrid-electric or electric vehicles by September 30, 2015 (under five years from when the FY2011 NDAA would have been enacted) – a sweeping and costly change, without a clear mission-oriented rationale. Another would have made a renewable electricity goal into a mandate by preceding the goal with “shall.” This seemingly simple wording change to an existing statute would cause CBO to score the bill as requiring outlays, likely significant, and ensured that this section was a permanent non-starter. A third section would have bound contractors and concessionaries with the federal government to the same renewable energy goals mandated in the previous section. The final provision

was an unsubtle and frankly unrealistic shot across DOD's bow, requiring the National Security Strategy, the Secretary of Defense's annual report to Congress, the Quadrennial Defense Review, and the National Military Strategy to all consider DOD's energy performance plan in their development.²³⁴

The other 6 provisions of DODESA 2010 that were incorporated into either HASC or SASC's mark were more modest. One required that in acquisitions, DOD should give "preference" to goods and services, those that are sustainable, including energy-efficient, water-efficient, environmentally preferable, or contain required content. Another amended DOD's extant energy performance plan to require "consideration" of the efficiency gains from "the high-performance construction, lease, operation, and maintenance of buildings" and "the value of incorporating electric, hybrid-electric, and high-efficiency vehicles into vehicle fleets." Three required reports or plans: one on assessing the energy and cost-savings associated with retrofitting the systems of DOD's buildings, but without associated funding for the instructed implementation; one the potential of incorporating hybrid-electric drive technologies into the tactical vehicle fleet, and one to develop a testing and certification plan to use non-feedstock-derived biofuels for aviation purposes by the beginning of FY 2017. The final incorporated provision funded specific energy conservation projects – a provision that has been included in the NDAA each year since at least FY2004.

²³⁴ Department of Defense Energy Security Act of 2010, H.R. 5280, 111th Cong. § 2, 4, 6, and 9 (2010).

Four of these provisions survived into the final enacted version of the law: the two requiring “consideration” of energy efficiency gains from buildings and vehicle fleets and “preference” for procuring sustainable goods and services, the specific energy conservation projects, and an amended section authorizing (but not requiring) the Secretary of Defense to carry out an R&D program to speed technological advances in ground vehicles, including improvements in “research and development of batteries, advanced materials, power electronics, fuel cells and fuel cell systems, hybrid systems, and advanced engines.”²³⁵ The two that were cut entirely were the most sweeping, requiring quadrennial evaluations and retrofitting of DOD’s facilities and moving DOD towards actual use of alternative fuels for aviation.²³⁶ Both of these were included in the HASC markup, but cut before final enactment of the bill, as their broad goals and extensive implementation met cautious members and a lack of associated funds.

The 2011 version of DODESA was even more successful. In the Senate, it was introduced by Sen. Mark Udall (D-CO), who had also introduced DODESA 2010 the prior year. In the House, Rep. Giffords had been seriously injured in a shooting in January of 2011. In her stead, the HASC Ranking Member, Rep. Adam Smith (D-WA) introduced the House version of the bill. Overall, 10 of the 18 provisions of DODESA 2011 made it into the HASC version of the FY2012 NDAA. As the ranking member of the HASC Rep. Smith’s sponsorship and shepherding of the bill

²³⁵ H.R. 5280, § 5, 3, 7 and 10, enacted in the FY2011 NDAA (Pub. L. No. 111-383, 124 Stat. 4137 (2011)), as § 2831, 842, 2403, and 214, respectively.

²³⁶ H.R. 5280, § 8; § 11.

though the markup process in Rep. Giffords' stead carried substantial weight. In the Senate, Sen. Mark Udall wasn't quite as successful, but still managed to get 3 of the provisions into the SASC markup of the bill. However, Sen. Mark Warner (D-VA), introduced three of DODESA 2011's provisions as amendments during floor consideration of the FY2012 NDAA. One never received a vote (the fate of most Senate floor amendments), but two others were included in the manager's en bloc package and added to the Senate version of the bill. In total, 11 of the 18 provisions made it into the final enacted law. In other words, every single provision that was incorporated by either HASC or SASC into their mark up of the bill was preserved into the final enacted law. 5 of these were in both the House and Senate versions of the bill, guaranteeing that they would survive the conference committee to reconcile the House and Senate bills, but the other 6 provisions that were only in one version also all survived.

Overall, installation energy is the major focus of the bill, accounting for 14 out of the 18 sections. A theme of measuring and systematizing DOD's energy use is apparent: successful provisions variously require the Pentagon to report on its standards for energy efficiency in buildings, identify energy-efficient products for use in its buildings, develop a core training curriculum for the energy managers at installations, track and meter its energy use, consider energy security and vulnerability to disruption in developing new renewable energy sources, expands the set of what can

be considered renewable energy sources beyond geothermal, and complete a study on the energy security of its installations.

Gavi Begtrup and Ryan McKeon were the staffers in Rep. Giffords' office responsible for drafting and advancing the bill in the HASC. Casey Howard was Sen. Udall's military legislative assistant, who also worked on the bill. All emphasized that DODESA was an unfinished, iterative process. The best provisions would be included in the NDAA each year, while the "not quite baked" sections would be reworked and improved in the next year's bill. This evolution in legislative skills can be seen between DODESA 2010 and DODESA 2011.²³⁷ The tenor of the sections is different in DODESA 2011: its provisions are longer and more detailed, with a greater focus how DOD would implement them. They are also more legislatively sophisticated, with a greater use of iterative expansions of previous authorities and widening the definition of renewable energy. For example, DODESA 2010 included a provision that would have mandated that the Secretary of Defense develop a testing and certification plan to develop non-feedstock biofuel for aviation use within 6 years, notifying Congress as soon as a 50%+ blend became operationally available. Note the absence of cost as a consideration. The approach taken in DODESA 2011 is more collaborative and less blunt instrument. The section, which was enacted into

²³⁷ Begtrup and McKeon, interview; Howard, interview. Begtrup worked for Rep. Giffords as a science fellow, covering the science and technology portfolio from 2009 until her official resignation in 2012. McKeon worked as Rep. Giffords' Military Legislative Assistant from 2008-2011, handling issues related to defense and Rep. Giffords' HASC membership. Howard worked as Sen. Mark Udall's military legislative assistant from 2009-2015.

law, required DOD to establish a task force for operationalizing the use of alternative fuels, with senior-level representatives, to streamline and leverage R&D investments across the services and coordinate with other federal agencies towards this goal. However, a downside of this more cooperative approach is that it relies more heavily on key individuals within DOD for implementation, and is very vulnerable to sandbagging. Similarly, a section in DODESA 2010 would have required DOD to convert its entire non-tactical vehicle fleet to hybrid or electric propulsion by September 30, 2015. The short timeframe, high costs, and dubious national security gains made this provision a non-starter – it failed to be incorporated into the HASC’s markup. DODESA 2011 contained a similar provision. Less burdensome, instead of requiring that DOD’s entire non-tactical vehicle fleet be recapitalized within 5 years, it mandated that all new non-tactical vehicles purchased after September 30, 2017 have a hybrid or alternative propulsion system. However, despite the less-aggressive goal, this provision also failed to be included in the HASC mark.

Part of the reason for DODESA’s success lies in the Rep. Giffords and Sen. Udall’s seats on the House and Senate Armed Services Committees. A Democratic Representative from Arizona, Rep. Gabrielle Giffords was on the Readiness Subcommittee of the House Armed Services Committee. Representing the Tucson area, Rep. Giffords had an interest in solar power and renewable energy, as well as military readiness, with the major military bases of Davis-Motham Air Force Base and Fort Huachuca in her district. Linking the two and examining DOD’s energy use

and resilience, was a seemingly natural combination of her interests. Ryan McKeon, her military legislative assistant from 2008 - 2011, recalled beginning working on military energy issues shortly after he joined Rep. Giffords office. Similarly, Sen. Mark Udall, a former colleague of Rep. Giffords on the HASC, had grown interested in military energy issues then. According to Casey Howard, Sen. Udall's Military Legislative Assistant from 2009 – 2015, Sen. Udall had already “staked out his grounds on defense energy policy,” when he won his seat in the Senate. Howard characterized Sen. Udall as “one of the top handful of advocates of defense energy policy” in Congress. With his seat on both the Senate Energy and Natural Resources Committee and on the Senate Armed Services Committee's Readiness Subcommittee, Sen. Udall was well-placed to get provisions of DODESA into that SASC Readiness's initial markup.

Party control does not appear to have been a significant factor. Although Democrats controlled both the House and the Senate in 2010 (in the 111th Congress), the Republicans, riding the wave of the Tea Party, retook the House in the 2010 midterms, leading to split control in the 112th Congress. However, more provisions were incorporated into the HASC markup of the FY2012 NDAA from DODESA 2011 (10 of 18) than DODESA 2010 (4 of 10). Neither Begtrup nor McKeon mentioned partisanship or minority vs. majority status on the HASC at all during our interview. Even though party control had flipped in the House, the HASC still maintained its bipartisan character. Rep. Madeline Bordallo, (D-Guam), the ranking

member of the Readiness Subcommittee, specifically praised the bipartisan efforts of the Readiness Chairman, Rep. Randy Forbes (R-VA), and the HASC Chairman and ranking member, Reps. Buck McKeon (R-CA), and Rep. Adam Smith (D-WA), in conducting the subcommittee and full committee marks in her remarks supporting the bill after its subcommittee markup and on the House floor.²³⁸ Rep. Bordallo noted in her statement following the subcommittee markup, “because she cannot be here with us today, I want to thank you, Mr. Chairman, on behalf of our colleague Gabby Giffords for ensuring that her interests are addressed in this mark.”

Part of the answer lies in timing, and growing dissatisfaction with the endless-seeming war in Afghanistan. In the spring of 2010, the vulnerability of military fuel logistics in both Iraq and Afghanistan was widely seen as an appalling military risk, one that led directly to American casualties and deaths. President Obama had announced the surge of an additional 30,000 troops to Afghanistan in early December, 2009, redoubling American commitment to the troubled war.²³⁹ Meanwhile, the logistics of the war in Afghanistan remained very difficult. Pakistan had repeatedly closed the major border crossing into Afghanistan to NATO convoys, holding up fuel and other supplies, and NATO supply convoys were coming under

²³⁸ House Armed Services Committee Democrats, “Ranking Member Bordallo Statement at Readiness Committee Markup,” May 5, 2011, <http://democrats-armedservices.house.gov/2011/5/ranking-member-bordallo-statement-at-readiness-subcommittee-markup>; 157 Cong. Rec. H3393 (daily ed. May 24, 2011) (statement of Rep. Bordallo).

²³⁹ Sheryl Gay Stolberg and Helene Cooper, “Obama Adds Troops, but Maps Exit Plan,” *New York Times*, December 1, 2009, <http://www.nytimes.com/2009/12/02/world/asia/02prexy.html>.

frequent attack by the Taliban and insurgent forces.²⁴⁰ For those in Congress, particularly on the Armed Services Committees, the issue of fuel and logistics for the war in Afghanistan was a persistent and difficult problem. The high costs of fuel delivery also weighed on lawmakers, including the Chairman of the House Appropriations Committee Defense subcommittee, Rep. John Murtha (D-PA).²⁴¹

Another portion lies in the legislative legwork undertaken by Rep. Giffords and her staffers, Ryan McKeon and Gavi Begtrup, as well as by then-Sen. Udall (CO) and Casey Howard, his lead staffer on this issue. According to McKeon and Begtrup, Rep. Giffords pounded the pavement tirelessly on this issue. “Gabby took this on as *her* issue. She very quickly became *the* champion not just in the House, but in Congress, for doing things on defense energy issues. We were deputized to go out and figure out what should be done.”²⁴² In their recollection, Begtrup and McKeon talked to everyone they could convince to take a meeting: every service branch, think

²⁴⁰ Ibrahim Shinwari, “Fuel Supply to NATO Forces ‘Suspended,’” *Dawn*, September 6, 2008, <https://www.dawn.com/news/320011/fuel-supply-to-nato-forces>; Salman Masood, “Bridge Attack Halts NATO Supplies to Afghanistan,” *New York Times*, February 3, 2009, <http://www.nytimes.com/2009/02/04/world/asia/04pstan.html>; “Militants Destroy Nine NATO Vehicles in Peshawar: Officials,” *Nation*, April 3, 2009, <http://nation.com.pk/Politics/03-Apr-2009/Militants-destroy-nine-Nato-vehicles-in-Peshawar-officials>; “Special Report: U.S.-NATO, Facing the Reality of Risk in Pakistan,” *Stratfor*, April 27, 2009, <https://www.stratfor.com/analysis/special-report-us-nato-facing-reality-risk-pakistan-stratfor-interactive-map>; Tim McGirk, “Taliban Stepping Up Attacks on NATO Supply Convoys,” *Time*, October 7, 2009, <https://content.time.com/time/world/article/0,8599,1928899,00.html>; Steven Mufson and Walter Pincus, “Major Challenge for Pentagon Is Getting Fuel to U.S. Troops in Afghanistan,” *Washington Post*, December 15, 2009, <http://www.washingtonpost.com/wp-dyn/content/article/2009/12/14/AR2009121403123.html>.

²⁴¹ Roxana Tiron, “\$400 per Gallon to Drive Debate over Cost of War in Afghanistan,” *The Hill*, October 16, 2009, <http://thehill.com/homenews/administration/63407-400gallon-gas-another-cost-of-war-in-afghanistan->; Christopher Drew, “High Costs Weigh on Troop Debate for Afghan War,” *New York Times*, November 14, 2009, <http://www.nytimes.com/2009/11/15/us/politics/15cost.html>.

²⁴² Begtrup and McKeon, interview.

tanks, industry, academic, etc. Within the Pentagon, Begtrup and McKeon say they spoke with any office that touched energy issues at all, whether energy policy, facilities and installations, or operational energy, as well as leadership in the combatant commands, and discussed the initial draft of what became the DODESA 2010 bill.

In Congress, McKeon emphasized that Rep. Giffords and he spent two years developing the bill and reaching out to members and staff a full two years before the bill was introduced. The Defense Energy Support Caucus (DESC), formed in July 2011, also played a role in socializing the later DODESA bills, as well as the theory of the case that animated Rep. Giffords' and her staff's work on DOD's energy use. With two Republicans and two Democrats at the helm, the DESC was a useful to demonstrate that DOD energy issues had broad and bipartisan support and advance their cause with the HASC.²⁴³ With a very low bar for engagement on the part of members, forming a caucus was nevertheless a forum in which to air defense energy issues on the hill and invite DOD energy officials to showcase their work.

²⁴³ Shifra Mincer, "Defense Energy Security Caucus Launches," *Breaking Defense*, July 8, 2011, <http://breakingdefense.com/2011/07/defense-energy-security-caucus-launches/>. The caucus was founded by Rep. Maurice Hinchley (D-NY), Rep. Roscoe Bartlett (R-MD), Rep. Jack Kingston (R-GA), and the office of Rep. Gabrielle Giffords. Rep. Earl Blumenauer (D-OR), Rep. Gerry Connolly (D-VA), Randy Forbes (R-VA), John Garamendi (D-CA), Colleen Hanabusa (D-HI), Jay Inslee (D-WA), Steve Israel (D-NY), Adam Kinzinger (R-IL), Jim Langevin (D-RI), Rep. Mike Turner (R-OH), and Madelleine Bordallo (D-Guam) comprised the remainder of its initial membership. Although the founding was evenly bipartisan, Democrats outnumbered Republicans in membership nearly two to one.

Giffords' and Udall's staffers explicitly recognized that the DODESA provisions would have to be incorporated into the annual NDAA to have any chance of success.

As Gavi Begtrup put it,

“We really felt that it [DODESA] should be comprehensive, and look at the entire sweep of energy things in DOD – how they use it, budget for it, and change processes to make DOD take it into an account. So it [DODESA 2010] needed to be introduced as a stand-alone bill. But very few bills have been passed as stand-alones, and [we] knew that *the* vehicle for defense bills is the NDAA.”²⁴⁴

As Casey Howard, Udall's MLA recalled, “the idea was to kind of plant the flag with DODESA and then take out discrete pieces that were more palatable, or more discrete, or whatever and putting them into the NDAA, putting them in the chairman's mark of the NDAA.”²⁴⁵

Rep. Giffords was on the Readiness Subcommittee of the SASC, and so Begtrup and McKeon had an existing relationship with the Readiness Subcommittee professional staffers, Rep. Ortiz, at the time the Chair of the Readiness Subcommittee, and his staffers. Both Begtrup, who handled science and technology policy, and McKeon, Giffords' Military Legislative Assistant, built close relationships with the House Armed Services Committee professional staff members whom they would have to convince of the merits of their proposals. McKeon and Begtrup did a “a lot of personal lobbying” of HASC professional staff members, “walk[ing] people through the things [from DODESA] that should be in the NDAA,” and “worked closely [with the committee staff] to figure out not just what policy areas to cover, but how to pay

²⁴⁴ Begtrup and McKeon, interview.

²⁴⁵ Howard, interview.

for it,” and how to fit the legislative provisions of DODESA within the rigid structure of the NDAA.²⁴⁶ Begtrup and McKeon both acknowledged that working closely with the professional staff members of the House Armed Services Committee (in 2010, the Democrats held the majority), was a critical prerequisite to their success in getting “about 6 provisions” from DODESA 2010 into the HASC markup of the FY2011 NDAA, and 5 provisions into the final enacted bill.²⁴⁷ Rep. Ortiz (D-TX) was supportive of efforts to make the Pentagon more careful with its energy use and reduce the risk to servicemembers. A HASC staff member who worked on energy issues during this time frame recalled working with Begtrup and McKeon at the staff level, helping them frame and word their proposals so that they would be workable and productive at the policy level and acceptable to the HASC Readiness members.²⁴⁸

However, the House version of the NDAA is just half the battle. As Begtrup described, “even though getting things into the House version is good, it doesn’t make it law. We realized early that we needed to reach across the aisle [to the Senate].”²⁴⁹ In particular, provisions that are in just one chamber’s version of the bill are frequently left on the cutting room floor during the conference committee to reconcile the House and Senate versions. However, luckily for them, Begtrup and McKeon had an ally at a key post in the Senate. Sen. Mark Udall (D-CO) had grown interested in the Pentagon’s energy policy while he was in the House and served on

²⁴⁶ Begtrup and McKeon, interview.

²⁴⁷ Begtrup and McKeon, interview.

²⁴⁸ Interview with HASC staffer, June 2016.

²⁴⁹ Begtrup and McKeon, interview. Begtrup’s wording here echoes an old quip about Congress, sometimes attributed to Rep. Al Swift: The Republicans are the opposition, but the Senate is the enemy.

the HASC. In the Senate, Sen. Udall became the leading Senate advocate of a smarter energy policy for the Pentagon, emphasizing sustainability and thinking about energy needs in logistics and acquisitions decisions. Sen. Udall (D-CO) co-sponsored the bill in the Senate and “shepherded it through the SASC [NDAA markup] process.”²⁵⁰ As in the House, the support of the Chairman of the Readiness Subcommittees, Sen. Shaheen (D-NH), and, especially, the committee staff, was essential to incorporating the consensus sections of DODESA 2010 and 2011 into the Chairman’s mark of the NDAA in the Senate Armed Services Committee. As described in the prior chapter, provisions incorporated during the HASC or SASC markup process are generally highly conserved in the enacted law. Of all the provisions related to DOD energy introduced as part of the NDAA process between 2004 and 2013, 81% those included in the bill during the HASC markup phase, and 71% of those included in the bill during the SASC markup, made it into the final enacted law. Begtrup and McKeon recalled getting “about six” provisions of DODESA 2010 into the final enacted NDAA.

Begtrup and McKeon’s latitude to work on this issue, Rep. Giffords’ close relationship with other members on HASC, and Sen. Udall’s efforts in the Senate were even more critical for DODESA 2011. After Rep. Giffords was shot in the head at a campaign event in Tucson in January 2011, Begtrup and McKeon were faced with the question of how much congressional work on Rep. Giffords behalf was

²⁵⁰ Begtrup and McKeon, interview.

appropriate. Among the staff, the decision was made to continue working on a few legislative areas that Rep. Giffords had been personally committed to and focused on, including defense energy. Gavi Begtrup was charged with acting in Rep. Giffords' stead on DODESA 2011, working closely once again with Sen. Mark Udall and his MLA, Casey Howard, to advance the bill and get it incorporated into both chambers' NDAA markups. Sen. Mark Udall introduced the bill in the Senate on June 15, 2011, as the Senate was preparing for the FY2012 NDAA markups. In the House, Rep. Adam Smith (D-WA), who had become the ranking member of HASC, introduced the bill in Rep. Giffords' stead and tended to it in the committee process. Again, "about six" of the provisions of DODESA 2011 made it into the final enacted NDAA, illustrating the degree to which access to the markup process is essential to successful defense policymaking. While Begtrup and McKeon's advancement of DODESA 2011 without Rep. Giffords' direct involvement was certainly a product of unique circumstances, it also emphasizes the degree to which a member's staffers are their primary agents in devising, socializing, and advancing legislation in the normal course of congressional business.

Although access to the NDAA process, opportune recognition of the problem and the devoted work of Rep. Giffords, Sen. Udall and their staffers were certainly necessary conditions. However, all these factors would have been insufficient if the contents of the bill were controversial. Howard was frank about non-controversiality being an essential characteristic of provisions one hoped to have included in the subcommittee

chairman's mark of the NDAA. As Howard described, "most of the things that we had gotten done with that bill were pretty non-controversial."²⁵¹ He described the process of sitting down with the Senate Armed Services Readiness Subcommittee professional staff to pitch portions of DODESA and try to get them incorporated into the chairman's mark of the NDAA:

"Before the chairman's mark, before the markup, I would go sit down with other staffers. Some things [in the DODESA bills] weren't ready yet, not baked yet, but you'd bring the other things to the [professional] staffers and if they didn't object, it went into the chairman's mark.

As far as things went in the NDAA, in the markups... if something was really controversial, really going to draw a fight, it would sometimes be introduced and then withdrawn. If you can't get common-sense agreement, more than 60% of the room to agree, you just don't do it [put a provision into the markup.] It just isn't done.

[Provisions] had to be pretty non-controversial, had to be pretty well cooked. I didn't have to do much socializing. Just talked about it [a provision] for a few minutes, what it does. The [Readiness Subcommittee] Chairman was [Sen.] Shaheen [D-NH]. [Her lead staffer] Catherine and I had a great relationship. Stuff would mostly get worked out between ourselves. We had known each other well and long enough that we had a good sense of what people were going to have time for and what not.²⁵²

Despite the years of legislative effort and coordination it took for Begtrup, McKeon, and Howard to draft DODESA 2010 and 2011, socialize it, and maneuver for provisions to be incorporated into the annual NDAA markup and maintained through the final enacted law, there was curiously little attention paid by the staffers to the impact of their labors. When asked what the most successful provision was in changing DOD's use of energy, Howard was at a loss, saying that he didn't "really

²⁵¹ Howard, interview.

²⁵² Howard, interview.

have a good answer” and would “need to go back and think about it.” He noted that “for a long time, the easy thing to do was ask for a report or study.” But studies are frequently not followed up on – as Howard continued, “I bet it’s less than 10% of the time that they [the staffer who mandated it] ever go back and read it [the study], unless they are actively tracking it.” Begtrup and McKeon also didn’t have a ready answer for which of their efforts had been most impactful.

The gap between the increasing sophistication in drafting *implementable* legislative language and a lack of interest and knowledge of what was actually *implemented* suggests that the revealed aims of DODESA 2010 and 2011 were to have done *something* and to have raised DOD’s use of energy as an issue. None of the staffers involved in DODESA articulated a specific outcome they were working towards, despite their fervent belief that the way the Pentagon was thinking about and using energy was deeply flawed.

Alternative fuels

In the Congress, “alternative fuels” was a conveniently vague term, whose very vagueness allowed bipartisan support. According to a HASC staffer, Republicans were able to advance liquid coal fuels, while Democrats could support renewable and biofuels, as long as no one forced the issue of what exactly the “alternative fuels” were.²⁵³ Some Members of Congress, particularly those from coal country, were very

²⁵³ Interview with HASC staffer, May 2015.

supportive of coal-based alternative fuels. Democrats tended to be more supportive of non-fossil fuel alternatives, whether algae fuels or fuels made from rendered fat. The broad umbrella of alternative fuels allowed for a certain level of bipartisan support, but there was only superficial consensus on the purposes, merits, and methods of pushing DOD to embrace alternative fuels. Members opposed to the Pentagon's alternative fuel efforts saw them as inimical to key policy and constituent priorities, particularly domestic coal and oil production. Others worried that DOD was straying out of its lane, taking too aggressive a role in developing alternative fuels at the risk of neglecting its core national security responsibilities.

The different alternative fuels pursued by the services, and their reception by the Congress, speaks to this papered-over difference. In the mid 2000s, the Air Force pursued coal-to-liquid fuels, using the Fischer Tropsch process. Inspired in part by high oil and fuel prices, the Air Force effort was intended to demonstrate that their engines would run on fuels derived from other sources. In 2005, in the FY2006 NDAA Sen. Byrd's (D-WV) amendment to require DOD to utilize coal-to-liquid fuels was adopted in the Republican Senate by unanimous consent, but was stripped in conference due to objections from the HASC, at that time with Republicans in the House majority.²⁵⁴ A few years later, the Navy, spearheaded by Secretary Mabus, was pursuing a set of conservation and efficiency initiatives, including creating a "Green

²⁵⁴ S. Amdt. 2561 (Sen. Byrd) to S. 1042 (National Defense Authorization Act for Fiscal Year 2006, 109th Cong. § 1090 (2005)); H.R. Rep. No. 109-360, at 790 (2005) (Conf. Rep.).

Strike Group” of ships powered by biofuels by 2012 and deploying it by 2016.²⁵⁵ Announced in October 2009, these alternative fuels efforts emphasized biofuels, principally those derived from algae and waste fats. The scale of the Navy’s fuel usage that Secretary Mabus envisioned led the Navy to take a more direct role in creating the fuel supplies that it would use, rather than waiting for the market to supply the biofuels.

The vagueness at the heart of “alternative fuels,” despite wide differences in what it could mean in practical terms, allowed congressional provisions on DOD’s use of alternative fuels to be advanced, and supported, by both Democrats and Republicans, despite deep divides between the parties on energy, domestic energy production, and climate issues. For example, in the FY2009 NDAA, amendments offered by Sen. Bunning (R-KY) and Sen. Thune (R-ND) would have allowed DOD to enter into multi-year procurement contracts for alternative fuels, and supported the Air Force’s goal of utilizing at least 50% alternative fuels from domestic by the end of 2016 – both provisions that would have advanced coal-to-liquids fuels.²⁵⁶ Neither amendment received a vote. A similar provision allowing multi-year contracting authority was included in the Democrat-controlled SASC mark of the FY2009 NDAA, before being stripped in conference.²⁵⁷ In the FY2010 NDAA, separate

²⁵⁵ Paula Paige, “SECNAV Outlines Five ‘Ambitious’ Energy Goals,” U.S. Navy, Story No. NNS091016-30, October 16, 2009, http://www.navy.mil/submit/display.asp?story_id=49044.

²⁵⁶ S. Amdt. 5432 (Sen. Bunning) and S. Amdt. 5317 (Sen. Thune) to S. 3001 (Duncan Hunter National Defense Authorization Act, 110th Cong. (2008)).

²⁵⁷ Duncan Hunter National Defense Authorization Act, S. 3001, 110th Cong. § 821, at 216-221 (as reported by the Senate Armed Services Comm., May 12, 2008).

House and Senate provisions related to the services' alternative energy goals were combined in committee, downgraded to a study on DOD's current and potential future use of alternative fuels, despite Democratic control in both chambers.²⁵⁸

However, this careful ambiguity as to what exactly "alternative fuels" was couldn't last long in the flurry of provisions designed to curb or enhance DOD's renewable and alternative fuels efforts, amid a debate growing steadily more partisan and contentious.

Section 526 of the Energy Security and Independence Act of 2007 appears rather superficially boring. Written by a Democratic Congress and signed into law on December 19, 2007, the bill is the most recent major comprehensive energy legislation enacted, subsequent attempts having broken down along partisan lines.

This particular section prohibits federal agencies from buying any alternative or synthetic fuels that have a greater lifecycle greenhouse gas emissions than conventional petroleum sources, with an exception for research and testing.²⁵⁹ An anodyne provision, it was dismissed by Pentagon energy officials as a footnote in the energy bill, having no impact on nor imposing any restrictions on the Pentagon's

²⁵⁸ National Defense Authorization Act for Fiscal Year 2010, H.R. 2647, 111th Cong. § 334, at 108 (2009) (as adopted by the House, June 25, 2009); S. 1390, 111th Cong. § 334, at 118 (as adopted by the Senate, July 24, 2009), <https://www.congress.gov/111/bills/s1390/BILLS-111s1390pp.pdf>; Pub. L. No. 111-84, § 334, 123 Stat. 2259 (2009).

²⁵⁹ Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 526, 121 Stat. 1663 (2007). The section reads: "No Federal agency shall enter into a contract for procurement of an alternative or synthetic fuel, including a fuel produced from nonconventional petroleum sources, for any mobility-related use, other than for research or testing, unless the contract specifies that the lifecycle greenhouse gas emissions associated with the production and combustion of the fuel supplied under the contract must, on an ongoing basis, be less than or equal to such emissions from the equivalent conventional fuel produced from conventional petroleum sources."

regular purchase of petroleum. However, it did put a stop to the Air Force's coal-to-liquids experimentation.

Although this provision wasn't a meaningful restriction on the Pentagon's vast fuel purchases, it was endowed with enormous symbolic meaning, coming to represent the Obama-era "green Pentagon" and drawing partisan fire. As described by one HASC staffer, the section 526 repeal provisions were too controversial to include in the draft of the mark and thus these provisions offered as separate amendments during floor consideration of the bill. According to this staffer, the efforts to repeal Section 526 were driven largely by Republican members representing oil areas, and members with "district sensitivities" – like coal mining. Another HASC staffer agreed that the touchier provisions about section 526 and biofuels were held for the debate in the HASC chairman's mark due to their controversiality. These topics were ipso facto too controversial to be included in any of the subcommittee marks.²⁶⁰ The inappropriateness of including controversial provisions in a subcommittee mark was something these HASC staffers – from different parties – agreed strongly on.

From the FY2009 to the FY2011 NDAs, at least one proposed floor amendment every year attempted to either repeal section 526 or exempt DOD from it. However, none of them received a vote on the floor. In the Senate, an amendment to S. 3001 for the FY2009 NDAA, offered by Sen. Dominici (R-NM), failed to receive a vote, as

²⁶⁰ Interview with HASC staffer, May 2015.

did an amendment to the FY2010 NDAA (S. 1390), offered by Sen. Brownback (R-KS). On the House side, amendments by Rep. Bishop (R-UT) to the FY2010 NDAA (H.R. 2647) and Rep. Gingrey (R-GA) to the FY2011 NDAA (H.R. 1540) were not ruled germane by the House Rules committee, and thus were not debated on the floor. Republican attempts to repeal section 526 via floor amendments was also forced in part because the Democrats had the majority in the House, and thus the committee leadership posts, and were not inclined to welcome efforts to repeal portions of just-passed national energy legislation.²⁶¹

A related series of efforts headed by Democratic members of Congress attempted to clarify that Sec 526 would not prohibit DOD's current purchases of conventional petroleum fuels. Those amendments generally did make it into one version of the bill, only to be dropped by the conference committee as unnecessary. An amendment to the FY2009 NDAA (H.R. 5658) offered on the House floor by Rep. Boren (D-OK), clarified that DOD could continue to purchase regular conventional fuels under Section 526. While this amendment was agreed to by a voice vote, it was dropped in the conference version. Sen. Bingaman (D-NM) submitted an identical amendment to the Senate, which was not debated. The conference report reads, "The agreement does not include the provision. Section 526 was not intended to preclude the Department of Defense from purchasing the fuel that it needs for the national defense from the generally-available fuel supply. We expect the Department to continue

²⁶¹ Interview with HASC staffer, June 2016.

making such purchases.”²⁶² The following year, Rep. Connolly’s (D-VA) amendment in the same vein was adopted on the floor of the House by recorded vote, and was dropped in conference, as was Rep. Polis’ (D-CO) on the FY2011 NDAA. However, these provisions were efforts by Members of Congress outside of the committee process to amend the House or the Senate bill through floor amendments. The FY2012 NDAA, which saw the House return to Republican control, saw greater endorsement of partisan-inflected alternative fuels provisions by the committee. The HASC markup saw a provision to except DOD from Section 526 of EISA 2007 adopted by voice vote, though stripped in conference.²⁶³ Accounts of staffers who worked for HASC and SASC at the time echoed that alternative fuels was becoming an increasingly delicate – and partisan – topic, with an increasing volume of legislative activity and committee support once Republicans regained the House and Senate majorities.²⁶⁴

During the FY2013 legislative process, DOD programs related to biofuels moved fully from the realm of low-profile, bi-partisan policy-making into a contentious, hot-button issue, sparked by vehement Republican opposition to the Navy’s plan (strongly endorsed by President Obama) to invest in biorefineries to produce biofuels

²⁶² An explanatory statement functioning as a conference report was submitted into the Congressional Record in lieu of an actual conference report. 154 Cong. Rec. H8718-H9081 (daily ed. September 23, 2008) (statement of Rep. Skelton).

²⁶³ National Defense Authorization Act for Fiscal Year 2012, H.R. 1540, 112th Cong. § 844 (as reported by the House Armed Services Comm., May 17, 2011).

²⁶⁴ Interviews with HASC staffers, May 2015; June 2016; interview with SASC staffer, March 2016.

at a commercial scale.²⁶⁵ Starting with skeptical and aggressive questioning of the Navy's biofuel initiatives during the HASC Readiness Subcommittee's hearing on DOD's energy security initiatives by Chairman Randy Forbes (R-VA), Republicans in both the House and Senate made DOD support of alternative fuels into a lightning rod.²⁶⁶ Rep. Conaway (R-TX), also a HASC member, also argued that there was no connection between increased DOD use of biofuels and improved military capability or national security. Skepticism among energy experts also dampened Democratic enthusiasm for the Navy's efforts.²⁶⁷ The HASC version of the FY2013 NDAA included provisions that would have restricted DOD's ability to purchase alternative fuels that are costlier than conventional petroleum fuels.²⁶⁸

In the Senate, SASC ranking member Sen. McCain (R-AZ) and fellow conservative Sen. Inhofe (R-OK) also began arguing vociferously against DOD investments in biofuels, expressing skepticism over both the military utility and the high costs per gallon. The SASC-reported version of the FY2013 NDAA contained a provision

²⁶⁵ U.S. Navy, Department of Energy, and Department of Agriculture, *Memorandum of Understanding between the Department of the Navy, the Department of Energy and the Department of Agriculture*, June 28, 2011.

<http://www.energy.gov/sites/prod/files/2014/04/f14/DPASignedMOUEnergyNavyUSDA.pdf>; Carlo Muñoz, "Rep. Forbes Slams 'Green' Navy; Political Argument Falls Flat on Hill," *Breaking Defense*, February 22, 2012, <http://breakingdefense.com/2012/02/forbes-slams-green-navy-political-argument-falls-flat-on-hill/>; Zack Colman, "Navy Pushes Forward with 'Green Fleet' Despite GOP Resistance," *The Hill*, July 19, 2012, <http://thehill.com/policy/energy-environment/239023-navy-pushes-forward-with-qgreen-fleetq-despite-gop-resistance>; Diane Cardwell, "Military Spending on Biofuels Draws Fire," *New York Times*, August 27, 2012, <http://www.nytimes.com/2012/08/28/business/military-spending-on-biofuels-draws-fire.html>.

²⁶⁶ What Is the Price Of Energy Security: From Battlefields to Bases: Hearing Before the Readiness Subcommittee of the Committee on Armed Services, House of Representatives, 112th Cong., H.A.S.C. No. 112-128 (March 29, 2012). See especially Chairman Randy Forbes' questioning of Jackalyn Pfannenstiel, Assistant Secretary of the Navy for Installations, Energy and Environment, 17-26.

²⁶⁷ Noah Shachtman, "How the Navy's Incompetence Sank the 'Green Fleet'," *Brookings*, July 17, 2012, <https://www.brookings.edu/opinions/how-the-navys-incompetence-sank-the-green-fleet/>.

²⁶⁸ House Armed Services Comm., National Defense Authorization Act for Fiscal Year 2013, H.R. Rep. No. 112-479 pt. 1, at 141 (2012).

prohibiting DOD from purchasing alternative fuels that were more costly than conventional petroleum fuels that was word-for-word identical to the section in the HASC-reported bill.²⁶⁹ It also included a section that would have prohibited DOD from entering into any type of contract related to a biorefinery, essentially killing the Navy's initiative under the Defense Production Act to invest up to \$170 million to support a domestic advanced biofuels industry, with additional funds from the Departments of Energy and Agriculture.²⁷⁰ However, both of the Senate-reported provisions were stripped from S. 3254 via roll call votes during floor debate. On November 28, 2012, the Senate agreed, 62-37, to Sen. Udall (CO)'s S.Amdt. 2985, striking Section 313 of S. 3254, which limited the availability of funds for the procurement of alternative fuel. On November 29, 2012, the Senate agreed, 54-41, to S.Amdt. 3095, proposed by Sen. Hagan, striking Section 2823, which prohibited the construction of a biofuel refinery. These highly controversial and tense votes left the Senate version without any restrictive provisions related to DOD biofuels initiatives.²⁷¹ With the House and Senate versions at odds, the House and Senate conferees adopted a compromise position. The final reported version of the bill did not contain any restrictions regarding purchasing alternative fuels, but prohibited any contracts related to a biofuels refinery with FY2013 appropriated funds unless or until

²⁶⁹ Senate Armed Services Comm., National Defense Authorization Act for Fiscal Year 2013, S. Rep. No. 112-173, at 80 (2012).

²⁷⁰ S. Rep. No. 112-173, at 277.

²⁷¹ Zack Colman and Ramsey Cox, "Senate Passes Amendment Keeping Biofuel Investments in Defense Bill," *The Hill*, November 28, 2012, <http://thehill.com/blogs/floor-action/senate/269897-senate-passes-amendment-keeping-biofuel-investments-in-defense-bill>.

the matching contributions from the Departments of Energy and Agriculture were received.²⁷²

The neat summation of the votes to strike the amendment understates how difficult it was to pull together a coalition to strike the two provisions prohibiting the Navy's biofuel efforts that had been controversially included in the SASC markup. "The politics were pretty ugly at that time."²⁷³ As Sen. Udall's Military Legislative Assistant, Casey Howard, recalled, he and staffers from Sen. Murray (D-WA), Sen. Hagan (D-NC) and Sen. Shaheen (D-NH) spent months trying to strike the prohibitory sections from the SASC mark on the floor. Sen. Udall's office took the lead on the efforts to strike the prohibition on procuring alternative fuels, while Sen. Hagan's office took the lead on striking the provisions prohibiting funding for biorefineries.²⁷⁴

In Howard's account, efforts to remove the prohibition against purchasing alternative fuels were the easier lift of the two. Although Sen. Collins (R-ME) has been the only Republican senator who had been overt in her support for the Navy's biofuel efforts, Howard says that a number of other Republican offices said that the coalition would have their office's support, but that they couldn't come out publically in favor of removing these provisions. In making their case, Howard argued the value of biofuels in providing better options for the Department of Defense, finding better ways of brining fuel to the marketplace and into the operational force. A few

²⁷² National Defense Authorization Act for Fiscal Year 2013, H.R. Rep. No. 112-705 (2012) (Conf. Rep.), enacted in Pub. L. No. 112-239 (2013).

²⁷³ Howard, interview.

²⁷⁴ Howard, interview.

Republican agricultural senators like Sen. Fischer (R-NE) and grew to be in favor of striking these SASC provisions, once the coalition demonstrated that “there was a home-state value there.” Tactically, Howard says that their approach was to slide the amendment striking the provision below the radar to avoid stirring up further opposition. As he put it, “the upside [of the provision to strike] was that member can make it whatever they need for their home states. The downside it that it was a direct strike on Inhofe, and the chairman [Sen. Levin (D-MI), who had allowed the vote in committee.]”²⁷⁵ Ultimately, the amendment to remove the prohibition on the purchase of alternative fuels was adopted by a floor vote, 62-37. A total of 11 Republicans supported the amendment, either moderate Republicans like Sen. Collins (R-ME) or Sen. Murkowski (R-AK), farm-state senators like Sen. Johanns (R-NE) and Sen. Moran (R-KS), or both, like Sen. Grassley (R-IA) and Sen. Lugar (R-IN).²⁷⁶

The effort to remove the provision against funding biorefineries was led by the office of Sen. Hagan (D-NC). Per Howard’s account, there was greater opposition to removing that restriction, due in part to a real philosophical divide about whether DOD ought to be involved in biofuels production at all, or whether it was an area that should be left strictly within DOE’s jurisdiction. Howard recalled that effort as being “hard fought,” in part due to the strong opposition from Sen. Inhofe, who opposed anything he viewed as being environmental. While Sen. Inhofe would support

²⁷⁵ Howard, interview.

²⁷⁶ S. Amdt. 2985 (Sen. Udall) to S. 3254 (National Defense Authorization Act for Fiscal Year 2013, 112th Cong. (2012)). The 11 Republican Senators who supported the amendment were: Sen. Blunt (R-MO), Sen. Cochran (R-MS), Sen. Collins (R-ME), Sen. Grassley (R-IA), Sen. Hoeven, (R-ND), Sen. Johanns (R-NE), Sen. Lugar (R-IN), Sen. Moran (R-KS), Sen. Murkowski (R-AK), Sen. Snowe (R-ME), and Sen. Thune (R-SD).

conservation efforts that would shrink the logistics tail (and in fact met with ASD for OEPP Sharon Burke the next year at a microgrid factory in his state of Oklahoma), he strongly opposed anything he viewed as anti-petroleum or as responsive to climate change, including biofuels.²⁷⁷ Howard recalled Sen. McCain's opposition as grounded in an opposition to spending scarce defense dollars on what should have been a DOE program, and skepticism about the Navy's promised cost savings and operational benefits.²⁷⁸ While Sen. Hagan's amendment to strike the prohibition against funding for biorefineries passed, the margin was thin – just 54 to 41, with the support of only four Republican senators.²⁷⁹

This legislative history of biofuels-related sections in the FY2013 NDAA illustrates the limitations of quantitative analysis in congressional policy-making. The FY2013 NDAA appears to represent a downturn, with 8 provisions successful enacted into statute compared to 19 in the FY2012 NDAA. However, this figure only counts the section on biofuels agreed to by the conferees, and does not include the heated debate in the Senate and the 3 sections related to biofuels in the House and Senate versions of the NDAA were stripped out before the final enacted version of the bill.

²⁷⁷ Interview with senior staffer for Sen. Inhofe, October 2014; Office of Senator James M. Inhofe, "Inhofe, Secretary Burke, L-3 Westwood Announce DOD Contract Award, New Jobs in Broken Arrow," April 19, 2013, <http://www.inhofe.senate.gov/newsroom/press-releases/inhofe-secretary-burke-l-3-westwood-announce-dod-contract-award-new-jobs-in-broken-arrow>; Howard, interview.

²⁷⁸ Howard, interview.

²⁷⁹ S. Amdt. 3095 (Sen. Hagan) to S. 3254 (National Defense Authorization Act for Fiscal Year 2013, 112th Cong. (2012)). The 4 Republican senators who supported the amendment were Sen. Collins (R-ME), Sen. Grassley (D-IA), Sen. Johanns (R-NE), and Sen. Lugar (R-IN).

It also reinforces the power of the committees in shaping the defense bill, and how rare and effortful it is for there to be a floor challenge to a provision in the SASC or HASC mark. Although the twin SASC provisions limiting DOD's biofuel efforts were themselves quite controversial and skirted customary procedures, it was very difficult to whip supporters into opposing these measures on the floor. It would have almost certainly have been impossible without democratic control of the Senate, which allowed the amendments advanced by Sen. Udall and Sen. Hagan to receive votes.

The story of biofuels during the FY2013 NDAA legislative process also illustrates how contingent congressional policy-making can be. The two provisions in the Senate bill S. 3254 that restricted DOD biofuels initiatives, as described above, were originally offered as amendments during the SASC markup by Sen. Inhofe (R-OK) and Ranking Member John McCain (R-AZ). Both passed the Armed Services Committee narrowly, by 13-12 votes, with the support of Sen. Manchin (D-WV) and Sen. Webb (D-VA) proving decisive.²⁸⁰ However, this slim margin of victory was made possible by the abstention of Sen. Collins (R-ME), who was briefly absent from the mark-up due to the outbreak of a serious fire at the Portsmouth Navy Shipyard, a major Navy shipyard in Maine, during this series of votes. By tradition, votes on amendments are put on hold until the member returns, but that did not happen in this

²⁸⁰ Carlo Muñoz, "Senate Blocks Biofuel Development in Draft Defense Bill," *The Hill*, May 25, 2012, <http://thehill.com/policy/defense/229573-senate-blocks-biofuel-development-in-draft-defense-bill->; Robert F. Service, "Senate Committee Wants to Sink Military's Biofuels Program," *Science*, May 25, 2012, <http://www.sciencemag.org/news/2012/05/senate-committee-wants-sink-militarys-biofuels-program>.

case. Sen. Collins had consistently supported the Navy's biofuels efforts, and would have voted against the McCain and Inhofe amendments.²⁸¹ With Sen. Collins' support for the Navy's biofuel initiatives, the vote would have been tied 13-13, and the amendments would not have been incorporated into the version of the bill that was reported out of committee.

Ultimately, the controversy over the alternative fuels provisions did not spread to other DOD energy topics during the FY2013 NDAA cycle. Both HASC and SASC committee reports on their versions of the FY2013 NDAA included extensive sections on other DOD energy topics, both offering support and exercising the committees' oversight role. The HASC report contained a lengthy section on "Energy Issues," which includes 7 requests for briefings and sections praising various Pentagon energy efforts while cautioning the Pentagon to remain vigilant about costs vs. benefits.²⁸² The companion SASC report is also generally supportive of non-biofuel DOD energy efforts. It too exercises oversight functions, directing the Pentagon to develop guidance for the services on renewable energy financing, increase coordination with the Department of Energy on energy efficiency research, and consider greater use of fuel cells.²⁸³ Despite the lower number of enacted provisions in the FY2013 bill, the HASC and SASC committee reports demonstrate

²⁸¹ Erik Slavin, "Susan Collins, Veterans Defend Navy Green Energy Initiatives," *Bangor Daily News*, July 27, 2012, <http://bangordailynews.com/2012/07/26/politics/susan-collins-veterans-defend-navy-green-energy-initiatives/?ref=search>; Jeanne Shaheen and Susan Collins, "Pentagon Aids Energy Independence," *Politico*, July 15, 2012, <http://www.politico.com/story/2012/07/pentagon-biofuels-effort-aids-energy-independence-078517>.

²⁸² House Armed Services Comm., National Defense Authorization Act for Fiscal Year 2013, H.R. Rep. No. 112-479 pt. 1, at 121-123 (2012).

²⁸³ Senate Armed Services Comm., National Defense Authorization Act for Fiscal Year 2013, S. Rep. 112-173 (2012).

that for other defense energy topics, the process of congressional defense policymaking continued uninterrupted. Overall, the FY2013 NDAA represented a turning point for DOD energy as a policy area, as the issue of alternative fuels became highly controversial.

Conclusion

These close studies of legislative activity related to the Pentagon's use of energy (nuclear-powered surface combatants, operational energy efforts led by HASC staffers, the Department of Defense Energy Security Act, and the growing controversy over alternative fuels), also suggest a few themes about how defense policy gets enacted into law in the contemporary Congress, and suggest some potential characteristics of this type of defense policymaking.

A major commonality is the privileged position of the HASC and SASC to include and preserve sections in the annual defense policy bill, the National Defense Authorization Act. While it is no surprise that the committees of jurisdiction are in a position to have the strongest influence on the bill, it is worth re-emphasizing that institutional positions and power matter. The HASC subcommittee chairman and ranking member had no difficulty seeing their requirement that the Navy use nuclear propulsion for future surface ships incorporated into the NDAA. Similarly, the HASC staffers working on operational energy efforts were able to use their committee roles to hold hearings and mandate GAO and CRS reports that articulated

a need for an operational energy strategy for the Pentagon, as well as to see that their provisions made it into the HASC's mark of the NDAA. By contrast, McKeon and Begtrup had to work harder to persuade HASC members and staffers to support putting provisions from their DODESA bill into the committee's mark, and were only partly successful.

While the prerogatives of senior HASC and SASC members, including the subcommittee chairmen and ranking members, are to be expected, the professional staff members largely share this privilege. Due to the other demands on members' time, the committees' professional staffers function as not only the legislative actors of their bosses, the committee and subcommittee leadership, but also the legislative gatekeepers of the subcommittees marks and amendments during the markups. The HASC staffers involved in the operational energy efforts and the creation of the Office of Operational Energy Plans and Programs had considerable latitude to pursue their own legislative strategy, while also functioning as the sounding board and vettors of the DODESA sections advanced by Rep. Giffords' staffers, Gavi Begtrup and Ryan McKeon. The subcommittee mark, in particular, emerged as the key vehicle for successful legislative activity, serving as a vector for the nuclear propulsion, DODESA, and operational energy initiatives. The broad extent of staffers' latitude to develop and advance specific policy is also evident from the DODESA and operational energy efforts. While DODESA advanced Rep. Giffords' and Sen. Udall's broader goals, it was the staffers who conceived, developed, refined,

socialized, and lobbied for the specific provisions. While the degree to which Gavi Begtrup and Ryan McKeon were acting on behalf on Rep. Giffords after she was shot is certainly unusual, they had considerable freedom to develop the first iteration of the DODESA bill. The latitude of the HASC staffers who advanced and pushed operational energy as a key issue for the Congress and DOD was even more striking. Tellingly, two HASC staffers intimately involved described the subcommittee members as “supportive.”²⁸⁴

Several factors contributed to the ability of the staffers to develop and advance their legislative agendas. First, the strong tradition of bipartisanship on the HASC and SASC allows staffers for the majority and minority to work constructively and collaboratively together. Shogan documents this bipartisan tradition within the contemporary SASC.²⁸⁵ Staffers for the HASC, as well as personal staff who worked with the HASC staff also emphasized the staff’s bipartisan working relationship, and its uniqueness in the contemporary hyper-partisan Congress.²⁸⁶ This bipartisan working relationship, and clear sense of a shared committee aim, as well as a highly routinized NDAA process (as described in Chapter 2) may allow SASC and HASC staffers more scope for autonomous action than in the other policy committees. Finally, the SASC and HASC professional staff tend to have long professional tenures and deep issue expertise. Many have prior Pentagon or uniformed service

²⁸⁴ Interviews with HASC staffer, May 2015; June 2016; Begtrup and McKeon, interview

²⁸⁵ Shogan, “Defense Authorization.”

²⁸⁶ Interview with personal staff of a member active on energy issues in HASC, August 2014; Interview with HASC staffer, November 2014; Interview with former HASC staffer, June 2016; interview with HASC staffer, May 2015; Begtrup and McKeon interview.

experience, and most are retained when the Chairman (for majority staff), or Ranking Member (for minority staff) changes – not the norm for committee staffs, giving them substantial ability to affect the policy decisions taken by the committees. One interviewee related an anecdote where former HASC staff director Doug Roach, a former Air Force pilot well-known for his deep knowledge of all things Air Force and his confrontational style, piled a tall stack of binders on a particular point before a member of Congress, and promised to go through all the arguments and documents in the binders with them until the member of Congress saw it his way.²⁸⁷ Further study of the role of professional committee staff in policy development in defense policy, and comparative across a wider set of issue areas, is warranted.

The bipartisan working relationships between the majority and minority on the SASC and HASC have so far endured, but given contemporary political developments this tradition may be on borrowed time. Partisanship is on the rise within the House and Senate, with each chamber increasingly polarized. While the SASC and HASC members tend to be more centrist than other committees (see discussion in Chapter 4), the widening gyre of partisanship means that the national-security centrism can't be assumed to hold. The tone and practices of each committee are set by the committee chairmen and ranking members. The political turbulence over the past decade, particularly in the House following the rise of the Tea Party, has reduced both

²⁸⁷ Frank Oliveri, "Veteran Defense Panel Staffer Dies at 70," *Roll Call*, January 14, 2013. http://www.rollcall.com/news/veteran_defense_panel_staffer_dies_at_70-220707-1.html; Interview with personal staff of a member active on energy issues in HASC, August 2014.

the tenure and the national expertise of the members of Congress serving on the HASC and SASC specifically, and within the body as a whole.²⁸⁸ While the prestige of the HASC and SASC as plum assignments means that the chairmanships tend to go to members of Congress with longer tenures, and so far, commitment to the traditions of the institutions, that bench may be empty sooner rather than later.

Also notable is the extent to which these legislative efforts occurred in isolation from one another, despite working in the same policy arena. This fractured approach is enabled by the NDAA process, which allows everyone with access to the process to put their oar in. Neither Giffords' nor Udall's staffers recall being aware of or influenced by the efforts by HASC staffers to create and empower an Operational Energy Office, although they occurred in parallel with their own efforts with DODESA 2010 and 2011. A SASC staffer who somewhat covered DOD energy issues during the same time frame was similarly unaware of the Operational Energy Office efforts while they were underway, and only vaguely recalled being aware of DODESA when prompted.²⁸⁹

While Congress often is dismissed as a bunch of crooked political insiders, each of the staffers and members interviewed who helmed these DOD energy efforts saw

²⁸⁸ Personal discussion with current HASC professional staff regarding the lesser national security expertise of members of HASC due to the influx of new members of Congress. Politico found that the average tenure of a member of SASC fell from eleven and a half years in the Senate in 2009, to six and a half years in 2016. Connor O'Brien, "Congress' national security brain drain," *Politico*, June 16, 2016, <https://www.politico.com/story/2016/06/congress-defense-brain-drain-224404>

²⁸⁹ Interview with SASC staffer, March 2016.

their efforts as rooted in an urgent need to improve the way DOD uses and thinks about energy. While some of the provisions, particularly those in DODESA, had the potential to show results in the short term, others were acknowledged by their architects to be longer-term efforts. In particular, the Operational Energy Plans and Programs office, the requirement to consider the fully-burdened cost of energy as a Key Performance Parameter, and the mandate for nuclear-powered surface ships were areas in which the expected benefits would be decades in the making. While one staffer described the utility and flexibility of earmarks in directing RDT&E funding for promising energy technologies and research, many of the staffers interviewed saw themselves as clear-eyed with regard to efforts by companies to influence legislation, and considered it separate from their own efforts.²⁹⁰ For example, a provision requiring a study on solar and wind energy for expeditionary forces was described as having been incorporated into the HASC mark in response to intense lobbying by solar companies of the committee. While the companies asked for funding, the committee mandated this report instead. In the post-earmarks era, the study was necessary to justify the national security rationale for the funding.²⁹¹

To a large extent, these HASC and personal staffers created their own opportunity for legislative action by drawing attention to the problems that U.S. soldiers faced, particularly the casualty costs associated with fuel logistics and the burden of batteries on patrol in Iraq and Afghanistan. The facts on the ground existed, of

²⁹⁰ Interview with SASC staffer, March 2016.

²⁹¹ Interview with HASC staffer, June 2016.

course, but it was the staffers' work of making them legible to Congress via hearings and GAO and CRS reports that created the opportunity for legislative action. The report and hearings allowed the staffers to create a common understanding of the problems of DOD's profligate use of fuel created in the battlespace and in the logistics tail. This common understanding contributed directly to the support they received from HASC members, including the Readiness subcommittee leaders, to pursue their policy objectives in forcing DOD to grapple with their energy use by mandating an operational energy report and creating the Operational Energy Plans and Programs office.

As a corollary, the staffers interviewed unanimously emphasized that non-controversiality was the key criterion to a provision being includable in the subcommittee mark of the NDAA. Having a strong rationale for why one's provision would improve national security was important, but non-controversiality was essential. Frustratingly, there is no threshold for what defines a non-controversial vs. a controversial policy change, lending an "I'll know it when I see it" quality to the hurdle. Moreover, what may be seen as a common sense or practical approach in one Congress may be seen as radical or conservative in another, as the individuals in Congress turn over and the Overton window shifts. The requirement that any provisions adopted in the markup be uncontroversial to their membership is in large part due to the structure and practices of the HASC and SASC markups – the objections of one member (or more realistically, their staff) would preclude a

provisions' inclusion in the mark, due to norms of bipartisan cooperation in the committee markups that are still valued in the committees. Any provision seen as too controversial to be included in the subcommittee's mark must either be included in the Chairman's mark, or be adopted in the full committee debate and amendments process – a far less sure process to inclusion in the NDAA. It is often easier to shelve defense issues that prompt disagreement and debate. The decisive venue of the subcommittee and committee negotiations about what provisions will be accepted into the committees' marks, combined with the requirement that provisions be uncontroversial, suggests that an incremental, "small-bore" approach that doesn't kill any sacred cows is likely to be the dominant paradigm of defense policymaking through the NDAA, at least for the rank-and-file members of the armed services committees.

This incremental, small-bore style of defense policymaking recall's Lindblom's incrementalism of "muddling through."²⁹² However, it is not clear that the incremental policy shifts outlined above arose from the simplified decision-making heuristic described by Lindblom. Rather, Congressional policymakers may have considered a broader array of possible solutions but been limited to making incremental policy shifts due to the absolute requirement for non-controversiality in advancing provisions through the NDAA. The incentives to incrementalism in the

²⁹² Charles E. Lindblom. "The science of" muddling through"." *Public administration review* (1959): 79-88.

NDAA – its annual recurrence and consensus-driven procedural tradition – may result in a greater degree of incrementalism, or at least apparent incrementalism, than in other policy areas where the opportunity for a policy shift comes more rarely, incentivizing bolder action and allowing for a broader universe of potential policies.

Staffers and members also had difficulty following up on their provisions and ensuring their successful implementation. Although many of the staffers ably used reports and hearings to draw attention to an area and allow their policy to be enacted, the same staffers struggled to provide sustained congressional oversight and attention to implementation. This disjunction is more striking, as oversight and implementation would largely be accomplished via the same mechanisms – reports and hearings – that helped advance their efforts in the first place. For Rep. Bartlett and Rep. Taylor’s nuclear-powered ships provision, there was very little follow-through on the requirement, particularly once the near-term opportunity to potentially include nuclear power on future class of CG(X) ships evaporated when that program was cancelled. Nearly 10 years after that requirement was enacted, there is no prospect of nuclear-powered surface ships on the horizon (all submarines are already nuclear-powered), and it is doubtful that the Navy would consider itself bound by this mandate, despite its status as enacted law. Similarly, the scattershot nature of the DODESA provisions made them difficult for Begtrup, McKeon and Howard to track, even shortly after they were passed. None of the staffers involved in the DODESA efforts interviewed were able to describe a particular end state they were trying to bring about, beyond a DOD more cognizant and thoughtful about its energy use.

Neither Begtrup, McKeon, or Howard had an answer for which of their DODESA efforts was most successful or consequential, even though Begtrup and McKeon were able to proudly describe how many of the DODESA provisions were incorporated into the NDAA in 2010 and 2011. The question of implementation is somewhat clearer for the operational energy efforts advanced by HASC staffers, in part because their goals were more concrete and focused. An Office of Operational Energy Plans and Programs was established, and an operational energy strategy and annual reports were issued. However, the ebbing national and member interest in the logistics burden of DOD's energy practices, due in large part to the end of the Iraq conflict and a disengagement with the war in Afghanistan, have firmly put this issue on the back burner. Without congressional care and feeding, DOD's reluctance to allow a new office to take root within the bureaucracy jeopardizes the durability of the staffers' efforts and achievements. In each of these cases, the implementability and actual implementation by DOD appears to have been a secondary consideration. Two HASC staffers involved in the operational energy efforts specifically cited greater efforts to get the OEPP office off to a strong start as a missed opportunity.²⁹³ This problem of implementation appears well within the norm. As one of the HASC staffers put it, "there is probably a lot of legislation passed that nothing comes of."²⁹⁴ Eventually, all of the staffers who were involved in the creation of the Operational Energy Plans and Programs office moved on. The difficulties of sustained oversight – including a sometimes truculent bureaucracy, the packed schedule and demanding

²⁹³ Interviews with HASC staffers, May 2015; June 2016.

²⁹⁴ Interview with HASC staffer, May 2015.

tempo of committee and staff work, and the perennial risk of member or staff departure make shaping policy to coax or coerce the Pentagon into owning the issue, and taking on the policy's implementation, all the more imperative.

From these examples of defense energy policymaking outlined above, there are a number of clear policy outputs that had or have the potential to significantly impact DOD's energy conservation and use over time. Perhaps the foremost achievement was the creation of the new Assistant Secretary-level Office of Operational Energy Plans and Programs, and the endowment of that office with some real bureaucratic levers of power. The iterative attempts to force DOD to consider the energy demands of weapons systems and consider energy efficiency in acquisitions, contracts and logistics, also show promise. On the installations energy front, setting clear goals for DOD energy conservation and renewable energy, coupled with iterated reporting requirements and more flexibility around energy procurement contracts has the potential to push DOD to significantly reshape its electricity consumption. And despite forceful Republican opposition, the Navy's biofuels initiative has moved ahead.²⁹⁵ These fruits of defense policymaking seem to promise a long-term revision in the Pentagon's energy priorities and some initial reduction in petroleum use and growth in renewable energy utilization. Although the implementation within the

²⁹⁵ Tony Radich, "Biofuels Are Included in Latest U.S. Navy Fuel Procurement," *Today in Energy*, EIA (Washington, DC: Department of Energy, 2014), <https://www.eia.gov/todayinenergy/detail.php?id=17271>; Department of Energy, "Departments of the Navy, Energy and Agriculture Invest in Construction of Three Biorefineries to Produce Drop-in Biofuel for Military," September 19, 2014, <https://energy.gov/articles/departments-navy-energy-and-agriculture-invest-construction-three-biorefineries-produce>.

Pentagon is critical to the eventual impact of these provisions, and is largely out of the hands of the congressional staff that led these efforts, these enacted provisions illustrate that the NDAA remains a vital avenue of defense policymaking.

Chapter 4: How Congress Makes Defense Policy – Quantitative Analysis

The detailed narrative case studies of the previous chapter allow for a close study of how Congress is able to make defense policy. A broader quantitative examination of the content and context of all 213 of the legislative proposals related to defense energy, both successfully enacted and those that are unsuccessful, provides deeper insight into the *what* of defense policy and allows for the identification of its characteristics. This chapter analyzes all of the 213 defense energy-related provisions that were proposed at every stage of the NDAA's legislative lifecycle for the FY2004 – FY2013 NDAs. Evaluating this complete set of prospective legislative sections allows for a fuller inductive identification and description of the characteristics of defense policymaking.

Aside from their subject matter, these prospective and enacted legislative provisions about DOD's energy use have few superficial similarities. In analyzing these provisions as potential examples of defense policymaking through the NDAA, this chapter asks:

- What accounts for the creation of these congressional provisions regarding the Pentagon's energy use?
- Who adds these sections to the National Defense Authorization Act (NDAA)?

- What characterizes these provisions, and what allows them to succeed? What do they illuminate about the characteristics of defense policymaking?
- How has congressional interest in DOD energy use waxed or waned over time, and what does this reveal about the institutionalization of defense policymaking?
- What broader implications do the insights from this type of defense policymaking have?

The first portion of this chapter examines the growth of legislative activity on defense energy, and compares the characteristics of successful vs. unsuccessful provisions.

This section includes an analysis of the controversy and congressional opposition to DOD's biofuels efforts as an illustrative negative case. The next section uses successful provisions to identify key characteristics of defense policymaking: spending; studies and oversight; policymaking; incrementalism; non-controversiality; and enhancement of national security. The final section identifies key elements of the process of defense policymaking vis-a-vis the NDAA, describes the privileged position of the armed services committees, and discusses the role of the conference committee and partisanship.

The chapter concludes with a short discussion of the impacts and implications for congressional defense policymaking and oversight.

Quantitative Analysis

This chapter analyzes the legislative history of the all 213 sections related to DOD energy that were proposed or enacted into law as part of the consideration annual National Defense Authorization Act between FY2004 – FY2013. They range from statutorily required substantial reductions in energy and water use, mandates to consider fuel efficiency in the acquisition of weapons systems, to a multitude of energy-related reports and the creation a new operational energy office. This 10-year span corresponds with the emergence of DOD energy as a topic for legislative attention.

The enacted sections were found via examining the final enrolled bill text (available on the Library of Congress' THOMAS legislative website) for the terms “energy” or “fuel.” Sections related to DOD energy that were present in an earlier version of the bill but that were not included in the final enacted version were located by comparing all earlier versions of the House and Senate bills available on the THOMAS website to the final enacted law.²⁹⁶ This cross-comparison allowed for identifying both when a provision was added to the House or Senate versions of the bill (for example, during House floor debate), and at what stage it was removed from the bill, if applicable (for example, during the conference proceedings.) Provisions altered, combined, or removed during the conference proceedings were identified by using the conference

²⁹⁶ Typical House versions of the bill would include the versions introduced in the House, reported to the House by the Armed Services Committee, passed by the House, referred to the Senate, and the final post-conference version as passed by both the House and the Senate. For the Senate, the versions typically include the bill as placed on the calendar of the Senate by the Armed Services Committee and as passed by the Senate.

committee's report, which lays out legislative provisions adopted and not adopted, with explanations of the actions of the committee. Sections offered as an amendment were identified using the THOMAS website, in conjunction with the Congressional Record.²⁹⁷ This allowed for identification of the sponsor, co-sponsor(s), if any, and the disposition of the amendment, e.g., submitted but not voted on, included in *en bloc* amendment package, voice vote, or recorded vote. For the FY2013 and FY2012 bills, the only years for which they are available, the HASC full committee and subcommittee markups were examined in order to determine at which point provisions present in the version of the bill reported out by the full committee to the House were added, e.g., as part of the *en bloc* package of amendments offered by the HASC Subcommittee on Readiness during the full committee markup of the bill.

213 individual provisions were identified. Provisions were coded as successful if they were enacted in the final NDAA as law, and unsuccessful if they either were not incorporated into any versions of the NDAA, or were stripped out at any point in the legislative process. Provisions were also coded as either supportive or unsupportive of efforts to shift DOD's energy usage towards greater energy efficiency, greater consideration of energy in logistics planning and acquisitions, increased use of renewable energy, and greater reporting and oversight of DOD's energy use.

Supportive provisions included senses of Congress encouraging energy saving techniques, such as energy savings performance contracts, provisions that broadened

²⁹⁷ Due to the limitations of data about congressional amendments, only those amendments formally proposed and available via the Library of Congress' legislative information website (THOMAS) or the Congressional Record are included.

and extended energy use and energy savings reporting requirements, feasibility studies for new energy technologies, such as ground source heat pumps and biofuels, expanding the Pentagon's authorities to permit greater energy savings or alternative energy contracting, for example, by giving the service more authority to lease land to utilities for renewables generation, provisions to create and strengthen the Office of Operational Plans and Programs, and set energy-related goals. Unsupportive provisions attempted to curtail DOD's use of renewable energy or shift towards energy efficiency and conservation, principally by limiting funds available by either prohibiting DOD from spending funds for those purposes, or by re-directing funds allocated to those efforts to another purpose. For example, one amendment prohibited DOD from using funds to support LEED certified buildings, while another reduced energy conservation funds by \$10 million, redirecting those funds to the reliable warhead replacement program.²⁹⁸ All provisions to exempt DOD from section 526 of EISA 2007 were also coded as unsupportive. Focusing on defense policymaking via the NDAA, this analysis does not include any DOD appropriations bills, although they fund efforts that touch on energy, e.g. efforts to develop more efficient engines, and may contain energy-related policy riders.²⁹⁹

²⁹⁸ National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, § 2823, 126 Stat. 2152 (2013); H. Amdt 1052 (Rep. Pearce) to H.R. 5658 (Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, 110th Cong. (2008)).

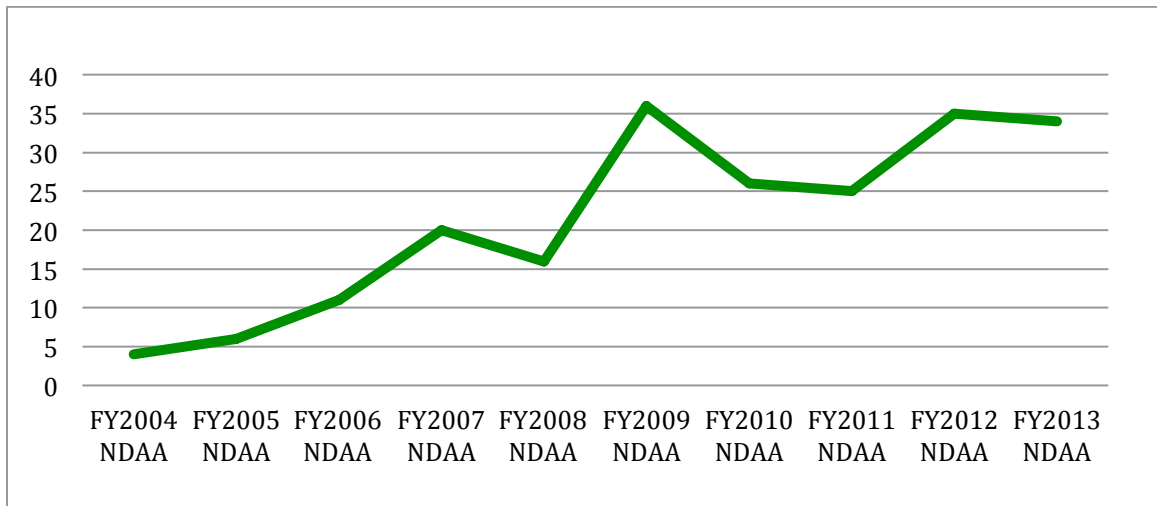
²⁹⁹ Jason A. MacDonald found that policy riders on appropriations bills rose substantially during periods of divided government (see "Limitation Riders and Congressional Influence over Bureaucratic Policy Decisions," *American Political Science Review* 104, no. 4 (2010): 766-82); while John H. Aldrich, Brittany N. Perry, and David W. Rohde found that party leadership increasingly turned to legislative riders in appropriations bills as a method to either advance or resist policy changes (see "House Appropriations After the Republican Revolution," *Congress and the Presidency* 39, no. 3 (2012): 229-53). This suggests that further research on a prospective defense inside-leadership game should additionally include appropriations riders.

This detailed and analytically rich legislative history of specific provisions allows for a complex view of the evolution of DOD energy as a topical area for congressional action and represents a significant improvement over the most commonly analyzed aspect of congressional action, the roll-call vote. While valuable, the roll-call vote by its nature is unable to shed light on a wide array of congressional behavior, including decisions by members to offer, support, or oppose legislation, the amendment process, the influence of the committees of jurisdiction, the practice of bundling amendments together *en bloc* and the far-more-common voice vote. For example, of the 87 DOD energy sections enacted into law, none were added to the bills via a roll call vote. Despite the imperfect lens offered by legislative provisions, they allow for tracking changing congressional behavior over time and identifying the patterns of policymaking at work.

All Provisions

During the legislative cycles for the FY2004 through the FY2013 NDAAAs, legislators considered 213 provisions related to DOD energy topics. Since the FY2004 NDAA, the number of provisions considered has trended consistently upwards. FY2009 was been the high-water mark, with 36 provisions considered (see Figure 3).

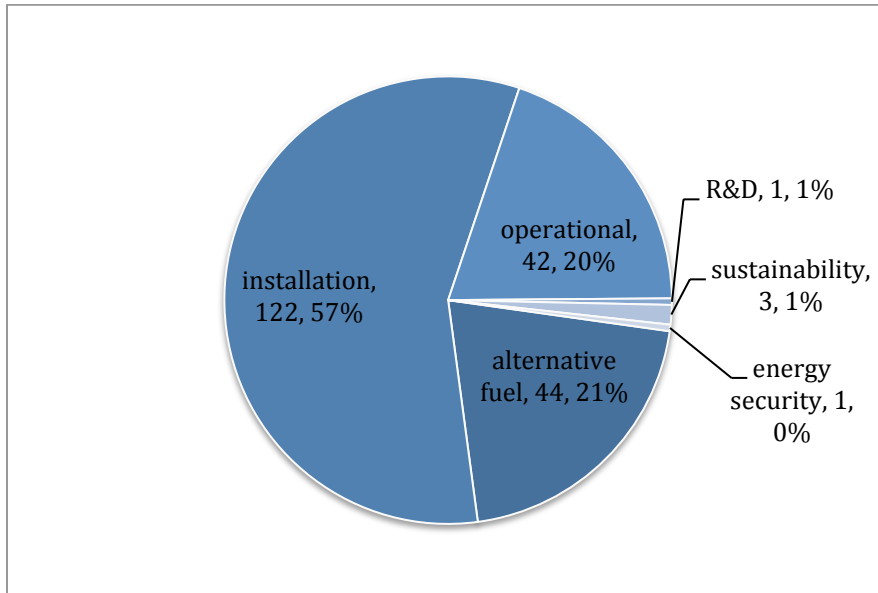
Figure 3: DOD Energy Provisions Considered



Overall, 89% of all proposed provisions were supportive. Just a quarter of the unsupportive provisions were successfully enacted.

Three areas related to DOD energy use received the greatest congressional attention in the FY2004 – FY2013 NDAs: installation energy, the energy DOD uses at facilities and installations, principally electricity and fuel for non-tactical vehicles, operational energy, the energy DOD uses in its weapons systems and platforms, principally petroleum fuels, and alternative non-petroleum fuels. Of these 213 provisions, 122 (57%) dealt with installation energy, while operational energy accounted for 42 sections (20%), and alternative fuels represented 44 sections, or 21% (see Figure 4).

Figure 4: Topical Distribution of Considered Provisions



Of these 213 provisions, 100 originated in the House, while 111 originated in the Senate, owing to the more liberal Senate amendment process. Of the House provisions, nearly three quarters (74 provisions out of a total of 100) were incorporated into the final law. Additionally, about three quarters of the House provisions originated in the House Armed Services Committee. By contrast, more than half of the Senate's sections - 73 in total - were amendments offered on the Senate floor. Of these amendments, less than half were voted or saw any type of floor consideration. Overall, the Senate was far less successful in having its provisions incorporated into law – 44 provisions out of 111 were enacted into the final statute, with 67 unsuccessful provisions. 3 provisions were *de facto* introduced by the conference committee and were significant departures from the original House and Senate provisions considered by the conference committee.

Enacted into Law

Over the ten-year span between the FY2004 and the FY2013 NDAA, Congress enacted 87 provisions related to defense energy issues into the final law of the annual NDAA, consolidating 120 separate House and/or Senate provisions. Since the FY2004 NDAA, the number of sections related to DOD energy that have been enacted in the final bill has trended upwards, reaching a peak of 18 in the FY2012 NDAA (see Figure 5). While the number of enacted provisions has not grown steadily, it has increased significantly since the FY2004 NDAA, demonstrating the emergence and solidification of defense energy as an area of congressional interest and oversight.

Figure 5: Number of DOD Energy-Related Provisions Enacted in the Annual National Defense Authorization Act

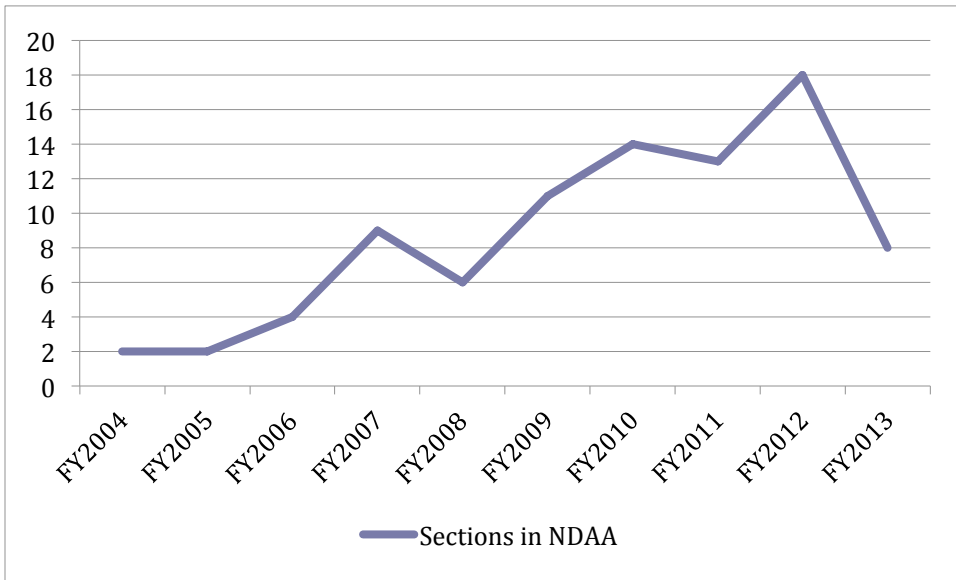
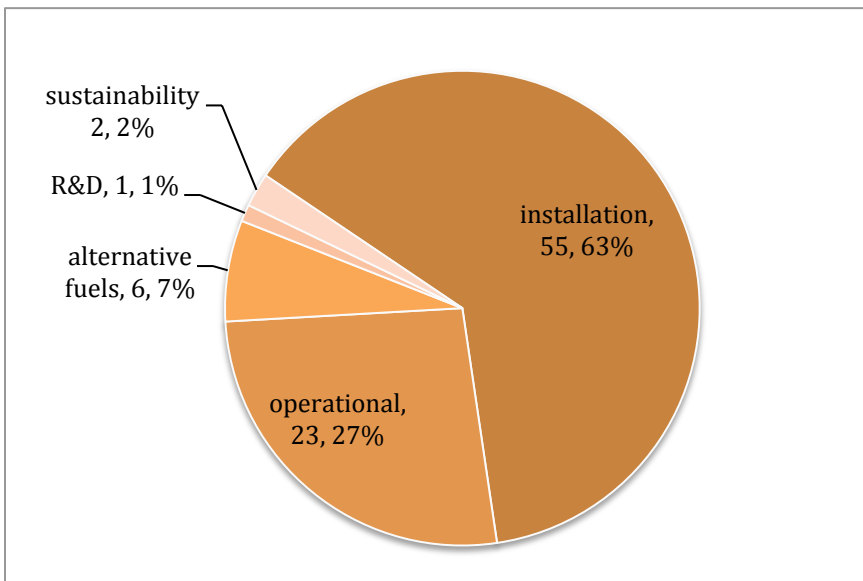


Figure 6: Topics of enacted congressional energy provisions, FY2004-FY2013

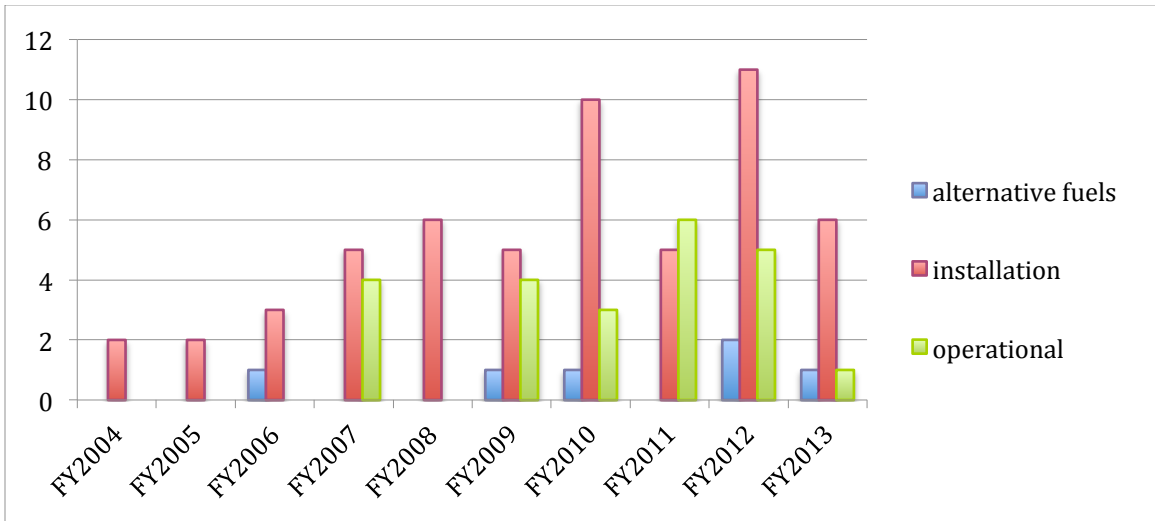


Of these 87 successful provisions – those enacted into law – 55, or 64%, dealt with installation energy topics. Installation energy was also the earliest and most consistent topic of legislative provisions, with sections addressing this aspect of DOD

energy use in each of the NDAAAs between FY2004 and FY2013 (see Figure 7.)

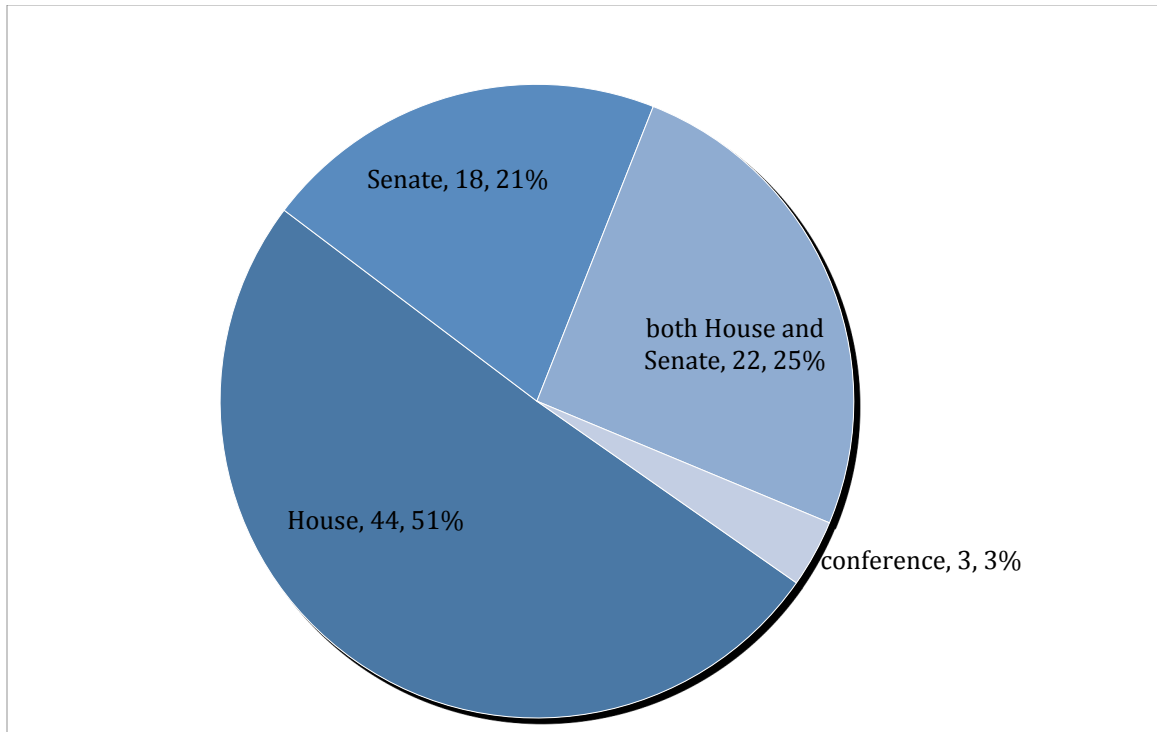
Operational energy was the area with the second-greatest number of legislative provisions, with 23 sections, 27% of the total. Operational energy was a later focus than installation energy, with the first provisions appearing in the FY2007 NDAA. However, it has remained a consistent area of focus since then, with sections related to operational energy in each of the subsequent NDAAAs, with the exception of the FY2008 bill. The timing strongly suggests that congressional interest in operational energy emerged following a high-profile Defense Science Board report in 2006 that detailed various concerns regarding energy during U.S. operations in Iraq, as well as prominent statements from active duty military commanders regarding the problems the U.S. faced regarding Iraqi fuel supply lines. During this time period, the third major topical focus was the military's interest in non-petroleum, or alternative, fuels. While this aspect of DOD energy resulted in 6 legislative provisions (7% of all DOD energy-related sections), it became a highly controversial topic and was the subject of multiple hearings during the FY2013 NDAA process.

Figure 7: Count of provisions on selected topics



These 87 enacted sections are a consolidation of 120 separate provisions – 71 provisions in the House-passed versions of the annual NDAA, and 46 provisions in the Senate-passed NDAA. Two provisions were *de facto* inserted during the conference process, as substantial departures from the original House or Senate sections on which they were based. Overall, 44 sections of the 87 sections, or 52%, were present exclusively in the House versions of the bill, while only 18, or 21% appeared exclusively in the Senate versions. (See Figure 8). Demonstrating significant coordination, 22 provisions, or 25%, were present in some form in both the House and Senate versions.

Figure 8: Chamber origin of provisions



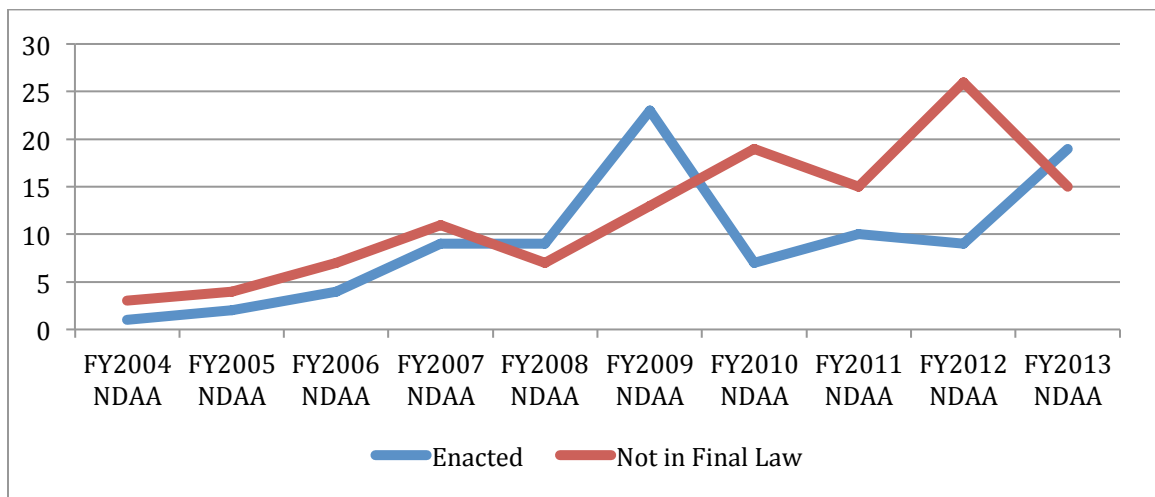
Two of the three provisions added during conference reflect the contentiousness of DOD use of biofuels. The first, section 344 in the FY2010 NDAA, consolidated three far more ambitious House and Senate provisions setting Air Force goals for procuring renewable aviation fuels, replacing them with a provision requiring a report on the potential utility of renewable aviation fuels to DOD. The second, Section 315 in the FY2013 NDAA, reflected the increasing controversy over the Navy’s biofuels initiatives. The conference provision represented a compromise between divergent provisions related to alternative fuels in the House and the Senate-passed versions of the bill following an acrimonious amendment battle on the Senate floor. The third significantly conference-amended provision, section 2864 of the FY2008 NDAA, required a study of DOD’s ability to meet renewable energy goals, rather than the

House-passed requirement that DOD procure 25% of its electricity as direct purchases from renewable sources.

Unsuccessful Provisions

Of the 213 DOD energy provisions introduced, 93 were unsuccessful, that is, not included in the final bills. While the absolute number of provisions, both successful and unsuccessful, increased as DOD energy grew as a distinct policy area, by the FY2010 NDAA the number of unsuccessful sections had outstripped the number that were ultimately enacted into the final law (see Figure 9).

Figure 9: Successful and Unsuccessful Provisions



Of the three major topical areas within defense energy (alternative fuels, operational energy, and installation energy), provisions related to alternative fuels were much less likely to be successful, with two unsuccessful provisions for every section that was included in the final bill. Installation energy provisions were generally more successful, with successful provisions outnumbering unsuccessful ones 3:2.

Provisions related to operation energy were the most successful, with successful provisions outnumbering unsuccessful ones by a factor of 5:2. (See Table 1.)

Table 1: Successful and unsuccessful provisions by topic

	Successful	Unsuccessful	Ratio of Successful to Unsuccessful
Alternative fuels	13	31	0.42
Installation energy	73	49	1.49
Operational energy	30	12	2.5

The Senate floor was by far the most common source of provisions that were not incorporated into the final law, accounting for 55 provisions, and 59% of all unsuccessful provisions. The likely explanation is that the looser rules in the Senate allowed amendments to be offered that were unlikely to be considered. Overall, nearly three times as many amendments were introduced on the Senate floor as on the House floor (73 vs. 25). However, only 28 of the Senate floor amendments were considered, while 46, or 63% of all Senate floor amendments, were submitted but not considered. All 28 Senate amendments that received floor consideration were included in the Senate version of the bill. 25 were included *en bloc*, while 1 passed by voice vote and two passed by roll call vote.³⁰⁰ Overall, the Senate provisions that received floor considerations had a decent likelihood of inclusion in the final bill, with 16 making it into the final enacted bills, while 12 provisions were stripped

³⁰⁰ These two amendments, S. Amdt. 2985 (Sen. Udall) and S. Amdt. 3095 (Sen. Hagan) to S. 3254 (National Defense Authorization Act for Fiscal Year 2013, 112th Cong. (2012)), part of the FY2013 NDAA legislative cycle, struck amendments inserted during the SASC markup of the bill that would have restricted DOD's ability to purchase biofuels. As such, they altered the bill text but do not make up part of the enacted text. This unusual occurrence is discussed in greater detail below.

during conference, for an overall success rate of 57% for considered Senate floor amendments.

This ratio of 57% of considered Senate amendments reaching the enacted bill is a comparable success rate to House floor amendments. House floor amendments were more likely to be incorporated into the House bill and be passed by the House. Of 25 House floor amendments, five failed to receive waivers from the Rules committee to allow them to be considered on the floor. Of the remaining 20 amendments, 19, or 95%, were included in the House bill.) However, 9 out of these 19 amendments in the House version of the bill were ultimately stripped by the conference, for a success rate of 53% of House floor amendments that passed the House and 40% of all House floor amendments offered.

What Characterizes Defense Policymaking in the NDAA?

This section offers a sampling of *how* these sections carried out policy-making in this area, through reporting, imposing policy goals, attempting to change DOD practice, and other avenues of congressional oversight. While not every provision will embody every characteristic identified below, the body of successfully enacted provisions related to defense energy over this ten-year time frame, contrasted with the corpus of unsuccessful provisions, allows us to draw some conclusions about the contours of congressional defense policymaking. While the subject must be low-profile enough to avoid attracting sustained opposition, this is a necessary but not a sufficient

condition for effective congressional policy-making and eventual enactment into statute. In addition, the overwhelming majority of successfully enacted provisions are low- or no-cost. Other common characteristics include short-term and/or once-off provisions, studies or reports on an issue, and incremental changes to previous policies. Proposals that are characterized by their supporters as enhancing national security or increasing military capability or readiness are also more likely to attract support.

These parameters suggest that there is a Goldilocks-esque approach to successful defense policymaking in the NDAA – not controversial, not expensive, often provisions that build on prior policymaking, and that appear to straightforwardly enhance national security or defense capabilities. I term provisions that fit this model “small-bore defense policymaking.”

The importance of these characteristics to successful congressional defense policymaking is reflected in the shared characteristics of the 87 successfully enacted provisions related to defense energy between FY2004 and FY2013. The majority of provisions related to defense energy that have been successfully enacted into statute have been low- or no-cost, comprise short-term or once-off provisions, particularly requirements for studies, reports, or DOD policies on a specific issue, and/or require incremental changes to extant policies.

Not all policymaking will succeed. Prospective provisions may not attract enough bipartisan support to be included in the NDAA, and legislative entrepreneurs have different levels of savvy and persuasiveness. Even if enacted, not all congressional policymaking is sound. Even sound policy on important issues faces difficult implementation hurdles within the Pentagon, the world's largest bureaucracy. But even small or incremental provisions and changes in defense policy can have substantial cumulative impacts on the Pentagon, shaping defense policy and the armed forces. The enacted amendments varied widely in their scope and potential impact, but show a steady growth in interest in fiscal and energy savings at DOD installations, and the emergence and rapid growth of operational energy and DOD use of alternative fuels as areas of congressional policy-making and oversight. (See Figure 7).

Spending

Of these 87 provisions, only 11 (13%) authorize any spending. The remaining 87%, though they may impact DOD spending, for example, by requiring consideration of energy efficiency in DOD procurement or authorizing a research program into more efficient ground vehicles, do not authorize any specific outlay. However, of these 11 provisions, 10 are the annual authorization of appropriations for specific energy conservation programs at DOD installations. This initiative, the Energy Conservation Investment Program has been in effect since its initial authorization in the FY1999 NDAA, authorizing approximately \$120 million annually for specific energy

conservation projects at pre-selected military installations.³⁰¹ The lone remaining section that authorized specific funding is Section 331 of the FY2010 NDAA, which authorizes \$5 million to fund the operations of the newly-created Office of Operational Energy Plans and Programs, which had been created via the FY2009 NDAA, two years earlier.³⁰² This \$5 million authorization conforms to the shared characteristics of small-bore defense policymaking, being both a relatively small sum in the defense budget and an incremental addition to previous congressional initiatives.

The popularity of provisions that don't authorize any specific authorization funding illustrates a foundational bureaucratic truth: it is far easier to secure support for a policy if it doesn't threaten your would-be supporters' own equities. Particularly during the present era of caps on defense spending, any increase in authorizations for one program requires a decrease elsewhere, in a zero sum game. Even during the growth of defense spending between FY 2003 and FY 2010, affixing a specific dollar amount to a program or policy attracted closer scrutiny and perhaps greater skepticism from other staffers or members of Congress; it necessarily requires a definitive statement about how valuable a program is. Provisions which attempt to

³⁰¹ Strom Thurmond National Defense Authorization Act for Fiscal Year 1999, Pub. L. No. 105-261, § 2403, 112 Stat. 2195 (1998). This program also demonstrates the persistence of small-bore defense programs, once included in the standard NDAA.

³⁰² National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, § 331, 123 Stat. 2257 (2009). This provision authorized \$5 million for the operations of the Director of Operational Energy Plans and Programs (OEPP) on the confirmation of a Director of that Office. OEPP had been created two years earlier in the FY2009 NDAA (Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417, § 902, 122 Stat. 4564 (2008)).

shape DOD's actions without authorizing any funding sidestep these concerns, but at the cost of jeopardizing implementation. Unfunded mandates, especially those unmoored from a bureaucratic champion within the Pentagon, are far less likely to have a substantial impact.

Studies and Oversight

A large proportion of these 87 enacted sections require DOD to submit reports or briefings to Congress, or to develop DOD internal policy or guidance, rather than proscribing specific policies or energy targets. Calling for a study or a report is a favorite technique of Congress generally, and can serve a variety of purposes. It can air congressional concerns about an issue, signal congressional attention, be a delaying tactic, focus on a Member's pet interest, be an element of congressional oversight, or lay the groundwork for future directive or policy language. Thus, these sections can perform important legislative functions and can be a prelude to more sustained attention and oversight, including demonstrating legislative interest, advancing a policy position in an impossible-to-object-to form, or breaking legislative deadlocks on an issue.³⁰³ The threshold to including a report or vague prescription in the annual NDAA is comparatively low, making them a popular gambit in small-bore defense policymaking.³⁰⁴ Ultimately, nearly half of the enacted sections related to DOD's energy use called for a report or study. Fully 41 of the 87 provisions (47%) require a report or a briefing to be submitted to Congress.

³⁰³ John R. Johannes, "Study and Recommend: Statutory Reporting Requirements as a Technique of Legislative Initiative in Congress—a Research Note," *Western Political Science Quarterly* 29, no. 4 (December 1976): 589-96.

³⁰⁴ Requests for briefings and other information in the HASC and SASC committee reports similarly demonstrates legislative interest in an attention to an issue, while being inherently non-divisive.

Some sections, like 2845 of the FY2010 NDAA (P.L. 111-84), which calls for a study on the possibility of powering military installations with nuclear power, represent the specific pet interest of a Member on one of the committees. Others, like Section 243 of the FY2010 NDAA (P.L. 111-84), which originated in the House Armed Services Committee, embody congressional performance of its oversight function. This section, responding to congressional frustration with fragmented and uncoordinated efforts between the services, required the DOD Comptroller General to evaluate the coordination of the DOD services and agencies in energy storage device (battery) requirements, purchases, and investments. Similarly, Section 2825 of the FY2013 NDAA (P.L. 112-239), originally introduced during the House floor debate by Rep. Welch (D-VT) and Rep. Gardener (R-CO), and adopted by an *en bloc* amendment, requires DOD to report on its use of a type of energy efficiency contract, including DOD spending and savings accrued from reduced energy use. These latter two reports appear to be attempts to gather additional information as a prelude to potential legislative change in a subsequent NDAA.

Reports and studies can play a significant role in the policymaking process. As the aphorism goes, “what gets measured gets managed.” Simply including a one-off or annual reporting requirement can bend DOD towards greater focus on an area. For example, Section 2825 of the FY2013 NDAA (P.L.112-239) required a report on the Pentagon’s use of energy savings performance contracts detailing the contracts

awarded, leveraging of private sector capital, and the savings achieved while Section 2864 of the FY2008 NDAA (P.L. 110-181) asked for detailed information about DOD's procurement of renewable electricity, requiring, among other pieces of information, "a graphical illustration of energy use from renewable energy sources by the Department as a percentage of total facility electricity use over time, starting no later than fiscal year 2000 and running through fiscal year 2025." These reports and studies may or may not have a direct causal impact on DOD's energy use, depending on the extent to which they are taken on board by the Pentagon. However, they can also be a prompt to DOD to take ownership of an issue or problem Congress has identified, rendering further direct congressional policymaking unnecessary – a potential win-win for both the Pentagon bureaucracy and the perennially-busy legislative staff.

Policymaking

A further 28 sections (33%) explicitly require DOD to develop a plan or policy, gather data, or issue guidance to achieve an energy-related goal. For example, each military service and defense agency was required to create an "energy performance master plan" to achieve the variety of energy goals set forth by Congress, executive orders and DOD policies, including a baseline of energy use, metrics to be used to evaluate progress, and specific proposed investments in each year's budget.³⁰⁵ After mandating the creation of an annual report on DOD's operational energy goals,

³⁰⁵ Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, § 2832, 124 Stat. 4468 (2011).

multiple provisions added other areas of DOD's efforts to the report, increasing its utility as a tool of congressional oversight.

Notably, while directive language is common -- overall, 79% of the enacted provisions related to DOD energy during this time frame play this directive role -- very few enacted provisions prescribe a specific end state as an outcome, instead of urging the Pentagon to take whatever factor into consideration. When they did proscribe a specific goal, they tended to be fairly significant in shaping DOD's energy policy. One provision, discussed at more length later in this chapter, required that DOD establish a goal of procuring at least 25% of its electricity from renewable sources by 2025.³⁰⁶ Another line of effort, described in the previous chapter, created the Operational Energy Plans and Programs office to oversee the Pentagon's operational energy efforts and force the Pentagon to consider energy in its internal planning.³⁰⁷ Additional sections simply directed DOD to "consider" various energy-related goals, for example, the greater use of fuel cells in back-up power systems.³⁰⁸

Naturally, there is some slippage between congressional policy goals and Pentagon implementation, examined in more detail in Chapter 7. As one of the largest and most formidable bureaucracies in the world, the Pentagon changes but slowly, and generally only if there is someone within the building investing significant effort into

³⁰⁶ Pub. L. No. 109-364, § 2825, 120 Stat. 2476.

³⁰⁷ Pub. L. No. 110-417, § 902.

³⁰⁸ John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 358, 120 Stat. 2164 (2006).

the changes. Additionally, although Congress frequently means well, the lack of detailed subject matter expertise means that provisions intended to effect a certain change often fall short of the mark, and don't have the hoped-for impact.

Incrementalism

The 87 enacted sections addressing defense energy are predominantly a series of small and incremental steps altering or expanding on previous requirements rather than charting a new path. For example, several amendments required additional topics to be included in the Annual Energy Management Report (which deals with DOD's installations energy use), the annual operational energy report, or the energy master plans of the military departments and agencies.³⁰⁹ Similarly, the Operational Energy Plans and Programs office featured in a number of sections after its creation, including a name tweak to better reflect its position within the Pentagon's bureaucratic hierarchy, an initial funding allotment, a provision offering a generally positive Sense of Congress about the office, and the addition of biofuels to the office's purview.³¹⁰ Overall, the small scale of each of these successful provisions, combined with a fairly clear argument for increasing energy efficiency in the Department of Defense as a benefit to national security, has allowed them to remain uncontroversial, attract bipartisan support, and be successfully incorporated into statute.

³⁰⁹ For example, see § 342, § 2822, § 2826, and § 2828, FY2012 NDAA (National Defense Authorization Act for Fiscal Year 2012, Pub. L. No. 112-81, 125 Stat. 1298 (2011)) – four tweaks to required reports in just one year.

³¹⁰ Pub. L. No. 111-84, § 331; § 903, 123 Stat. 2423; Pub. L. No. 111-383, § 901, 124 Stat. 4317; Pub. L. No. 112-81, § 311, 125 Stat. 1351; § 314, 125 Stat. 1357.

The congressional provisions enacted to effect substantive policy impacts clearly show an iterative, incremental process. As an example, consider a series of provisions intended to force DOD to consider the fuel efficiency of weapons systems in the acquisitions process. The first provision, stated that, “it shall be the policy of the Department of Defense to improve the fuel efficiency of weapons platforms,” and required a feasibility assessment of designating a senior DOD official to implement this policy – a quite general approach.³¹¹ Two years later, Congress required the fuel requirements of weapons systems to be considered in the analyses and force planning processes that feed into capability requirements for acquisitions decisions. Specifically, fuel efficiency was directed to be included as a Key Performance Parameter (KPP), a defined benchmark of critically important weapons system capabilities.³¹² While the specifics of how exactly the benefits fuel efficiency could be quantified was (and remains) a difficult methodological nut to crack, this provision, compared to the prior one, displayed much more specific knowledge of the DOD acquisitions procedures it aimed to influence. Two years later, another provision tackled the acquisition problem again, directing DOD to review the existing defense acquisition guidance, specifically including Department of Defense Instruction 5000.02, the nearly 150-page official writ of DOD acquisition policies, in regards to whether energy efficiency and sustainment of weapons systems were being appropriately considered. Again, this demonstrated further specificity of

³¹¹ Pub. L. No. 109-364, § 360, 120 Stat. 2164.

³¹² Pub. L. No. 110-417, § 332, 122 Stat. 4420.

congressional knowledge and intent in this area, illustrating both lackluster DOD performance in advancing this issue (from the congressional point of view), and the growing sophistication of the authors of these provisions.

Expanding on earlier provisions is an easier sell to fellow staff or members.

Incrementalism can thus provide the camel's nose in the tent, rather than having to persuade members or staff of the merits of a wholly new policy or requirement.

Adding further detail to or extending an extant policy area is also easier for members of Congress and their staff, requiring less effort, imagination and argumentation, and allowing for the growth of legislative expertise in that precise area. This incrementalism that increases the likelihood of successful enactment for any specific provision, also enhances the ability of congressional policymakers to achieve more substantial outcomes by building on prior elements, as well as learn from past failures. The annual recurrence of the NDAA allows the policy entrepreneurs multiple chances to engage on a particular issue and attempt to shape Pentagon implementation in subsequent years. For example, a series of provisions of increasing specificity attempted to force DOD to factor in the fuel needs of systems at various decision milestones in the acquisition process (discussed in Chapter 7).

Controversiality

The majority of both the successful and unsuccessful provisions aimed to advance energy conservation, energy efficiency, or renewable energy in the Pentagon. Just 17

of the total of 213 total provisions, or 7.6%, were unresponsive, and of those 17 unresponsive provisions, the majority (15, or 88%) were not enacted into the final law. Just two unresponsive provisions were enacted – 2.2% of the 87 enacted provisions. Overall, 96% of the successful provisions were responsive (one was neutral), demonstrating the generally bipartisanly-palatable nature of DOD energy issues and a critical component of its success as an area for small-bore congressional defense policymaking. Non-controversiality was also emphasized by each of the congressional interviewees as an essential feature. Without unanimous support of the members on the committee, provisions would not be included in the subcommittee marks. Similarly, if provisions had attracted controversy or opposition, they could not be included in the *en bloc* packages of amendments passed by unanimous consent or voice vote on the floor of the House or the Senate.

The controversy over alternative fuels in the FY2013 NDAA functions as a negative case, illustrating that *non-controversiality* is a necessary condition for successful small-bore defense policymaking. Unfortunately, while non-controversiality is a necessary condition, it is difficult to establish the *absence* of controversy. Generally, a provision's presence in the HASC or SASC subcommittee mark draft text, or inclusion into an *en bloc* set of amendments, either in the markup or on the chamber floor, is sufficient indication that that provision is not controversial for the political and policy context of the moment, and has been agreed to by both the majority and the minority. Similarly, a provision that is subject to a voice vote, and especially to a

recorded vote, can *prima facie* considered to be controversial. However, the political climate or policy context can, and do, shift, making formerly uncontroversial areas of defense policymaking a hotbed of partisan debate, as was the case with alternative fuels for the Pentagon.

Alternative fuels became highly controversial in the FY2013 NDAA process, driven by strong opposition by key Republican members of the House and Senate Armed Services Committees to a prominent Navy proposal to develop domestic biofuel refineries, a proposal that both involved considerable expenditure (\$510 million in total) and had questionable impacts on military capability.³¹³ General Republican support for petroleum-based and coal-based fuels and opposition to alternative liquid fuels had already been evident in the form of several attempts to allow DOD to use coal-to-liquid fuels and favorably position them vis-à-vis biofuels, in the form of 6 provisions between FY2009 and FY2012, but the Navy's aggressive pursuit of this biorefinery project (and the return of the Senate to Republican control) was the spark that lit the kindling. Strong and loudly-expressed Republican skepticism and objections followed, as did a robust attempt to bar the Navy from pursuing this project.

Small-bore defense policymaking requires that topics remain low-profile and uncontroversial, passing through the markup and floor stages of the NDAA and

³¹³ Talia Buford, "\$510M Initiative Aims to Spur Biofuels," *Politico*, August 16, 2011, <http://www.politico.com/story/2011/08/510m-initiative-aims-to-spur-biofuels-061492>.

attracting little negative attention. In the FY2013 NDAA, congressional policy-making about DOD alternative fuels moved out of the small-bore defense policymaking model, due to consistent and hostile political attention. The Pentagon's alternative fuels efforts faced extensive scrutiny at a high-profile House hearing, were prohibited in the HASC version of the bill and by two closely-watched and contentious SASC amendments during the committee markup, were argued over in dueling op-eds by Sen. Inhofe and Sens. Shaheen and Collins in the Capitol Hill newspaper *Politico*,³¹⁴ and were the subject of two even more controversial roll-call floor votes to strip out the two SASC amendments. (See discussion below.)

Alternative fuels had previously been a viable area of small-bore defense policymaking with 9 successful provisions out of 44 total, for an overall success rate of 20.4%. The developments in the FY2013 NDAA cycle that made it a hot-button topic also made it non-viable as an area of small-bore defense policymaking. This shift was fairly sudden - while alternative fuels made up 10 of the 17 total unsupportive provisions, 6 of these were proposed during the heated FY2013 legislative cycle debates about the Navy's alternative fuels efforts. Even so, just one of these, a provision limiting the use of DOD funds for biorefinery construction, was enacted into law, after being rewritten by the conference committee. The pattern of supportive and unsupportive provisions proposed related to alternative fuels

³¹⁴ Jim Inhofe, "Shrinking Defense Dollars and Biofuels," *Politico*, June 17, 2013, <http://www.politico.com/story/2013/06/shrinking-defense-dollars-and-biofuels-092868>; Jeanne Shaheen and Susan Collins, "Pentagon Aids Energy Independence," *Politico*, July 15, 2012, <http://www.politico.com/story/2012/07/pentagon-biofuels-effort-aids-energy-independence-078517>.

illustrates how it became a highly controversial and partisan topic, with fewer supportive provisions and more unsupportive provisions proposed as the controversiality grew. (See Figure 10) While just of these 10 unsupportive provisions were enacted into the final bill, and represent just 4.6% of all the proposed provisions, the disproportionate focus on alternative fuels in the unsupportive provisions illustrate the limitations of the common ground on DOD’s energy policy and in small-bore policymaking.

*Figure 10: Proposed Provisions related to alternative fuels, FY2004-FY2013 NDAA*s

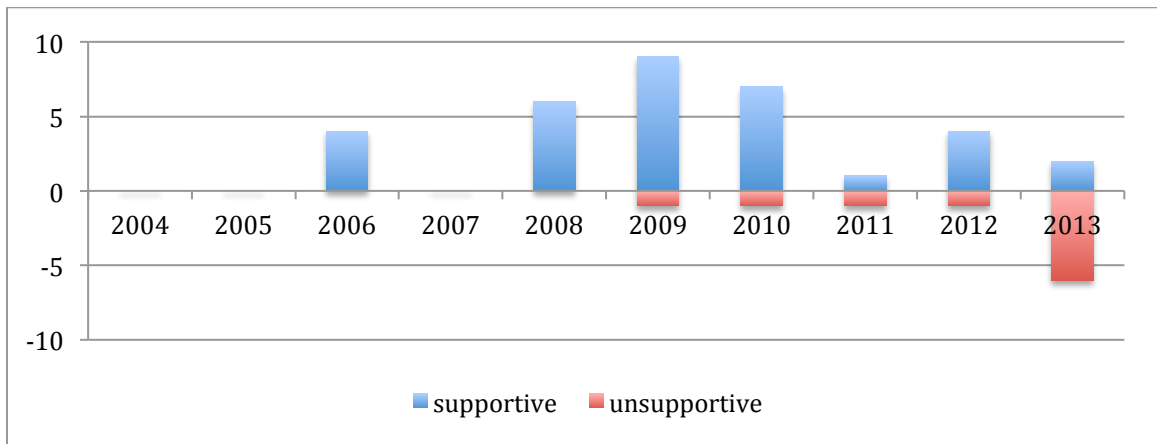
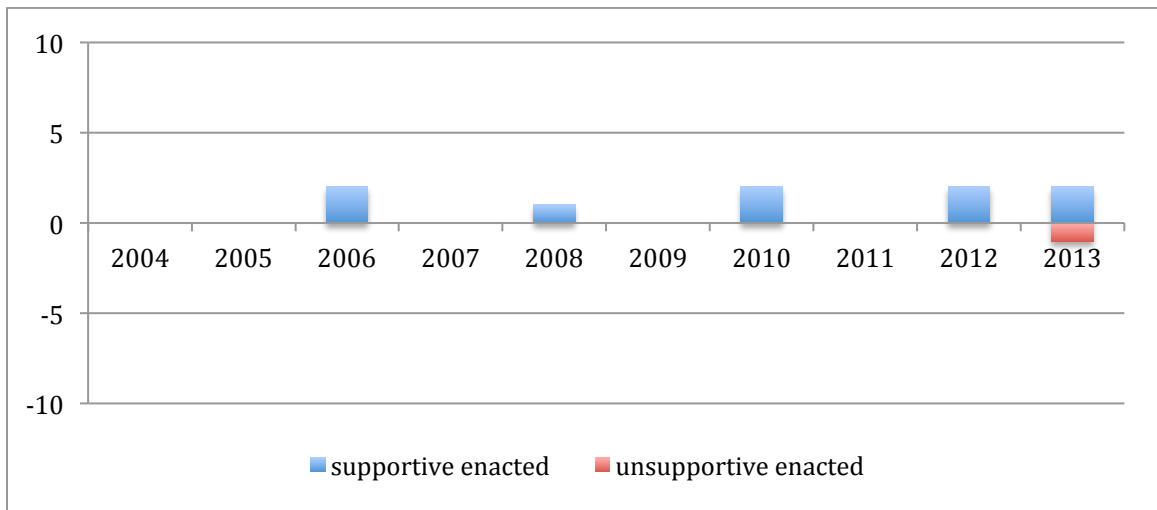


Figure 11: Enacted provisions related to alternative energy,, FY2004-FY2013 NDAA's



In Kingdon's parlance, defense energy quietly became both a problem stream and a solution stream. The expansive definition of the problem – increasing the energy security and resilience of the armed forces (carefully cultivated by the members and staffers who were working this policy area)– allows for a wide array of potential solutions, from greater use of solar power in deployed situations to greater energy efficiency in domestic bases. The malleable nature of defense energy as a problem, in addition to enabling for a range of potential congressional responses, has allowed the topic to retain strong bipartisan support (with the recent strong exception of alternative fuels, described earlier in this article).

Controversiality or non-controversiality are also not fixed parameters, but instead are subject to the shifting tides of partisanship and hyper-partisanship in the capitol, as well as the ever-present possibility that one's previously safely-nonpartisan provision

with bipartisan support or indifference attracts a partisan valance due to other political fights. The bipartisan tradition of collegiality and cooperation that persists in the HASC and SASC, if not their parent chambers, and the insulation of the NDAA process from the broader legislative process provides defense policymaking via the NDAA a degree of protection from the partisan fray. However, as discussed in the previous chapter, the tradition of bipartisan collaboration within HASC and SASC is not immune from growing partisan contentiousness and cannot be assumed indefinitely – potentially narrowing the scope what defense policymaking can be accomplished in a bipartisan manner, or polarizing different elements of defense policy. Furthermore, as discussed in Chapter 2, the lack of other legislative vehicles burdens the NDAA with partisan amendments added at the behest of party leadership, inserting hurdles to its passage that hadn't previously existed, and perhaps ultimately jeopardizing its must-pass status.

Enhancing National Security

However, while the above characteristics are helpful in ensuring this type of small-bore policymaking can be successful by remaining low-profile, non-controversial, and bipartisan, the substantive policy content of the provisions still matters. Within the parameters of these characteristics, the more strongly defense energy initiatives could be framed as a national security imperative or as enhancing military capability, the more likely they were to be enacted. Conversely, energy initiatives that had more tenuous arguments connecting them to a clear military benefit (including those that promised cost savings without improvements in military capability) were more

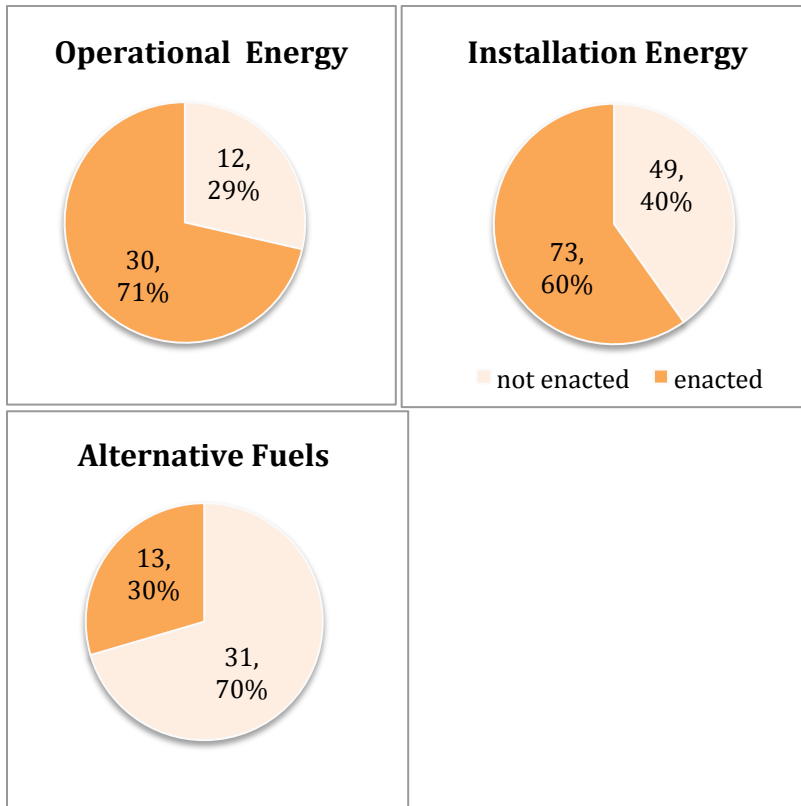
subject to the partisan politics that characterizes current congressional defense and energy policy.

This linkage becomes clear when examining the general success and failure rates of provisions related to three discrete aspects of DOD's energy use. Operational energy is the energy DOD uses in its weapons systems and platforms, principally petroleum fuels, and has been defined in statute as "the energy required for training, moving, and sustaining military forces and weapons platforms for military operations."³¹⁵ As such, improvements to operational energy use can be most closely linked to enhanced military capability. Installation energy, the energy DOD uses at its bases (principally electricity, in practice), is less closely linked to national security concerns or operational effectiveness, although there is some concern about DOD's reliance on the fragile electrical grid. Alternative fuels, while they may have second-order benefits, are designed to function identically to petroleum in current engines, and have the most tenuous relationship to improving national security or specific operational capabilities. Analyzing the success rate of provisions related to each area of DOD energy use supports the conclusion that the perceived military benefit was an important predictive factor for the success or failure of a provision. Fully 71% of provisions related to operational energy were enacted, as were 60% of provisions related to installation energy. By contrast, provisions related to alternative fuels were successful only 30% of the time, and alternative fuels became a highly controversial

³¹⁵ Pub. L. No. 112-81, § 2821(a), 125 Stat. 1689.

topic during the legislative cycle for the FY2013 NDAA, as discussed later. (See Figure 12).

Figure 12: Success Rates of Provisions, by Topic



The Process of Defense Policymaking in the NDAA

In addition to illuminating the contours of the content and form of defense policymaking in Congress, this examination of a broad swathe of provisions also highlights important aspects of the *process*.

The Importance of HASC and SASC

The House and Senate Armed Services committees appear to play a central role in the formulation of defense policy. Significantly, 79% of all of the defense energy provisions considered and enacted over this 10 year span originated during either the HASC or SASC markup stage, as seen in Figure 13. Of 87 sections, only 15, or 17%, were added during floor debate. By far the greatest number of provisions emerged from the HASC markup – 40 sections first appeared during the HASC markup, while an additional 17 appeared in both the HASC and SASC markups. Just 12 provisions appeared in only the SASC markup.

For both HASC and SASC, provisions that were in the reported-out versions of the bill were highly likely to be preserved in the House or Senate versions of the bill and ultimately enacted into law. Of the 53 sections that originated in the HASC versions of the annual NDAAAs, 43, or 81%, survived into the final bill. On the Senate side, 27 of SASC's 38 provisions, or 71%, survived into the final bill. I attribute HASC's greater number of provisions related to defense energy matters to defense energy efforts of the HASC committee staffers, discussed in Chapter 3. These efforts took place only in the HASC, without a parallel SASC effort. The DODESA line of effort

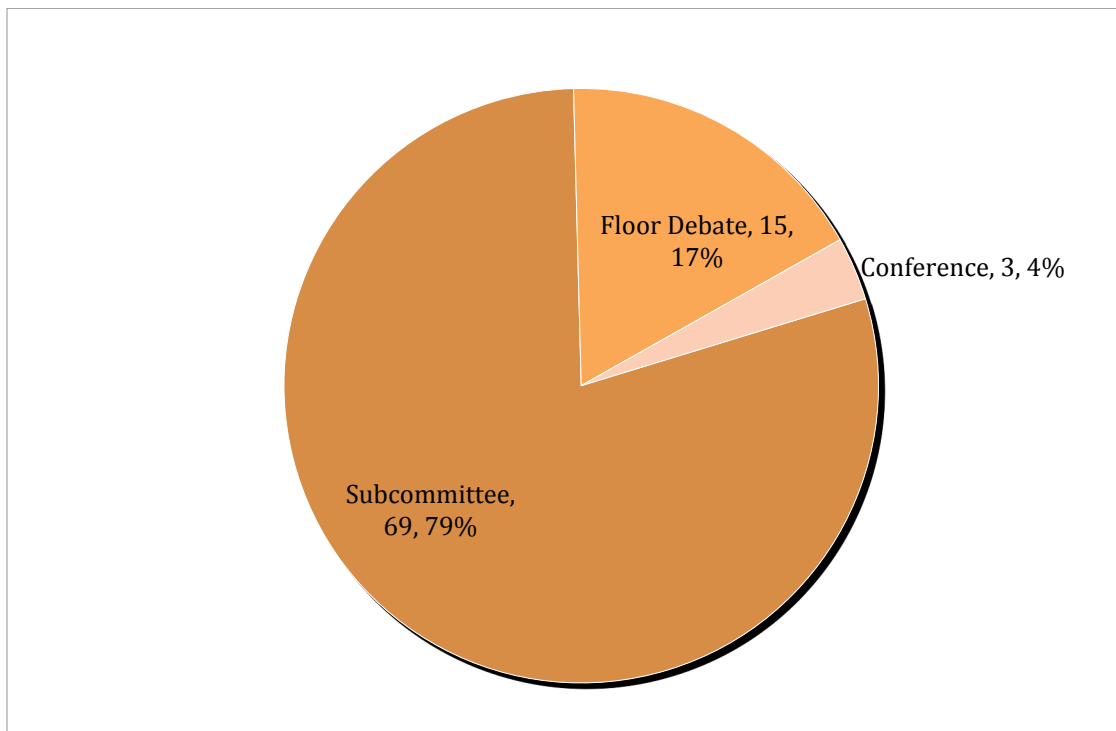
was pursued contemporaneously in the HASC and the SASC by Rep. Giffords' and Sen. Udall's staffers, respectively, leading several provisions to appear in both the HASC and SASC marks of the NDAA, as described in Chapter 3.

Of the 11 unsuccessful SASC provisions, 3 were provisions related to biofuels during the contentious FY2013 debate about the Navy's biofuel efforts. One provision failed on a recorded vote during SASC's markup, while two provisions were stripped from the bill by floor amendments, an infrequent occurrence for SASC-originated provisions. Without these three provisions, the overall persistence of SASC-originated sections would have been 27 out of 35, or 77%, very close to the HASC persistence rate of 81%.

The slightly higher conservation rate of defense energy provisions for HASC (81%) as compared to SASC (71%), suggests that HASC's open subcommittee and full committee markups do not harm the success or failure of the subcommittee's provisions in the final bill – a potential argument for transparency and opening the SASC subcommittee and full committee markups to the public. However, the open HASC subcommittee markups provide a note of caution for this optimistic conclusion. They are swift and pro-forma, lasting just 2 to 3 minutes each. Instead of forcing difficult issues to be hashed out under the watchful public eye, open subcommittee markups appear to instead have pushed the negotiations and (dis)agreements about what the subcommittee marks should include to earlier, private discussions. With a relatively small sample size, and without more detailed data as to whether specific provisions originated in the subcommittee's mark, the Chairman's

mark, or in the full committee mark-up process, it is difficult to draw conclusions about the degree to which legislative transparency or secrecy impacts the final contents of the bill. This would be a worthy topic for fuller study, including legislative provisions across wider range of topics.

Figure 13: Legislative stage origin of provisions



The high conservation of provisions originating in HASC or SASC points to the key role of the committees in the NDAA process. Both Armed Services Committees are highly successful at introducing sections that are able to persist into the final enacted version of the bill. While the transition to what Lindsay (1987) has described as “the outside game” has empowered rank-and-file members, SASC and HASC still retain considerable power in shaping the bulk of the annual NDAA text. This influence is likely to be magnified in small-bore policy topics, as provisions on these issues are

less likely to stir up the controversy and opposition necessary to remove them on the floor or strip them from the version of the bill that is reported out of the conference committee. By comparison, about half of provisions that are added to the bills during House or Senate floor consideration are cut during the conference stage.

The patterns of DOD energy provisions that persist into enacted legislation also highlight the importance of the Subcommittee and Committee chairs in the markups and the floor consideration of the bills. As noted above, 79% of all the DOD energy-related provisions that were enacted into statute in the FY2004 through FY2013 NDAA's originated in the Armed Services Committees. In part this reflects the devolved subcommittee structure of HASC in particular, where each subcommittee has substantial power within its own jurisdiction. This also reflects the general willingness of the chairmen and ranking members to include amendments that are considered broadly acceptable *en bloc*. For example, of the 131 amendments considered during the HASC markup of the FY2013 NDAA, 109 were considered *en bloc* and approved unanimously. Only 11 amendments were considered via voice vote, and 11 by recorded vote. While each of these amendments passed, over 80% of the amendments offered during the full committee markup did not require an individual vote at all, and were added to the marked-up bill via *en bloc* amendments.

The Power of the Floor Managers

This pattern of *en bloc* amendments persists in the floor debate. Of the 26 amendments related to DOD energy that were offered during floor debate on the FY2004 – FY2013 NDAA's and enacted into the final law, the 10 House amendments

were considered as part of an *en bloc* amendment package, while 13 of the 16 Senate amendments were adopted by unanimous consent or as part of an *en bloc* package. Only 3 Senate amendments, and no House amendments, were adopted by voice or roll-call votes.

The enormous discretion of the floor manager in managing the bill means that they can include even provisions that might be very impactful with little or no floor debate. For example, one amendment to the FY2007 NDAA (S. 2766), offered on the Senate Floor by Sen. Menendez (D-NJ), required DOD to set a goal of utilizing renewable energy for 25% of their energy needs by 2025.³¹⁶ This amendment was enacted as part of the FY2007 NDAA, and has become a yardstick by which DOD has had to measure its renewable energy consumption and work towards the 25% goal. However, this amendment made it into the NDAA without any debate whatsoever – it was adopted as part of a manager’s *en bloc* package of 22 amendments. The floor manager of the bill, SASC Chairman Sen. John Warner (R-VA), and his minority counterpart, SASC ranking member Sen. Carl Levin (D-MI), had between themselves agreed to this amendments package. Sen. Warner listed the amendments, and the package was agreed to by unanimous consent.³¹⁷

Why did Sen. Warner and Sen. Levin include this provision? I was unable to secure interviews with any of their staff, but Sen. Warner was a prominent supporter of

³¹⁶ S. Amdt. 4357 (Sen. Menendez) to S. 2766 (John Warner National Defense Authorization Act for Fiscal Year 2007, 109th Cong. (2006)).

³¹⁷ 152 Cong. Rec. SS6117 (daily ed. June 20, 2006).

efforts to address energy efficiency and climate change as a matter of national strategic importance, and co-sponsored the cap and trade bill that would have limited U.S. carbon dioxide emissions, the Lieberman-Warner Climate Security Act of 2007.³¹⁸ Following Sen. Warner's retirement from the Senate in 2009, he joined the Pew Charitable Trusts, where he advocates on the intersection of energy, climate, and national security.³¹⁹

The power of the floor managers cuts both ways. In a bipartisan, collaborate environment, the floor manager can bundle dozens of mutually acceptable amendments together in *en bloc* managers' packages. Savvy legislative operatives, by persuading the floor manager and her minority counterpart as to the merits and non-controversiality of their amendment(s), can append their amendment to the bill with virtually no other oversight by their peers. In a partisan fight, the Senate floor manager can fill the amendment tree, preventing members of the minority party from advancing any of their amendments.³²⁰

The Role of the Conference Committee

The role of the conference committee in the legislative process is to reconcile the House and Senate versions of a bill. As such, the conference committee also plays a central role in either preserving or eliminating specific provisions that are in either the

³¹⁸ Lieberman-Warner Climate Security Act of 2007, S. 2191, 110th Cong. (2007).

³¹⁹ Pew Charitable Trusts, "Warner and Burke: Advising on Clean Energy and National Security" (web page), <http://www.pewtrusts.org/en/research-and-analysis/collections/2015/08/warner-and-burke-advising-on-clean-energy-and-national-security> (updated August 13, 2015).

³²⁰ Beth et al., "Leadership Tools."

House or Senate's version of the bill, but not both, or in reconciling differing provisions.

As described by Rybicki (2015), Representatives from each chamber are appointed as conferees to negotiate provisions in disagreement. The Chairman and Ranking Member of the House and Senate Armed Services committees play a major part in deciding on the other conference members, who are predominantly drawn from influential members of the House and Senate Armed Services Committees, as well as selected members from other committees of jurisdiction. As such, they are still accorded institutional deference on defense topics. When the House and Senate disagree on a question, the conferees are empowered to write a conference substitute, as long as it is a compromise between the House and Senate provisions. As the reconcilers between divergent House and Senate versions of bills, there is very little scope for appeal of the conference committee's decisions. In theory, a recalcitrant chamber could raise a point of order against a conference report, both the House and Senate conference practices make it exceedingly unlikely. In practice, while the "Big 4" – the Chairmen and Ranking Members of the House and Armed Services Committees – are in charge, all but the most significant and consequential differences are resolved at the staff level by the majority and minority professional staff members of the committees.

The data demonstrate the importance of the conference committee in shaping the final bill. Three provisions – Sec. 315 of the FY2013 NDAA, Sec. 344 of the FY2010 NDAA, and Sec. 2864 of the FY2008 NDAA – were substantive re-writings to combine divergent House and Senate provisions. The conference’s compromise sections are sufficiently different from the original House and Senate provisions that they can justifiably be considered new provisions. In two out of these three cases, the House and Senate had passed very different competing provisions. Additionally, each of these three conference-written sections was a substantially lower hurdle for DOD energy than one of the House- or Senate-passed provisions. In Section 2864, the conferees reduced a House-passed requirement that DOD purchase 25% of its electricity from renewable sources that it owned and controlled by 2025, substituting a requirement that DOD evaluate its renewable power sourcing, detailing the fraction of its power consumption that DOD procured from renewable sources as well as whether the power was procured through appropriated funds or alternative financing. Section 344 eased ambitious House and Senate goals regarding aviation fuel, combining a HASC requirement that DOD procure 25% of its aviation fuels from renewable sources by 2025 and a competing SASC requirement that the Air Force ensure that its aircraft would be able to fly on a 50:50 renewable/conventional fuel blend by 2015 with a second HASC requirement that DOD consider the testing and certification of domestically-produced alternative fuels. The final enacted section, as drafted by the conference committee, required DOD to report on the actual and potential use of renewable fuels by the Pentagon. The third conference-drafted

provision, Section 315 of the FY2013 NDAA, was a product of the highly contentious debates surrounding the Navy's biofuel efforts. The conference provision attempted to thread the needle between a House provision forbidding such initiatives and a Senate bill that had had a similar prohibition stripped on the Senate floor.

Including these three substantive re-workings of sections in the House and Senate bills, the conference committee did not include 39 provisions that were present in either the House or the Senate bill, but not the other chamber's bill. If these provisions had been included, they would have made up about 33% of all of the enacted provisions. In other words, it appears as though the conference committee also plays a dampening role, stripping out provisions that are present in either the House or the Senate bills that are unacceptable to the broader congressional majority, which, after all, must vote to adopt the final bill. As most of the conference committees' decisions are made at the professional staff level, this highlights the need for small-bore policymaking to be broadly acceptable not just to the members, but both the Armed Services Committee's professional staff members from both the majority and the minority.

Partisanship, Politics, and Support for DOD Energy Provisions

Bipartisan congressional support for a more energy-conscious DOD is counterintuitive in the face of increasingly bitter partisan divides over other national energy issues, from "drill, baby drill" to the rancorous finger pointing about federal support for green energy in the wake of the 2011 Solyndra bankruptcy. However,

DOD energy provisions generally appeared to enjoy bipartisan tolerance or indifference, if not support, regardless of party control over each chamber, as reflected by the broad success in incorporating supportive provisions into the final bill. Just 23 of the 213 proposed provisions were unsupportive, and none of the unsupportive provisions made it into the final enacted bill during this time frame.

In both the House and Senate, the number of supportive provisions introduced appears to increase steadily over time, unconnected from shifts in control of each chamber. (see Figure 14) The same appears to be true for supportive provisions that are enacted in the final bill. (See Figure 15) Party control and the number of provisions reported out of the Armed Services Committees was not significant at the 0.05 level for either HASC or SASC.

Figure 14: Proposed Supportive Provisions originating in each Chamber

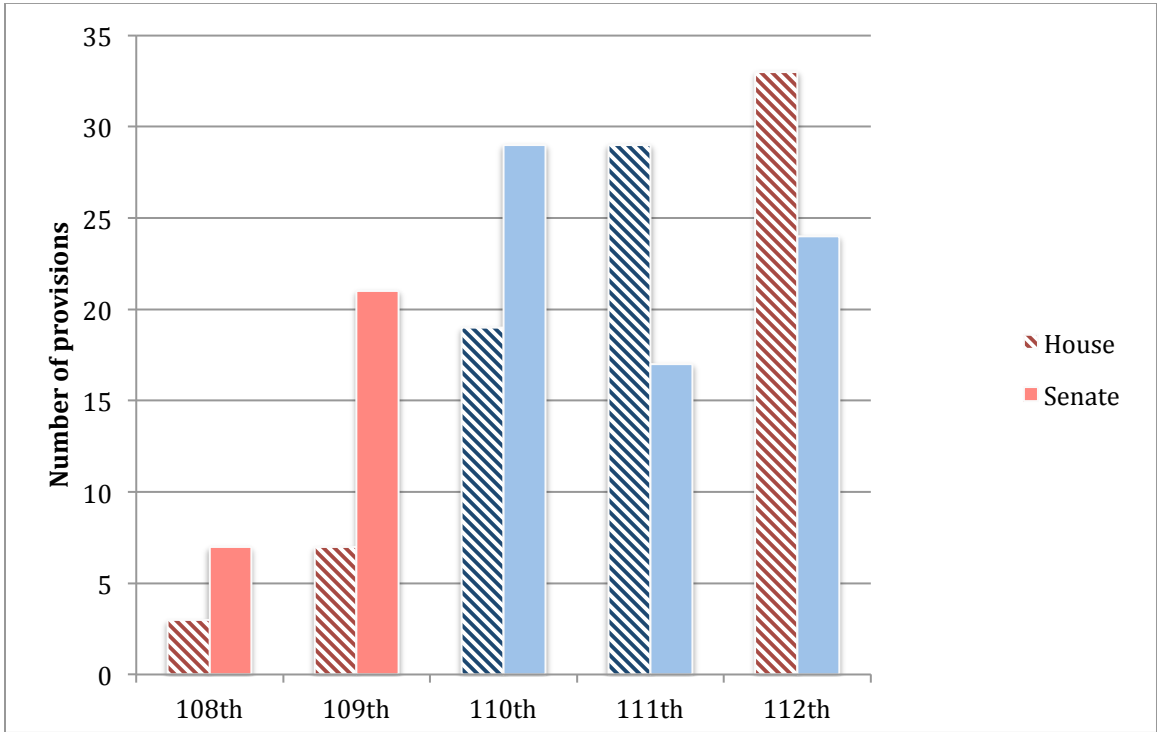
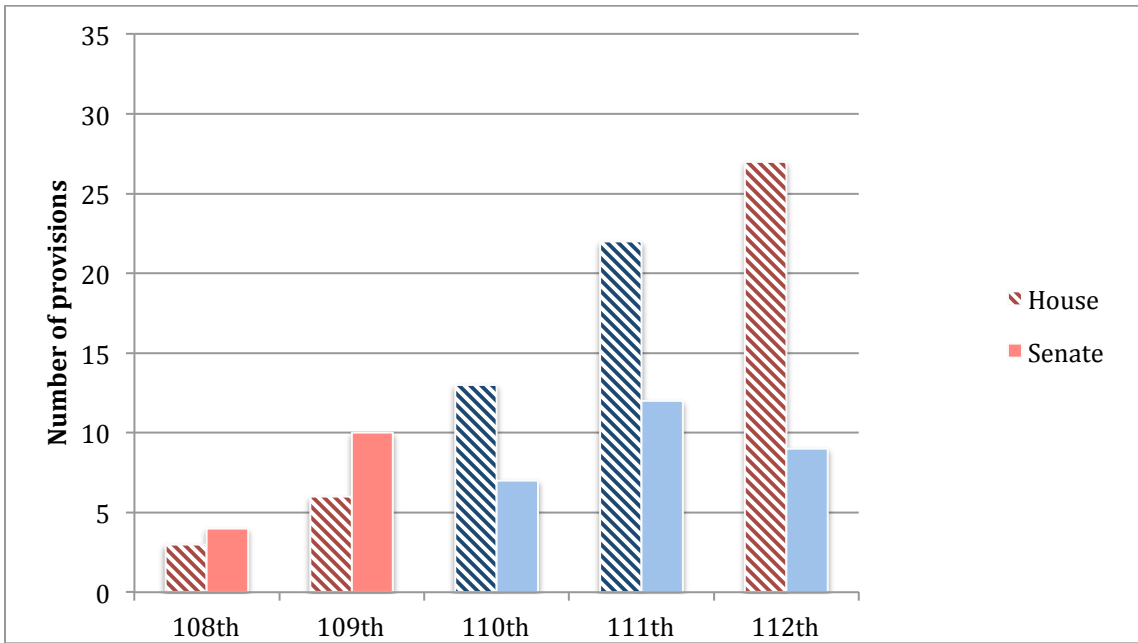


Figure 15: Enacted Supportive Provisions originating in each Chamber



Note: bar color denotes party control of the chamber.

When the House flipped to Republican control in the 112th Congress, the number of supportive provisions, both proposed and enacted, continued to increase in a nearly-perfectly linear fashion. In other words, despite gaining control over the House, Republicans continued to be supportive, or at least tolerant, of DOD energy initiatives.

This fairly broad support for DOD energy provisions over this decade, particularly in the House, is especially notable in the context of the trend towards greater conservatism in House Republicans over the last 10 years. What explains the apparent disconnect between party control and support for DOD energy initiatives?

One key factor that has largely insulated DOD energy provisions from the expected partisan furor over other energy issues is the central role of the House and Senate Armed Services Committees in formulating and advancing DOD energy policy. As discussed earlier, fully 79% of enacted provisions originated in HASC or SASC. While the committees certainly can – and have! – been the site of bitter partisan battles, for the most part they function in a very bipartisan fashion. In effect, the deep, bipartisan working relationship in the committee in order to successfully compete the annual NDAA appears to mitigate the effects of shifting control over the House and senate. The NDAA writing process illustrates the centrality of a strong bipartisan working relationship among the Members and committee staff. In order to be in the original Committee or Subcommittee mark (the draft of the bill, before

Committee or Subcommittee amendments), provisions must be broadly accepted by the members, without strong disagreement. Any contentious issues will be brought up in committee amendments, rather than included in the mark. This bipartisan, functional working relationship persists on most issues, even though, as Lindsay (1994) and Morin (2001) have noted, the congressional defense committees tend to be significantly more hawkish and conservative than the median of each chamber as a whole. Therefore, given the centrality of the committees to the defense policymaking process, the partisanship of the committees themselves should impact the success of provisions supportive of DOD energy reforms more than party control over each chamber.

Using Poole and Rosenthal's DW-NOMINATE measure (Poole and Rosenthal, 1997; Poole, 2013), I evaluate the conservatism of HASC and SASC against the number of DOD energy provisions advanced by each committee during markup. DW-NOMINATE measures the overall conservatism or liberalism of a member as captured through roll-call votes along a single linear axis. Scores are designed to be comparable across Congresses. For each Congress, each legislator has his or her own DW-NOMINATE score. The first dimension of the score, used in this analysis, represents the legislator's position on the classic liberal-conservative spectrum. In this measure, -1.0 represents the most liberal and 1.0 represents the most conservative position. A score of 0.0 would represent the mid-point between liberalism and conservatism. As the DW-NOMINATE scores are designed to be comparable across

multiple Congresses, a score of 0.82 can be considered conservative not only in that particular Congress, but in the history of that chamber as a whole. While a reconstruction of legislators' positions based on roll-call votes must necessarily capture only a limited slice of a political life of a legislator, they represent the most accurate comparison tool between the relative positions of legislators currently available.

The mean DW-NOMINATE scores for each committee were calculated for each Congress, using the House and Senate records of committee membership. These mean scores are presented in Table 2. Despite Democratic Control of the House in the 110th and 111th Congresses, and the Senate in the 110th, 111th, and 112th Congress, both HASC and SASC remain more conservative than the midpoint. SASC in particular shows little shift. The ideological position of HASC has been more variable, in line with the committee's greater turnover and the rightward trends in the Republican caucus in the House. Between these five Congresses, the standard deviation of the mean DW-Nominate score for HASC was 0.065, as compared to 0.023 for SASC over the same time frame.

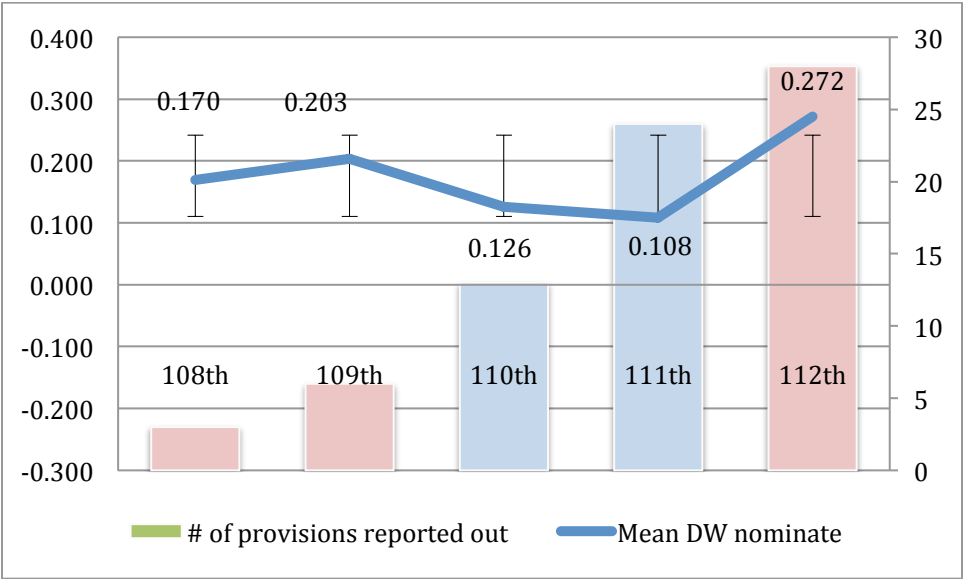
Table 2: Mean HASC and SASC DW-NOMINATE scores, 108th - 112th Congress

	HASC	SASC
108th Congress	0.169766667	0.05024
109th Congress	0.203396552	0.064416667
110th Congress	0.126344262	0.047
111th Congress	0.108	0.001896552

112 th Congress	0.272283333	0.039
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What is the relationship between the conservatism of the House and Senate Armed Services Committees and the number of DOD energy-related provisions reported out of committee? The mean DW-Nominate scores of HASC for the 108th through the 112th Congress are charted against the number of DOD energy related provisions reported out during each Congress in Figure 16. The error bars delineate the standard error.

Figure 16: Mean HASC DW-Nominate Scores and Number of HASC-Reported Provisions, 108th - 112th Congress

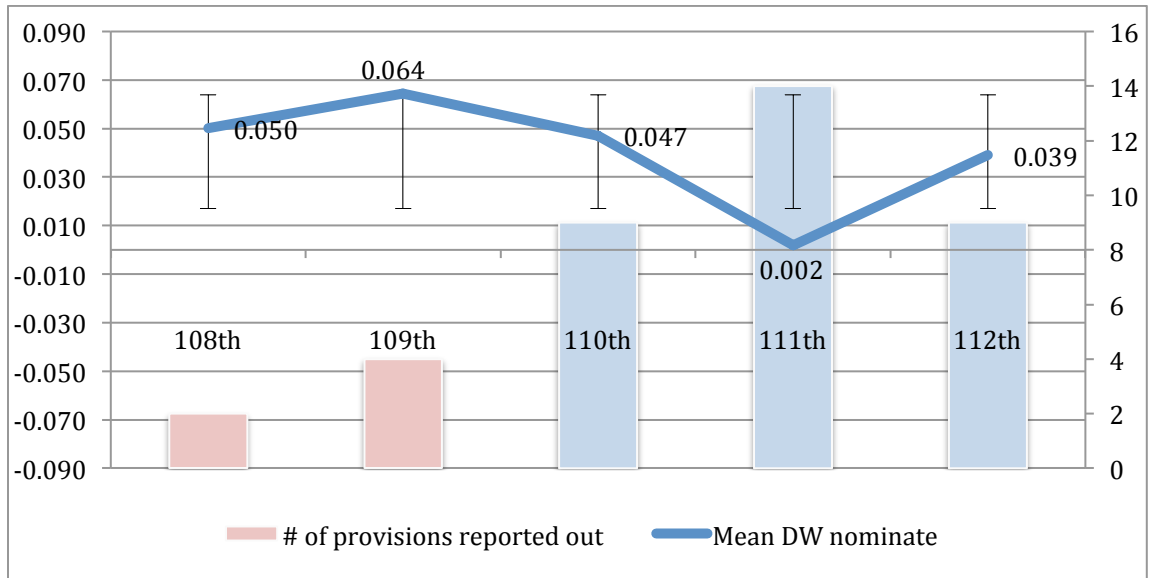


For HASC, the number of provisions reported out does not have any relationship with the fluctuations in the conservatism of the committee. Rather, the number of provisions has increased in a nearly perfectly linear fashion ($R^2 = 0.965$), evincing an emerging policy interest in DOD energy that is party-independent. The R^2 of supportive provisions is slightly lower, at 0.936. With p-values of 0.75 and 0.68,

respectively, neither the relationship between mean HASC DW-nominate scores and all HASC-reported provisions, nor the relationship between mean HASC DW-nominate scores and the subset of HASC-reported enacted DOD energy provisions, statistical significance at the 0.05 level. Similarly, with a p-value of 0.97, there is no relationship between mean HASC DW-nominate scores and the number of provisions HASC reports out that are supportive of DOD's energy efforts. Overall, shifts in HASC conservatism or liberalism over time are not connected to the number of DOD energy provisions that are reported out, or the success of those provisions. Rather, the number of DOD energy provisions reported out by HASC increases steadily, independent of both party control over the House and shifting HASC conservatism. Contrary to the received wisdom, HASC has advanced a growing number of provisions related to, and supportive of, DOD's energy conservation, efficiency, and renewables efforts, even under Republican control.

What is the picture like in the Senate? In contrast to HASC, the variations in the mean DW-NOMINATE scores from the 108th through the 112th Congresses for SASC are very small, with a standard deviation of 0.023460606 (approximately 1.17% of the total possible variation) and a maximum jump of 0.045 between the 110th and 111th Congresses (2.25% of the total possible variation). The mean DW-nominate scores of SASC for the 108th through 112th Congresses are charted against the number of DOD energy related provisions reported out during each Congress in Figure 17. The error bars delineate the standard error.

Figure 17: Mean SASC DW-Nominate Scores and Number of SASC-Reported Provisions, 108th - 112th Congress



Again, like in HASC party control is not a significant variable affecting the number of provisions reported out by SASC (insignificant at the 0.05 level). However, despite the very slight ideological variation of SASC during this time period as described by the small variation in mean DW-nominate scores across Congresses, there is a clear inverse relationship between SASC conservatism and a greater number of provisions related to DOD energy reported out, as seen in Figure 18. In other words, greater SASC liberalism, though slight, is correlated with increased numbers of DOD energy-related provisions being reported out. But, with a p-value of 0.62, the relationship between mean SASC DW-nominate scores and the number of DOD energy provisions SASC reported out falls short of statistical significance at the 0.05 level.

However, the relationship between SASC’s mean DW-nominate scores and the number of provisions reported out that are successful is statistically significant at the 0.05 level, with a p-value of 0.046. (See Figure 19). The R^2 value is 0.78, indicating that the mean-DW scores account for about 78% of the variance in the number of provisions reported out that are ultimately successfully enacted into law. This correlation is possibly indicative of the narrow band of bipartisan palatability that DOD energy provisions must tread. Alternatively, the data could reflect the biofuels controversies of the FY2013 NDAA, which involved 3 SASC-reported provisions that were stripped in a contentious floor amendment debate.

Figure 18: Linear Relationship between mean SASC DW-nominate scores and all SASC-reported provisions, 108th – 112th Congress

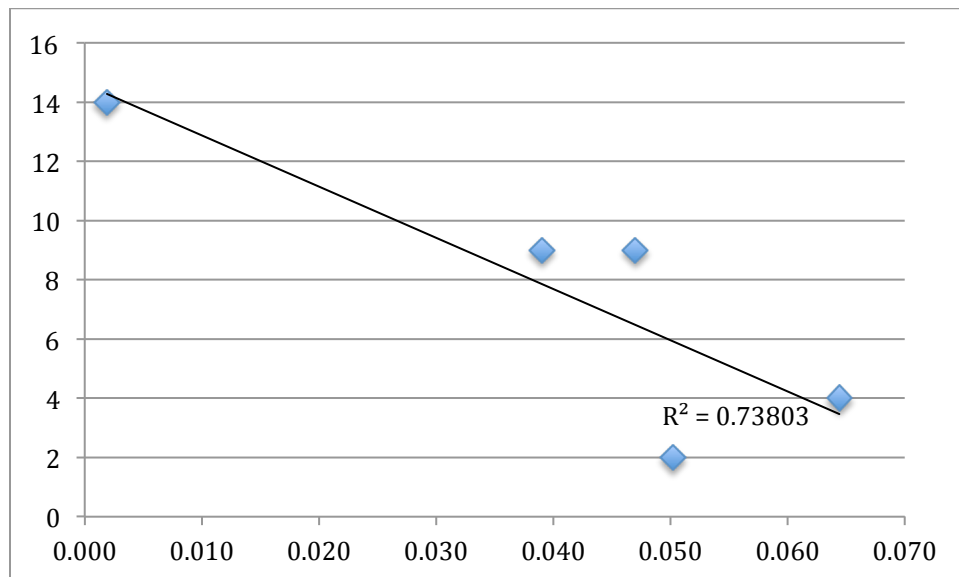
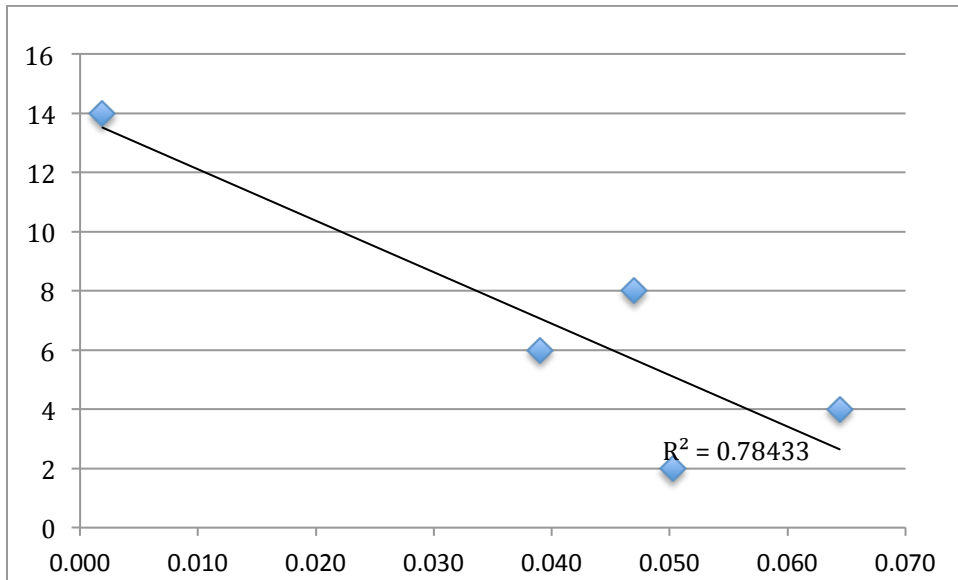


Figure 19: Linear Relationship between mean SASC DW-nominate scores and successful SASC-reported provisions, 108th - 112th Congress



While the above discussion focused on the simple numbers of amendments reported out by HASC and SASC, does partisan control or committee conservatism play a role in the supportiveness of provisions? Although the specific provisions do not overlap precisely, for each Congress, the number of SASC-reported provisions that are supportive of DOD energy efforts was the same as the number of SASC-reported provisions that were ultimately enacted into statute. Accordingly, the relationship between SASC's mean DW-nominate scores and the number of supportive provisions reported (with slightly higher liberalism correlated with a greater number of supportive provisions reported out) is statistically significant at the 0.05 level, with a p-value of 0.046. The R^2 value is 0.78, indicating that the mean-DW scores account for about 78% of the variance in the number of supportive provisions reported out.

This relationship in the Senate Armed Services Committee may be partly explained by the relative timing of the HASC and SASC markups. Because the SASC mark-up occurs after the HASC markup, the SASC markup may be less likely to include provisions with bipartisan support that have already appeared in the HASC markup. However, this explanation is not satisfactory, as there is no *prima facie* reason why SASC markups should not include HASC provisions. Indeed, roughly half of all the provisions reported by SASC also appeared in the HASC-reported version of the NDAA (13 of 28 total, 46%).

Another possible explanation is that, as SASC markups occur following the HASC markups, there is greater opportunity for provisions related to DOD energy to become politically contentious and partisan during the NDAA lifecycle. As the SASC markup typically occurs contemporaneous with or shortly after the House floor debate over the NDAA, inserting a provision into the SASC markup (or keeping a provision out of the SASC markup) may take on additional importance. As provisions are rarely stripped from the committee markups on the floor, the SASC markup provides the best opportunity for supporters or opponents of a position to attempt to ensure that their preferred outcome is reflected in the SASC-reported bill. However, the explanation is also not satisfactory, as it overlooks the steady stream of DOD-energy related provisions in the 108th to 111th Congresses, under both Democratic and Republican control. Excepting the 112th Congress, the number of

DOD energy provisions reported by SASC increased in a nearly perfectly-linear fashion ($R^2 = 0.968$).

The most persuasive explanation is that this relationship between greater SASC liberalism (though still below the mid-point) and increased DOD energy provisions is partially an artifact of the timing of the emergence of DOD energy as a policy area of interest, combined with the greatly increased controversy over DOD biofuels efforts in the FY2013 NDAA legislative cycle (discussed below). The two Congresses where Republicans had control of the Senate (the 108th and 109th) are also the Congresses where DOD energy began to garner congressional interest. Although the Senate changed hands in the 110th and 111th, SASC interest in DOD energy grew consistently, as reflected in the number of provisions reported out. This conclusion is supported by the steady growth in the number of provisions reported out by HASC between the 108th and 112th Congresses, ($R^2 = 0.965$), despite Republican control of the House in the 112th Congress.

In summary, neither party control over each chamber nor the relative conservatism or liberalism of the House and Senate Armed Services committees were a significant factor in relationship to the growing number of HASC- and SASC-reported provisions. Perhaps due to some combination of the necessarily uncontroversial path these provisions must tread and the close bipartisan working relationship among the committee members and staff, DOD energy has found bipartisan support, and not

been solely the province of Republicans or Democrats – a clear difference from other areas of energy policy.

Conclusion

This close quantitative analysis of the emergence and growth of defense energy illuminates some characteristics of defense policymaking and the centrality of the armed services committees to this method of policymaking. Substantively, successfully enacted provisions adhered to a fairly defined set of characteristics: non-controversial, incremental, beneficial for national security, not requiring spending, influencing policy rather than programs, and tending towards requiring studies and oversight rather than specific outcomes. The narrowness of the path it can follow suggests a modality of “small-bore” uncontroversial defense policymaking, which tends towards incrementalism rather than disruptive change.

Procedurally, the quantitative analysis forcefully illustrates the centrality of the House and Senate Armed Services Committees and the NDAA to the successful enactment of legislative provisions. As one of a very few must-pass bills, the National Defense Authorization Act bill process offers the greatest chance for legislative interests to be realized. While some provisions were adopted on the House or Senate floor, provisions were far likelier to survive through enactment if they were included in the House or Senate Armed Services Committee’s drafting of the bill. The committee’s role therefore structures what provisions can be included in the early versions of the bill, before it is reported out of committee. Above all, provisions must be broadly

acceptable to the other committee members (and, in practice, their staffs). This means that the potential provision must steer clear of controversy, offer a common-sense solution to a defense problem, and require little resourcing. If these criteria are met, there is a good likelihood of a provision being included in the initial subcommittee mark. Inclusion in the mark also confers a substantial likelihood of being conserved into the final enacted bill. Firstly, the very criteria necessary for inclusion in the subcommittee mark make it unlikely that any specific provision will attract enough opposition to be contested or removed in the floor debate, though it may still fall in the conference committee's reconciliation of the House and Senate bills. Even for those provisions that were adopted on the floor, they were most often adopted via unanimous consent as part of a manager's package of *en bloc* amendments – negotiated between the floor manager, typically armed services chairman – and their minority ranking member counterpart. The power of the HASC and SASC extends to the conference committee, where the professional staffers hammer out differences of in policy preferences between the House and Senate versions of a bill. Despite the rise of the “outside game” (Lindsay, 1987), there is still deference to the judgment of the armed services committees on defense issues.

The above criteria and the substantive knowledge required to advance effective defense policy provisions also illuminates the value of incremental, iterative policymaking by informed experts within the Congress. The professional committee staffers, by virtue of their longer tenures, greater independence from the policy goals

of a specific member, and greater expertise, are best-positioned to make thought-out policy that has a better likelihood of successful implementation. Additionally, the annual ritual of the NDAA provides opportunities to identify problems, define and socialize them to members and peers, attempt policy to address them, and refine and tweak that policy in subsequent years. However, policy ideas must still be sold, even within the context of the committee's deliberations on the bill. The examples of the operational energy office and DODESA in the prior chapter highlight the importance of socializing the problem, as well as your policy solution.

The central nature of the HASC and SASC in making defense policy, as described in this and the prior chapter, is also a strong argument for moving beyond bill sponsorship and roll-call votes as metrics of legislator effectiveness or legislative activity. The average member of Congress is likely to have only two choices to make regarding the NDAA – voting “yea” or “nay” on the final bill in the chamber, and then voting “yea” or “nay” on the final conferenced bill. With the NDAA passing both the House and Senate by dominant margins, roll call vote tallies offer very limited insight for scholars. For illustration, the House and Senate versions of the FY 2017 NDAA passed their respective chambers by 277 -147 and 90-7, and the final conferenced version passed by 375-34 and 92-7. Floor amendments offer similar difficulties – only 37% of floor amendments offered in the Senate were considered. In the House, 80% of floor amendments were considered – but with a more restrictive amendments process, governed by the House leadership, limiting what amendments

would be possible. Instead, the vast bulk of the legislative effort originated with the HASC and SASC committees. Methodologically, the discipline is ill equipped to trace the evolution of legislation within the committee markup process, or the integration and re-combination of different provisions or bills within a larger legislative vehicle. Even Volden and Wiseman's attempt to more fully weight legislator effectiveness relies on the *bill* as the unit of measure, rather than the *content* of the bill.³²¹

Ultimately, while defense policymaking does operate within Goldilocks-esque constraints, even incremental, small-bore defense policymaking it is a viable way of addressing a defense problem and having a significant impact over time. Of course, the implementation of these provisions is the other side of this coin, and the focus of the second half of this dissertation.

³²¹ Volden and Wiseman, *Legislative Effectiveness*.

Section II: DOD and Implementation

Chapter 5: DOD's Energy Initiatives, 1973-2003

From fueling jets, ships, and tactical vehicles to powering domestic installations and forward operating bases, DOD's use of energy, particularly petroleum fuels, is staggering in its scale. At 890 trillion Btu in FY2011, DOD by itself accounted for almost 1% of all U.S. energy consumption and 1.9% of all U.S. petroleum use.³²² Petroleum-based liquid fuels are by far DOD's largest source of energy, making up 71% of DOD energy use in FY2010. DOD's outlays on energy are also in the tens of billions annually, though they represent a small fraction of DOD's budget. In FY2012, DOD spent about \$20.4 billion on energy, of which about \$16.3 billion was on petroleum fuels.³²³ Overall, petroleum accounts for about 80% of DOD's use of and spending on energy.

The magnitude of DOD's energy use carries risks. In recent years, rising fuel costs and operations in Iraq and Afghanistan highlighted some of the security and logistics challenges and risks of DOD's reliance on petroleum fuels, while natural disasters and warnings of the fragility of the electrical grid have heightened concerns about the reliability of DOD's energy supply at installations. DOD spent over \$16 billion on petroleum fuels in FY2012, and sustains a vast fuel and logistics infrastructure in

³²² Calculations using data from U.S. Energy Information Administration (EIA), *Annual Energy Review* (Washington, DC: Department of Energy), Tables 1.11, 1.13, and 1.3, <http://www.eia.gov/totalenergy/data/annual/index.cfm#summary>.

³²³ Spending on fuel calculated from figures available in Office of the Deputy Under Secretary of Defense (Installations and Environment), *Department of Defense Annual Energy Management Report, Fiscal Year 2012* (Washington, DC: Department of Defense, June 2013), 16, <http://www.acq.osd.mil/eie/Downloads/IE/FY%202012%20AEMR.pdf>. Fuel volume data from Moshe Schwartz, Katherine Blakeley, and Ron O'Rourke, *Department of Defense Energy Initiatives: Background and Issues for Congress* (CRS Report No. R42558) (Washington, DC: Congressional Research Service, December 2012), 2, <https://fas.org/sgp/crs/natsec/R42558.pdf>.

order to transport fuel to forces in the field. This logistics tail, especially for petroleum fuels, was and is a major point of vulnerability. The risks of DOD's vast fuel and energy use can be divided into three categories: financial, operational and strategic.³²⁴

DOD's financial risks related to energy reliance are two-fold: rising costs over the long-term and short-term price spikes. Since the early 1990s, the cost of buying fuel has increased faster than any other major DOD budget category, including health care and military personnel. Between FY2005 and FY2011, the share of DOD's spending dedicated to fuel increased from about 1.6% to about 2.5% of total spending.

Although that change appears small, in a DOD budget of roughly \$700 billion per year, this 0.9% increase is roughly \$6 billion per year.³²⁵ Shorter-term volatility in fuel costs can wreck havoc on budgets planned about 2 years in advanced around a forecast fuel price, causing funding shortfalls in the current-year budget. As fuel is a must-pay bill, shortfalls due to substantial increases in fuel costs can require either submitting supplemental funding requests (such as the \$5 billion supplemental funding request to cover unexpectedly high fuel costs in FY2008), or reducing

³²⁴ For a full discussion of these risks, see Schwartz, Blakeley, and O'Rourke, *Department of Defense Energy Initiatives*, 7-14.

³²⁵ Schwartz, Blakeley, and O'Rourke, *Department of Defense Energy Initiatives*, 9. CRS analysis based on DOD budget authority figures in Office of the Under Secretary Of Defense (Comptroller), *National Defense Budget Estimates for FY2013* (Washington, DC: Department of Defense, March 2012), http://comptroller.defense.gov/Portals/45/Documents/defbudget/fy2013/FY13_Green_Book.pdf. Data on DOD fuel spending provided by Defense Logistics Agency—Energy, March 1, 2012.

funding for other activities in the same budget category, such as training and routine maintenance.³²⁶

DOD's reliance on energy in combat operations, principally petroleum fuels, also carries a number of operational risks and forces tradeoffs. Maintaining a fuel logistics capability for an overseas military operation requires substantial personnel and materiel resources. The logistic network for an overseas military operation can be so extensive that it can take as much as 1.4 gallons of fuel to deliver 1 gallon to forces on the battlefield.³²⁷ The use of personnel and material for getting fuel to the battlefield and protecting it en-route diverts resources that could otherwise be used for meeting other military requirements. Fuel requirements can slow down the rate at which U.S. forces can be deployed and assembled in an overseas theater. Once in the field, resupply needs can limit the rate of advance or the battlefield maneuverability of U.S. forces engaged in combat operations. High fuel consumption and the need for accompanying fuel logistics vehicles can affect the weight, speed, range, and lethality of U.S. weapon systems. Moreover, fuel supply lines are vulnerable to disruption from enemy attack or from natural events—such as poor weather, floods, or earthquakes—that can damage, destroy, or limit the use of roads, ports, and airfields. Protecting fuel-supply lines against enemy attack can lead to the assignment of additional personnel and other resources to the task of moving fuel through the

³²⁶ Schwartz, Blakeley, and O'Rourke, *Department of Defense Energy Initiatives*, 9-10; Department of Defense Energy Security Task Force, *Department of Defense Report to Congress on Energy Security Initiatives* (Washington, DC: Department of Defense, October 2008), 1.

³²⁷ Amory B. Lovins, "DOD's Energy Challenge as Strategic Opportunity," *Joint Forces Quarterly* 57 (2010): 37.

battlefield, increasing the above-discussed diversion of resources away from other military requirements. Electrical demands in combat are principally met through either generators or on-board auxiliary power units on vehicles, both of which burn fuel. The fragility of the U.S. electrical grid is also a concern, as missions are increasingly coordinated in real-time from U.S. installations, such as remotely-piloted drones.

On the strategic level, the availability of adequate fuel supplies at the right time and the right place shapes planned campaigns. Supply lines supporting overseas conflicts may cross international borders, giving other countries the ability to disrupt or otherwise influence the flow of supplies. More fundamentally, DOD plans for certain strategic capabilities, including logistics capabilities, when vehicles and weapons systems are budgeted for and bought. Choices in airlift vs. sealift, tanker ships, tanker trucks, refueling aircraft or Navy oilers, and investment or non-investment in the logistics backbone are fundamentally strategic decisions, locked in years or decades prior.

DOD has long been aware of these risks, and frequently cites fuel as a decisive element in battles, such as Rommel's loss at *el Alamein* during the World War II Western Desert campaign.³²⁸ As the widely-attributed quote holds, "Amateurs study tactics, armchair generals study strategy, but professionals study logistics." However,

³²⁸ Jay Hutton, "Logistics and the Desert Fox," *Army Logistician* 33, no. 1 (January-February 2001), 36-42. *Army Logistician*, now known as *Army Sustainment*, is a publication of the Army's Logistics University.

on its own, the Pentagon bureaucracy has been slow to recognize the financial, operational and strategic vulnerabilities linked to its extensive energy demands, even when addressing them has been a high priority of senior leaders. These blind spots seems *prima facie* counterintuitive – as an organization focused on warfare, the armed forces ought to have been cognizant of these risks, and working to reduce them. This chapter chronicles this contested and fits-and-starts evolution of DOD's understanding of the risks of its energy use from the 1973, following the Arab Oil Embargo, to the early 2000s and the U.S. invasions of Afghanistan and Iraq. It draws on primary source documents and interviews with key DOD officials, past and present.

History of DOD and Energy

Arab Oil Embargo and OPEC Price Increases, 1973-1974

The Arab Oil Embargo offered a sharp lesson about the degree to which DOD was vulnerable to oil price swings and fuel shortages – a lesson the Pentagon bureaucracy had difficulty learning. In the summer of 1973, the U.S. oil market faced tight oil supplies and increasing prices, as rising demand and flattening domestic production shifted the locus of surplus production to the Middle East.³²⁹ The OPEC states were in a contentious series of negotiations about costs and profits with the Western oil companies producing the oil. On October 16, 1973, OPEC raised prices by 70%, to \$5.40 per barrel, effective immediately. OPEC also announced ongoing production

³²⁹ Daniel Yergin, *The Prize: The Epic Quest for Oil, Money, and Power* (New York: Free Press, 2008), 571-74.

cuts.³³⁰ Against this backdrop, the Arab-Israeli Yom Kippur War (October 6 – 25, 1973) greatly increased tensions between OPEC nations and the west. On October 19th, in response to U.S. support of Israel, including airlifted re-supply of munitions and Nixon’s announcement of a \$2.2 billion dollar aid package, Libya imposed an oil embargo on the United States. Saudi Arabia, the largest OPEC producer, and the other Arab countries joined the embargo on October 20th, 1973. The embargo was soon extended to several Western European countries and Japan.³³¹ The impact on prices was immediate – between October 16 and mid-December, 1973, prices more than tripled above the OPEC price hike, rising from the OPEC-raised price of \$5.40 per barrel to over \$17 per barrel, as panicked buyers sought any and all available supplies.³³² Ineffective price controls on U.S. domestic production exacerbated price spikes. Between Q2 1973 and Q1 of 1974, the price importers paid for oil jumped from \$15.93 per barrel in 2010 dollars to \$47.91 in 2010 dollars. A July 1974 chart in a DOD report on energy illustrates the speed of price increases, particularly for refined products (see Figure 20).³³³

³³⁰ Yergin, *The Prize*, 588; Lutz Kilian, “Exogenous Oil Supply Shocks: How Big are They and How Much Do They Matter for the U.S. Economy?” (Paper presented at the 25th Anniversary of Seminal Research by Stephen Beveridge and Charles R. Nelson Conference, Atlanta, GA, March 31-April 1, 2006).

³³¹ Yergin, *The Prize*, 590.

³³² Yergin, 597.

³³³ Directorate for Energy, Office of the Assistant Secretary of Defense (Installations & Logistics), *Management of Defense Resources, Phase II Report* (AD-A013 554) (Washington, DC: Department of Defense, 1974), <http://www.dtic.mil/dtic/tr/fulltext/u2/a013554.pdf>.

Figure 20: Wholesale crude and refined petroleum price changes, 1963-1974, from Directorate for Energy, Management of Defense Resources, Phase II Report

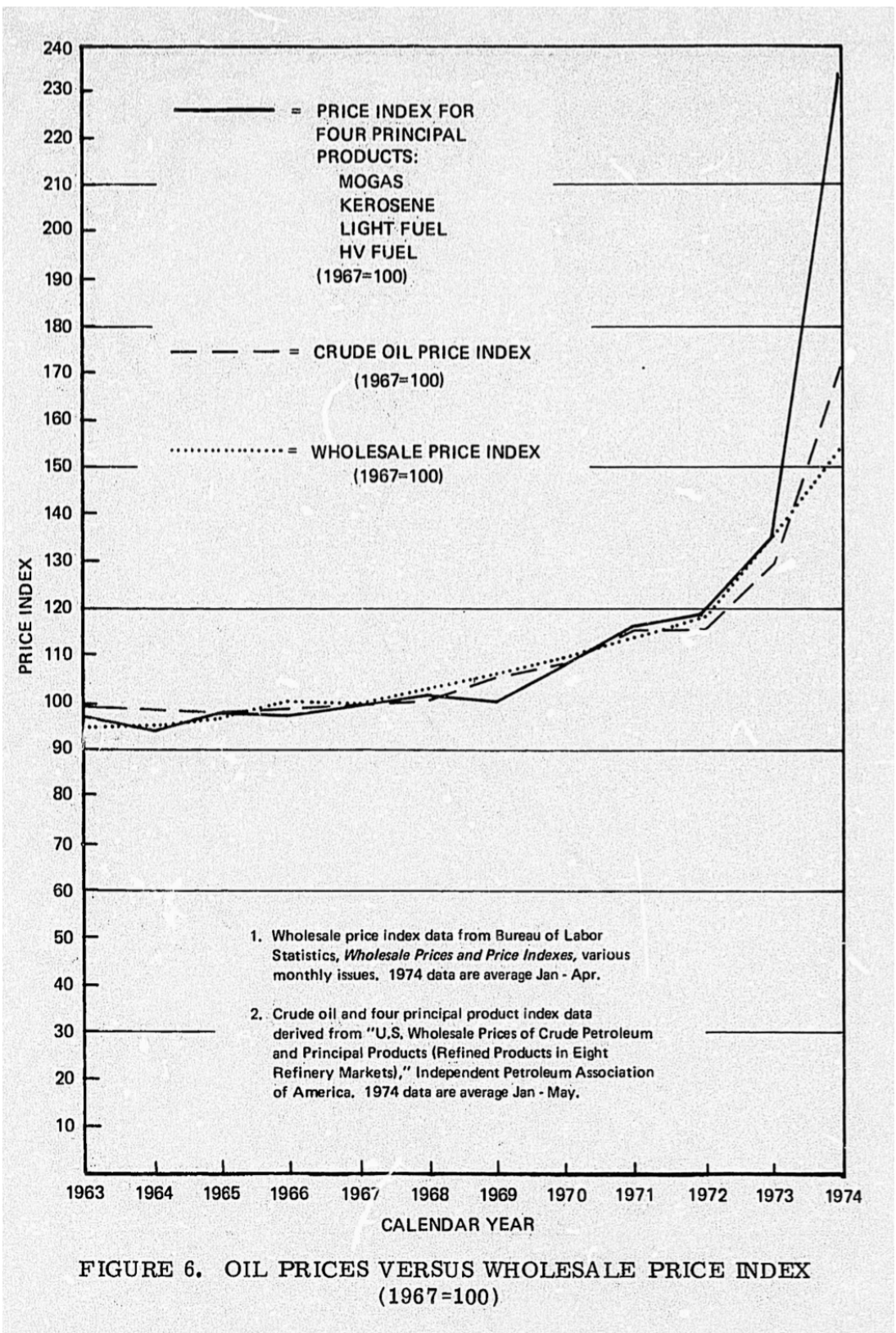


FIGURE 6. OIL PRICES VERSUS WHOLESALE PRICE INDEX (1967=100)

According to Yergin's account, DOD did not escape the embargo and subsequent fuel shortages. The OPEC embargo initially explicitly included U.S. armed forces in the Eastern Hemisphere, including those stationed in the Middle East. The short-term brittleness of DOD's petroleum supply system abroad was immediately apparent, when DOD had to improvise fuel delivery to these forces. Congress hastily passed a law prohibiting discriminating against the U.S. armed forces in petroleum sales and petroleum supplies resumed.³³⁴ After the immediate embargo was lifted, DOD still faced challenges sourcing petroleum products within the United States, and invoked the Defense Production Act to ensure that DOD would receive necessary minimum petroleum quantities.³³⁵ Although the embargo ended in March 1974, prices declined only gradually through 1978.³³⁶

Rattled by the United States' new reliance on imported oil and exposure to price shocks, President Nixon ordered a variety of conservation and energy efficiency measures for immediate implementation.³³⁷ In 1974, OECD countries created the International Energy Agency, which mandates that member nations maintain oil

³³⁴ Yergin, *The Prize*, 595.

³³⁵ Directorate for Energy, *Management of Defense Resources, Phase II*, 3.

³³⁶ Department of State, "Oil Embargo, 1973-1974," Milestones in the History of U.S. Foreign Relations (website), <http://history.state.gov/milestones/1969-1976/oil-embargo> (accessed September 27, 2017); EIA, "Crude Oil Prices React to a Variety of Geopolitical Events," chart in "What Drives Crude Oil Prices?" (web page), http://www.eia.gov/finance/markets/spot_prices.cfm (updated June 30, 2017).

³³⁷ EIA, "Petroleum Chronology 1970-2000" (web page), http://www.eia.gov/pub/oil_gas/petroleum/analysis_publications/chronology/petroleumchronology2000.htm (page no longer available).

stocks equivalent to at least 90 days of the previous years' petroleum imports.³³⁸ In addition, the 1975 Energy Policy and Conservation Act established the national Strategic Petroleum Reserve in order to counter a similar supply shock.³³⁹ Federal agencies were also required to begin reducing their energy use. All federal agencies, including the Department of Defense, were required to set energy conservation goals as part of the 1975 Energy Policy and Conservation Act.³⁴⁰ The 1978 National Energy Conservation Policy Act further refined these requirements, mandating the development of methods to evaluate the lifecycle energy costs of federal buildings, the promotion of renewable energy use by the federal government, specific energy targets for federal agencies and annual reporting requirements.³⁴¹

The risks of DOD's reliance on oil were readily apparent to DOD leadership, especially Secretary of Defense James Schlesinger, in the early 1970s, even prior to the Arab-Israeli war and OPEC oil price spikes in October 1973. Against the background of increasing oil prices in 1973, Secretary Schlesinger had made energy efficiency one of his four management areas of focus as the Pentagon's senior-most civilian leader. On 4 September 1973, Secretary Schlesinger ordered the creation of a Defense Energy Task Group, charged with completing a report on the "management of defense energy resources." Their November 15, 1973 report, released during the

³³⁸ These commitments were formalized in the November 18, 1974 "Agreement on an International Energy Program," reproduced by the IEA in Richard Scott, *The History of the International Energy Agency, the First Twenty Years: Volume 1: Origins and Structures of the IEA* (Paris: International Energy Agency, 1994), 353-404, <https://www.iea.org/media/about/1ieahistory.pdf>.

³³⁹ Pub. L. No. 94-163, §§ 151-166, 89 Stat. 881 (1975).

³⁴⁰ Pub. L. No. 94-163, §§ 381-383, 89 Stat. 939.

³⁴¹ Pub. L. No. 95-619, §§ 541-551, 92 Stat. 3277 (1978).

oil embargo crisis, was a crash overview of DOD's energy needs and vulnerabilities. It outlined DOD's energy usage, the current world fuel situation, and DOD's current fuel infrastructure and efficiency and R&D efforts. Presaging future warnings about DOD's fuel dependence, it also called for better metrics on energy use, raised serious concerns about DOD's ability to supply itself fuel in a major war, particularly intra-theatre, and recommended that DOD consolidate the plethora of fuels used into a few standard formulas. In complaints that echo in the present day, the Defense Energy Task Group found that “energy conservation has been oriented primarily toward cost savings and towards installations rather than tactical operations,” and that “heavy emphasis on first cost in military construction has precluded consideration of energy conservation and life-cycle costing benefits.”³⁴²

In immediate response to the oil embargo and price increases, DOD cut back sharply on fuel use. The Pentagon limited aircraft flying hours, reduced ship operations and imposed slower steaming speeds, began heating, lighting, and vehicle conservation efforts, and increased energy R&D.³⁴³ Even so, the shortages meant that DOD had to use the emergency powers of the Defense Production Act in November 1973 to ensure that DOD's fuel needs could be met, as sufficient quantities were not available

³⁴² Defense Energy Task Group, *Management of Defense Resources: Report of the Defense Energy Task Group* (AD-782 268) (Washington, DC: Department of Defense, 1973) 21, <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=AD0782268>

³⁴³ James R. Schlesinger, *Annual Defense Department Report, FY1975* (Washington, DC: Department of Defense, 1974) 233, http://history.defense.gov/Portals/70/Documents/annual_reports/1975_DoD_AR.pdf?ver=2014-06-24-150705-323.

on the open market.³⁴⁴ The crash energy conservation was a great success – DOD used 28% less energy in the first three quarters of FY1974 than over the same period in FY1973, four times over the 7% federal government conservation goal. The ongoing withdrawal from Vietnam, supply problems, and a mild winter helped DOD’s conservation efforts. However, “the extent to which decreases in usage can be attributed to purely energy conservation measures is indeterminate.”³⁴⁵ These dramatic reductions were primarily the result of cutting back on flying hours, particularly in the National Guard and Reserve (for operational energy), and heating oil use (for DOD installations.)³⁴⁶ Overall, FY1974 petroleum consumption was 15% below FY1973, and the lowest level in 16 years.

However, DOD’s energy usage still amounted 3.5% of the petroleum used in the United States and cost \$2.5 billion, mostly for petroleum.³⁴⁷ Despite handily beating the administration’s conservation goal of a 7% reduction in petroleum use, rapid oil price increases meant that DOD requested a staggering \$1 billion in emergency funding in response to increasing fuel prices in FY1974, and anticipated spending \$4.4 billion on energy in FY1975.³⁴⁸ With oil prices still at record highs, these emergency conservation measures persisted for several years. As noted in the

³⁴⁴ Directorate for Energy, *Management of Defense Resources, Phase II*, 3.

³⁴⁵ Directorate for Energy, 23

³⁴⁶ Directorate for Energy, 6-2.

³⁴⁷ Schlesinger, *Annual Defense Department Report, FY1975*, 217. \$2.5 billion in 1974 would amount to approximately \$12.02 billion in FY2015, according to the inflation calculator of the Bureau of Labor Statistics (“CPI Inflation Calculator” (web page), http://www.bls.gov/data/inflation_calculator.htm (accessed September 20, 2017)).

³⁴⁸ Directorate for Energy, *Management of Defense Resources, Phase II*, 3.

FY1976 defense budget submission in February 1975, “our efforts to conserve fuel have meant reductions in Army training exercises, Navy steaming hours, and flying hours for both the Navy and the Air Force.”³⁴⁹ DOD had reduced its oil consumption to 571,000 barrels per day – noted by the budget submission as the lowest volume since FY1955 – but it was still a prodigious amount, making up 3.4% of total U.S. fuel consumption.³⁵⁰ Specifically citing budgetary constraints and fuel prices, the document announces plans to hold fuel consumption for the following year at the same level.³⁵¹

The Defense Energy Task Group’s initial and follow-up reports made substantive recommendations to improve the Pentagon’s energy posture and reduce the fuel used in tactical operations. Suggestions included creating a single energy use management office for each service, with purview over both tactical and installation energy, and re-establishing the Navy’s shipboard Fuel Economy Competition to save energy.³⁵² Proposed R&D efforts included engine efficiency improvements for ships and planes, reductions in aircraft drag, more efficient propulsion systems, and improved methods to transfer petroleum from ships to shore during contingency operations. The Energy Task Group’s second set of recommendations focused on policies that “foster a strong

³⁴⁹ James R. Schlesinger, *Annual Defense Department Report: FY1976 and FY1977* (Washington, DC: Department of Defense, 1975), III-34, http://history.defense.gov/Portals/70/Documents/annual_reports/1976-77_DoD_AR.pdf?ver=2014-06-24-150722-417.

³⁵⁰ Schlesinger, *Annual Defense Department Report: FY1976 and FY1977*, VI-8.

³⁵¹ Schlesinger, VI-8.

³⁵² Renamed iENCON, or incentivized Energy Conservation, this program was revived as a pilot program in 1993 and expanded fleet-wide in 2000. U.S. Navy, “iENCON History and Timeline” (web page), http://www.i-encon.com/iencon_timeline.htm (accessed September 27, 2017).

conservation ethic vice a short period of limited supply,” exhorting other aspects of DOD to see the strategic, long-term picture.³⁵³ In August 1974, Secretary Schlesinger directed that all of the recommendations of the Defense Energy Task Group’s second report be implemented, calling for DOD “move ahead expeditiously to improve our capability for dealing with such shortages which may occur again,” and “maintain the momentum which has been developed in moving toward greater efficiency in the management and consumption of energy resources in the DOD.”³⁵⁴

The initial Defense Energy Task Group report also highlighted the significant operational risks Pentagon planners were taking on in stark terms. A prior simulation of a land war in central Europe had found that DOD's tanker fleet and private tankers would be able to meet the anticipated transport needs of 2.6 million dry weight tons of fuel, albeit barely. The Defense Energy Task Group report skeptically notes that the total capacity available to DOD at the height of the war in Vietnam was 2.5 million dry weight tons, and had declined since then. The ongoing shift to larger tanker ships with deeper drafts that required more specific terminal facilities, combined with declining numbers of smaller DOD tankers, also made fuel distribution more difficult and would force DOD to use a motley collection of fuel mooring buoys, floating petroleum storage, or tanker shuttles to get fuel from tankers to shore. The picture darkened in more complex conflicts. The report found that a large-scale war in Asia with disruptions to Middle Eastern petroleum production

³⁵³ Directorate for Energy, *Management of Defense Resources, Phase II*, 25.

³⁵⁴ Directorate for Energy, x.

would require a major convoy effort to move petroleum products into the theatre, and may not be sufficient to meet the demand. More concerning, the Defense Energy report dryly notes that the just-enough scenario planning used by the wargamers omitted any disruption of petroleum shipping by hostile force – a big, and risky bet on the safety of U.S. supply lines.³⁵⁵ As the initial report makes clear, Pentagon planners made optimistic assumptions about the availability of fuel and assets to deliver it during a conflict, and developed scenario and force structure plans with a very narrow margin of error.

But by the time the second energy report was finalized, in July 1974, the typical DOD bureaucratic inertia was already apparent – it was “proving more difficult to maintain a high level of interest in the conservation program as crisis symptoms subside,” despite the explicit and unqualified support of the Secretary of Defense and the report’s stark highlighting of operational risks created by the Pentagon’s fuel posture.³⁵⁶ The recommendations from the November 1973 report that would have required financial investment showed “little progress,” and “longer term and more complex methods to reduce fuel use and to create institutionalized mechanisms have not been fully developed.”³⁵⁷ On the installation side, “present statutory limitations and [financial] programming inhibit ... recommendations that require additional manpower and financial resources to make significant energy savings.”³⁵⁸

³⁵⁵ Defense Energy Task Group, *Management of Defense Resources*, 3-16.

³⁵⁶ Directorate for Energy, *Management of Defense Resources, Phase II*, 6-3.

³⁵⁷ Directorate for Energy, 24-5.

³⁵⁸ Directorate for Energy, 25.

The organizational changes effected in the early 1970s to address the energy crisis proved short-lived. In November 1973, the Energy Task Group recommended a centralized DOD energy office with broad authority over energy matters, empowered to issue DOD policies related to energy and coordinate their implementation. As originally envisioned, this office would be at the Office of the Secretary of Defense level, and have responsibility for the totality of DOD energy policy, monitoring R&D efforts to ensure energy consideration, managing the DOD energy conservation program, building energy consumption measures, and coordinating energy efforts across services and agencies.³⁵⁹ Following the Task Group's recommendation, Secretary Schlesinger rapidly established a Director for Energy with authority over energy use reporting to the Assistant Secretary of Defense (Installations and Logistics). This office was stood up on January 2, 1974. However, any authority this office may have gained in the immediate aftermath of the energy crisis was brief. Strong support for the bureaucratic changes came from the House Armed Services Committee Chairman and the Special Subcommittee on DOD Energy Resources and Requirements, who viewed the energy crisis as “far from over”. In a letter to the Secretary of Defense on June 26, 1974, HASC Chairman Rep. F. Edward Hebert (D-LA) wrote that he hoped “that the machinery set up in the Department to cope with the matter would not be dismantled though any false sense of complacency, but that the programs and manpower would be maintained while an unpublicized but very real

³⁵⁹ Defense Energy Task Group, *Management of Defense Resources*, 8-6.

energy problems remains.”³⁶⁰ By the Task Force's second report, in July 1974, the internal bureaucratic resistance to empowered DOD energy offices was apparent. DOD agencies were reducing their energy management staffing because “the crisis is over.”³⁶¹ The new energy management offices were also particularly vulnerable to staffing cuts necessitated by reductions in overall numbers of headquarters personnel, and the energy-focused offices diminished through the 1970s. The Office of the Director for Energy was rolled into the office of the Director for Energy Policy under the Deputy Assistant Secretary of Defense for Energy, Environment and Safety by 1980, and thereafter became subsumed by the bureaucratic bog of the Pentagon.

DOD had also begun to look more seriously at long-term energy savings at its installations. The second Defense Energy Task Group report found ample potential efficiencies on DOD installations. It recommended a revolving capital fund to finance building efficiency upgrades, reviving “neglected” utility conservation programs, an energy savings poster campaign, whose proposed logo can be see in Figure 21.³⁶² Focusing on “large, relatively rapid pay-off ... projects that merit priority consideration,” at a total cost of \$150 – \$180 million,³⁶³ DOD requested funding for a new Energy Conservation Investment Program (ECIP) in February 1975. This program would make energy efficiency improvements at DOD buildings and bases, including weatherization, the installation of storm doors, and more efficient HVAC

³⁶⁰ Excerpted in Directorate for Energy, *Management of Defense Resources, Phase II*, 8-16.

³⁶¹ Directorate for Energy, 8-16.

³⁶² Directorate for Energy, 6-6.

³⁶³ Directorate for Energy, 6-4.

systems, through dedicated project-by-project funding appropriated by Congress. ECIP was originally tended to be a \$1.35 billion, six-year push, focusing on short-term ROI in the first year. According to the a 1978 GAO report, large-scale programs of retrofitting existing structures to improve energy efficiency were new, and DOD faced a skeptical Congress that it had to win over. In the first year of the program, all of the projects proposed in the FY1976 budget submission would have a pay-back period of 4 years. After this proof-of-concept hurdle was cleared, the original ECIP program was intended to have a pay-back period of 10 years.

Figure 21: Proposed energy saving logo and slogan



But in August 1976, about 18 months after the ECIP was introduced, Secretary of Defense Donald Rumsfeld reduced the maximum pay-back period from 10 years to 6 years for all projects started in 1978 and after. As GAO states, this “re-emphasized cost savings over long term energy savings.” Secretary Rumsfeld also reduced the program scope from \$1.35 billion to \$722 million – a nearly 50% reduction in energy efficiency investments. By reducing anticipated funding and requiring shorter pay-back periods, “the program's total energy saving potential was substantially reduced.”³⁶⁴ In effect, the investment rubrics used by DOD, combined with perceived congressional pressure, oriented the ECIP program towards general and energy cost savings, instead of reducing energy usage or increasing DOD's energy security.³⁶⁵ In addition to the short pay-back horizons, the program excluded both contractor-operated facilities and overseas bases, regardless of the intensity of their energy usage or relative energy security. In their review of the program, GAO specifically recommended that overseas bases should be included, and their “vulnerability to supply disruptions” considered as an investment factor.³⁶⁶ However, this program got a last-minute reprieve due to President Carter's issuance of Executive Order 12003 on July 20, 1977 that established energy efficiency goals for federal buildings.³⁶⁷ DOD,

³⁶⁴ General Accounting Office, *Improvements Needed in Department of Defense Energy Conservation Investment Program* (EMD-78-15) (Washington, DC: U.S. General Accounting Office, January 1978), 4, <http://www.gao.gov/assets/130/121202.pdf>. GAO's name was changed to the Government Accountability Office in 2004.

³⁶⁵ GAO, *Improvements Needed*, 9.

³⁶⁶ GAO, 9.

³⁶⁷ GAO; James Earl Carter Jr., “Energy Policy and Conservation,” Exec. Order No. 12,003 (July 20, 1977).

in order to meet new energy goals of a 20% reduction in energy use on a per-square foot basis, continued the ECIP program. It still exists today in much the same form.

The quick down-scaling of the initial ECIP program illustrates the vulnerability of new ways of thinking about energy in the department. Despite the relatively modest goals of the ECIP – saving facilities energy was very much of a piece with contemporaneous energy efficiency goals – energy efficiency was not seen as a core DOD interest. Worried about harsh congressional reaction to something tangential to DOD's national security mission, DOD pre-emptively limited the energy-savings aspects of the ECIP as first conceived to get the “quick wins” of short ROIs. DOD's bureaucratic inertia can also be seen in the shift towards cost savings, including both energy and ongoing maintenance cost savings, in lieu of actual energy savings in the form of BTUs. Saving money frees up funds for other uses and is hard to resist, while saving energy provides no tangible benefit. This episode also emphasizes the critical importance of timing and strong leadership in support of new DOD initiatives. Without President Carter's Executive Order, it is likely that the program would have ended after achieving its scaled-down goals at the end of the six-year initiative. With renewed focus and a concrete goal, the ECIP program persisted, and provided the germ of today's efforts to increase DOD's facilities energy and the Annual Energy Management Report.

The energy crisis and the shortages of jet fuels and various military specification fuels did hasten DOD's efforts to standardize fuel use across platforms, as the Defense Energy Task Group had recommended. Recommended changes included the retirement of older platforms that used the niche fuel AVGAS 115 or AVGAS 145 in favor of more common aviation blends, and the standardization of the Air Force's aircraft fleet on JP-8.³⁶⁸ The clear military benefits of greater standardization and fuel availability, combined with the already mature status of this effort, made the fuel standardization drive the most durable result of DOD efforts to increase operational efficiency following the energy crisis of 1973-1974. The FY1976 budget request pays some lip service to improving DOD's fuel consumption trajectory over the long-term - the document describes improved tracking of petroleum inventories, as well as non-specific mentions of defense R&D "in those areas promising the most direct payoff in improved specific fuel consumption, such as in aircraft and ship operations."³⁶⁹ However, these R&D efforts didn't result in fuel savings for DOD's weapons systems and platforms, and it is not clear how seriously they were pursued. On the contrary, the trend was towards heavier and less fuel-efficient systems.³⁷⁰ Despite the Energy Task Force's emphasis on the long-term fuel efficiencies of operational fuel consumption, their recommendation that life-cycle energy costs be considered in R&D and acquisitions efforts gained little traction. "Energy

³⁶⁸ Directorate for Energy, *Management of Defense Resources, Phase II*, 4-9-10.

³⁶⁹ Schlesinger, Annual Defense Department Report: FY1976 and FY1977, VI-9.

³⁷⁰ In 1999, a U.S. Army Armored division was estimated to consume approximately 600,000 gallons of fuel a day (Richard H. Truly and Alvin L. Alm, *More Capable Warfighting through Reduced Fuel Burden*

(Washington, DC: Defense Science Board, May 2001), 13, <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392666>.)

effectiveness” never received enough political and technical support to reach parity with “cost effectiveness” and “mission effectiveness” in DOD acquisitions decision-making.³⁷¹

Overall, the Department of Defense's energy efforts in response to the fuel shortages and price spikes of the early 1970s relied on a slower operational tempo and reduced training, rather than a long-term energy conservation strategy with associated resource commitments. Although some within DOD remained concerned, many in DOD and the national security policy elite remained rather blasé after the immediate crisis had passed and the sense of urgency waned. By December 1976, a memo written by Director of Energy's office complains that “Repeated efforts have been made by DOD to redirect [national energy policy] thinking towards national security considerations. All have apparently been to little avail.”³⁷² The long-term implications of price volatility, OPEC’s “oil weapon” and DOD's energy supply chain vulnerabilities began to fade from DOD’s institutional memory. According to Defense Logistics Agency – Energy officials in 2012, DOD had had “no response” to the oil price shocks of the early 1970s.³⁷³

³⁷¹ Directorate for Energy, *Management of Defense Resources, Phase II*, 7-6; 7-10.

³⁷² Office of the Director for Energy, Assistant Secretary of Defense for Installations and Logistics, *DOD Role in Development of National Energy Policy* (Washington, DC: Department of Defense, December 1976), <https://archive.org/details/Carter-ReaganTransitionPapers>.

³⁷³ Private communication with the author, March 2012.

The Turbulent late 1970s and 1980s

The late 1970s and the 1980s continued to be a turbulent period for the world oil market, with a second oil crisis prompted by the Iranian revolution, although the impact on the Pentagon was muted. Energy was one of President Carter's foremost economic and national security concerns. Like James Schlesinger, the previous Secretary of Defense and then President Carter's inaugural Secretary of Energy, President Carter was convinced of future oil shortages and the need to reduce the United State's reliance on imported oil – a task he framed as “the moral equivalent of war.”³⁷⁴ The administration planned to transition the economy to market-rate oil and spur domestic production, particularly in Alaska by relaxing the remaining price controls put in place by President Nixon, while reducing the impact of higher prices on consumers by encouraging conservation. The 1978-79 Iranian revolution and overthrow of the Shah significantly disrupted Iranian oil production, at that time the second-largest in the world. Over the next 8 years, Iranian production improved in fits and starts, but averaged 2 million barrels per day, far below previous levels.³⁷⁵ Similarly, oil production in Iraq dropped from 2.7 million barrels per day to just 143,000 barrels per day after the start of the Iran-Iraq war. Production improved over the duration of the war, but averaged just 1.5 million barrels per day, down from 3.3 million barrels per day in 1979. The prices increases from production shortfalls were exacerbated by President Carter's de-regulation of wholesale oil prices. Spooked by

³⁷⁴ Yergin, *The Prize*, 645.

³⁷⁵ EIA, “World Crude Oil Production: OPEC Members” (Table 11.a), available at Total Energy Data Browser (website), <http://www.eia.gov/beta/MER/index.cfm?tbl=T11.01A#/?f=A&start=1973&end=2004&charted=12> (updated August 28, 2017).

memories of oil shortages in 1973, panic buying led to long lines at U.S. gas stations, and several states implemented gasoline rationing. The 1978 - 1979 oil crisis stemming from plummeting Iran and Iraqi oil production led to rapid price increases, with oil prices tripling between the end of 1978 and the early months of 1981 before leveling off.³⁷⁶

Improving the Pentagon's energy efficiency, which seemed so pressing in 1973 and 1974, receded across the horizon during the 1980s, despite the 1979 oil crisis. DOD's attention to energy security and energy savings, already tenuous, waned nearly into non-existence. The lone exception was the Navy. Apparently spooked by either the previous decades' rapid price increases or the geopolitical calculus of the Middle East, began studying various aspects of oil quality and availability through their research labs and the newly created Navy Energy and Natural Resources R&D Office within the Office of Naval Research. In a series of nine reports published by the Department of Energy's Oak Ridge National Laboratory from 1985-1991, the Navy analyzed various oil market crisis scenarios using the newly developed Navy Mobility Fuels Forecasting System software. Several scenarios focused on the risks to DOD fuel availability and quality from disruptions to oil production in North Africa and the Persian Gulf. For example, a 1989 paper modeled the impacts of a 90-day disruption forecast in 1995 that included a total loss of production in in the Libya, Algeria, and the Persian Gulf, a 40% reduction in North Sea production, a 300% increase in

³⁷⁶ Vartanig G. Vartan, "Investing: The Great Oil Play's Morning After," *New York Times*, May 24, 1981, <http://www.nytimes.com/1981/05/24/business/investing-the-great-oil-play-s-morning-after.html>.

military fuel use, a 37% reduction in Soviet petroleum exports, the drawdown of global strategic petroleum reserves, and shipping difficulties, amounting to a 40% loss of global petroleum production.³⁷⁷ In this scenario, petroleum products increased about 500%, and the costs of JP-5 and F-76 (Naval aviation jet fuel and marine diesel) increasing between \$3-\$11 per gallon, depending on the region. The Navy concluded that they would be able to source sufficient quantities of fuel, although fuel quality might become an issue, due to crude oil-refinery mismatches with the disruption of normal patterns of petroleum product refining.³⁷⁸ Aside from this modeling, DOD took essentially no actions to reduce its dependence on petroleum during the 1980s.

Ultimately, the impact of declining Iranian and Iraqi production was mitigated by increasing energy efficiency, deregulation of U.S. petroleum pricing controls, Saudi Arabia's adoption of the “swing producer” role and the emergence of other major producers. Despite the drop-off of Iranian and Iraqi oil production, world oil prices declined steadily between 1981 and 1986. In the mid-1980s, internal tensions within OPEC led Saudi Arabia to abandon its policy of restricting oil production to maintain higher OPEC oil prices. Saudi's production increased from an average of 3.4 million barrels per day in 1985 to 6.4 million barrels a day in 1990, though still well below its

³⁷⁷ G. R. Hadder and R.M. Davis, *Navy Mobility Fuels Forecasting System Phase VI Report: Impacts of a Military Disruption on Navy Fuel Availability and Quality* (ORNL-6637) (Oak Ridge, TN: Oak Ridge National Laboratory, September 1990), S-1, <http://www.osti.gov/scitech/servlets/purl/6488213>.

³⁷⁸ Hadder and Davis, *Navy Mobility Fuels Forecasting System*, S-1.

peak production of nearly 10 million barrels a day in 1980.³⁷⁹ With the OPEC members at odds, oil prices plummeted, falling by more than half in the first six months of 1986.³⁸⁰ By the end of the decade, crude oil prices were less than half the 1980 price.³⁸¹

Operation Desert Shield/Desert Storm, August 1990 – March 1991

The 1990 – 1991 Gulf War also illustrated the scale of DOD’s reliance on petroleum and offered sharper lessons about the operational and strategic vulnerabilities of this reliance. Unfortunately, the Pentagon didn’t learn them.

Following Iraq’s invasion of Kuwait on August 2, 1990, crude oil prices spiked from an average of \$16.54 per barrel in July 1990 to \$24.26 in August 1990. Of more immediate concern for DOD, the Kuwait Petroleum Company had been the supplier for more than 90% of the jet fuel (JP-5) for Navy forces in the Pacific.³⁸² The Defense Logistics Agency – Energy and the Navy would have to scramble for a new supplier. Following the invasion of Kuwait, oil prices continued to climb, reaching a monthly peak of \$30.19 in November 1990 – a rise of nearly 85% - before declining

³⁷⁹ EIA, “World Crude Oil Production: OPEC Members.”

³⁸⁰ Nominal crude oil prices fell from \$24.93 per barrel in January 1986 to \$10.91 per barrel in July 1986. In real terms, this was a drop from \$53.76 per barrel to \$23.61 per barrel (EIA, “Real Prices Viewer: Imported Crude Oil Prices” (web page), <http://www.eia.gov/forecasts/steo/realprices/> (updated September 12, 2017)).

³⁸¹ Nominal crude oil prices fell from \$30.75 per barrel in January 1980 to \$20.05 per barrel in December 1989. In real terms, this was a drop from \$93.42 per barrel to \$37.62 per barrel (EIA, “Real Prices Viewer”).

³⁸² Joseph T. Thomas, *Petroleum Operations in the Gulf War: An Operation Desert Storm Personal Experience Monograph* (Carlisle Barracks, PA: U.S. Army War College, May 1993), 10, <http://www.dtic.mil/dtic/tr/fulltext/u2/a263676.pdf>.

once U.S. military coalition appeared likely.³⁸³ Retail gasoline prices were only moderately impacted, with the price of a gallon of gas rising from an average of \$1.05 per gallon in July 1990 to \$1.34 per gallon in October and November 1990, a rise of 28%. By contrast, jet fuel prices more than doubled over the same time period, rising from \$0.497 per gallon on July 2, 1990 and peaking at \$1.43 on October 12, 1990 before declining slowly through the cessation of hostilities.

The short time frame of the combined campaign, which lasted from January 17 to February 28, 1991, meant that the U.S. and Saudi forces were able to meet their increased fuel needs on the world market, despite the reduction in world supply from the loss of Kuwait's exports. Saudi Arabia, which suddenly required hundreds of thousands of barrels of jet fuel for coalition sorties, became a net importer overnight, halting exports of jet fuel and heavy diesel while purchasing an additional 200,000 – 400,000 barrels of jet and diesel fuel per day over their own production of between 350,000 – 400,000 barrels per day.³⁸⁴ The U.S. and Saudi demand for jet fuel to prosecute the Desert Storm campaign pushed local prices in the Middle East up substantially, to about \$41.06-\$41.34 per barrel, compared to \$29.08-\$29.19 in Houston.³⁸⁵ Saudi Arabia reportedly quietly purchased about 8 million barrels of

³⁸³ Historical prices from EIA, "Real Prices Viewer."

³⁸⁴ Judith Miller, "Saudis Importing Fuel to Fight War," *New York Times*, January 23, 1991, <http://www.nytimes.com/1991/01/23/world/war-in-the-gulf-saudi-arabia-saudis-importing-fuel-to-fight-war.html?mcubz=0>; Patrick Lee, "Thirst for Jet Fuel Dries Up Supplies in Europe and Asia," *Los Angeles Times*, January 26, 1991, http://articles.latimes.com/1991-01-26/business/fi-635_1_jet-fuel.

³⁸⁵ Lee, "Thirst for Jet Fuel."

diesel jet fuel in the 6 weeks prior to Desert Storm.³⁸⁶ The United State's Military Sealift Command delivered an additional 35 million gallons of fuel in support of Desert Shield/Desert Storm though February 17 1991.³⁸⁷

Within the theatre, petroleum logistics was a much more complicated proposition. In addition to the procurement of fuel, refueling of tactical vehicles was at the core of the logistics for both the air and ground campaigns that were central to the offensive of Operation Desert Storm. A GAO report evaluating the efficacy of the air campaign termed Operation Desert Storm a "tanker-dependent war."³⁸⁸ Nearly all of the sorties flown required aerial refueling, due to the "around-the-clock operations" and the great distances planes flew from bases and carriers to their targets. GAO notes that there were an average of 1,399 refuelings per day, totaling over 800 million pounds of fuel.³⁸⁹ In the ground campaign, refueling of the Abrahms was "a constant concern," due to the tank's high fuel consumption and limited range.³⁹⁰ With fuel consumption of approximately 7 gallons per mile and persistent fuel system

³⁸⁶ Miller, "Saudis Importing Fuel."

³⁸⁷ Ronald F. Rost, John F. Addams, and John J. Nelson, *Sealift in Operation Desert Shield/Desert Storm: 7 August 1990 to 17 February 1991* (CRM 91-109) (Alexandria, VA: Center for Naval Analyses, May 1991), 21, www.dtic.mil/get-tr-doc/pdf?AD=ADA246480.

³⁸⁸ Kwai-Cheung Chan, *Operation Desert Storm: Evaluation of the Air Campaign* (GAO/NSIAD-97-134) (Washington, DC: U.S. General Accounting Office, June 1997), 83, <http://www.gao.gov/assets/230/224366.pdf>

³⁸⁹ Chan, *Operation Desert Storm*, 83.

³⁹⁰ GAO, *Operation Desert Storm: Early Performance Assessment of Bradley and Abrams* (GAO-NSIAD-92-94) (Washington, DC: General Accounting Office, January 1992), 25, <http://www.gao.gov/assets/220/215553.pdf>.

reliability problems, the Army planned to refuel the Abrams approximately every 3-5 hours, straining the logistics systems considerably.³⁹¹

During the initial deployments in late summer 1990, before Operation Desert Storm began, the logistics and supply chain functions, particularly for fueling, had been under-resourced and had to play catch-up.³⁹² Although other aspects of sustainment were largely functional after 6-8 weeks, the petroleum logistics backbone remained hobbled by limited deployments of petroleum quartermaster personnel and fuel handling capacity limitations in the logistics chain. In the words of Lt. Col. Thomas, this “resulted in a disjointed, uncoordinated, uniformly inefficient and ineffective distribution effort.” Supply officers resorted to guess-work to predict petroleum needs, with “abysmal” results.³⁹³ Even given the lack of U.S. military fuel transport capacity, fuel systems and effective fuel management, the local existence of large-scale commercial refineries and fuel infrastructure in Saudi Arabia allowed the fuel logistics for the war effort to more-or-less skate by. The Army’s secondment of Saudi distribution infrastructure and 3 commercial refineries was vital to the

³⁹¹ GAO, Operation Desert Storm, 25-26.

³⁹² The early-stage scramble for logistics and sustainment, including buses to meet newly-arriving U.S. soldiers at the airport, is described in Center of Military History, *War in the Persian Gulf: Operations Desert Shield and Desert Storm, August 1990-March 1991* (CMH Pub. 70-117-1) (Washington, DC: United States Army, 2010), 4-14, http://www.history.army.mil/html/books/070/70-117-1/CMH_70-117-1.pdf; Scott Conrad discusses the strategic reasons combat forces were prioritized over the associated logistics forces, and how this would become “our Achilles heel” in *Moving the Force: Desert Storm and Beyond*, McNair Paper No. 32 (Washington, DC: National Defense University, Institute for National Strategic Studies, December 1994), 28-33. Conrad comments that the U.S. armed forces have “a long tradition of tying one hand behind its back, logistically, and then wondering why we commit the same mistake in every war.” The disarray in the petroleum logistics is comprehensively described by Lt. Col. Joseph T. Thomas in *Petroleum Operations in the Gulf War*, 11-18.

³⁹³ Thomas, *Petroleum Operations in the Gulf War*, 17.

sustainment of combat forces.³⁹⁴ In November 1990, after the announcement that the number of combat forces would be doubled, the logisticians marshaled additional resources, deploying all but one of the Army's petroleum distribution and storage units to Saudi Arabia. They also prepared to buy jet fuel on the open market, to be stored on tanker ships leased by the Saudis and on ultra-large crude carriers owned by the government of Kuwait.³⁹⁵ When air sorties began, the coalition's demand for jet fuel increased tremendously. Use of three commercial-scale Saudi refineries also allowed for the maximization of jet fuel production from crude by tweaking the ratios of distillates produced.³⁹⁶

Despite the improved capability of the petroleum logistics system, the beginning of ground combat operations would further stress the petroleum logistics system.³⁹⁷ According to Lt. Col. Thomas' account, the Army's "inability" to manage their petroleum demands became acute "shortly after" the onset of ground operations.³⁹⁸ There were widespread concerns about the reliability of the third-party nationals, usually poorly-paid contractors, who drove the fuel tankers to the logistics bases. The tankers that had moved forward with the Army remained forward, leaving the Army with no petroleum resupply capability as the front advanced, and further limiting the resupply capability of other services in theatre, risking imminent re-supply failure.

³⁹⁴ Thomas, 21.

³⁹⁵ Thomas, 29-30.

³⁹⁶ Thomas, 33.

³⁹⁷ Thomas, 35.

³⁹⁸ Thomas, 35.

The pace of the Army's progress into Iraq was greater than the forward fuel trucks could sustain, leaving the lead tanks of the 24th Infantry Division (Mechanized) with an average of less than 100 gallons of fuel left in the desert after the second day of advances against much-less-than-expected resistance from the Iraqi forces.³⁹⁹ An official Army narrative describes the *ad hoc* solution:

“Brigade commanders had the fuel, but lead elements were not sure where to rendezvous in the desert. ... A small number of junior officers took the initiative to lead tanker-truck convoys across the desert at night with only a vague idea of where either brigade fuel supplies or needy assault units were located. By approaching whatever vehicles came into view and asking for unit identity, those leaders managed to refuel most of the division's vehicles by midnight.”⁴⁰⁰

These efforts, while successful, cannot have been reassuring to Lt. Col. Thomas, who recounts that “when combat operations on the ground were terminated after only 100 hours, the entire petroleum community in Theatre [sic] breathed a sigh of relief. ... The problems encountered during the seven months of "combat" operations for the petroleum units were inclusive of almost all possible problems.”⁴⁰¹ A single Army division consumed more than 2.4 million gallons of fuel, delivered by 475 5,000-gallon tanker truck refuelings during the 100-hour ground offensive of Desert Storm.⁴⁰² Many strategists believe that if the ground campaign had been longer, combat operations would have had to halt until the logistics ‘tail’ could catch up.⁴⁰³

³⁹⁹ Center of Military History, *War in the Persian Gulf*, 56.

⁴⁰⁰ Center of Military History, 56.

⁴⁰¹ Thomas, *Petroleum Operations in the Gulf War*, 36-37.

⁴⁰² Conrad, *Moving the Force*.

⁴⁰³ Conrad, 46.

Notably, these fuel challenges occurred even though Operations Desert Shield and Desert Storm had several unique and favorable conditions that are unlikely to be replicated in other combat situations. First, U.S. forces began arriving in Saudi Arabia in August 1990 at the request of the Saudi government. This nearly six-month lead time between the invasion of Kuwait and the coalition's counter-strike was "unprecedented" and gave U.S. forces a considerable advantage in organization and preparations for an offensive campaign. During this time, coalition forces and resources were unharried by Iraqi forces and control over air and sea-lanes was assured.⁴⁰⁴ Developed Saudi infrastructure, including modern ports and highways, was critical to the speedy movement of people and materiel.⁴⁰⁵ Close U.S. cooperation with other regional partners, including Bahrain, Qatar, Oman, and the United Arab Emirates, also facilitated this rapid build-up and allowed for assured supply lines, including refueling and overflight rights.⁴⁰⁶ The ability to purchase petroleum products on the spot market and un-hindered sea-lanes for delivery were also vital. The world petroleum markets remained open, the purchased oil could be delivered, and the market had sufficient petroleum for sale that DOD and Saudi Arabia were able to meet their increased fuel needs on the open market, albeit at higher prices. U.S. forces were also able to divert nearly all of Saudi Arabia's

⁴⁰⁴ Conrad, 39-40.

⁴⁰⁵ Conrad, 27-28.

⁴⁰⁶ Center of Military History, *War in the Persian Gulf*, 56; Naval History and Heritage Command, "Lessons Learned and Summary," in *U.S. Navy in Desert Shield/Desert Storm* (Ser OO/IU500179) (Washington, DC: U.S. Navy, May 1991), <https://www.history.navy.mil/research/library/online-reading-room/title-list-alphabetically/u/us-navy-in-desert-shield-desert-storm/lessons-learned.html>.

considerable petroleum infrastructure to immediate military use, including domestic oil production, three commercial-scale refineries, oil tankers, pipelines, and approximately 2,500 Saudi commercial fuel-hauling trucks.⁴⁰⁷ The Navy's ability to ship sufficient quantities of fuels would have been "severely tested" if local petroleum fuels were not available. The ports were even more critical. Without the special infrastructure of the petroleum ports, providing the requisite volumes of fuel would have been "impossible." The Navy's tanker ships can discharge 1 million gallons per day, but the forces needed 25 million gallons per day during the combined air-ground assault.⁴⁰⁸ Moreover, DOD's fuel demands were far lower than they would have been in a full-scale war.

Congress, observing the logistics challenges of Operations Desert Shield and Desert Storm, ordered DOD to perform a thorough review of their mobility needs and capability.⁴⁰⁹ A variety of after-action analyses emphasized the constraints high fuel consumption placed on the force and diagnosed specific fuel logistics problems. During the Gulf War, nearly 100% of the Army's petroleum capability was in theatre, supporting less than half of the Army's combat strength. Even so, the Army was unable to distribute petroleum to the Navy and Air Force, and struggled to maintain

⁴⁰⁷ Thomas, *Petroleum Operations in the Gulf War*, 4; 11-17; 33.

⁴⁰⁸ Thomas, 45.

⁴⁰⁹ National Defense Authorization Act for Fiscal Year 1991, Pub. L. No. 101-510, § 909, 104 Stat. 1623 (1990). This report, the *Mobility Requirements Study of 1992* (Joint Chiefs of Staff, Washington, DC: Department of Defense, January 23, 1992), is available at http://www.dod.mil/pubs/foi/joint_staff/jointStaff_jointOperations/514.pdf.

its own refueling.⁴¹⁰ Lt. Col. Thomas concludes that the Army was totally unprepared to distribute fuel inland to all services, even though the land distribution of petroleum is one of the Army's missions. Lt. Col. Thomas also raises major concerns about the reliability of non-military contract divers, typically third-country nationals, to transport fuel.⁴¹¹ Looking ahead to future conflicts, another military analyst predicted heavy reliance on the rapid global reach of U.S. forces, and, among other recommendations, advocated slimming the future logistics needs of the force by reducing fuel consumption.⁴¹² The Army history likewise recommends greater advances in fuel efficiency.⁴¹³

However, the quick collapse of Saddam Hussein's forces appears to have overshadowed any nascent concerns about the fuel needs of the military's combat forces, the inadequacy of the petroleum supply chain, and the risks of a large logistics tail. Engine efficiency in the Army's tanks worsened rather than improving in the years after the Gulf War, and the essential role of enabling logistics infrastructure, like tanker trucks and ships, continued to be undervalued by the Pentagon leadership and military planners.

⁴¹⁰ Thomas, *Petroleum Operations in the Gulf War*, 40.

⁴¹¹ Thomas, 40.

⁴¹² Conrad, *Moving the Force*, 70.

⁴¹³ Center of Military History, *War in the Persian Gulf*, 70.

Energy and Environment in the 1990s and early 2000s

The risks of DOD's reliance on petroleum fuels that had once again been brought into the spotlight by the Gulf War faded away rapidly. The only DOD energy efforts were either half-heartedly-met legislative requirements or anemic holdovers from previous initiatives or. For example, the 1992 Energy Policy Act mandated that all federal agencies purchase alternative-fueled vehicles for at least 75% of their non-tactical vehicles.⁴¹⁴ However, although there were reporting requirements, there was no penalty for non-compliance by DOD or other federal agencies. Base commanders would be asked if they had purchased the requisite number of hybrid cars, and respond that they had used their budgets on higher mission priorities – there was no further recourse or argument to be made.⁴¹⁵ By contrast, DOD violations of the Clean Air Act from environmental contamination at DOD sites received a notice of violation, and thenceforth faced both a clear pathway to returning to compliance and serious penalties for continued non-compliance.⁴¹⁶ Similarly, a few 1970s-era energy efficiency holdover programs remained. The Energy Conservation Investment Program continued to be reliably funded by Congress to invest in energy efficiency upgrades to specific installations. The Federal Energy Management Program, created in 1973 to coordinate energy efficiency across the federal government, continued to do its work. However, the Republican controlled Congress was often openly

⁴¹⁴ Pub. L. No. 102-486, 106 Stat. 2776 (1992). The EAct of 1992 also mandated that all federal agencies reduce their petroleum usage by 10% by 2000 and 20% by 2010, and overall energy intensity by 10% by 1995 and by 20% by 2000. However, like the goals for alternative fueled vehicles, there were no penalties for non-compliance and generous loopholes for national security exceptions.

⁴¹⁵ Sherri Goodman (former Deputy Under Secretary of Defense for Environmental Security) in interview with the author, June 2014.

⁴¹⁶ Goodman, interview.

antagonistic to Clinton's environmental efforts, including those that would apply to DOD, trying to derail efficiency and environmental initiatives and Executive Orders directly, but prohibiting implementation, and indirectly, by withholding funds.⁴¹⁷

Instead, Pentagon attention turned to military nuclear waste and environmental contamination, compelled by public demands and environmental activism that led to congressional sustained interest and oversight.

Contaminated Land

In late 1980s, alarming stories about problems sites associated with DOD and DOE's nuclear program dominated the front page of the New York Times and other major papers, as revelations about poor safety records and radioactive contamination at the Hanford, Savannah River, Idaho and Rocky Flats reactors came to light. Reactors for the nuclear weapons enterprise are exempt from oversight from the Nuclear Regulatory Commission, and stories of toxic and radioactive wastes and shutdown reactors increased public opposition and environmental activism. The Department of Energy's nuclear budget (some 50% of its total budget) attracted substantial attention from the HASC and SASC for the first time. Previously, the DOE's nuclear budget had been such an afterthought to the rest of the defense appropriations bill that it was called the "New Mexico" bill, after the numerous defense nuclear facilities in the state. Simultaneously, the non-nuclear environmental contamination of DOD bases

⁴¹⁷ Robert F. Durant, *Greening the Military: Environmental Policy, National Security, and Organization Change* (Washington, DC: Georgetown University Press, 2007), 216.

and facilities was also receiving increased attention. The 1989 and 1991 Base Realignment and Closure Rounds highlighted the prevalence of environmental contamination at DOD sites, and provoked widespread demand that DOD be held to account.

The startling realities of DOD's environmental and radiological contamination and unexploded ordnance, combined with the congressional pressures of the ongoing BRAC process in the relatively stable post-Cold War national security landscape allowed environmental issues to rate relatively highly in DOD's agenda. Vice President Al Gore's well-known environmental interests provided additional an White House push for DOD to tackle environmental issues during the Clinton Administration. Shortly after President Clinton took office, he created a pair of positions to handle the environmental and economic consequences of the BRAC rounds of 1989, 1991, and the upcoming 1993 and 1995 rounds. The new positions, the Deputy Undersecretaries of Defense for Environmental Security and Economic Security, respectively, were created under the Assistant Secretary of Defense for Acquisition, Technology and Logistics. In effect, these positions split the responsibilities of the present Deputy Under Secretary of Defense for Installations and Environment into two offices.

Throughout the mid-1990s, this environmental cleanup was DOD's exclusive focus when it came to environmental or energy-related issues. In addition to strong interest

from the White House, pointed congressional interest in the BRAC process and environmental contamination at local bases, as well as regulatory compliance challenges from state EPAs, heightened DOD attention to the issue.⁴¹⁸ While the Deputy Under Secretary of Defense for Environmental Security (DUSD(ES)) Sherri Goodman's office nominally had responsibility for all Pentagon environmental topics, her office was principally focused on the Defense Environmental Restoration Fund and the BRAC environmental cleanup process.⁴¹⁹ Despite the creation of this new office and authorities, the services and DOD agencies frequently pushed back against Goodman's environmental mitigation efforts with a variety of delaying and minimization techniques.⁴²⁰ At the end of her eight-year tenure as DUSD(ES), environmental improvements and cleaning up contaminated sites were still seen as distractions from core DOD mission areas. Leaving office, Goodman noted, "it has been difficult for the military to accept changes in its business practices to better protect human health and the environment."⁴²¹ However, the White House attention and congressional pressure meant that it still got done, even if begrudgingly, by most of the Pentagon's bureaucracy.

⁴¹⁸ Durant analyzes the Pentagon's uneven, halting and contested efforts to grapple with its legacy of environmental contamination, including regulatory challenges, the clean-up process, and environmental stewardship in *Greening the Military*.

⁴¹⁹ Goodman, interview.

⁴²⁰ Durant, *Greening the Military*.

⁴²¹ Durant, *Greening the Military*, 203, citing "Weapons Acquisition, UXO Key Areas for Environmental Technology," *Defense Environment Alert* 8, no. 25 (December 2000), 4.

Kyoto Protocol Negotiations and Energy Conservation at DOD

For the bulk of the 1990s, this benign neglect of energy and environmental issues remained the status quo. However, the December 1997 Kyoto negotiations prompted some consideration of DOD's relationship to greenhouse gases and climate change, including evaluating DOD's contributions to domestic greenhouse gas emissions, and anticipating how new limitations on greenhouse gas emissions could impact DOD operations. As part of the build-up to the Kyoto negotiations, DOD officials argued that DOD could acceptably be subject to limitations on greenhouse gas emissions for non-tactical applications, such as fleet vehicles and installations, but categorically rejected greenhouse gas emissions limitations for tactical energy uses. DOD was particularly concerned about potential limitations on ships' use of bunker fuels, which are a significant source of greenhouse gas and sulfur emissions. According to Goodman, this delineation was the origin of “operational” vs. “installation” energy, although the terms had yet to be coined.⁴²²

In the months leading up to the December 1998 Kyoto negotiations, DOD argued forcefully that military operations and tactical systems should receive blanket exclusions from any greenhouse gas emissions reductions requirements, and in particular against any reductions in fuel use. This memorandum, “Draft Department of Defense Background Paper on a National Security Provision for the Proposed Climate Change Protocol,” published by DUSD(ES) Goodman's office, laid out dire

⁴²² Goodman, interview.

scenarios resulting from a 10% reduction in DOD's greenhouse gas emissions, effected through a 10% reduction in DOD's fuel use.⁴²³ Among other potential impacts, it would “reduce [the Army's] OPTEMPO [operations tempo] to a level that would downgrade unit readiness and require up to six additional weeks to prepare and deploy.” A 10% reduction in Navy fuel use would similarly “cut some 2,000 steaming days per year from training and operations.” For the Air Force, a 10% reduction would “result in the lost of over 210,000 flying hours per year,” resulting in the Air Force being “incapable of meeting all of the requirements of the national Military Strategy.” Overall, it concludes that a 10% reduction in DOD's fuel use would “represent a serious threat to national security.”⁴²⁴ A draft DOD proposal for Kyoto exempted emissions attributable to military tactical or strategic systems in all operations and in training.⁴²⁵

While DOD didn't receive a blanket exemption of all operational fuels use, the exemptions in the Kyoto Protocol were still substantial. According to a DOD memorandum on the relevant provisions of the Kyoto Protocol, multilateral combat operations would be not be counted against any country's emissions limits. Second,

⁴²³ Addison D. Davis IV, *Emerging Non-Traditional Security Issues for the New Millennium* (Carlisle Barracks, PA: U.S. Army War College, 1999), <http://handle.dtic.mil/100.2/ADA368247>, quoting Office of the Deputy Under Secretary of Defense (Environmental Security), “Draft Department of Defense Background Paper on a National Security Provision for the Proposed Climate Change Protocol,” *Defense Environment Alert* 5, no. 20 (September 1997): 4-6.

⁴²⁴ Jeffrey Salmon, *National Security and Military Policy Issues Involved in the Kyoto Treaty* (Arlington, VA: The George C. Marshall Institute, May 1999), <http://marshall.org/climate-change/national-security-and-military-policy-issues-involved-in-the-kyoto-treaty/>, quoting Office of the Deputy Under Secretary of Defense (Environmental Security), “Draft Department of Defense Background Paper.”

⁴²⁵ Salmon, *National Security and Military Policy Issues*, quoting Office of the Deputy Under Secretary of Defense (Environmental Security), “Draft Department of Defense Background Paper.”

all bunker fuels would be exempted. Finally, emissions from other military efforts abroad could be allocated between all of the participating countries, by agreement.⁴²⁶

However, the exact contours of DOD's exemptions were unclear to policymakers.

Skepticism in the Republican-controlled House and Senate were abundant. DOD held that "we achieved the Department's three international objectives at Kyoto," while Senator Hagel reportedly requested a written explanation in early 1998 regarding the military's exemption request and how the Kyoto Protocol as written differs from that request.⁴²⁷ On March 11, 1998, DUSD(ES) Goodman testified before the SASC Readiness Subcommittee that the administration will "oppose efforts to impose emissions limits on domestic military operations and training."⁴²⁸

In other words, in 1997 and 1998 the Pentagon's highest-ranking environmental officer had forcefully argued against cutting DOD's fuel use, arguing that it would jeopardize training and readiness. Amid contentious debate about ratification, potential restrictions on DOD's operational energy use were held up as a point of resistance and as a reason to reject the Kyoto Protocol.

By linking energy conservation closely to degraded military readiness and training, greenhouse gas emissions reductions and the United Nations, DOD officials and

⁴²⁶ Davis, *Emerging Non-Traditional Security Issues*, 15, citing "U.S. Interpretation of the Provisions of the Kyoto Protocol That Address Military Operations and Training" (Draft Department of Defense Memorandum, 19 May 1998), 3.

⁴²⁷ William Perry (Secretary of Defense) in a letter to Representative Spencer T. Bachus, February 24, 1998; Salmon, *National Security and Military Policy Issues*.

⁴²⁸ Thomas Gale Moore, "In Defense of Defense" (web page) (Stanford, CA: The Hoover Institution), <http://www.stanford.edu/~moore/Defense.html> (accessed September 20, 2017), citing testimony of Sherri Goodman, Deputy Under Secretary of Defense for Environmental Security, before the Readiness Subcommittee of the Senate Armed Services Committee, 105th Cong. (March, 11 1998).

DUSD(ES) Sherri Goodman inadvertently poisoned the well regarding DOD energy conservation.

2001 Report, “More Effective Warfighting Through Reduced Fuel Usage” - Mixed Motives, but Clear Warnings Go Unheeded

In a somewhat surprising turn after the Pentagon’s position on the 1997 Kyoto Protocol negotiations, Deputy Under Secretary of Defense for Environmental Security Sherri Goodman and Deputy Under Secretary of Defense for Science & Technology (DUSD(S&T)), Dr. Delores Etter, along with Assistant Secretary of Defense for Acquisitions, Technology & Logistics (ASD(AT&L)), Dr. Jacques Gansler, jointly sponsored a Defense Science Board task force on improving the fuel efficiency of weapons platforms in 1999. According to Goodman, the principal goal of the report was to begin address the military's contributions to climate change – to identify the greatest and least efficient fuel users in DOD as a first step towards reducing DOD's fuel use and greenhouse gas emissions.⁴²⁹ Goodman’s sponsorship of the Defense Science Board task force may have been an effort to recast the narrative of DOD energy efficiency within the Pentagon. After arguing that reductions in DOD fuel use degraded readiness and training in the lead-up to the Kyoto negotiations, this report took the opposite tack, focusing on the potential military capability gains achieved through more efficient fuel usage – not necessarily reducing how much fuel DOD consumed. Assistant Secretary Gansler recalls the origins of the task force somewhat differently. In an interview, he emphasized the

⁴²⁹ Goodman, interview.

problems he faced as ASD(AT&L), and how fuel requirements always ended up as a major logistics requirement and cost for weapons systems and vehicles in past studies, driving high lifecycle operations and sustainment costs. With declining budgets, focusing on the lifecycle costs of fuel and ways to improve the fuel efficiency of weapons systems and platforms was “an obvious idea.”⁴³⁰ That way, DOD would be able to account for not just the direct fuel costs of a system, but also the costs of the supply tankers and trucks fueling it – the core of the fully-burdened cost of fuel concept.

Regardless of the potentially overlapping motivations for the study, the Defense Science Board task force took to their work diligently, producing a 130-page survey of DOD's energy institutional landscape, fuel use and inefficiencies. The Defense Science Board task force was directed to review “technologies that improve fuel efficiency of the full range of weapons platforms (land, sea, and air) and assess their operational, logistical, cost and environmental impacts for a range of practical implementation scenarios,” specifically focusing on fuel-efficient technologies that could be implemented within the next ten years.⁴³¹ The most significant finding was that the benefits of weapons systems fuel-efficiency, which include greater performance, improved agility, a smaller logistics burden, and less exposure to fuel price volatility, are “not valued or emphasized in the DOD requirements and acquisition process.” Because services pay a set price for fuel, fixed in advance, they

⁴³⁰ Dr. Jacques Gansler in interview with the author, May 2012.

⁴³¹ Truly and Alm, *More Capable Warfighting*, Appendix A.

do not value the actual costs of fuel delivery to where it will be used. Similarly, the DOD budgeting process largely does not reward fuel efficiency or penalize inefficiency. Finally, high-payoff technologies are available to improve fuel efficiency and “war-fighting effectiveness” through cost-effective retrofits and other improvements.⁴³²

The 2001 DSB report consistently emphasized the three categories of risk arising from the scope of DOD's fuel reliance discussed at the beginning of this chapter: financial, operational and strategic. DOD's fuel pricing and purchasing mechanisms were discussed at length, detailing the budgeting problems the services face when fuel purchase costs far exceed the stabilized prices the Defense Logistics Agency-Energy sets for its customers, the military services.⁴³³ On the operational side, the report outlines a wish list of improved military capabilities that could be achieved through more efficient fuel usage, including improving the element of surprise through smaller heat signatures and a smaller logistics tail, greater maneuverability and deployed flexibility, more secure supply lines, and simpler operations with less refueling.⁴³⁴ In addition to this all-of-the-above vision, greater DOD fuel efficiency is also discussed as a stimulant to U.S. development of efficiency technologies. On the strategic side, the report cites long pre-deployment force build-up times, long and vulnerable fuel supply lines, operations constrained by geopolitics as limitations.⁴³⁵

⁴³² Truly and Alm, ES-2-5.

⁴³³ Truly and Alm, 8-9.

⁴³⁴ Truly and Alm, 10.

⁴³⁵ Truly and Alm, 13.

The DSB report aimed to persuade. Various analyses demonstrated that substantial reductions in DOD's operational fuel use were possible with cost-effective upgrades. For example, re-engining the M1A1 Abrams battle tank as part of the expected Service Life Extension Program retrofits to the 1960s technology would significantly improve mean time between failures, vehicle range, repairability, and fuel consumption, adding up to an approximately 40% reduction in ownership costs over the 30-year lifespan of the tank.⁴³⁶ Similarly, adding an auxiliary power unit to power electronic systems, instead of using the main engines of the Abrams, was estimated to save significant sums per year as well as increase the range of the tank by 50%.⁴³⁷ Analogous examples of upgrades and the benefits of greater fuel efficiency were provided for each services, focusing heavily on the increased military capability of more efficient fuel use, as promised in the report's title.

Nevertheless, the report landed on deaf ears in the Pentagon. A variety of factors contributed to this report landing with a thud rather than a bang. First, the services were already skeptical to energy efficiency and conservation efforts and resistant to many of the environmental initiatives promulgated by DUSD(ES) Goodman's office.⁴³⁸ Second, the report was released in May 2001, a few months into the Bush administration and Donald Rumsfeld's second tenure as Secretary of Defense. A new administration is not likely to charge ahead with findings from a report supported by

⁴³⁶ Truly and Alm, 43-44.

⁴³⁷ Truly and Alm, 45-46.

⁴³⁸ These conflicts are described at length in Durant, *Greening the Military*.

the old, particularly not one touching on energy and environmental issues and that is not enthusiastically supported by the senior uniformed leadership of the services.

Third, the events of September 11, 2001, immediately precluded Pentagon attention to as-yet hypothetical challenges due to extensive fuel reliance and stretched-out supply lines to more immediate and consuming concerns of terrorism.

Aside from these contingent factors, institutional element made the Pentagon's embrace of this report unlikely, even with more favorable timing. As described in the 2001 Defense Science Board report, energy factors were at odds with the institutional practices and incentives of the Pentagon. Logistics were undervalued or entirely un-simulated in wargames, the prices the services paid for fuels used by weapons systems didn't reflect the costs of providing that fuel in the battlefield or the extensive logistics supply chain required, the sustainment costs were not considered in acquisitions decisions, cost-benefit analyses focused on single platforms rather than the sustainment costs across the services, DOD accounting procedures didn't reward saving fuel or other costs or penalize fuel inefficiency, and immediate costs were weighted far more heavily than future savings when considering acquisitions decisions or R&D investments. In short, incorporating energy considerations into the Pentagon's routine decision-making was where the efficiency and capability windfalls lay, but would require Herculean efforts to alter the extant bureaucratic practices of DOD.

Conclusion

As the above history illustrates, DOD has long been aware of the critical importance of energy and energy logistics in prior battles and campaigns, as well as the financial risks of high or volatile energy prices. Secretary of Defense Schlesinger's focus on energy as one of his four management areas of focus, and the Arab Oil Embargo as an object lesson in the vulnerability of DOD's forward-deployed force posture to energy disruptions, seem like they should have been sufficient to provoke some soul-searching in the Pentagon. Secretary of Defense Schlesinger created a Director for Energy with authority over energy use early in 1974, with the strong support of the House Armed Services Committee chairman. However, any authority this office may have gained in the immediate aftermath of the energy crisis was brief. By mid-1974, the new office was succumbing to bureaucratic resistance from stakeholders whose equities it infringed upon, and was weakened by cannibalization of staff and resources. Following a reorganization under it was combined with another office by 1980, and apparently expired. The second oil crisis in 1979, following the Iranian Revolution, and President Carter's well-known focus on energy efficiency failed to shift the Pentagon bureaucracy's use of energy. The Army narrowly avoided a logistics crisis during the Gulf War in the early 1990s, but this object lesson and its implications weren't taken up by a Pentagon consumed with the ending of the Cold War.

, Fuel concerns re-emerged in 2006, when local commanders in Iraq put out an urgent request for renewable energy technology for forward bases. A spike in oil and fuel prices in 2008 again brought the lesson home. Although DOD's attention was consumed by the wars in Iraq and Afghanistan, Congress, roused, began inserting specific provisions related to DOD's energy use into the annual defense authorization bill, as detailed in prior chapters. But as described in the following chapters, implementation and shifts in DOD's energy use would be slow going.

Chapter 6: The Pentagon’s Shifting Energy Use

One of the major self-identified goals of the congressional legislative entrepreneurs discussed in prior chapters was to impact the Pentagon’s energy use – variously, to have the Pentagon use less fuel overall, or at least to use it more efficiently, to improve energy conservation on installations, and to increase its use of and support for renewable energy projects. This chapter charts shifts in the energy use of the Pentagon and the military services, and discusses how much of these shifts can be attributed congressional energy mandates.

DOD’s Total Energy Use

Installation Energy

The Pentagon reduced its installation energy use dramatically between FY1975 and FY2015. In 1975, DOD used a total of 439,228 billion Btu (BBtu) worth of energy in their buildings – 73% of all of the federal government’s energy use, at a total cost of \$3.77 billion in FY2015 dollars.⁴³⁹ Fuel oil made up 40% of DOD’s facility energy mix – it’s largest single source of installation energy - at 174,719 billion BTU. The Pentagon burned over 1,259,000 thousand gallons annually. In 2015, it accounted for just 8%, a 91% reduction in the volume burned. Similarly, natural gas made up 27% of DOD’s facility energy use, electricity 20%, and coal 12%. However, electricity made up 55% of DOD’s spending on facility energy, at over \$2 billion in FY2015

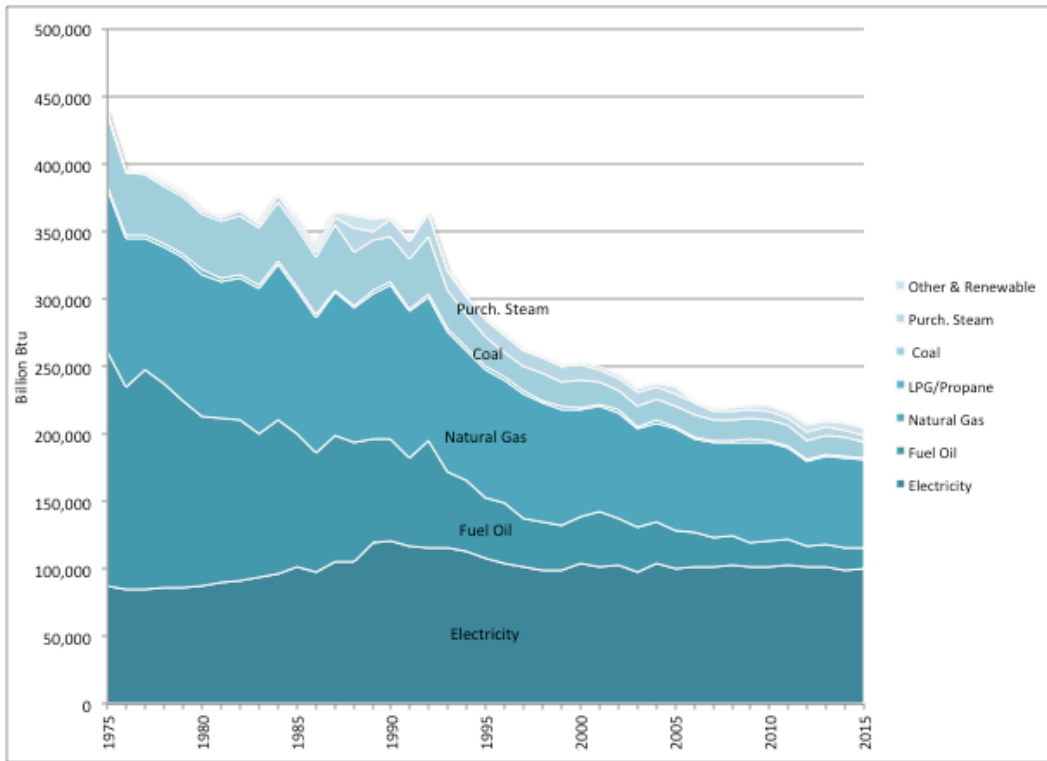
⁴³⁹ Department of Energy Office of Energy Efficiency and Renewable Energy, “Historical Federal Energy Consumption and Cost Data by Agency and Energy Type (FY 1975 to Present)” (A-5), *Comprehensive Annual Energy Data and Sustainability Performance* (Washington, DC: Department of Energy), <http://ctsedwwweb.ee.doe.gov/Annual/Report/HistoricalFederalEnergyConsumptionDataByAgencyAndEnergyTypeFY1975ToPresent.aspx>.

dollars, despite its small share of DOD's facility energy use. Between FY1975 and FY2015, the Pentagon's total electricity rose 15%, but it now accounts for just under half of installation energy used, up from 20%. (See Figure 22)

Between 2004 and 2015, DOD reduced its facility energy use by 14% overall. Electricity use actually rose by 14%, but steep declines in natural gas, steam, fuel oil, and coal more than offset that increase.⁴⁴⁰ (see Figure 23). Between FY2007 and FY2015, DOD's decline in total installation energy use slowed, falling 10% from 205,230 BBtu to 184,836 BBtu. The drop was sharpest for purchased steam (-54%), fuel oil (-48%) and LNG/propane (-31%). Fuel oil also accounted for the largest absolute reduction in energy use, with DOD's consumption declining by 14,357 billion BTUs. Over the same timeframe, DOD's use of renewable energy sources almost doubled, from 2,693 BBtu to 5,351 BBtu in 2015, rising to 3% of DOD's energy use. (See Figure 23).

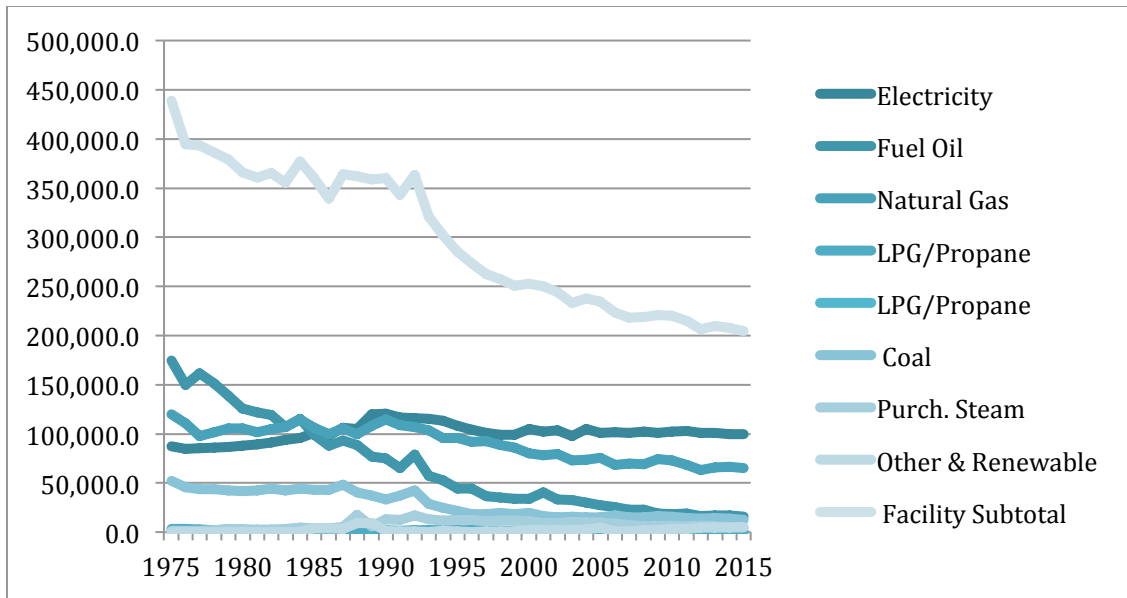
⁴⁴⁰ These figures include energy consumed in DOD's facilities and buildings, but do not include DOD's non-tactical petroleum usage, the other component of installation energy as defined in statute. In FY2015, non-tactical petroleum usage was 9,021BBTus. (Department of Defense Office of the Deputy Under Secretary of Defense (Energy, Installations, and Environment), *Department of Defense Annual Energy Management Report, Fiscal Year 2015* (Washington, DC: Department of Defense, June 2016), 18, <http://www.acq.osd.mil/eie/Downloads/IE/FY%202015%20AEMR.pdf>, henceforth *AEMR FY2015*).

Figure 22: DOD Installation Energy Use, 1975-2015



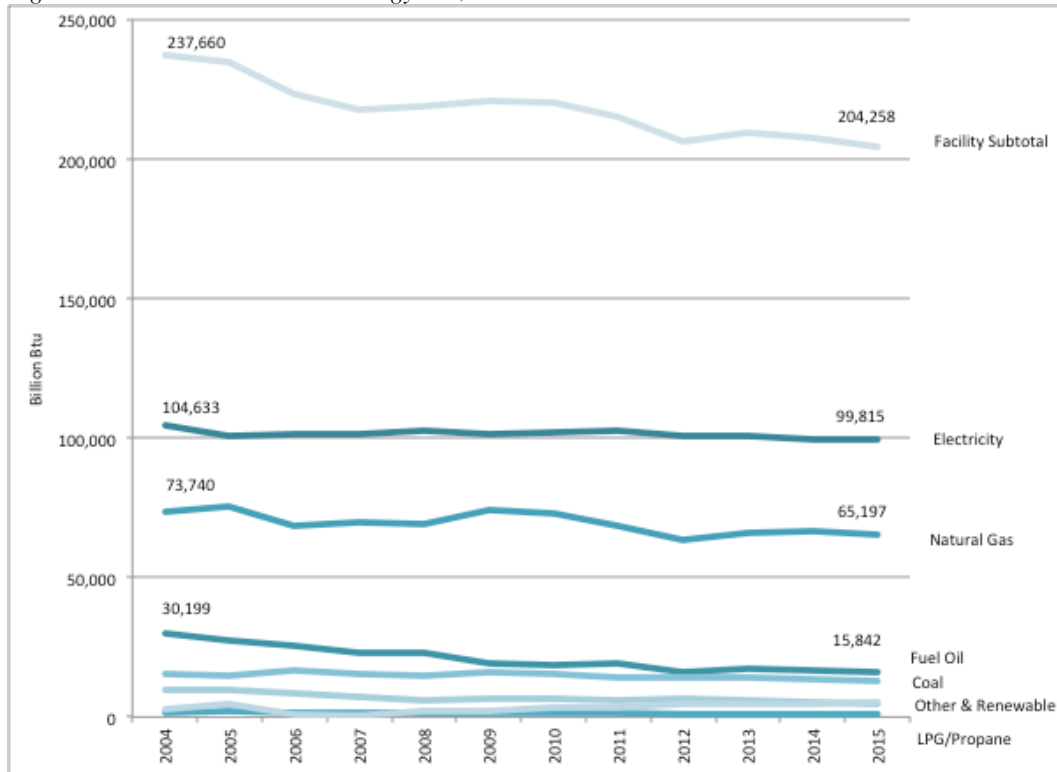
Data from Department of Energy Office of Energy Efficiency and Renewable Energy, *Comprehensive Annual Energy Data and Sustainability Performance* (Washington, DC: Department of Energy, June 1, 2017), <http://ctsedweb.ee.doe.gov/Annual/Report/Report.aspx> (accessed October 2, 2017).

Figure 23: DOD installation energy use by type, FY1975-FY2015, BBtu



Data from Department of Energy, *Comprehensive Annual Energy Data and Sustainability Performance*.

Figure 24: DOD's installation energy use, 2004-2015



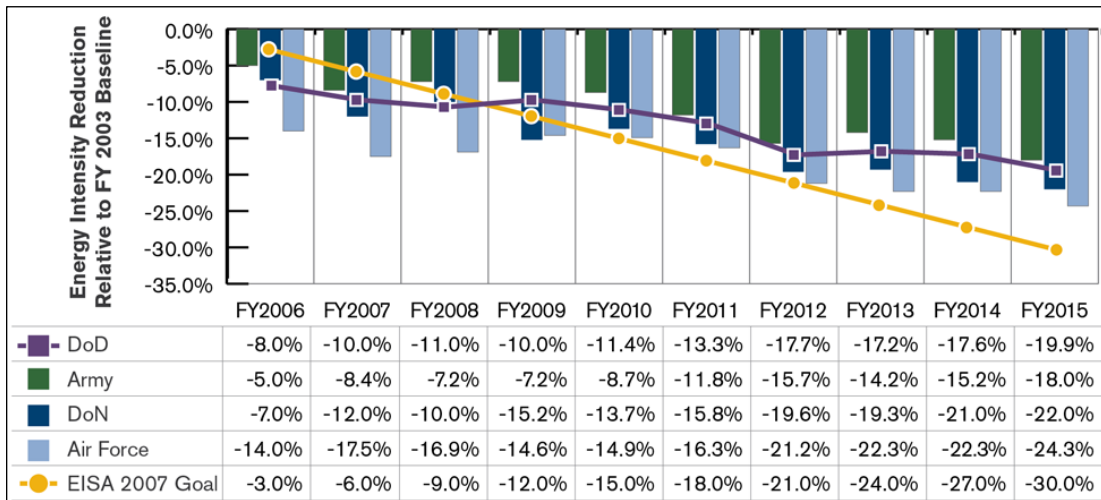
Data from Department of Energy, *Comprehensive Annual Energy Data and Sustainability Performance*.

In tandem with a slowing rate of overall energy consumption, the Pentagon's reductions in energy intensity have also slowed. The Pentagon has fallen short of the heightened energy-intensity requirements of EISA 2007, achieving an overall reduction of 19.9% from FY2003 levels by FY2015, well below the 30% reduction required. (The Air Force came closest, with a reduction of 24.3%).⁴⁴¹ (see Figure 25). However, DOD's total energy intensity per square foot in FY 2016, at 107,528 Btu per gross square foot (Btu/GSF) compares very favorably to other government agencies. (See *Table 3* and *Figure 27*). The DOD's energy intensity is even more favorable when site-generated renewable energy is factored in, with DOD's FY 2016 energy intensity falling to 93,010 Btu/GSF, below the average civilian agency installation energy intensity of 99,165 Btu/GSF (See

⁴⁴¹ Department of Defense, *AEMR FY2015*, 20.

Table 4). However, DOD has shown much less improvement in their energy intensity than other federal agencies. Between FY2003 and FY2016, DOD improved their total energy consumption by 20.4%, the fifth-least of all federal agencies. Some of the differential can be chalked up to different starting places and the availability of low-hanging energy fruit. However, the Department of Labor had a very similar energy intensity to DOD in FY2003 – 117,3649 Btu/GSF vs. 98,021 Btu/GSF. By FY 2016, the Department of Labor had improved their energy intensity to 78,719 Btu/GSF, a 33.7% decrease in energy intensity. By contrast, DOD had improved to 93,010 Btu/GSF, a for a more modest 20.4% reduction in energy intensity.

Figure 25: DOD Energy Intensity EISA2007 Goal Attainment⁴⁴²



Data from Department of Defense, *AEMR FY2015*, 20.

⁴⁴² Department of Defense, 20.

Table 3: Unadjusted Total Site-Delivered Energy Consumption in Btu per Gross Square Foot by Federal Agency by Year

Agency	FY 2016	% Change FY 1985-2016
HHS	323,815	16.3%
EPA	269,772	-32.5%
Commerce	175,050	-10.6%
Energy	164,860	-64.5%
Justice	158,805	-46.0%
NASA	157,323	-41.4%
Veterans Affairs	156,328	-21.3%
Treasury	154,391	55.5%
Smithsonian	111,710	
Archives	106,413	
DHS	85,940	
State	83,081	-7.1%
SSA	81,993	
Labor	78,923	-33.0%
OPM	74,226	16.7%
Transportation	71,738	-49.8%
Postal Service	70,460	-17.8%
HUD	69,487	-14.9%
USACE	69,147	
GSA	62,034	-38.3%
Agriculture	58,258	-49.1%
TVA	52,939	-46.8%
Interior	47,341	-46.2%
Education		
Other*	74,169	-36.7%
Civilian Agencies Subtotal	108,157	-33.8%
Defense	107,528	-19.7%
Government Total	107,772	-23.5%

Data from Department of Energy Office of Energy Efficiency and Renewable Energy, "Unadjusted Total Site-Delivered Energy Consumption per Gross Square Foot by Federal Agency by Year," *Comprehensive Annual Energy Data and Sustainability Performance* (Washington, DC: Department of Energy, June 1, 2017),

<http://ctsedweb.ee.doe.gov/Annual/Report/TotalSiteDeliveredEnergyConsumptionPerGrossSquareFootByFederalAgenciesByYear.aspx>

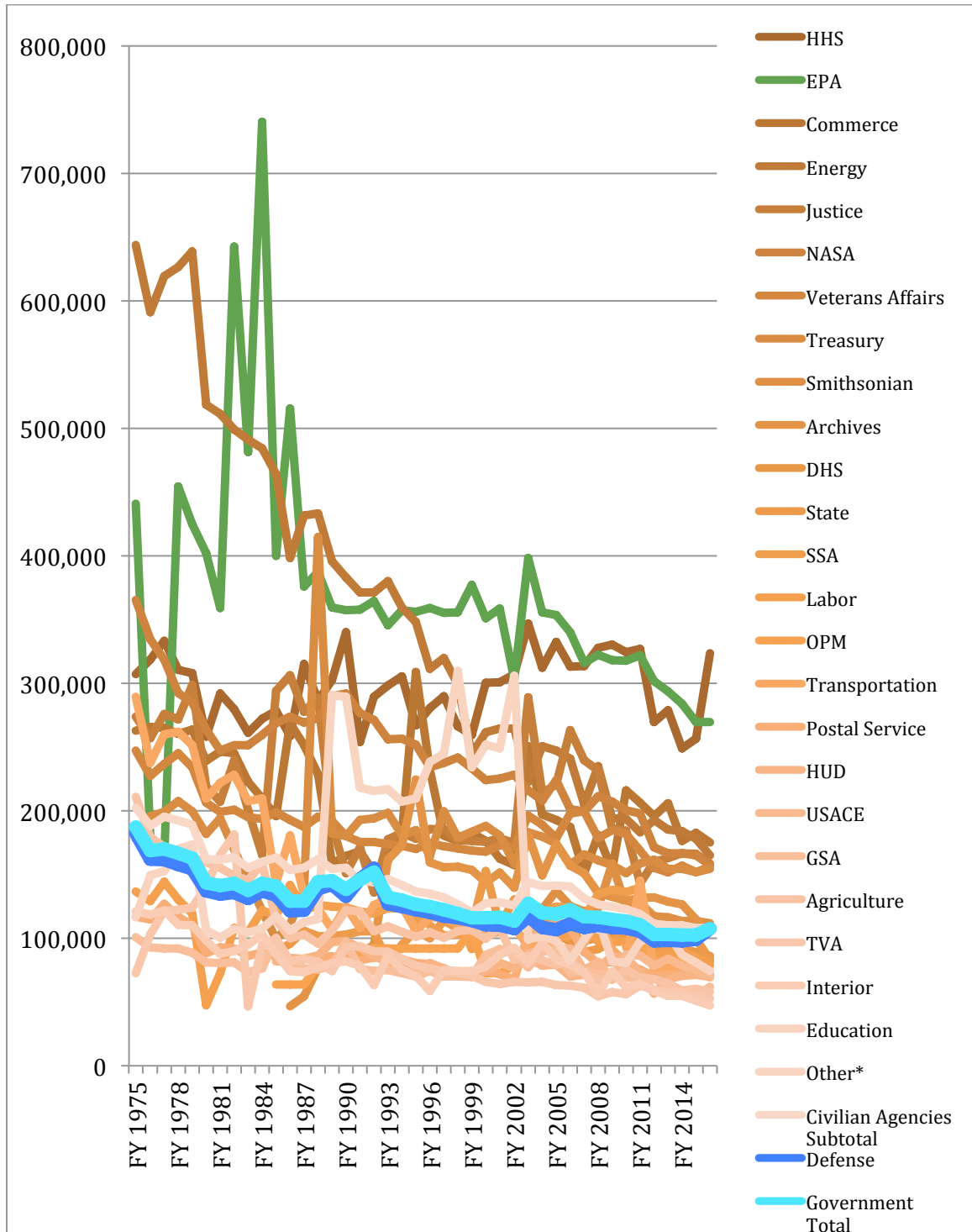
Table 4: Goal-Subject Building Site-Delivered Energy Use per Gross Square Foot, by Federal Agency (FY 2003 and FY 2016)

	FY 2003 Btu/GSF (Adjusted)	FY 2016 Btu/GSF (Adjusted)	BTU/GSF Change FY 2016 vs. FY 2003 Percentage
Agriculture	86,281	57,815	-33.0
Archives	181,189	105,824	-41.6
Commerce	250,792	175,015	-30.2
DHS	118,602	85,103	-28.2
Energy	222,627	141,092	-36.6
EPA	398,311	260,469	-34.6
GSA	77,095	51,273	-33.5
HHS	347,026	239,747	-30.9
HUD	84,416	69,487	-17.7
Interior	80,731	45,312	-43.9
Justice	289,056	155,782	-46.1
Labor	118,769	78,719	-33.7
NASA	215,906	141,745	-34.3
OPM	84,660	73,828	-12.8
Other*	99,369	74,169	-25.4
Postal Service	103,820	70,200	-32.4
Smithsonian	128,570	106,965	-16.8
SSA	122,666	77,326	-37.0
State	106,162	83,025	-21.8
Transportation	93,778	68,842	-26.6
Treasury	183,237	154,332	-15.8
TVA	65,536	42,271	-35.5
USACE	87,944	58,117	-33.9
Veterans Affairs	196,022	145,142	-26.0
Civilian Agencies Subtotal	143,962	99,165	-31.1
Defense	117,334	93,010	-20.7
Government Total	127,376	95,394	-25.1

Data from Department of Energy Office of Energy Efficiency and Renewable Energy, “Goal-Subject Building Site-Delivered Energy Use per Gross Square Foot, by Federal Agency (FY 2003 and FY 2016),” *Comprehensive Annual Energy Data and Sustainability Performance* (Washington, DC: Department of Energy, June 1, 2017),

<http://ctsedweb.ee.doe.gov/Annual/Report/GoalSubjectBuildingSiteDeliveredEnergyUseperGrossSquareFoot.aspx>.

Figure 26: Unadjusted Total Site-Delivered Energy Consumption per Gross Square Foot by Federal Agency by Year, FY1975-FY2016



Data from Department of Energy, ‘Unadjusted Total Site-Delivered Energy Consumption per Gross Square Foot by Federal Agency by Year.’

DOD argues installation energy efficiency gains have slowed because many of the most straightforward and low- or no-cost conservation measures with shorter payback periods have been done, arguing that “more capital-intensive projects that yield greater life-cycle savings, may be needed”⁴⁴³ However, the installation energy intensity of each service varies widely.⁴⁴⁴ (See Figure 27) Although the Air Force showed the greatest improvement in energy intensity per square foot, a -24% reduction below the FY2003 baseline, it still had the most energy-intense installations out of any service. As of FY2015, the Air Force’s average BTU per square foot was 106,160. This was 11% higher than the DOD-wide level of 93,963, and 25% higher than the Army’s 19,709. A 2014 national labs report on the potential for future reductions in government energy intensity estimated that DOD could realize an additional 22.5% reduction in energy intensity between 2015 and 2025, largely through improvements in the building envelope to reduce heating and cooling needs. Achieving this reduction in energy intensity would cost DOD \$5 billion and achieve an annual savings of approximately \$1.2 billion annually, or \$12 billion in total over the 10-year span.⁴⁴⁵

⁴⁴³ Department of Defense, 20.

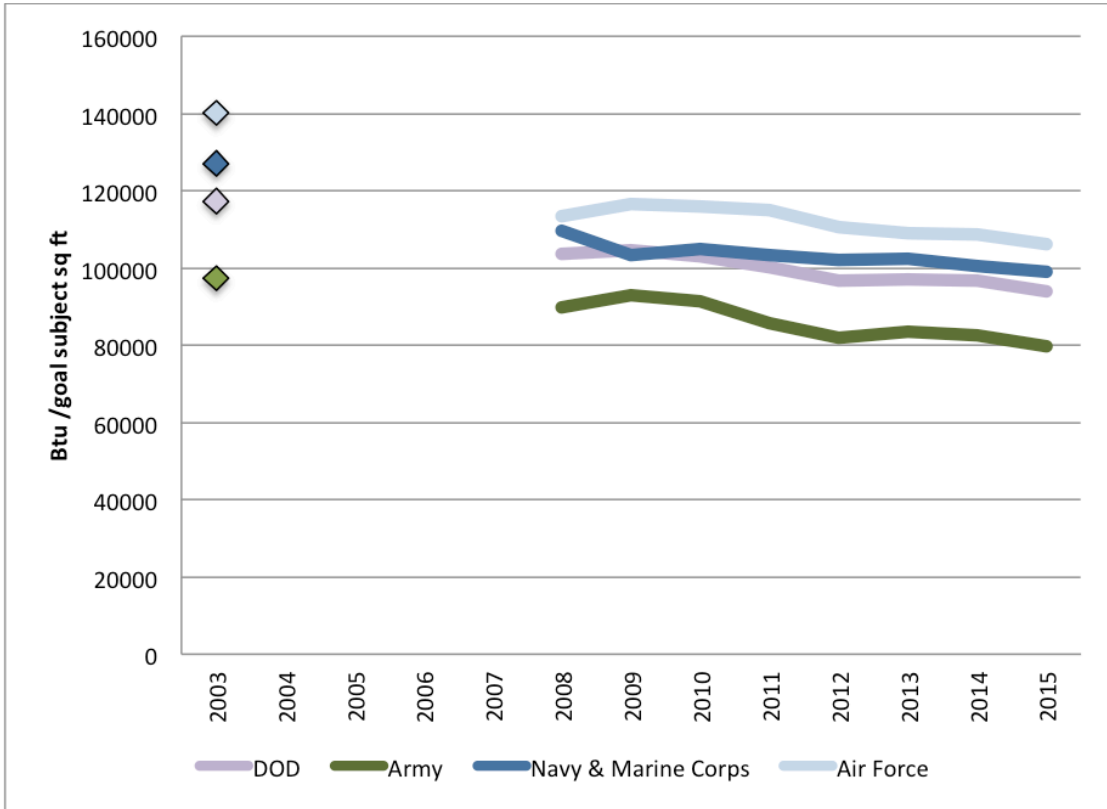
⁴⁴⁴ The energy intensity provisions in EISA 2007 (Pub. L. No. 110-140, § 431, 121 Stat. 1607 (2007)) gives DOD wide latitude to exclude buildings from being counted towards the energy intensity goals. Permissible reasons for exclusion include buildings in which “energy intense activities” are carried out, those where compliance would be impracticable and all life-cycle cost-effective projects have been completed, or that the building is used “in the performance of a national security function.”

⁴⁴⁵ K.S. Judd et al., *Analysis of Federal Agency Facility Energy Reduction Potential and Goal-Setting Approaches for FY2025* (PNNL-23063) (Richland, WA: Pacific Northwest National Lab, May 2014), 22, http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-23063.pdf.

Pointing to the likelihood of substantial unrealized energy savings in DOD's installations portfolio, the 10 most energy-intensive facilities within the Pentagon's portfolio show dramatically different levels of energy-intensity reduction, ranging from a 2% reduction between FY2010 and FY2015 for US Army Garrison Bavaria (home to 35,000 servicemembers and family members), to an impressive 32% reduction at Fort Bliss, Texas.⁴⁴⁶ Home to 90,000 servicemembers and family members, Fort Bliss has nearly tripled in size over the past decade, and the construction of new buildings has undoubtedly allowed the building-in of greater energy efficiency per square foot. However, this variation between the most energy intense military installations and across the services suggests that significant scope for energy conservation and reductions in energy intensity remain. In particular, the services are also lagging significantly behind the requirement for all new buildings constructed after FY2007 to be at least 30% more energy-efficient than existing code. Just 65% of the Pentagon's buildings have met that requirement – a missed opportunity that will be difficult to make up for.

⁴⁴⁶ Department of Defense, *AEMR FY2015*, 22.

Figure 27: Energy intensity by service, FY2003 - FY2015



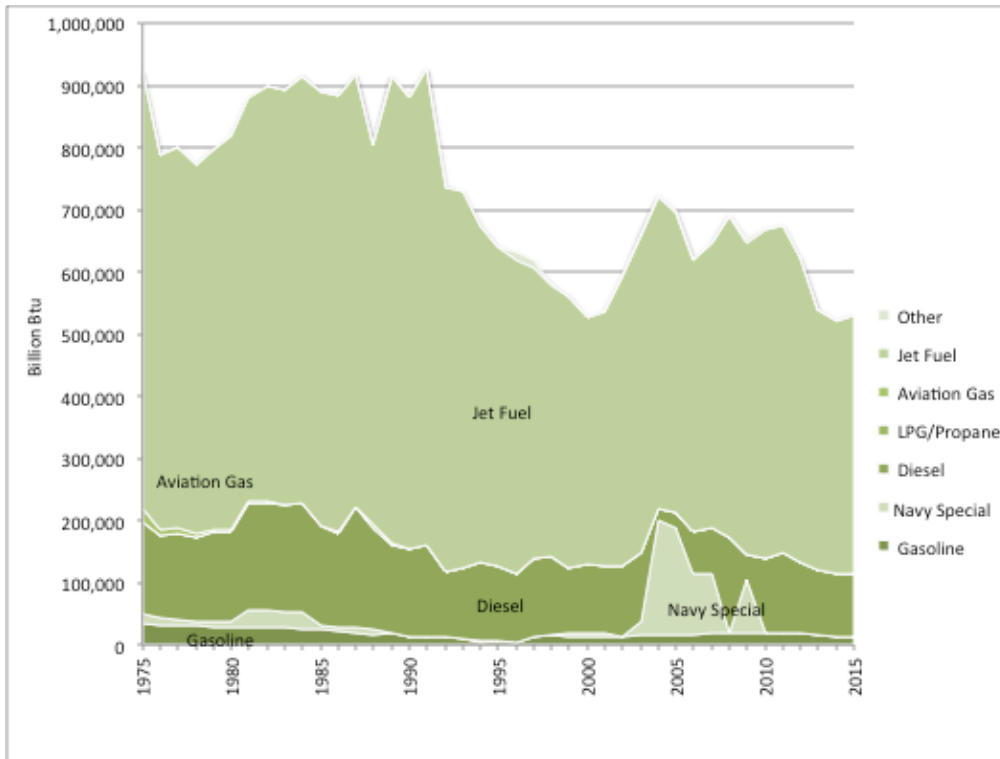
Data from Department of Defense Annual Energy Management Reports, FY2003-FY2015.

Petroleum Fuels

Approximately 71% of DOD’s overall current energy use is for petroleum-based fuels, with the remaining 29% for installation energy, principally electricity. Over the 40 years between 1975 and 2015, the Pentagon’s petroleum fuel use unequivocally declined. DOD’s use of petroleum fuels plummeted in the 1990s, following the end of the Cold War and a major divestment of U.S. force structure and shrinking defense budgets, only to rise during the Iraq and Afghanistan wars of the 2000s before declining again in recent years.

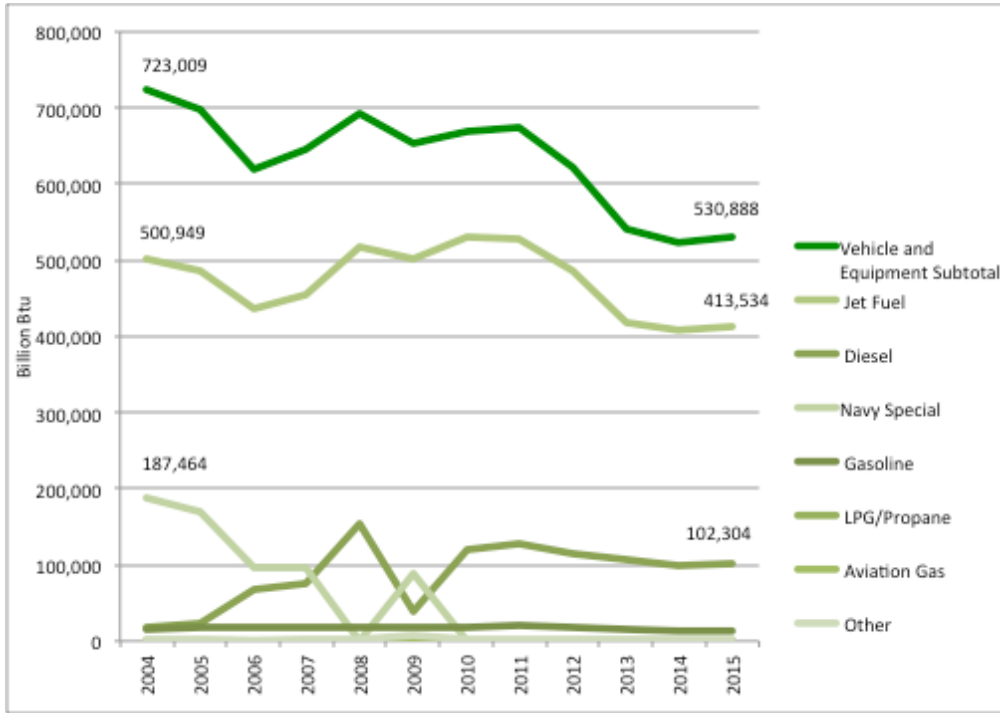
There is also no question that the Pentagon by the end of 2016 used less energy than in 2004. Between 2004 and 2015, DOD reduced its use of petroleum-based fuels by 27% overall. The most dramatic reduction was for Navy special fuel. The Navy used 1,351 thousand gallons, about 187.4 billion Btu worth of this heavy, viscous fuel oil to power ships in 2004. The Navy hasn't used any since 2009, replacing it with diesel to power the turbine engines in ships. In addition, the Pentagon used 17% less jet fuel in 2015 than in 2004, a reduction of 790,000 thousand gallons. (See Figure 28 and Figure 29) Aside from the switch away from the heavy Navy special fuel, the relative composition of the petroleum fuels consumed by DOD's tactical vehicles hasn't changed dramatically. Since 1975, jet fuel has accounted for between 69% and 83% of DOD's vehicle petroleum use.

Figure 28: DOD Vehicle Energy Use, 1975-2015



Data from Department of Energy, *Comprehensive Annual Energy Data and Sustainability Performance*.

Figure 29: DOD Vehicle-based fuels use, 2004-2015



Data from Department of Energy, *Comprehensive Annual Energy Data and Sustainability Performance*.

What is more difficult to assess is whether the Pentagon actually became more efficient – or more effective – with its operational petroleum fuel use, or whether the energy reductions were achieved by a combination of change to operational tempo (i.e., planes flying less and ships sailing less), or reduced force structure (fewer planes and ships.) Developing and applying a metric for operational energy effectiveness was one of the major goals of the operational energy plans and programs office, and one they largely failed at. OEPP was tasked with developing operational energy performance metrics at its creation. But developing analytically-sounds metrics was difficult, and a straightforward reduction of gallons or barrels of fuel used wouldn't

address the crux of the problem – making the Pentagon more efficient and militarily effective for each gallon used.⁴⁴⁷

Both the Navy and the Air Force developed energy goals that explicitly valued reductions in energy use over improvements in energy efficiency. The Navy committed to use renewable energy for 50% of all energy used afloat by 2020 (counting nuclear propulsion as renewable), and to reducing energy used afloat by 15%. Results from the Navy’s maritime and aviation energy efficiency initiatives are not available to the public.⁴⁴⁸ The Air Force’s initial 2006 goal of a 10% improvement in fuel used per flight hour was quietly reduced in 2009 to a 10% reduction in aviation fuel usage by 2015. Goals of a 20% improvement in lift-to-drag ratio in future acquisitions were quietly shelved. The Air Force announced that it had reached that 10% reduction in fuel used in 2013 through efficiency practices like better flight planning, not carrying excess extra fuel, and reducing unneeded plane weight.⁴⁴⁹ However, others challenge this claim, arguing that the Air Force’s 10% decrease in consumption was actually achieved primarily through cuts to force structure resulting in less flying being done.⁴⁵⁰ However, the Air Force’s January 2017 energy strategy reinstated the goal of improving aviation energy efficiency by

⁴⁴⁷ Interview with senior OEPP official, August 2014.

⁴⁴⁸ U.S. Navy, “Quarterly Fuel Reports” (web page), <http://www.i-encon.com/fuelreports.htm> (accessed September 20, 2017).

⁴⁴⁹ Jared Serbu, “Air Force Meets Fuel Efficiency Goal Several Years Early,” *Federal News Radio*, March 22, 2013, <https://federalnewsradio.com/sequestration/2013/03/air-force-meets-fuel-efficiency-goal-several-years-early/>; Department of Energy, “Air Force Achieves Fuel Efficiency through Industry Best Practices,” *Federal Energy Management Program*, October 2013, https://energy.gov/sites/prod/files/2013/10/f3/af_fueefficiency.pdf;

⁴⁵⁰ Interview with senior OEPP official, August 2014.

10% by 2020, from a 2011 baseline.⁴⁵¹ RDT&E efforts have focused on improving engine efficiency, usually expressed in miles per gallon (or gallons per mile), gallons per flight hour, and distance achieved per fueling. Metrics that attempt to include effectiveness measures, reportedly under consideration as part of the energy review now required in the early parts acquisition process, include a miles per gallon metric scaled by weight (for ground systems), and payload-ton-miles per gallon, which could allow for more effective analysis of the energy used per outcome, rather than time underway.

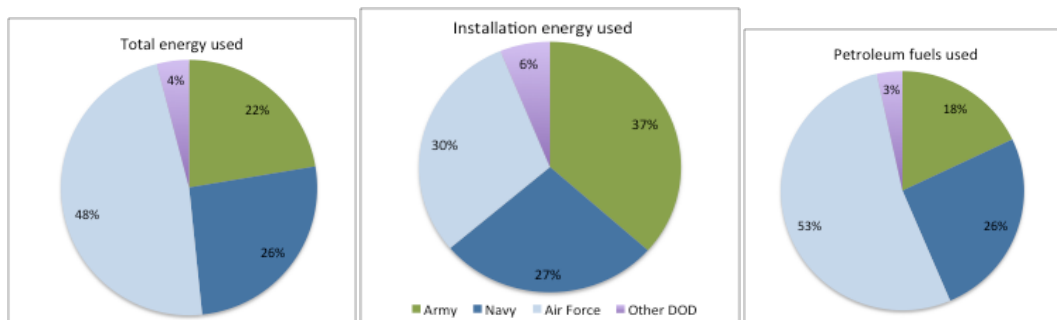
Energy in the Military Services

The Pentagon is far from a unitary actor. Each of the four military services took different approaches towards reforming their energy use, sometimes radically so. In part, this reflects the very different composition of each service's energy use. For example, in FY2010, nearly 28% of the Pentagon's entire fuel use is consumed by the Air Force's Air Mobility command, charged with flying cargo, equipment, and personnel around the globe to meet all of the services' needs. The Air Force used 53% of DOD's petroleum, principally as jet fuel. The Navy and Marine Corps together accounted for 18% of the Pentagon's petroleum use, as did the Army. For installation energy, the Army accounted for about 36% of the Pentagon's overall installation energy use in FY2010, while the Air Force used 30% and the Navy and Marine Corps 27%. (see Figure 30) Nonetheless, despite their varying energy use

⁴⁵¹ Office of the Assistant Secretary of the Air Force (Installations, Environment and Energy), *Energy Flight Plan, 2017-2036* (Washington, DC: U.S. Air Force, January 2017), 14, <http://www.safie.hq.af.mil/Portals/78/AFEnergyFlightPlan2017.pdf?ver=2017-01-13-133958-503>.

profiles, each of the military departments was subject to the same broader set of federal and Pentagon-specific energy requirements set by Congress, ranging from energy conservation to energy use in weapons systems. The different approaches of the military services thus function somewhat as a natural experiment, illustrating the powerful impact of different service cultures and especially, service leadership, in setting energy policy and shifting service energy use. The general energy approaches, specific energy goals, and bureaucratic responses of the different services are outlined below.

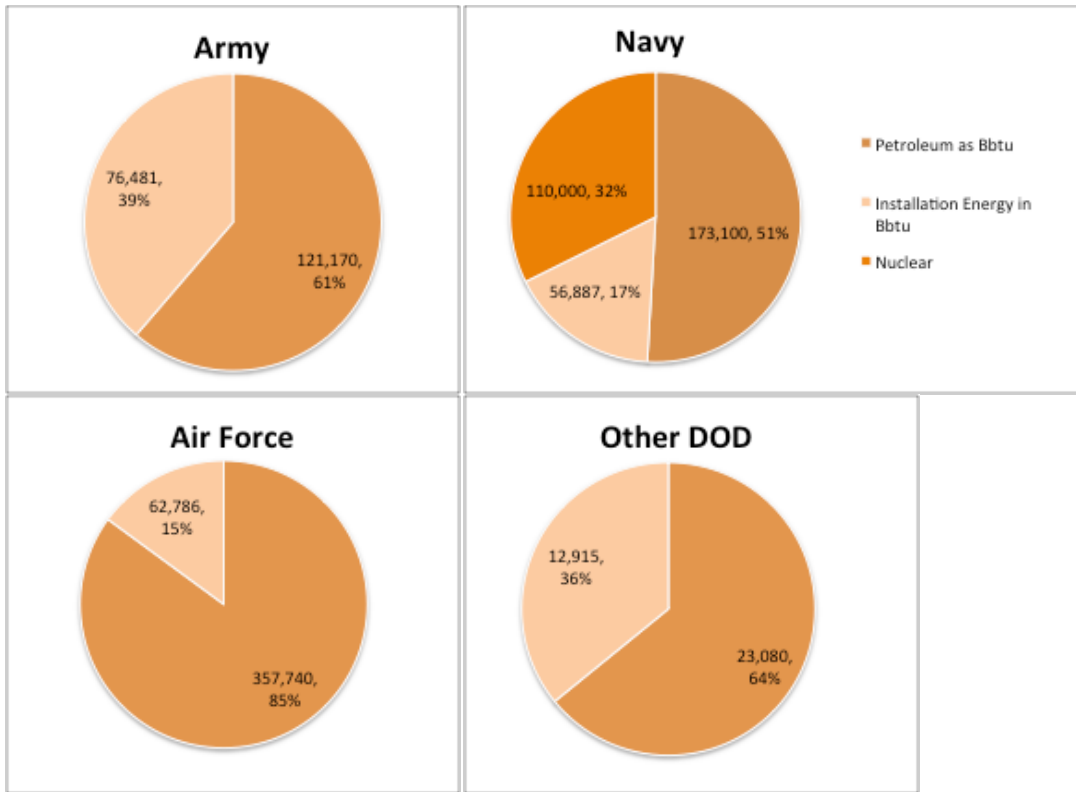
Figure 30: Proportions of energy used by DOD services in FY2010, in BBtu



In this FY2010 snapshot, the Army was the most reliant of the services on installation energy, at roughly 39% of its overall energy needs, with the remaining 61% coming from petroleum-based fuels. The Navy's use of nuclear propulsion makes it less reliant on petroleum. Overall, Navy data indicated that nuclear propulsion accounted for 22% of its overall energy use, as compared to 59% for petroleum fuels, split between fuel for aircraft and ships, while electricity accounted for 19%. By contrast,

the Air Force relied on petroleum-based fuels for approximately 85% of its overall energy use.⁴⁵² (See Figure 31)

Figure 31: Service energy use in FY2010, in Bbtu



⁴⁵² Petroleum estimates based on service fuel consumption volumes reported by the services, reported in Moshe Schwartz, Katherine Blakeley, and Ron O'Rourke, *Department of Defense Energy Initiatives: Background and Issues for Congress* (CRS Report No. R42558) (Washington, DC: Congressional Research Service, December 2012), 2, <https://fas.org/sgp/crs/natsec/R42558.pdf>. Petroleum volumes converted into approximate Btus for diesel fuel (the most similar to aviation gas, the predominant fuel type used) of 137,381 Btu per gallon, based on the conversion factor published by the EIA ("Energy Units and Calculators Explained" (web page), https://www.eia.gov/energyexplained/index.cfm?page=about_energy_units (updated June 7, 2017); installation energy data for the services calculated based on Army energy data provided in the FY2010 AEMR (Department of Defense Office of the Deputy Under Secretary of Defense (Installations and Environment), *Department of Defense Annual Energy Management Report, Fiscal Year 2010* (Washington, DC: Department of Defense, July 2011), <http://www.acq.osd.mil/eie/Downloads/IE/FY%202010%20AEMR.pdf>).

Army

The Army uses the least overall energy, and the least petroleum fuel, of the services. However, as the nation's ground force, is the most dependent on getting fuel to its forces through a combat zone in war. An oft-cited statistic holds that up to 70% of the Army's total tonnage of cargo during war is petroleum fuels.⁴⁵³ Particularly during the height of the conflicts in Iraq and Afghanistan, when the Army relied on hundreds of fuel convoys, the Army had every reason to strive for more efficient energy use.

The Army's formal operational energy policy emphasizes more efficient use of energy in operations, reducing the need for energy re-supply, reducing the energy consumption needs of Army systems, and developing "operationally viable" alternative energy systems.⁴⁵⁴ The U.S. Army Natick Soldier Research, Development & Engineering Center has been at the forefront of developing energy efficient expeditionary bases, deployable, small-scale solar and wind, and waste power generation systems, and a self-contained base for a small unit that requires no re-supply for 3 days, and technologies to minimize the load of batteries a soldier needs

⁴⁵³ This statistic has been frequently cited in conversations, reports, and initiatives to reduce the Army's fuels usage. However, the analysis on which that figure is based is unknown. The earliest found usage was in a 1984 field manual on Army bulk petroleum distribution systems, *Military Petroleum Pipeline Systems* (Field Manual No. 5-482) (Washington, DC: U.S. Army, August 1994),

http://usacac.army.mil/sites/default/files/misc/doctrine/CDG/cdg_resources/manuals/fm/fm5_482.pdf.

⁴⁵⁴ John M. McHugh (Secretary of the Army), "Army Operational Energy Policy" (Memorandum, April 30, 2013),

<http://www.asaie.army.mil/Public/ES/doc/Army%20Operational%20Energy%20Policy%2030%20Apr%202013.pdf>; Peter W. Chiarelli (General, U.S. Army) and Joseph W. Westphal (Under Secretary of the Army), "Army Policy for Establishing, Managing, and Transitioning Contingency Bases" (Memorandum, June 1, 2011),

<http://www.asaie.army.mil/Public/ES/doc/Army%20Policy%20for%20Establishing,%20Managing%20and%20Transitioning%20Contingency%20Bas.pdf>.

to carry, ranging from motion-powered recharging to investigation of photovoltaic fabrics.⁴⁵⁵ The Army's Soldier Power portfolio within the Army's acquisition system is responsible for integrating these advancements into the actual gear a soldier carries. Recently deployed equipment includes a modular charger for any Army battery, replacing separate specialized chargers, and a wearable rechargeable battery.⁴⁵⁶

The Army's major investments targeted towards improving energy efficiency in weapons systems have focused on ground vehicles, developing auxiliary power units that can power the electrical systems of the vehicles without having the engine on, and more efficient helicopter engines, reflecting the composition of the Army's force structure. However, it is not clear how much impact the Army's investments have had on their overall petroleum fuel and operational energy usage. In part, this is because the Army has not modernized or replaced most of their ground combat vehicles. Investments in engine efficiency technologies may have a broad impact, but these investments are decades away from being incorporated into the Army's force structure under current modernization plans.

⁴⁵⁵ For examples of research and engineering, see Jane Benson, "Self-Generated Power Could Reduce Soldiers' Load," U.S. Army, October 2016, https://www.army.mil/article/177130/self_generated_power_could_reduce_soldiers_load; U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC), *Expeditionary Basing and Collective Protection Directorate Catalogue 2016* (Natick, MA: NSRDEC, August 2016), https://www.nsrdec.army.mil/img/pdfs/EBCPD_Web%20%7BFINAL%7D09-07-16.pdf; NSRDEC, *Warfighter Directorate Catalogue 2016*, (Natick, MA: NSRDEC, July 2016), https://www.nsrdec.army.mil/img/pdfs/WD_Web%20%7BFINAL%7D09-07-16.pdf.

⁴⁵⁶ Program Executive Office Soldier, "Soldier Power" in *Portfolio 2017: Ensuring Soldier Dominance* (Fort Belvoir, VA: Program Executive Office Soldier, 2017), <http://www.peosoldier.army.mil/portfolio/#189>.

Sometime in 2010, responding to the congressional mandate to designate a senior service official for operational energy, the Army re-designated the Assistant Secretary of the Army (Installations & Environment) to be the Assistant Secretary of the Army (Installations, Energy & Environment). Katherine Hammack, a career installation energy efficiency specialist, took office in July 2010.⁴⁵⁷ At the same time, the Army also created the role of the Deputy Assistant Secretary of the Army for Energy and Sustainability.

Initially, the Army's energy efforts focused primarily on installations. The Army established the Net Zero initiative in 2010 as a test bed for installation energy efficiency practices. The initial goal was to have 5 installations reach net zero energy, 5 reach net zero water and 5 reach net zero waste use by 2020, as well as one installation that was net zero for energy, water, and waste.⁴⁵⁸ Between 2011 and 2015, the 17 pilot institutions collectively reduced energy use intensity by 13% and generated 28,700 MW of renewable energy.⁴⁵⁹ For comparison, the Army as a whole reduced energy use intensity by 7%. The Army also created the Energy Initiatives Task Force (now made permanent as the Army Office of Energy Initiatives), a team of renewable energy project experts, to partner with Army installations for large-scale

⁴⁵⁷ U.S. Army, "Honorable Katherine Hammack" (web page), <http://www.asaie.army.mil/Public/IE/bios/print/hammackprint.html> (accessed September 20, 2017).

⁴⁵⁸ Assistant Secretary of the Army (Installations, Energy, and Environment), "Net Zero: A Force Multiplier" (web page), http://www.asaie.army.mil/Public/IE/netzero_info.html (updated December 15, 2010).

⁴⁵⁹ Assistant Secretary of the Army (Installations, Energy, and Environment), *2015 Progress Report: Army Net Zero Initiative* (Richland, WA: Pacific Northwest National Laboratory, October 2016), v, <https://www.army.mil/e2/c/downloads/456813.pdf>.

renewable and alternative energy projects. As a result, the Army has installed or contracted for 336 MW of renewable energy generation capacity between 2011 and 2016.⁴⁶⁰

Navy

Led by Secretary of the Navy Ray Mabus, the Navy established an aggressive set of energy goals in 2009. These were: 1. Reach 50% alternative energy use (including nuclear) afloat by 2020, 2. Produce 50% of shore energy from alternative sources and having 50% of Marine installations be net-zero by 2020, 3. Demonstrate a “Great Green Fleet” by 2012 and sail it in regular operations by 2016, 4. Reduce non-tactical petroleum use by 50% by 2020, and 5. Evaluate energy factors in all Navy contracts.⁴⁶¹ The Navy’s strategic documents and policy also adopted energy as a concern fairly rapidly, driven by the personal interest and attention to energy by Secretary Mabus.

In March 2010, the Navy created a Deputy Assistant Secretary of the Navy (Energy) for developing and overseeing Navy energy policy and initiatives within the office of the Assistant Secretary of the Navy for Installations, and Environment, and added

⁴⁶⁰ Army Office of Energy Initiatives, “Projects and Opportunities” (web page), <http://www.asaie.army.mil/Public/ES/oei/projects.html> (updated August 18, 2017); John M. McHugh (Secretary of the Army), “Army Directive 2014-22 (Establishment on the Office of Energy Initiatives)” (Memorandum, August 1, 2014), <http://army-energy.hqda.pentagon.mil/policies/docs/ad2014-22.pdf>.

⁴⁶¹ United States Navy, “Energy” (web page), <http://greenfleet.dodlive.mil/energy/#DON> (accessed September 20, 2017); Paula Paige, “SECNAV Outlines Five ‘Ambitious’ Energy Goals,” Story No. NNS091016-30, October 16, 2009, http://www.navy.mil/submit/display.asp?story_id=49044.

energy to the portfolio of that office.⁴⁶² The Deputy Chief of Naval Operations for Fleet Readiness and Logistics (CNO N4), Vice Admiral Phil Cullom, was also tasked with standing up the Navy's Task Force Energy to support the Navy's overall energy strategy. In October 2010, the Navy published a "Navy Energy Vision for the 21st Century," framed around the strategic and operational vulnerabilities of over-reliance on petroleum use. In addition to reiterating Secretary Mabus' energy goals, this document added goals from Admiral Roughead, the Chief of Naval Operations, then the senior-most uniformed Navy officer. The additional goals called for: a 15% reduction in energy used afloat, including a 4% reduction in fuel used in aviation, a 50% reduction in energy consumption and intensity ashore, and redundant, reliable energy systems for critical infrastructure.⁴⁶³ The accompanying Navy energy strategic roadmap laid out the Navy's current energy use, the bureaucratic responsibilities and authorities for the Navy's energy initiatives, and the broad tools by which change would be effected, like the adoption of more energy-efficient technologies and enabling and incentivizing behavioral change in the pursuit of the Navy's energy goals. With a dedicated energy bureaucracy touching shore, fleet, and expeditionary energy, the acquisitions and budgeting process, and structured area of responsibility, the Navy's energy goals appeared to be on a firm foundation. The Navy's energy policy development also progressed apace: in 2012, the Navy issued a

⁴⁶² Assistant Secretary of the Navy (Energy, Installations, and Environment), "Energy" (web page), <http://www.secnav.navy.mil/eie/Pages/Energy.aspx> (accessed September 20, 2017).

⁴⁶³ Office of the Chief of Naval Operations, *A Navy Energy Vision for the 21st Century* (Washington, DC: U.S. Navy, October 2010), <http://greenfleet.dodlive.mil/files/2010/10/Navy-Energy-Vision-Oct-2010.pdf>.

broad energy security policy with implementation responsibilities, an instruction for shore energy policy, and a renewable energy strategy.⁴⁶⁴

The Navy had already had a shipboard energy conservation program, i-ENCON (short for incentivized energy conservation), begun in FY1999. The program tracks the average fuel consumed for each class of ships, and then rewards the crew of the ships with the greatest proportional “underburn” with cash awards of up to \$67,000, which the ship’s commanding officer can spend as they see fit.⁴⁶⁵ The iEONCON program experts can brief the ships crews, and maintain a detailed best practices guide.⁴⁶⁶ Quarterly fuel burn rates by ship class are made available, so ships’ Commanders can benchmark their success. By changing the ships routine practices, such as using just one of the two engines when possible, improving navigation and maintenance, and keeping the propeller and hull clean, ships have been able to reduce fuel burned by about 14%.⁴⁶⁷ In FY2008, when fuel prices were at their highest, this

⁴⁶⁴ Ray Mabus (Secretary of the Navy), *Department of the Navy Program for Security and Independence Roles and Responsibilities* (SECNAV Instruction 4101.3) (Washington, DC: U.S. Navy, February 2012), <http://www.secnav.navy.mil/eie/ASN%20EIE%20Policy/4101.3.pdf>; P.H. Cullom (Vice Admiral and Deputy Chief of Naval Operations (Fleet Readiness and Logistics)), *Shore Energy Management* (OPNAV Instruction 4100.5E) (Washington, DC: U.S. Navy, June 2012), <http://greenfleet.dodlive.mil/files/2012/07/OPNAVINST-4100.5E.pdf>; 1 Gigawatt Task Force, *Department of the Navy Strategy for Renewable Energy* (Washington, DC: U.S. Navy, October 2012), <http://www.secnav.navy.mil/eie/Documents/DoNStrategyforRenewableEnergy.pdf>.

⁴⁶⁵ Philip Ewing, “More COs Conserving Fuel as Part of Program,” *Navy Times*, April 13, 2009, http://www.i-encon.com/article_04_13_09.htm.

⁴⁶⁶ Naval Sea Systems Command, *Shipboard Energy Conservation Guide* (Navsea Technical Publication No. SL101-AA-GYD-010, Revision 5) (Washington, DC: U.S. Navy, July 2016) http://www.i-encon.com/PDF_FILES/iencon_guide/SL101-AA-GYD-010%20Rev5.pdf.

⁴⁶⁷ Naval Sea Systems Command, “Navy Energy Conservation Program Saves \$79 million,” U.S. Navy, Story No. NNS090514-09, May 14, 2009, http://www.navy.mil/submit/display.asp?story_id=45283.

resulted in avoiding \$136 million in fuel costs.⁴⁶⁸ Between FY1999 and FY2014, the Navy's fuel burn rate per ship declined by about 20% - even as each ship's underway rate increased by 5%.⁴⁶⁹

In early 2013, the Navy started an analogous program for their planes – Air-ENCON. Like the i-ENCON program for ships, the Air-ENCON program provides quarterly reports on squadron's fuel burn rates, and offers training and guidance on operational process changes that save fuel without impacting readiness or effectiveness, like tweaking the carrier refueling tempo and refueling planes with trucks while their engines are off, rather than taxiing and being refueled from a refueling station with the engines on.⁴⁷⁰ The Navy's initial goal was to reduce aircraft fuel use by 4% by FY2020 without changing their mission effectiveness – part of reaching the CNO's overall goal of a 15% reduction in fleet fuel use by FY2020.⁴⁷¹ Initial efforts focused on the F/A-18 fleet, which uses over half of the Navy's total aviation fuel.⁴⁷² Little data on results is available, but the program holds promise.

⁴⁶⁸ Naval Sea Systems Command, "Navy Energy Conservation."

⁴⁶⁹ Naval Sea Systems Command, "Shipboard Incentivized Energy Conservation (iENCON) Program Overview," 20, <http://www.i-encon.com/slides.htm>. This presentation is a component of the training materials provided at ENCON seminars.

⁴⁷⁰ Andrea Watters, "Fleet Launches Aircraft Energy-Saving Initiatives," U.S. Navy, Story No. NNS130226-12, February 26, 2013, http://www.navy.mil/submit/display.asp?story_id=72352.

⁴⁷¹ U.S. Navy Air Energy Conservation (Air-ENCON) Program, "Air Energy Conservation (Air ENCON) Program Overview" (Fact Sheet) (Washington, DC: U.S. Navy, 2012), http://airencon.dodlive.mil/files/2012/10/Program-Fact-Sheet_FINAL_v3-Oct-2012.pdf

⁴⁷² Mike Olszewski, Daniel Quinn, and Bill Noel, "Navy Air Energy Conservation (Air ECONON)" (PowerPoint presentation, National Defense Industrial Association (NDIA) Environment, Energy Security and Sustainability Symposium, New Orleans, LA, May 2012, <http://e2s2.ndia.org/schedule/Documents/2012%20Abstracts/Breakout%20Sessions/14383.pdf>).

Marine Corps

The Marine Corps, part of the Department of the Navy, focused its energy efforts on the energy used by Marines deployed during conflict, what it termed expeditionary energy. The Marine Corps' energy vision was strongly shaped by two of its Commandants, who advocated for greater agility and self-sufficiency on the battlefield. Reducing deployed energy use was an essential requirement to this vision of the future Marine Corps. In 2009, Commandant Conway designated energy as a top priority for the Marine Corps, and created the Marine Corps Expeditionary Energy Office (E2O).⁴⁷³ This office also fulfilled the 2008 congressional mandate to designate a senior official responsible for operational energy. General Amos, who succeeded General Conway as Commandant in October 2010, emphasized the need to re-center the Corps as expeditionary force in his Commandant's Planning Guidance, a keystone guidance document for the USMC.⁴⁷⁴ Describing the need to reduce energy consumption and increase energy efficiency in order to operate lighter and faster, with less sustainment burdens, General Amos directed the Expeditionary Energy Office to decrease the Marine Corps use of fossil fuels in a deployed environment. The three specific taskings were to increase the use of renewable energy, "instill an ethos of energy efficiency," and increase the efficiency of equipment.⁴⁷⁵

⁴⁷³ U.S. Marine Corps Expeditionary Energy Office, "Mission and Vision" (web page), <http://www.hqmc.marines.mil/e2o/Mission-Vision/> (accessed September 20, 2017). This announcement appears to have occurred at the U.S. Marine Corps (USMC) Energy Summit, August 13, 2009, in Washington, DC.

⁴⁷⁴ James F. Amos (Commandant of the Marine Corps), *Commandant's Planning Guidance* (Washington, DC: U.S. Marine Corps, October 2010), <http://www.marines.mil/Portals/59/Publications/35th%20CMC's%20Planning%20Guidance.pdf>.

⁴⁷⁵ Amos, *Commandant's Planning Guidance*, 13.

Released in 2011, the Marine Corps' Expeditionary Energy Strategy and Implementation Plan is an extraordinarily comprehensive document, including well-thought out goals, directives, and way-points for improving the Marine Corps' use and conceptualization of energy on the battlefield. The document clearly ties improved energy use to battlefield effectiveness:

As a Corps, we have become more lethal, yet we have also become increasingly dependent on fossil fuel. Our growing demand for liquid logistics comes at a price. By tethering our operations to vulnerable supply lines, it degrades our expeditionary capabilities and ultimately puts Marines at risk. To maintain our lethal edge, we must change the way we use energy.⁴⁷⁶

The imprint of the then-raging war in Afghanistan can be clearly seen – the initial sentence of the section outlining the energy use of the Marine Corps points to the over 200,000 gallons the Corps used daily in Afghanistan as a foundational reason to think about Marine Corps energy use. While the strategic, operational and tactical imperatives are there, the Corps' energy strategy also lays out clear energy goals: to be able to deploy expeditionary forces from the sea that are energy-self sufficient, except for vehicle fuels, by 2025; and reducing the gallons of fuel needed per Marine on the battlefield by 50% by 2025. Finally, the strategy also included a detailed cross-walk of the Marine Corps, Navy, DOD, and federal government energy goals, a clear and specific delineation of responsibilities to achieve them, a 20-page implementation plan. General Amos, then the Commandant, committed to fully resourcing the effort by FY2013.

⁴⁷⁶ Amos, "Commandant's Message," in *United States Marine Corps Expeditionary Energy Strategy and Implementation Plan: Bases-to-Battlefield* (Washington, DC: U.S Marine Corps, March 2011), 3, <http://www.hqmc.marines.mil/Portals/160/Docs/USMC%20Expeditionary%20Energy%20Strategy%20Implementation%20Planning%20Guidance.pdf>.

The Marine Corps followed up the Expeditionary Energy Strategy with a detailed assessment of capability gaps between the Marine Corps of today and the vision of a Marine Corps that can operate self-sufficiently for 120 days, except for vehicle fuel, with a 50% increase in operational energy efficiency, greater water self-sufficiency, and better waste management.⁴⁷⁷ This jargon-rich document (illustrated at length with the requisite PowerPoint slides), identifies and prioritizes 29 energy, water and waste-related tasks performed by an expeditionary Marine unit, lays out and ranks the severity of 152 capability gaps, and describes material and non-materiel solutions to address them. While the document itself is a primer on Pentagon bureaucracy and acronyms, the initial capabilities document is the foundational prerequisite to be able to feed expeditionary energy needs into the Marine Corps and joint acquisition process.⁴⁷⁸ In addition, energy featured prominently in the Marine Corps' latest Science and Technology plan, released in early 2012. This plan translates the energy efficiency, reduced energy use, and focus on lightening the load of individual soldiers

⁴⁷⁷ United States Marine Corps, *Initial Capabilities Document for United States Marine Corps Expeditionary Energy, Water and Waste* (CDTM Doc. No. 11110808578, v. 2) (Washington, DC: U.S. Marine Corps, September 2011), <http://www.hqmc.marines.mil/Portals/160/Docs/USMC%20E2W2%20ICD.pdf>.

⁴⁷⁸ A full description of the Pentagon's acquisition process is beyond the scope of this work, but the initial process of identifying a military requirement is the Joint Capabilities Integration and Development System, abbreviated JCIDS. Step one of that process is identifying a capabilities gap, for which materiel or non-materiel solutions can be sought. The solution space is canonically abbreviated into the mnemonic acronym DOTML-PF, pronounced "dot-ml-p-f," which stands for doctrine, organization, training, materiel, leadership, personnel and facilities. Without a capability gap assessment, there can be no validated requirements, and without validated requirements, no procurement can be contemplated. For a brief primer on the bureaucratic steps of the Pentagon's acquisition process, see the article "JCIDS Process," on AcqNotes, designed as a helpful guide to the aerospace community (AcqNotes, "JCIDS Process" (web page), <http://www.acqnotes.com/acqnote/acquisitions/jcids-overview> (updated July 12, 2017)).

into priority areas of science and technology investment.⁴⁷⁹ Technology development areas included being able to “harvest” energy from the sun, battlefield waste, vehicles and personnel while deployed; electronics that don’t require cooling, better energy storage, improved water purification, and more efficient combat vehicles.⁴⁸⁰

Air Force

By itself, the Air Force accounts for about half of DOD’s use of jet fuel. Within the Air Force, jet fuel makes up about 83-86% of the Air Force’s overall energy costs, with facilities accounting for about 11-16% and non-tactical ground vehicles about 3%.⁴⁸¹ In part, the Air Force’s demand for jet fuel is driven as much or more by its cargo planes as its fighter jets – in FY2011, Air Mobility Command alone accounted for about 28% of DOD’s petroleum fuels use. In September 2006, the Air Force first set a concrete goal to reduce its use of aviation fuel – by 10% by FY2015.⁴⁸² This planned reduction followed un-budgeted fuel price spikes of \$1.5 billion in 2005 and \$1.6 billion in 2006 – about 25% of the Air Force’s aviation fuel budget.⁴⁸³

In 2008, the Air Force issued a broad energy policy memorandum, its first since 1993. This memorandum defined the 10% reduction in aviation fuel as fuel use per

⁴⁷⁹ U.S. Marine Corps, *2012 U.S. Marine Corps Science and Technology Strategic Plan: Leading Edge Technology for the Marines of Tomorrow* (Washington, DC: U.S. Marine Corps, January 17, 2012), http://www.hqmc.marines.mil/Portals/160/Docs/USMC%20S_T%20Strat_Plan_2012_Final_31_%20Jan.pdf.

⁴⁸⁰ U.S. Marine Corps, *Science and Technology Strategic Plan*, 30-32.

⁴⁸¹ U.S. Air Force, *U.S. Air Force Energy Strategic Plan* (Washington, DC: U.S. Air Force, March 6, 2013), 7, <http://www.afcec.af.mil/Portals/17/documents/Energy/AFD-130325-132.pdf>; Office of the Assistant Secretary of the Air Force, Installations, Environment and Energy, *Energy Flight Plan*.

⁴⁸² Air Force Aviation Fuel Conservation (Memorandum, September 21, 2006).

⁴⁸³ Breanne Wagner, “Air Force Energy-Saving Plans Face Technical, Financial Hurdles,” *National Defense Magazine*, May 1 2007, <http://www.nationaldefensemagazine.org/archive/2007/May/Pages/AirForceenergy2636.aspx>.

flying hour by FY2015. In addition, the acquisition and technology working group was tasked with ambitious goals: reducing aviation fuel demand by achieving a 20% improvement in lift to drag ratio, reducing aircraft fuel demand by 20%, using alternative fuels to meet 50% of demand in the continental US by 2016, certify all Air Force aircraft on a synthetic fuel blend by FY2011, and be prepared to acquire up to 50% of aviation fuel needs from cost-competitive alternative fuel blends by FY2016.⁴⁸⁴ This memorandum also incorporated other federal energy requirements and executive orders, mandated that at least half of the Air Force's required renewable energy use come from new sources.

However, these goals were soon eased in subsequent Air Force Instruction.⁴⁸⁵ In perhaps a tacit acknowledgement that Air Force fuel data and analysis capabilities were inadequate for an analysis of the fuel used per flying hour, the goal of a 10% improvement in fuel used per flight hour was quietly reverted to a 10% reduction in aviation fuel usage in the 2009 implementation guidance for the memorandum, and the goal of using alternative fuels for 50% of domestic demand by 2016 dropped entirely. Similarly, the ambitious engineering goals were watered down to much vaguer (and more achievable) commitments to develop efficient aircraft technology and improve jet engine performance. Most controversial were the Air Force's

⁴⁸⁴ Michael B. Donley (Secretary of the Air Force), "Air Force Energy Program Policy Memorandum (AFPM10-1)" (Memorandum, December 19, 2008), http://www.airforcemag.com/SiteCollectionDocuments/Reports/2009/January%202009/Day07/Energy_Policy_121908.pdf.

⁴⁸⁵ Secretary of the Air Force, *Energy Management* (Air Force Instruction 90-1701) (Washington, DC: U.S. Air Force, July 16, 2009), http://static.e-publishing.af.mil/production/1/saf_ie/publication/afi90-1701/afi90-1701.pdf.

alternative fuels goals. Unlike the Navy, which explicitly required greater use of alternative fuels in order to reach the goal of 50% renewable energy used afloat, the Air Force's goal was more cautious: to be *prepared* to purchase up to 50% of domestic aviation fuel from alternative sources. Aside from its aviation fuel efficiency efforts, the Air Force also put a significant emphasis on building renewable energy generation capacity, even though facility energy account for only about 15% of the Air Force's total energy use.

The Air Force declared the 10% reduction in aviation fuel usage achieved in 2013 – 3 years ahead of the FY2015 goal.⁴⁸⁶ Specifically, the Air Force claims a 12.4% reduction, or almost 200 million gallons in aviation fuels used. In financial terms, this was a savings of \$1.2 billion in fuel costs in FY2012 alone.⁴⁸⁷ The follow-on to the Air Force Energy Plan 2010, the 2013 Strategic Energy Plan sought further reductions, aiming for another 10% reduction from the lower FY2011 level by 2020.⁴⁸⁸ However, these claimed reductions are somewhat suspect. In a 2011 briefing, Dr. Geiss, the Secretary of the Air Force for Installation, Energy and Environment, stated that the Air Force had achieved a 2% reduction in aviation fuel usage between FY2006 and FY2010 – leaving a large 10.4% delta to be achieved within two years to meet the Air Force's claimed numbers. The described FY2012

⁴⁸⁶ Air Force News Service, "Air Force Announces Energy Consumption Achievements, New Energy Strategic Plan," March 22, 2013, <http://www.nellis.af.mil/News/tabid/6431/Article/284413/air-force-announces-energy-consumption-achievements-new-energy-strategic-plan.aspx>.

⁴⁸⁷ U.S. Air Force, "Air Force Energy: Improving Our Energy Security Posture to Power the Force and Fuel the Fight" (Fact Sheet) (Washington, DC: U.S. Air Force, 2012), <http://www.jbsa.mil/Portals/102/Documents/Energy%20Awareness/AFD-130925-074.pdf>.

⁴⁸⁸ U.S. Air Force, U.S. Air Force Energy Strategic Plan.

aviation fuel reduction initiatives he describes, including a 5% reduction in flying hours for the combat air force and efficiency improvements for Air Mobility Command achieve savings of 53 million gallons and 15 million gallons, respectively – far short of the nearly 200 million gallons the Air Force would claim was saved.⁴⁸⁹ Senior OEPP officials dismissed the Air Force’s claimed aviation fuel consumption reductions, describing them as purely the result of reductions in the size of their air fleets, rather than of efficiency efforts.⁴⁹⁰

Like the Navy, the Air Force also created a robust energy bureaucracy. Responding to congressional mandates, this 2008 Air Force memo also designated the Under Secretary of the Air Force, or the Assistant Secretary of the Air Force for Installations, Environment and Logistics, as the senior energy official of the service. In 2009, the Air Force created the Energy Program Management Office. In 2010, Dr. Kevin Geiss, who has formerly worked as the program director for energy security in the Office of the Assistant Secretary of the Army for Installations and Environment, was named the first Deputy Assistant Secretary of the Air Force for Energy.⁴⁹¹ The supporting 2011 Air Force Policy Directive on energy management reinforced the

⁴⁸⁹ Kevin Geiss, “U.S. Air Force Energy Program” (PowerPoint presentation, NDIA Environment, Energy Security and Sustainability Symposium, New Orleans, LA, May 2012, <http://www.dtic.mil/docs/citations/ADA564596>).

⁴⁹⁰ Interview with senior OEPP official, August 2014.

⁴⁹¹ Chris Sukach, “Air Force Officials Name Deputy Assistant Secretary for Energy,” Air Force Public Affairs, November 12, 2010, <http://www.afspc.af.mil/News/Article-Display/Article/250094/air-force-officials-name-deputy-assistant-secretary-for-energy/>.

bureaucratic shifts, mandating energy elements in all Air Force departments, combatant commands, major functional units, and installations.⁴⁹²

In July 2014, the Air Force elevated energy considerations in the Air Force Secretariat, adding energy to the portfolio of what was formerly the Assistant Secretary of the Air Force for Installations, Environment and Logistics – now the Assistant Secretary of the Air Force for Installations, Energy and Environment.⁴⁹³ In tandem, the Deputy Assistant Secretary for Energy was shifted to focus on operational energy, becoming the Deputy Assistant Secretary for Operational Energy. The Air Force’s energy policy was reaffirmed in a November 2016 policy directive.⁴⁹⁴ Perhaps drawing on the private-sector renewable energy and energy efficiency of then-ASAF(IE&E) Miranda Ballantine, who formerly directed Wal-Mart’s energy efficiency efforts, this directive laid out the most expansive Air Force approach to energy and water policy to date. Notable inclusions were commitments to be able to power mission-critical infrastructure without the grid for at least 7 days, to maximize the use of energy efficient technology, improve the energy performance of weapons systems, platforms and equipment, to utilize organization-wide energy data collection and management systems, and to incorporate energy into all strategic

⁴⁹² Secretary of the Air Force, *Energy Management* (Air Force Policy Directive 90-17) (Washington, DC: U.S. Air Force, November 29, 2011), <http://govdocs.rutgers.edu/mil/af/AFPD90-17.pdf>.

⁴⁹³ Secretary of the Air Force, *Assistant Secretary of the Air Force (Installations, Environment and Energy)* (HAF Mission Directive 1-18) (Washington, DC: U.S. Air Force, July 10, 2014), http://static.e-publishing.af.mil/production/1/saf_ie/publication/hafmd1-18/hafmd1-18.pdf.

⁴⁹⁴ Secretary of the Air Force, *Energy and Water Management* (Air Force Policy Directive 90-17) (Washington, DC: U.S. Air Force, November 18, 2016), http://static.e-publishing.af.mil/production/1/saf_ie/publication/afpd90-17/afpd90-17.pdf.

planning, exercises, wargames, and acquisitions decisions. In January 2017, likely trying to beat the buzzer on the incoming Trump administration, the Air Force released an “Energy Flight Plan” for 2017-2036.⁴⁹⁵ With more specific goals and targeted completion timeframes than in any prior Air Force energy plan, and tied directly to the Air Force’s Strategic Master Plan, this plan attempts to cement energy considerations into the Air Force for the long haul.

Conclusion

The FY2009 NDAA requirement to designate a senior official in each service with responsibility for operational energy concerns was particularly instrumental in providing the capability to shift the Pentagon bureaucracy. It prompted the Army, Navy, and Air Force to create a Deputy Assistant Secretary-level position with energy as their primary responsibility, with clear authorities. However, each of these Deputy Assistant Service Secretaries for Energy was created under the auspices of the respective Assistant Secretary for Installations and Environment for each service – a bureaucratic perch which would give them ample remit to tackle renewable energy and installation energy goals, but with very limited leverage into the operational energy problem. With a precarious institutional position, the impacts of these energy offices, task forces, etc. would be strongly shaped by the leadership, priorities, and energy cultures of each service.

⁴⁹⁵ Assistant Secretary of the Air Force for Installations, Environment and Energy, *Energy Flight Plan*.

By about 2010, the Pentagon and the services were equipped to start rethinking their energy use in both the operational and installation energy portfolios. The varied congressional requirements for the Pentagon's energy policy were slowing being incorporated into official Pentagon and service policies, instructions, and directives, although the gears took a while to turn. Once published, these energy policies take even longer to be incorporated into the actual programs and practices of the Pentagon and the services. However, the incorporation of energy considerations into official policy documents provides the underpinning and, crucially, the authorities of the offices impacted. Following another congressional requirement, the Pentagon and each of the services had drafted an operational energy strategy around 2011. However, in most cases this was a one-and-done effort. This somewhat pro-forma response was far from the annually-updated energy plan and implementation strategy, closely tied to budget development and investment process that Congress had envisioned. However, lacking congressional follow-up, the services had no imperative to update their energy plans without a driving force from within their service.

The variation in the interest and follow-through among the military services illustrates the shaping impact their different energy use profiles have. The Army, which uses the least petroleum fuels, and whose ground vehicles each use a relatively tiny amount of petroleum, hasn't focused much on petroleum consumption by systems. Instead, their operational energy efforts have been concentrated on soldier

power and tactical renewable power generation in the field, mitigating the problems of a risky and expensive fuel supply on the remote battlefields in Afghanistan. On the installation energy front, while the Army has lagged in reducing energy intensity, they do have the lowest energy intensity of any of the services, and they have led the pack in developing large-scale renewable power. The Navy, whose ships will have 30-50 year lifespans, has focused on small upgrades and behavioral changes to reduce energy use underway. While no robust data on the impact of the Navy's efficiency initiatives is publicly available, the Navy's early adoption, robust advocacy from the Navy's senior-most civilian (and to a lesser extent, military) leadership, and ease of replication across a limited number of ship classes bode well. The Marine Corps, like the Army, focused on electricity generation and fuel conservation in the battlefield, largely sidestepping the question of expeditionary vehicle fuels. Finally, the Air Force was eager to declare victory with mostly-behavioral and process-oriented efficiency hacks. However, the Air Force's fleet is aging, and substantial energy efficiency improvements are unlikely without costly upgrades, like the perennial suggestion to re-engine the B-52 bombers, which would improve fuel efficiency, and therefore range, by about 30%, or the acquisition of new fleets of planes with highly efficient engines. While the Air Force has actually put substantial resources into developing efficient engines (mostly for the performance, range, and endurance benefits), their maturation and incorporation into the bulk of the fleet remain decades away.

These absolute declines in the Pentagon's energy use do not necessarily mean that DOD is actually more efficient – if energy use is declining due to declining numbers of ships, planes, or soldiers, than the declines may not be backed by any real shifts to DOD's energy policies or practices. Neither do reductions in the Pentagon's overall energy use nor in energy intensity illuminate what drove the reductions. How much was driven either by specific legislative provisions, or by the bureaucratic or policy changes that the legislative changes required? The following chapter discusses how congressional defense energy policymaking impacted the fundamentals of the Pentagon's energy landscape.

Chapter 7: Congress' Impact on the Pentagon's Energy Culture

For each of the three positive case studies analyzed in the previous section, the legislative actors' principal focus appears to have been the creation, rather than the implementation or the ultimate impact of their efforts. While the staffers and members believed that their efforts would improve or even transform DOD's energy use, their visions of how exactly that would occur were hazy at best. The rhythms and demands of the legislative cycle also make sustained oversight activity difficult, as does the natural bureaucratic reluctance of the Pentagon to continually be reviewed by and responsive to congressional demands. Nevertheless, several of the policy outputs appear to have or have had the potential to shift DOD's energy use substantially over time. As one would expect from the world's largest and most intricate bureaucracy, policy development and policy and programmatic implementation within DOD depends on a variety of actors, all with their own competing bureaucratic goals and differential access to power. Among other factors, the bureaucratic savvy of principals, the degree of senior leader interest and attention, and the level of internal bureaucratic acceptance, neutrality, or active resistance towards a new policy, program, or procedure determine whether policies and programs succeed or fail.

Additionally, none of Congress' defense energy policymaking through the NDAA was occurring in a vacuum. As described in the previous chapters, the difficult and deadly logistics of the conflicts in Iraq and Afghanistan motivated congressional

attention to the question of DOD's energy use. These concerns also animated some within the Pentagon to consider, and attempt to reduce, DOD's energy use, particularly on the battlefield. Similarly, the increasingly apparent and urgent specter of climate change prompted several Executive Orders by Presidents Bush and Obama, calling for greater energy efficiency and sustainability within the federal government as whole.

This chapter evaluates the extent to which the Pentagon's bureaucracy has adopted and implemented Congress' legislative activity on defense energy enacted in the FY2004-FY2014 NDAs. Did the efforts by members and staff described in previous chapters actually matter? To answer that question, this chapter focuses on DOD's energy efforts between 2004-2016, after Congress began enacting provisions related to DOD's energy use. This first half of this chapter describes overall shifts in the broader bureaucratic energy landscape within the Pentagon that occurred between 2004 and 2016. It evaluates the extent to which DOD's energy policy and bureaucracy was altered specifically as a product of the legislative activity. This second half of this chapter focuses on four areas that were the major themes of legislative activity:

1. Specific goals for installation energy conservation;
2. Specific targets for renewable energy installation and usage;

3. The creation of the concept of operational energy, and role and impact of the Office of Operational Energy Plans and Programs, operational energy's bureaucratic champion; and
4. Requirements for energy efficiency and consideration of energy demands in acquisitions.

Cumulatively, these areas encompass the broad sweep of DOD's energy use, and hold the potential to drive wholesale transformation in the way the Pentagon uses energy at bases and on the battlefield, what types of energy it uses, and how it thinks about energy as a bureaucratic institution. This chapter traces the enactment and the (non-)implementation of specific legislative requirements in these four issue areas within the Pentagon, and adjudicates, where possible, their impact on the Pentagon's energy practices and use. Due to the sheer number of actors, the multiplicity of confounding factors, the confidentiality of pre-decisional bureaucratic information within DOD and the enormous complexity of the Pentagon and the services, tracing the *process* by which congressional policies, preferences and requirements were implemented is difficult-to-impossible without direct personal knowledge. Accordingly, this chapter draws on interviews with participants when possible. However, the depth and fragmentation of DOD's bureaucracy and the reluctance of civil servants to be interviewed means that interview data is limited. Therefore, this chapter also utilizes

several hoops to determine whether the congressional energy provisions successfully impacted DOD's energy use:⁴⁹⁶

1. Were congressional policy mandates, preferences and requirements incorporated into official DOD and service policy? Answering this question draws on official DOD policy directives and instructions.⁴⁹⁷
2. Were congressional policy mandates, preferences and requirements incorporated into the practices of the Pentagon, the armed services, and other relevant offices and organizations within DOD? Answering this question draws on the relevant organizations' and offices' websites, documents, training guides, manuals, and news stories.
3. Did these policies and practices engender concrete impacts on DOD's actions and/or energy use? Evidence includes official DOD reports, e.g. on energy use or renewable energy developed, announced projects, news stories, etc.
4. To what extent were these policy changes and concrete impacts driven by Congress, vice other agents or confounding factors? This is the most difficult

⁴⁹⁶ Alexander L. George and Andrew Bennett, *Case Studies and Theory Development in the Social Sciences* (Cambridge, MA: MIT Press, 2005); Henry E. Brady and David Collier, *Rethinking Social Inquiry: Diverse Tools, Shared Standards*, 2nd ed. (Lanham, MD: Rowman and Littlefield Publishers, 2010).

⁴⁹⁷ DOD's development of policy has its own intensely bureaucratic process, with distinct development, pre-coordination, coordination, review and revision, and publication stages. DOD official policy documents also come in several painstakingly-delineated subtypes. The most significant are directives, which lay out DOD policy and the authorities and responsibilities of offices, and instructions, which, in addition to laying out the official policy and authorizes and responsibility, describe how to implement a policy or prescribe how a policy will be carried out. Manuals, intended to be working documents, provide detailed policy implementation and process guidance. For a snapshot of the process, see the basic guidance provided by DOD at "DoD Issuances" (web page), http://www.esd.whs.mil/Directives/issuance_process/proc_dod_iss/ (updated August 23, 2017).

question to adjudicate, requiring a broad knowledge of the other possible factors, such as DOD officials' priorities, and a subjective determination of the degree of their possible impact. The closer DOD conforms to a specific congressional directive, as well as the degree to which a congressional directive is unique, will be relevant factors.

Policy

Officially, the Pentagon of 2016 officially cared far more about energy than the Pentagon of 2004. As an enormous bureaucracy, policy and procedures are a vital element to how the Pentagon actually functions, and thus a critical avenue for effecting change.

In 2014, DOD adopted a new official energy policy, replacing DOD Instruction 4170.10, "Energy Management Policy," which had not been updated since its issuance in 1991. The old policy still carried the imprimatur of the petroleum supply disruptions of the 1970s, describing in multi-page detail the process for determining priority of access to petroleum supplies in the event of an energy emergency, with accompanying form language for declaring a supply disruption. A few other broad sections described support for increasing the diversity of energy supplies and supporting energy conservation, but there was no reckoning with the implications and

risks of DOD’s hunger for energy, especially petroleum fuels.⁴⁹⁸ The 2014 energy policy was a dramatic shift, making official DOD energy policy goals of enhancing military capability, improving energy security, and mitigating costs in its use and management of energy. To achieve those ends, DOD made it official policy to: improve the energy performance of weapons systems and equipment; diversity and expand energy sources including renewable energy and alternative fuels; ensure that energy analyses are conducted as part of the planning, requirements, acquisition, and budgeting processes; manage energy-related risks to operations, training and DOD infrastructure; develop and acquire technologies to help DOD meet these needs, and to educate and train personnel “in valuing energy as a mission-essential resource.”⁴⁹⁹

Most of the elements of the Pentagon’s new energy policy were originally advanced or mandated by Congress through the NDAA. (See Table 5) For the most part, this bricolage of congressional defense energy policy was assembled a few provisions at a time, gradually building into a cohesive whole, codified in 2010 at 10 U.S.C. in a new chapter, “Chapter 173: Energy Security.”⁵⁰⁰ The non-congressional elements of DOD’s official energy policy are the government-wide energy-intensity and non-tactical petroleum usage reduction mandates, the products of the Energy Independence and Security Act of 2007 and federal Executive Orders 13423 and

⁴⁹⁸ U.S. Department of Defense, *Energy Management Policy* (Department of Defense Instruction 4170.10), (Washington, DC: Department of Defense, August 8, 1991), <http://www.dtic.mil/dtic/tr/fulltext/u2/a271398.pdf>.

⁴⁹⁹ Christine H. Fox (Acting Deputy Secretary of Defense), *DoD Energy Policy* (Department of Defense Directive 4180.01) (Washington, DC: Department of Defense, April 16, 2014), https://fas.org/irp/doddir/dod/d4180_01.pdf.

⁵⁰⁰ “Energy Security,” 10 U.S.C. §§ 2911-2926.

13514, respectively. Considering the degree to which the official DOD policy bears the cumulative fingerprints of Congress, congressional defense policymaking can fairly be said to have driven the creation and content of the Pentagon’s official energy policy.

Table 5: Aspects of DOD's Energy Policy and the Corresponding Congressional Requirements

Policy or Goal	Major Legislative Provisions	Requirement	Origin/Sponsor	Chamber Control
Improve the energy performance of weapons systems and platforms	Section 360 of FY2007 NDAA (P.L. 109-364)	“It shall be the policy of the Department of Defense to improve the fuel efficiency of weapons platforms”	Sen. Clinton (D-NY), Sen. Bingaman (D-NM)	R
Use of diverse energy sources, including renewable energy and alternative fuels	Section 2851 of FY2007 NDAA (P.L. 109-364)	DOD shall consider alternative energy and alternative fuels	Senate Armed Services Committee	R
	Section 334 of FY2010 NDAA (P.L. 111-84)	DOD shall consider use of alternative fuels	House Armed Services Committee	D
Include energy analyses as part of the planning, acquisitions, planning and budgeting processes	Section 2851 of FY2007 NDAA (P.L. 109-364)	DOD “shall consider “opportunities to reduce the future demand and the requirements for the use of energy.”	Senate Armed Services Committee	R
	Section 332 of FY 2009 NDAA (P.L. 111-117)	DOD must consider fuel logistics support	House and Senate Armed Services Committees	D, D

	110-417)	requirements in capability and acquisition decisions		
	Sections 861, 864 of FY2011 NDAA (P.L. 111-383)	DOD must assess whether energy-efficiency has been sufficiently considered in the acquisition process	House Armed Services Committee	D
	Section 315 of FY2012 NDAA (P.L. 112-81)	DOD must consider energy efficiency and overall demand in contingency contracting	House Armed Services Committee	R
Manage energy-related risks to DOD operations, training and infrastructure	Section 2851 of FY2007 NDAA (P.L. 109-364)	DOD shall consider, “the value of diversification of types and sources of energy used”	Senate Armed Services Committee	R
	Section 358 of FY2007 NDAA (P.L. 109-364)	DOD must consider fuel cells for backup power	Sen. Bingaman (D – NM)	R
	Section 335 of FY2009 NDAA (P.L. 110-417)	DOD must conduct a technical and operational risk assessment of extended power outages	Senate Armed Services Committee	D
	Section 335 of FY2010 NDAA (P.L. 111-84)	DOD must develop a plan to mitigate risks of power disruptions at bases	Senate Armed Services Committee	D
	Section 2822 of FY2012 NDAA (P.L.	DOD must consider energy security in	Senate Armed Services Committee	R

	112-81)	renewable projects		
Acquire technologies to help DOD meet these energy policies	Section 218 of FY2009 NDAA (P.L. 110-417)	DOD and DARPA roadmap for advanced energy storage technologies and domestic manufacturing capabilities	Senate Armed Services Committee	D
	Section 243 of FY2010 NDAA (P.L. 111-84)	DOD shall coordinate energy storage needs, purchases and investments	House Armed Services Committee	D
	Section 214 of FY2011 NDAA (P.L. 111-363)	DOD shall have an RDT&E program for advanced energy and powertrain technologies in ground vehicles	Senate Armed Services Committee	D
Educate and train personnel on utilizing energy as a vital resource	Section 2829 of FY2012 NDAA (P.L. 112-81)	DOD must establish a consistent training program for installation energy managers	House Armed Services Committee, Sen. Warner (D-VA)	R,D
Energy goals and master plan	Section 2851 of FY2007 NDAA (P.L. 109-364)	Required energy goals and master plan	Senate Armed Services Committee	R
	Section 2832 of FY2011 NDAA (P.L. 111-383)	Each military department and agency shall have an energy plan, and the energy plans must include metrics to measure achieving energy	House and Senate Armed Services Committees	D, D

		goals		
Reduce energy intensity by 37.5% by FY2024	<i>Executive Order 13423</i>	<i>Federal agencies must reduce energy intensity by 30% by FY2015</i>		
Increase the use of renewable energy by 25% by 2024	Section 2852 of FY2007 NDAA (P.L. 109-364)	Set 25% goal	Sen. Menendez (D-NJ)	R
	Section 2846 of FY2010 NDAA (P.L.111-84)	Required report on DOD renewable energy projects and how they related to goal	House Armed Services Committee, Senate Armed Services Committee	D
	Section 2842 of FY2010 NDAA (P.L.111-84)	Specified what counted as renewable energy sources	House Armed Services Committee	D
	Section 2823 of FY2012 NDAA (P.L. 112-81)	Set interim renewable energy goal for FY2018	House Armed Services Committee	R
Reduce non-tactical petroleum use by 30% by 2024	Section 2844 of FY2010 NDAA (P.L. 111-84)	DOD should use electric and hybrid vehicles	House Armed Services Committee	D
	<i>Executive Order 13514, October 5, 2009</i>	<i>Federal agencies must reduce petroleum use by 2% annually relative to FY2005</i>		

Defense Energy Plan

In 2006, Congress required DOD to set energy performance goals for the next one, five, ten and twenty years, update the goals annually, and to develop an energy plan

to reach them.⁵⁰¹ These goals were left to the Pentagon's direction (though the Pentagon was already subject to a variety of federal government energy efficiency goals), with the exception of a goal to meet 25% of electricity needs with renewables by 2025.⁵⁰² However, Congress did include guidance in the form of directives as to what approaches were to be considered. Initially, this list of considerations included reductions in energy use, avoidance of future energy use, greater energy efficiency, support for alternative energy and energy diversification, balanced with cost-effectiveness.⁵⁰³ Over the next several years, legislators mandated additional factors to be considered, including overall environmental sustainability and energy security, as well as broadened which technologies would be considered to meet the renewable energy goals to include direct solar and geothermal.⁵⁰⁴ In 2010, each military department was required to create their own separate master plan for achieving the Pentagon's energy goals.⁵⁰⁵

The Pentagon bureaucracy was slow to take up the charge. Though the initial requirement for the Pentagon to submit annual energy performance goals and a plan to meet them was created by Congress in October 2006, the first energy performance plan wasn't submitted until September 2012, as a short appendix the FY2011 annual

⁵⁰¹ John Warner National Defense Authorization Act for Fiscal Year 2007, Pub. L. No. 109-364, § 2851, 120 Stat. 2489 (2006).

⁵⁰² Pub. L. No. 109-364, § 2852, 120 Stat. 2496.

⁵⁰³ § 2851, 120 Stat. 2489.

⁵⁰⁴ § 2854, 120 Stat. 2497; Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Pub. L. No. 111-383, §§ 2831-2832, 124 Stat. 4467-4468 (2011); National Defense Authorization Act for Fiscal Year 2012, Pub. L. No. 112-81, § 2822, 125 Stat. 1691 (2011); § 2825, 125 Stat. 1693.

⁵⁰⁵ Pub. L. No. 111-383, § 2832.

energy management report. Moreover, the energy plan was only submitted after Congress reiterated the requirement in the FY2012 NDAA.⁵⁰⁶ The submitted plan is more a statement of targets, without an actual implementable plan for how to reach them. It has not been updated since. Nonetheless, in addition to the legislatively mandated requirements that apply to all federal agencies, the plan calls for reducing the intensity of energy use by 37.5%, increasing the use of renewable energy by 25%, and reducing non-tactical petroleum use by 30%.⁵⁰⁷ The reporting of the Pentagon's compliance with these overall federal energy goals has improved, as discussed below in the section on installation energy.

Bureaucracy

Congress' legislative actions also touched the Pentagon's energy bureaucracy in three major ways. First, as part of the legislative efforts to force the Pentagon to conceptualize and care about operational energy, HASC staffers created the Operational Energy Plans and Programs Office. As a new senior office within the Office of the Secretary of Defense, this position was intended to have broad powers to shape the Pentagon's energy thinking and use.⁵⁰⁸ This office will be discussed at length later in this chapter. Second, as part of the push for operational energy in the

⁵⁰⁶ Department of Defense Office of the Deputy Under Secretary of Defense (Installations and Environment), "Energy Performance Master Plan," in *Department of Defense Annual Energy Management Report, Fiscal Year 2011* (Washington, DC: Department of Defense, September 2012), C-1-C-60, <http://www.acq.osd.mil/eie/Downloads/IE/FY%202011%20AEMR.pdf> (henceforth AEMR FY2011).

⁵⁰⁷ Department of Defense Office of the Deputy Under Secretary of Defense (Energy, Installations, and Environment), *Department of Defense Annual Energy Management Report, Fiscal Year 2015* (Washington, DC: Department of Defense, June 2016), <http://www.acq.osd.mil/eie/Downloads/IE/FY%202015%20AEMR.pdf>.

⁵⁰⁸ Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, Pub. L. No. 110-417, § 902, 122 Stat. 4564 (2008). The goals of the congressional staffers who created this office, and the office's authorities, successes, and failures, is discussed later in the chapter.

Pentagon, the HASC staffers also required the joint chiefs and each of the military services to designate a senior official to have responsibility for implementing operational energy initiatives within that service in the FY2009 NDAA.⁵⁰⁹ In effect, this required the Army, Navy, Air Force and Marine Corps to set up at least a token operational energy staff, tasked with reviewing and improving their service's operational energy use. Finally, on the installation energy side, Congress required improved and standardized training for Pentagon installation energy managers.⁵¹⁰

Ultimately, policy and plans are functionally meaningless without the bureaucracy and senior leaders who will be charged with implementing them. Each DOD policy document includes a tabulation of the responsibilities of all the DOD officials who have an official role in implementing some aspect of the policy. For example, in the 2014 update to the Pentagon's energy policy, the listing of responsibilities and authorities stretches across seven pages, from the Under Secretary of Defense for Policy (the 3rd senior-most civilian role in the Pentagon) to the senior service chiefs to the Joint Chiefs of Staff and the combatant commanders, and further into the bureaucracy to the Director of the Defense Logistics Agency and the Comptroller. While this tabulation of responsibilities and authorities must include those given directly by Congress – for example, the Assistant Secretary of the newly-created office of Operational Energy Plans and Programs had primary responsibility for advising the Secretary of Defense on operational energy issues, as well for

⁵⁰⁹ Pub. L. No. 110-417, § 902.

⁵¹⁰ Pub. L. No. 112-81, § 2829, 125 Stat. 1694.

operational energy in the Pentagon’s planning and acquisitions – other delineations of responsibility and delegations of authority are at the discretion of the Secretary of Defense. Also in the 2014 updated DOD energy policy, the Under Secretary of Defense for Personnel and Readiness was tasked with ensuring that all DOD personnel were “educated and trained in valuing energy as a mission-essential resource,” while the Assistant Secretary of Defense for Logistics and Materiel Readiness was charged with providing guidance for obtaining or modifying equipment to improve mission effectiveness and energy performance and ensuring the participation of logistics personnel in the efforts to demonstrate and certify alternative fuels in various airplanes and ships.

This broad set of energy responsibilities in the Pentagon’s 2014 energy policy illustrates the crosscutting nature and importance of energy in the Pentagon. Energy’s fundamental importance to the military is a key element what attracted congressional actors to it as a policy area for legislative action. However, this breadth is a double-edged sword. Because energy touches nearly every functional area of the Pentagon, the various responsibilities and authorities of the Pentagon’s senior leaders will inherently impinge on each other, with the resultant bureaucratic friction and possibility of bitterly contested turf wars. This also means that no bureaucratic actor can advance energy-related policies and programs without substantial internal diplomacy and support from other senior civilian and military leaders. In part, the bureaucratic power of actors in the Pentagon can live or die on the authorities and

responsibilities given. In this regard, a well-drafted instruction can increase or impair the ability of bureaucratic actors to effect policy in that arena. The Pentagon's 2014 energy policy, as well as the 2009 installation energy policy, are both thoughtfully drafted and appear to enable the advancement of improvements to DOD's energy efficiency and overall energy use, rather than hinder them.

The second half of this chapter traces the impact of specific legislative actions in four areas of defense energy: installation energy conservation, renewable energy, operational energy, and energy efficiency and demand in weapons systems.

Installation Energy Conservation

Installation energy is the area of DOD's energy use that has the deepest institutional roots, drawing on the government-wide energy conservation and cost savings efforts of the 1970s. Like the rest of the federal government, a series of laws and policies required the Department of Defense to reduce the energy it used in buildings. As noted in Chapter 2, this effort was already weakening shortly after it began. Rather than prompt consideration of DOD's overall energy usage, the 1970s efforts within DOD rapidly changed to focus on cost savings. It is difficult to disentangle DOD's installation energy conservation efforts that were the result of specific NDAA provisions from this broader background of requirements.

Government-wide installation energy efficiency initiatives

Part of the Department of Energy since its creation in 1973, the Federal Energy Management Program (FEMP) was intended to coordinate and promote energy

efficiency in the federal government. Responding to the 1973 oil crisis, Congress passed the National Energy Policy Conservation Act in 1975. Among other provisions, it required the executive branch to create a 10-year plan to improve energy efficiency in federal government buildings.⁵¹¹ President Carter followed up on this requirement in his 1977 Executive Order 12003. This executive order required all existing federal buildings to reduce their energy use per square foot by an average of 20% by 1985. New buildings were required to be 45% more energy-efficient. In addition, President Carter directed federal agencies to come up with a 10-year plan for ongoing energy and cost savings in federal buildings, and instructed the Office of Management and Budget to create a methodology by which to calculate the total lifecycle ownership and operating costs of federal residential, commercial, and industrial buildings, in order to determine if energy-efficiency improvements were cost effective.⁵¹²

Exactly one year after President Carter's executive order, it was clear that this effort was running headlong into the shoals of implementation. In a sharply worded letter dated July 20, 1978, the head of the General Accounting Office criticized the Secretary of Energy for abandoning an earlier, comprehensive plan for overseeing and administering agency efforts to improve the energy efficiency of buildings they own or lease – a draft plan that GAO itself favorably reviewed, with some

⁵¹¹ Pub. L. No. 94-163, §§ 381-383, 89 Stat. 939 (1975).

⁵¹² James Earl Carter Jr., "Energy Policy and Conservation," Exec. Order No. 12,003 (July 20, 1977).

constructive criticism, just six months before.⁵¹³ The later GAO report bluntly states, “A comprehensive 10-year plan is not being developed,” and “Program management and leadership responsibilities need to be fulfilled.”⁵¹⁴ The critiques provide a laundry list of classic bureaucratic obstacles and foot-dragging: the relevant agency within the Department of Energy was 20% underfunded and located in a distant branch of the org chart, the Department of Energy shifted from developing a comprehensive plan to providing “guidelines” for each federal agency to develop their own 10-year conservation plan, the scope was narrowed from all federally-owned or leased buildings to just those owned by the government, and DOE cited the issuance of EO 12003 and the prospective National Energy Act as making the original, more comprehensive plan outdated.⁵¹⁵

Despite this early hiccup, a steady stream of legislation and executive orders between the 1980s through the 2010s built on previous government-wide energy efficiency requirements. Collectively, they enabled various contracting and procurement tools for energy efficiency and renewable energy, and created the bureaucratic and institutional infrastructure necessary to support and expand federal building energy efforts. Table 6 provides a comprehensive overview of the statues and executive orders

⁵¹³ Monte Canfield Jr., *Report to Secretary, Department of Energy* (EMD-78-89) (Washington, DC: U.S. General Accounting Office, July 1978), <http://www.gao.gov/assets/130/123350.pdf>; General Accounting Office, *Evaluation of the Plan to Conserve Energy in Federal Buildings Through Retrofit Programs* (EMD-78-02) (Washington, DC: U.S. General Accounting Office, December 1977), <http://gao.gov/assets/130/120923.pdf>. The Secretary of Energy at the time was James Schlesinger, who had previously been Director of the CIA the Secretary of Defense under President Nixon, until his dismissal as Secretary of Defense by President Ford in 1975.

⁵¹⁴ Canfield, *Report to Secretary*, 1; 4.

⁵¹⁵ Canfield. The resulting 1978 law, the National Energy Conservation Policy Act (Pub. L. No. 95-619, 92 Stat. 3206 (1978)) established some modest retrofitting programs, encouraged the use of solar and other renewable energy technologies, and mandated an annual report on the energy consumption of federal buildings.

setting various goals and mandates for federal agency facility energy use from 1980-2015. Despite a rapid drop-off of interest within DOD in the 1970s, these government-wide efforts required some level of participation from the Department of Defense, the largest user of energy within the federal government.

Table 6: Selected Federal Government-wide Facility Energy Requirements, 1980-2015

Statute or Executive Order	Selected Installation Energy Requirements
Federal Energy Management Improvement Act of 1988, P.L. 100-615.	<ul style="list-style-type: none"> • 10% reduction in federal building energy intensity from FY1985 baseline by FY1995
Energy Policy Act of 1992	<ul style="list-style-type: none"> • Required building energy standards and energy efficiency measures that are “technologically feasible and economically justified.” • Required a 20% reduction in federal building energy intensity from a FY1985 baseline by FY2000 (had previously been a “goal”) • Mandated installation of all energy- and water-conservation measures with a <10-year payback period by January 1, 2005 • Authorized federal Energy Savings Performance Contracts (ESPCs) up to 25 years long
Executive Order 13123, June 3, 1999 ⁵¹⁶	<ul style="list-style-type: none"> • 30% reduction in greenhouse gases from 1990 levels by 2010 • 30% reduction in energy intensity from 1985 levels by 2005, 35% reduction by 2010 • “strive to procure” electricity from renewable sources • “strive to install” 2,000 rooftop solar panels by 2000, and 20,000 by 2010, as part of the Million Solar Roofs initiative to encourage renewable energy

⁵¹⁶ William J. Clinton, “Greening the Government Through Efficient Energy Management,” Exec. Order No. 13,123 (June 3, 1999).

	<p>announced in 1997</p> <ul style="list-style-type: none"> • general efforts to reduce petroleum and conserve water • annual report and implementation plan • required designation of agency officials and energy management teams responsible for coordinating with the Federal Energy Management Program
Energy Policy Act, 2005	<ul style="list-style-type: none"> • mandated use of advanced meters in federal buildings by the beginning of FY2013 • required further reductions in energy intensity by 20% by FY2015, relative to a FY2002 baseline • New federal buildings must be 30% more efficient than previous standards • Committed the federal government to utilize increasing proportions of renewable energy sources for electricity, rising from 3% to 7.5% by FY2013
Energy Independence and Security Act (EISA) 2007	<ul style="list-style-type: none"> • required deeper reductions in building energy intensity of 30% by FY2015, relative to a FY2005 baseline • mandated agencies to designate a facility energy manager, and begin to implement any lifecycle-cost effective energy efficiency programs, and ensure life-cycle cost effectiveness of major equipment replacements • Reduce fossil fuel use in new federal buildings by 55% by FY2010, relative to FY2003, progressing to zero fossil fuel use by 2030 • Made permanent authorization for ESPCs, allowed more flexible financing of ESPCs, and directed DOD to study ESPC's for non-building applications • Mandated internal energy and water evaluations every four years, and periodic audits of federal green building performance • Metering of natural gas and steam usage by FY2017
Executive Order 13423,	<ul style="list-style-type: none"> • Reduce energy intensity by 3% annually or 30% by

<p>January 24, 2007⁵¹⁷</p>	<p>end of FY2015, compared to FY2003 baseline</p> <ul style="list-style-type: none"> • Reduce vehicle fleets' total consumption of petroleum by 2% annually through the end of FY2015, compared to FY2005 baseline • Ensure that 50% of renewable energy used comes from new sources • Reduce water consumption intensity by 2% annually or by 16%, by FY2016, compared to FY2007
<p>Executive Order 13514, October 5, 2009⁵¹⁸</p>	<ul style="list-style-type: none"> • Requires reductions of greenhouse gas emissions from the agency's own use, and from energy generation of 28% by FY2020, relative to FY2008 • Reducing petroleum used in vehicle fleets by 2% annually through FY2020, compared to FY2005 • Reductions in potable water intensity of 2% annually or 26% total, by FY2020, relative to FY2007, and reductions in other water intensity of 2% annually, or 20% total, by FY2020 relative to a FY2010 baseline • Implementation of high-performance building standards by FY2020, including requiring that all new buildings be net-zero energy by FY2030
<p>Executive Order 13693, March 19, 2015⁵¹⁹</p>	<ul style="list-style-type: none"> • Raised goals for federal use of renewable energy for electricity to 30% by FY2015 • Further reductions in facility energy intensity of 25% by FY2025, from a FY2015 baseline • Further reductions in potable and non-potable water intensity of 30% and 40% by FY2025, from FY2008

⁵¹⁷ George W. Bush, "Strengthening Federal Environmental, Energy, and Transportation Management," Exec. Order No. 13,423 (January 24, 2007).

⁵¹⁸ Barack H. Obama, "Federal Leadership in Environmental, Energy, and Economic Performance," Exec. Order No. 13,514 (October 5, 2009).

⁵¹⁹ Barack H. Obama, "Planning for Federal Sustainability in the Next Decade," Exec. Order No. 13,693 (March 19, 2015).

	<p>and FY2010 baselines, respectively</p> <ul style="list-style-type: none"> • Reductions in greenhouse gas emissions from agency’s own use and from agency power generation of 40% by FY2025 from a FY2008 baseline, and from indirect emissions of 28%
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DOD incorporated these various installation energy requirements into official policy. DOD Instruction 4170.11 lays out DOD’s installation energy policy, responsibilities, goals, and resources for implementation. First issued in 2004, with slight updates in 2005, the 2009 revision expanded DOD’s energy policy to include energy security and resilience. Overall, this DOD instruction is a comprehensive framework for managing DOD’s installation energy.⁵²⁰ It describes DOD’s installation energy policy as complying with legislative and executive mandates on energy, with a secure, safe, reliable and efficient utility infrastructure, effective and efficient utilities procurement, maximized energy and water conservation efforts, cost-effective renewable energy, applicable to all facilities that use U.S. funding (not just domestic bases, or U.S.-owned bases), and incorporating readiness and sustainability in energy management practices. Equally sweeping is the list of responsibilities. For example, the military services are required to “provide program and budget funds sufficient to meet energy and water conservation goals,” report on progress in meeting metrics, develop and staff energy management programs to maximize efficiency, develop qualified energy managers, and encourage energy awareness among their service, to include how energy conservation relates to operational readiness. In the main, this policy document substantially reflects congressional action requiring energy conservation both government-wide (through the EPACT of 2005 and the Energy Independence and Security Act of 2007) and through the annual NDAA process.⁵²¹

Pentagon-specific Installation Energy Requirements

Against this broader background of federal government energy efficiency initiatives, the few DOD-specific provisions enacted by Congress between 2004-2013 played a supporting role. None of the defense energy-specific provisions adopted by Congress set new energy efficiency requirements for DOD beyond those already mandated for

⁵²⁰ The original 2004 instruction is not available. See instead Department of Defense, Under Secretary of Defense (Acquisition, Technology and Logistics), *Installation Energy Management* (Department of Defense Instruction 4170.11) (Washington, DC: Department of Defense, November 22, 2005); *Installation Energy Management* (Department of Defense Instruction 4170.11) (Washington, DC: Department of Defense, December 11, 2009).

⁵²¹ The installation energy provisions that were advanced through the NDAA are codified at 10 U.S.C. § 2911.

all federal agencies. Rather, the provisions enacted fall into three broad categories: provisions that required DOD installation energy goals and a master plan to achieve them, affirming and extending DOD's requirement to report on its facility energy use, and provisions that authorized different funding mechanisms for DOD's energy efficiency initiatives.⁵²² The energy performance goals, energy performance master plan, and annual energy management report were all extensions of the extant requirements of all federal agencies. However, at over 50% of the total federal government's facility energy use, improvements at DOD would have the greatest impact.⁵²³

Energy reporting

Apparently operating on the principle that “what gets measured, gets managed,” Congress spelled out detailed energy reporting and plan requirements in three main provisions, not connected to any of the specific legislative efforts described in Chapter 3.⁵²⁴ Included in the committee's mark and reported by the SASC under both Republican and Democrat, they can be assumed to have broad bipartisan support within the committee. The length and specificity of the reporting requirements

⁵²² The requirement for DOD installation energy goals and a master plan to achieve them was codified at 10 U.S.C. § 2925, while the various reporting requirements were codified at 10 U.S.C. § 2911, and most energy-related procurement requirements were codified at 10 U.S.C. §§ 2922-2922(h).

⁵²³ As a share of overall federal facility energy use, DOD's energy use by Btus has fallen from 73% in 1975 to 56% in 2015. Data available from the Department of Energy Office of Energy Efficiency and Renewable Energy (see “Site-Delivered Energy Use, Costs, and Gross Square Footage of Federal Facilities by Agency” (A-3) in *Comprehensive Federal Annual Energy Performance Data*, <http://ctsedweb.ee.doe.gov/Annual/Report/SiteDeliveredEnergyUseCostsAndGrossSquareFootageByAgency.aspx>).

⁵²⁴ Pub. L. No. 109-364, § 2851, 120 Stat. 2489 (2006); National Defense Authorization Act for Fiscal Year 2010, Pub. L. No. 111-84, § 332, 123 Stat. 2257 (2009); Pub. L. No. 111-383, § 2832.

describes congressional dissatisfaction with the status quo of DOD's demonstrated commitment to reducing its energy use. For example, DOD was specifically directed to consider how to reduce its current energy use, avoid future energy use, pursue conservation and alternative energy, consider cost-effectiveness, and incentivize energy conservation among servicemembers, and describe progress towards the energy goals and the specific actions taken and their resulting energy savings. One of these provisions even took the step of enumerating energy efficiency projects for consideration, which "at a minimum" were to include efficient HVAC systems, energy efficient appliances, wall insulation, thermal windows, electric meters, and building energy data systems. Apparently skeptical about DOD's compliance with the report, the accompanying committee report directed GAO to review DOD's energy report for completeness and responsiveness.⁵²⁵

The Pentagon's energy reporting has definitively improved. The FY1998 Annual Energy Management Report was a scanty 14 pages, while the FY2015 version was 75 pages, not counting voluminous appendices. More important than the length, the utility of the information in the FY2015 report is far greater. It provides actual data for the Pentagon's energy use, energy intensity, renewable energy use, financing for energy efficiency projects with appropriations and third-party funds, and lists the overall energy intensity of each DOD installation. Three new axes of reporting are particularly salient – an overview of DOD's compliance with all of the extant congressional reporting requirements, an at-a-glance snapshot of DOD's performance

⁵²⁵ House Armed Services Comm., National Defense Authorization Act for Fiscal Year 2010, H.R. Rep. No. 111-166 pt. 1, at 304 (2009).

on the various federal energy and environmental requirements, and a methodical approach to describing the performance of each of the services and the Department individually for each energy performance reporting area. The greater depth of reporting allows for a far higher level of scrutiny and oversight in a way that had not been previously possible. Some of the Pentagon's growing reporting responsiveness must be attributed to the spur provided by President Bush's Executive Order 13423.⁵²⁶ In addition to broad federal government requirements for energy reductions and encouragement of renewable energy, it specifically required annual energy reports from the Department of Defense through 2010, in compliance with a 2001 legislative mandate.⁵²⁷ This reporting requirement appears to have been taken to heart – DOD's level of detail in the annual energy management report shot up for the FY2007 report, published in January 2008.⁵²⁸

⁵²⁶ Exec. Order No. 13,423.

⁵²⁷ The Bush Administration's energy policy overall was largely shaped by a desire to increase American energy independence, including by improving energy efficiency. President Bush addressed this theme briefly in his 2007 State of the Union address, and issued Executive Order 13423 the following day. By contrast, climate change and reducing carbon dioxide emissions, was to some degree compelled by the public attention to the report of the International Commission on Climate Change, released in March 2007, and the landmark case, *Massachusetts v. Environmental Protection Agency*, decided April 2, 2007, which found that the EPA could properly regulate carbon dioxide emissions under the Clean Air Act. Executive Order 13432, which obligated the Department of Energy and the EPA to coordinate with other federal agencies that would be impacted by federal regulations on carbon dioxide emissions from vehicles, was issued on May 16, 2007. The energy reporting requirement was pursuant to subsection 317(e) of the FY2002 NDAA (Pub. L. No. 107-107, 115 Stat. 1012 (2001)). Section 317(e) in the FY2002 NDAA was itself a congressional codification of the agency reports on meeting the greenhouse gas, energy efficiency, renewable energy, and other environmental goals required by Section 303 of Executive Order 13123, issued by President Clinton on June 3, 1999.

⁵²⁸ Department of Defense Office of the Deputy Under Secretary of Defense (Installations and Environment), *Annual Energy Management Report, Fiscal Year 2007* (Washington, DC: Department of Defense, January 2008), <http://www.acq.osd.mil/eie/Downloads/IE/FY%202007%20AEMR.pdf> (henceforth AEMR FY2007).

This improvement in the level and detail and utility of DOD's installation energy reporting was enabled, at least in part, by the consistency of congressional oversight – these reporting requirements were incrementally expanded on over several years. At least some in the HASC and SASC and SAC-D and HAC-D appear to be invested in continued oversight and scrutiny of the Pentagon's energy usage. One of the requirements in the report accompanying the FY2016 DOD appropriations bill mandated that the Pentagon report the dates of the latest energy audits and follow-up actions taken for its ten most energy-intensive installations – information faithfully presented in the FY2015 energy report, published in June 2016. Additionally, these congressional reporting requirements were able to piggyback on the exiting Annual Energy Management Report, which already captured at least some information on DOD's installation energy use. This existing report proved an easy scaffold on which to hang the additional information mandated, like renewable energy use and third-party financing, rather than creating a fragmented series of new annual reports that would have had to compete with offices' existing workload for attention.⁵²⁹

Energy meters

DOD was required to install power meters by the Energy Policy Act of 2005. In 2011, unsatisfied with the Pentagon's progress and use of meter data, Congress required DOD to capture and track the information and to install meters on Navy

⁵²⁹ The office responsible for the report, the Deputy Secretary of Defense for Installations and Environment, was already devoting substantial staff work time to creating the annual report. For example, the FY2010 report cost a total of \$633,321 in DOD staff time (Department of Defense Office of the Deputy Under Secretary of Defense (Installations and Environment), *Department of Defense Annual Energy Management Report, Fiscal Year 2010* (Washington, DC: Department of Defense, July 2011), <http://www.acq.osd.mil/eie/Downloads/IE/FY%202010%20AEMR.pdf>).

piers to track ships' power usage while docked.⁵³⁰ These requirements were enacted on December 31, 2011. Within four months, on April 17, 2012, the Deputy Secretary of Defense directed the services and DOD agencies to increase the metering of their facilities.⁵³¹ Within six months, Dorothy Robyn, the Deputy Under Secretary of Defense for Installations and Environment, had convened a working group of service and OSD installation energy managers and developed a Pentagon-wide Enterprise Energy Information Management framework that would provide the common framework and systems to enable the collection, tracking, analysis and decision-making based on smart meter data.⁵³² The following spring, the Deputy Under Secretary of Defense issued a memorandum mandating that all DOD organizations install advanced meters on enough buildings to: capture 60% of electricity and natural gas use, capture 85% of use by FY2020, and begin metering potable and non-potable water use. Within a year, the services were instructed to come up with a plan to meter their installations, and a plan to use the data generated by the advanced meters to manage their energy and water use.⁵³³

⁵³⁰ Pub. L. No. 112-81, § 2827, 125 Stat. 1694; § 2828, 125 Stat. 1694. The data capture and tracking requirement was also a provision in the 2011 DODESA bill, discussed earlier.

⁵³¹ Deputy Secretary of Defense, instruction given at April 17, 2012 Deputy's Management Group Meeting, as referenced in John Conger (Acting Deputy Under Secretary of Defense (Installations and Environment)), "Utilities Meter Policy" (Memorandum, April 16, 2013), <http://www.denix.osd.mil/references/dod/policy-guidance/16-apr-13-odusd-policy-memo-on-utilities-metering-policy/>.

⁵³² Dorothy Robyn (Deputy Under Secretary of Defense (Installations and Environment)), "Enterprise Energy Information Management Vision" (Memorandum, June 26, 2012), <http://www.acq.osd.mil/eie/Downloads/IE/Robyn%20Memo%20with%20Final%20EEIM%20High%20level%20vision.pdf>.

⁵³³ Conger, "Utilities Meter Policy."

The FY2012 requirement that DOD actually utilize the information from the meters they had already been required by statute to install, with brisk DOD policy responses, appears on the surface to have been a successful spur to action. However, the EPA Act of 2005 had already mandated utility meters with remote and interval reading capabilities, and DOD had already incorporated this mandate into official policy.⁵³⁴ This initial metering effort was patchy, and there was only a limited subsequent effort to use the data to manage energy and water use. By September 2012, 75% of DOD buildings had regular or advanced electricity meters, but these meters captured only 53% of electricity usage.⁵³⁵ By the end of FY2015, DOD had reached the goal of having all buildings metered for electricity. However, the percentage of electricity captured by advanced meters dropped from 37% in FY2011 to 23% in FY2015. Part of this was due to reductions in electricity use after advanced meters were installed. Total electricity use in facilities with advanced meters dropped from 35,326 BBTU in FY2011 to 22,655BBtu in FY2015, suggesting that advanced meters were impactful in reducing DOD electricity usage. However, there is clearly still substantial room for improvement in installation of advanced meters in using meters' data to reduce energy use.

Although Congress required the Navy to install pier-side electricity meters in 2011, portions of the Navy had already been using metering of ships powered by shore power at piers to optimize and reduce the ships' energy demand as early as 2007,

⁵³⁴ Department of Defense, *Installation Energy Management*.

⁵³⁵ Department of Defense, *AEMR FY2011*, 56-57.

when Naval Base San Diego (the fourth-largest Navy base) began a pilot program to energy consumption and costs of moored ships.⁵³⁶ The program achieved energy use reductions of about 20%. The Navy's Pacific Fleet hired an energy manager in 2009, tasked with reducing ships' energy usage underway and moored in port.⁵³⁷ In 2010, in order to disseminate the lessons learned to other Navy bases, Naval Base San Diego issued a Shipboard Shore Energy Management Handbook with detailed guidance and best practices on how to reduce moored ships' electricity demand.⁵³⁸ Explicitly drawing on these best practices, the Navy's Pacific Fleet installed pier-side electrical meters at Navy Base Pearl Harbor (the second largest Navy base) to start actively managing ship' shore electricity usage. In December 2011, the Navy issued an official shore energy policy to support Secretary Mabus' goal of using renewable energy for 50% of shore energy demand by 2020.⁵³⁹ Reducing energy consumption would be necessary to meet that goal, and the shore energy policy explicitly called for "utilizing actual meter data to affect change."⁵⁴⁰ The Chief of Navy's Operations' June 2012 "Shore Energy Management" instruction also called for all ship berths to

⁵³⁶ U.S. Navy, "Shipboard Shore Energy Management Program" (Fact Sheet) (Washington, DC: U.S. Navy, September 2011), http://greenfleet.dodlive.mil/files/2011/09/20110830_ShipboardShoreEnergyManagementEnergyFactsheet.pdf.

⁵³⁷ U.S. Navy, "Pacific Fleet Targets Shipboard Power Use with Meter Technology," *Currents* (Fall 2011), http://greenfleet.dodlive.mil/files/2011/10/Fall11_PACFLT_Shipboard_Power_Use.pdf.

⁵³⁸ U.S. Navy, "Pacific Fleet Targets Shipboard Power Use"; *Shipboard Shore Energy Management Handbook* (Washington, DC: U.S. Navy), http://www.iencon.com/PDF_FILES/ssem_handbook/SSEM_Handbook.pdf.

⁵³⁹ U.S. Navy, "The Department of the Navy's Energy Goals" (web page), http://www.navy.mil/features/Navy_EnergySecurity.pdf (accessed September 20, 2017).

⁵⁴⁰ Tom Hicks, Office of the Assistant Secretary of the Navy (Energy, Installations, and Environment), "SECNAV Shore Energy Policy" (Memorandum, December 1, 2011), <http://www.secnav.navy.mil/eie/ASN%20EIE%20Policy/ShoreEnergyPolicy.pdf>.

be metered.⁵⁴¹ While Congress's FY2012 for Navy pier energy monitoring may have reinforced the Navy's efforts, Secretary Mabus had already been making the Navy's energy use a major focus, and significant efforts to use pier-side meters to reduce ships' energy demand were already underway when the FY2012 legislative requirement was enacted.

Energy project financing

The final strain of congressional action focused on giving DOD broader authority to utilize an array of financing mechanisms to pay for energy efficiency initiatives. Step by step, Congress added project financing tools like longer-term power purchasing agreements, recouping and reinvesting savings from energy conservation into more energy conservation projects, simplified contracting for energy savings performance contracts (ESPCs), utility energy service contracts (UESCs), enhanced-use leases (EULs), and participation in demand management programs run by utility providers. Reported out of the Senate Armed Services Committee, chaired by Sen. John Warner (R-VA), the FY2007 NDAA included a major reorganization of the Pentagon's energy efficiency authorities, mandated defense energy performance goals, and gave the Pentagon new authorities, including taking advantage of utility demand management incentive payments.⁵⁴² The Pentagon was also required to issue clear guidance on how to finance renewable energy projects, ensure that this guidance was disseminated across the Pentagon, to report to Congress on how its energy efficiency

⁵⁴¹ Office of the Chief of Naval Operations, *Shore Energy Management* (OPNAV Instruction 4100.5E) (Washington, DC: U.S. Navy, June 22, 2012), <http://greenfleet.dodlive.mil/files/2012/07/OPNAVINST-4100.5E.pdf>.

⁵⁴² Pub. L. No. 109-364, § 2851, 120 Stat. 2489 (2006).

projects were financed.⁵⁴³ Later, this requirement was expanded to include reports on the success of energy savings performance contracts, including the amounts spent, the amount of private sector financing leveraged, and the total energy savings that resulted.⁵⁴⁴ Perhaps the most important effort was a mandate that DOD train all of its energy managers in energy contracting and third-party financing, renewable portfolio standards, current renewable energy technology options, energy audits, and strategies for reducing energy consumption.⁵⁴⁵

These efforts represented bona-fide bipartisan efforts to stretch DOD's dollars.⁵⁴⁶

They also involved behind-the-scenes discussions of ways of enabling DOD's investment in long-term arrangements, like energy saving performance contracts or long-term power purchase agreements, in order to secure lower rates and finance

⁵⁴³ Provisions included in the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Pub. L. No. 108-375, § 1090, 118 Stat. 2067 (2004); Pub. L. No. 109-364, § 2851; § 2853, 120 Stat. 2496; Pub. L. No. 111-84, §2843, 123 Stat. 2681; and the National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, §§ 2824-2825, 126 Stat. 2153-2154 (2013).

⁵⁴⁴ Pub. L. No. 111-84, § 332, which originated in S. 1390, 111th Cong. § 332 (as reported by the Senate Armed Services Comm., July 24, 2009); National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239 § 2825, 126 Stat. 2154, added en bloc on the House floor after being proposed by Reps. Welch (D-VT) and Gardner (R-CO). Reps. Welch and Gardner are founding co-chairs of the House Energy Savings Performance Caucus, which advocates for greater federal use of ESCPs. See Darren Goode, "Energy Efficiency Push Underway," *Politico*, December 7, 2012, <http://www.politico.com/story/2012/12/gardner-welch-form-bipartisan-energy-efficiency-caucus-in-congress-084707>.

⁵⁴⁵ Pub. L. No. 112-81, § 2829. This provision was advanced by the HASC Readiness Subcommittee, and added in the Senate's version by Sen. Warner (D-VA) during floor debate.

⁵⁴⁶ Elements of this section draw on my direction observations of congressional efforts while working for the Congressional Research Service as a defense analyst. In keeping with this role, I am prohibited from discussing specific offices or individuals involved.

upfront costs of energy efficient systems or renewable power projects without having them “score” as a mandatory contractual outlay under the CBO’s rules.⁵⁴⁷

Echoing congressional concerns, some elements within the Pentagon also tried to spur greater use of innovative contracting arrangements for energy conservation and renewable energy. In January 2008, the Deputy Under Secretary of Defense for Installations and Environment highlighted the role of energy savings performance contracts and utility energy service contracts in achieving conservation targets in an official memorandum. This memorandum set a goal for the military services to finance energy projects equal to at least 10 percent of the prior years’ energy costs, but had no way of mandating that they hit that target⁵⁴⁸ The memorandum also illustrates Congress’ role in enabling these contracts, noting that these contract types had only recently been restored to DOD’s toolkit after a 2004 lapse in authorization to use them. In 2012, the Deputy Under Secretary of Defense for Installations and Environment issued a subsequent memorandum clarifying third-party finance

⁵⁴⁷ Any contract that would obligate DOD to pay money in the future, like in an ESCP or PPA, is considered mandatory future spending by CBO, and thus counts as a government outlay. However, savings from reduced energy bills would impact funding that is appropriated on an annual basis, and therefore savings can’t be assumed in the future years. For a detailed explanation of this issue related to scoring ESCPs, see Doug Elmendorf (CBO Director) in a letter to Representative Fred Upton (Chairman of the House Committee on Energy and Commerce), July 1, 2011, <https://www.cbo.gov/sites/default/files/112th-congress-2011-2012/reports/07-01-uptonltrespcs.pdf>.

⁵⁴⁸ Alex A. Beehler (Acting Deputy Under Secretary of Defense (Installations and Environment)), “Energy Savings Performance Contracts and Utility Energy Service Contracts” (Memorandum, January 24, 2008), http://www.acq.osd.mil/eie/Downloads/IE/espc_memo012408.pdf.

contracting procedures in response to Congress' FY2007 authorization of enhanced use leases and power purchasing agreements of up to 30 years.⁵⁴⁹

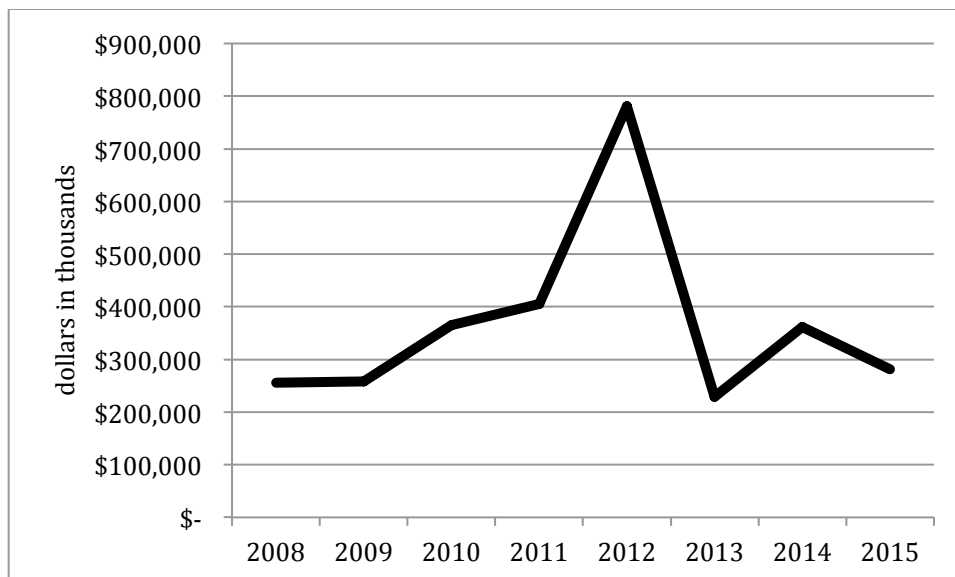
How much did the Pentagon use these new contract authorities, and how much money or energy did the Pentagon save? Between FY2008 and FY2015, the Pentagon awarded a cumulative \$2.9 billion in ESPCs and UESCs.⁵⁵⁰ Despite congressional interest in promoting DOD's use of third-party financing mechanisms for energy efficiency, DOD's ESPC and UESC contracting efforts were initially rather lethargic. A 2011 White House challenge to award at least \$2 billion in ESPCs within two years (later expanded to \$4 billion in awards by the end of 2016) prompted DOD to massively expand the use of ESPCs and UESCs.⁵⁵¹ With Presidential attention, DOD nearly doubled the value of the contracts awarded between FY2011 and FY2012, to just under \$800 million. However, this burst of contracting activity was short-lived. Awards fell to only \$228 million in FY2013, lower than any other years for which data are available, and have not recovered to near their previous highs. (see Figure 32)

⁵⁴⁹ John Conger (Deputy Under Secretary of Defense (Installations and Environment)), "Financing of Renewable Energy Projects Policy" (Memorandum, November 9, 2012), http://www.acq.osd.mil/eie/Downloads/IE/Policy_Financing%20of%20Energy%20Projects%20Nov2012.pdf. Enhanced use leases and power purchase agreements were permitted by Section 2851 of the FY2007 NDAA (Pub. L. No. 109-364) following an amendment made on the Senate Floor by Senator Menendez (NJ-D).

⁵⁵⁰ The Pentagon only began providing data on its awards of ESPC and UESCs in FY2008, and only began breaking it down by service and contract type in FY2010.

⁵⁵¹ The original \$2 billion ESPC goal was announced in a 2011 Presidential Memorandum (Barack H. Obama, "Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Savings," December 2, 2011, <https://obamawhitehouse.archives.gov/the-press-office/2011/12/02/presidential-memorandum-implementation-energy-savings-projects-and-perfo>).

Figure 32: DOD ESCP and UESC Awards, FY2008-FY2015



Data from Department of Defense Annual Energy Management Reports, FY2008-FY2015.

The Army was the clear leader, awarding over half of all of the Pentagon’s ESCP and UESCs contract awards between FY2010 and FY2015. The Navy’s contributions were negligible, while the Air Force only really awarded contracts in FY2012, following the Presidential directive. (See Figure 33) By contrast, the Army saved \$92.6 million in avoided energy costs and 3.4 million MBtus through energy saving performance contracts from FY2009 through FY2016.⁵⁵² The Energy Division of the U.S. Army Engineering and Support Center, in Huntsville, Alabama, was given the Army’s ESCP and UESC contracting duty in 2008.⁵⁵³ As this office was already in charge of the Army’s energy audits, utility rate negotiation, and renewable energy project financing, the Engineering and Support Center was set up for success. Part of the Army’s success was in their use of a new type of contract vehicle, the Multiple Award Task Order, which allowed for multiple ESCP awards under the same contract, greatly simplifying the contracting process. The most recent tranche of this ESCP multiple award task order was for up to \$1.5 billion.⁵⁵⁴ The Army’s Engineering and Support Center was so successful in ESCP contracting that they

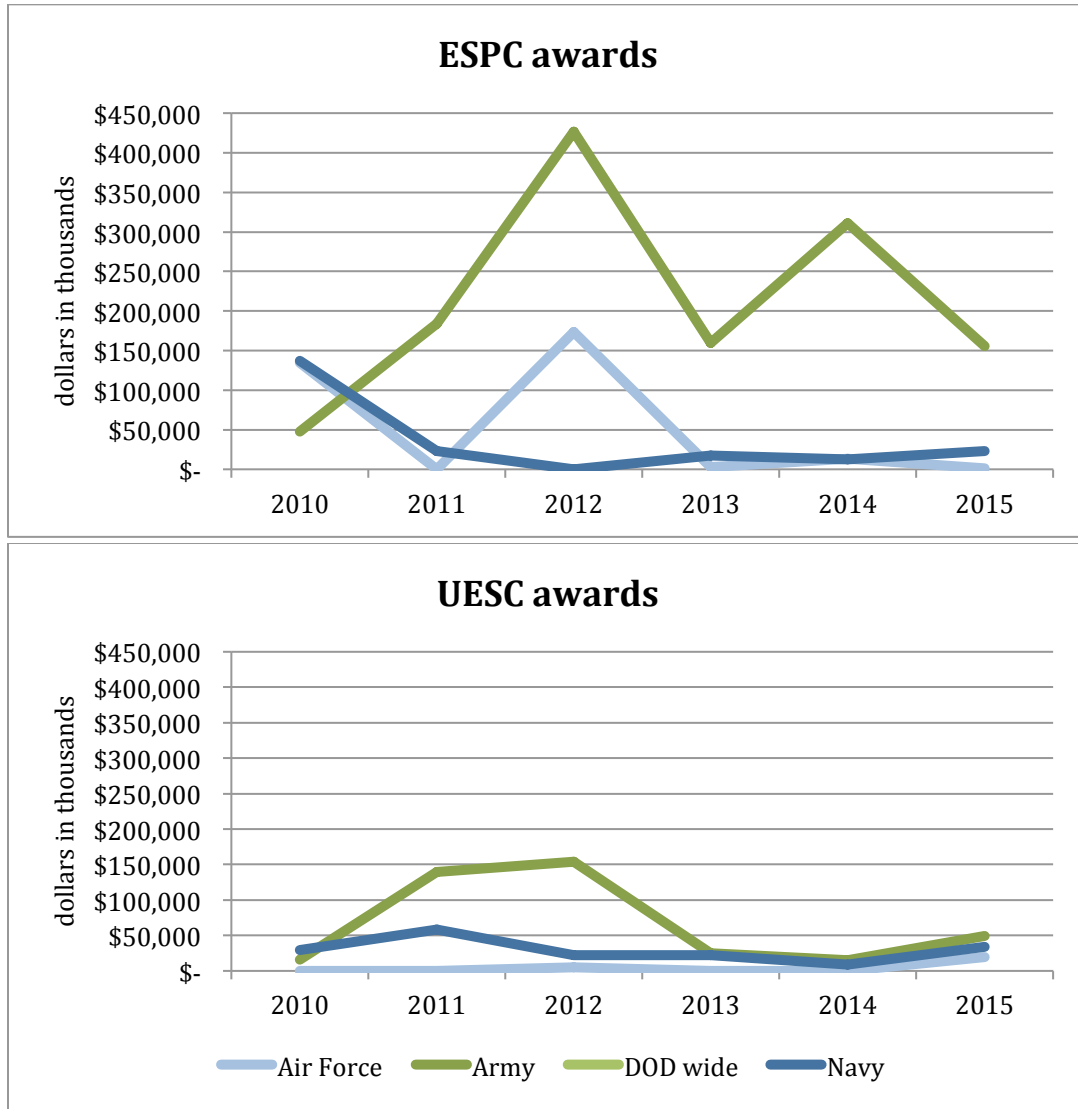
⁵⁵² U.S. Army Engineering and Support Center, “Energy Savings Performance Contracting” (Fact Sheet) (Huntsville, AL: U.S. Army Corps of Engineers, July 2016), <http://www.hnc.usace.army.mil/Portals/65/docs/PAO/Fact%20Sheets/2016%20Fact%20Sheets/ESPC07-16.pdf?ver=2016-07-15-160512-247>

⁵⁵³ U.S. Army, *Policy Guidance for Implementation of an Energy Savings Performance Contract*, (Washington, DC: U.S. Army, November 2008), http://army-energy.hqda.pentagon.mil/funding/docs/ESPC_policy_hdbk_v3_1108.pdf.

⁵⁵⁴ This contract vehicle is discussed in more detail in the subsequent section on renewable energy. U.S. Army Engineering and Support Center, “\$1.5 Billion ESCP MATOC Awarded to 14 Companies,” news release no. 15-038, May 11, 2015, <http://www.hnc.usace.army.mil/Media/News-Releases/Article/588348/15-billion-escp-matoc-awarded-to-14-companies/>.

were asked to share their expertise with the broader federal government via Department of Energy’s Federal Energy Management Program.⁵⁵⁵

Figure 33: ESPC and EUSC contracts awarded, FY2010-FY2015



Data from Department of Defense Annual Energy Management Reports, FY2008-FY2015.

Discussion

Even though it fell short of federal requirements, the Pentagon reduced its installation energy use and improved its energy intensity by FY2015 compared to the FY2003

⁵⁵⁵ U.S. Army Engineering and Support Center, “Army Corps of Engineers, Department of Energy Partner to Drive Down Federal Energy Costs,” news release no. 15-033, March 9, 2015, <http://www.hnc.usace.army.mil/Media/News-Releases/Article/579527/army-corps-of-engineers-department-of-energy-partner-to-drive-down-federal-ener/>.

baseline. (see Department of Energy, *Comprehensive Annual Energy Data and Sustainability Performance*.

Figure 24, *Figure 25*, and *Figure 27* in the previous chapter). However, these requirements were common across the federal government, rather than a specific goal for the Pentagon. Congress' defense installation energy efficiency provisions were minor tweaks to this long-standing federal framework. While more detailed reporting requirements improved congressional oversight ability, there was no indication that the committees actually used the annual reports and improved metrics to evaluate the Pentagon's energy efficiency progress. Similarly, Congress mandated that the Pentagon install and use advanced energy meters to improve energy efficiency, but there appears to have been little to no congressional follow-up after the 2011 provision became law. Congress' most significant impact on DOD's installation energy use was in giving DOD the authority to take advantage of ESPCs, UESCs, utility incentive programs, to reinvest energy savings into morale and welfare programs, and to use enhanced use leases, and other third-party financing, and insuring that energy managers were aware of these contracting tools. However, only the Army really took advantage of these capabilities.

Renewable Energy

Congressional Action

On a bipartisan basis, both the House and Senate Armed Services Committees pushed DOD to expand its use of renewable energy to meet its energy needs – particularly renewable energy that could be generated on military bases. Congress set clear DOD renewable energy use goals, and several times enacted clarifications or mandated reports on DOD’s progress:

- In 2006, in a floor amendment to the FY2007 NDAA, Sen. Menendez (D-NJ) called for a major expansion in DOD’s use of renewable energy to power its installations: a goal of 25% of all electricity by FY2025. The amendment also called for DOD to procure electricity from renewable sources whenever practicable. Although Republicans controlled the Senate, this measure passed by unanimous consent.⁵⁵⁶
- In 2009, both the HASC the SASC asked for a report on the status of DOD’s renewable energy installation efforts, progress towards the goal of using renewable energy for 25% of installation energy needs by 2025, any hurdles, and any legislative or administrative actions that would help the Pentagon reach these goals.⁵⁵⁷

⁵⁵⁶ Pub. L. No. 109-364, § 2852. The amendment was originally offered as Senate Amendment 4357 to S. 2766 (John Warner National Defense Authorization Act for Fiscal Year 2007, 109th Cong. (2006)).

⁵⁵⁷ Pub. L. No. 111-84, § 2846, 123 Stat. 2683.

- HASC also expanded the goal to be 25% of facility energy, not just electricity, and specified what was to count as renewable energy: solar, wind, biomass, landfill gas, ocean, geothermal, and new hydroelectricity efficiencies or capacity at existing hydroelectric plants.⁵⁵⁸
- In 2010, as part of the FY2011 NDAA, both the HASC and SASC continued their prompting for DOD to take greater strides in using renewable energy, reinforcing the role of renewable energy in meeting the variety of energy efficiency and energy security goals, and calling for a report on the impacts of renewable energy projects on military operations and military installations, designed to head off any objections that renewable energy projects could hurt training or readiness.⁵⁵⁹
- In the FY2012 NDAA, the HASC, by that point controlled by Republicans, tried to keep the Pentagon on track to achieve this ambitious 25% target. They mandated that the Pentagon should create an interim renewable energy goal for FY2018, as well as create a policy for purchasing renewable energy credits, within 180 days of the NDAA's enactment.⁵⁶⁰
- At the same time, HASC also mandated that DOD's purchase of renewable energy credits go through a central purchasing agent, to allow for bulk

⁵⁵⁸ Pub. L. No. 111-84, § 2842, 123 Stat. 2680.

⁵⁵⁹ Pub. L. No. 111-383, § 358, 124 Stat. 4198; § 2832.

⁵⁶⁰ Pub. L. No. 112-81, § 2823, 125 Stat. 1692.

purchasing leverage, and that all of DOD's renewable energy projects include energy security for DOD installations as a key consideration.⁵⁶¹

In parallel to these congressional actions, President Obama issued a challenge to each of the military services to contract for at least 1 GW of renewable energy in April 2012.⁵⁶² The Air Force aimed to meet this target by FY2016, the Navy by FY2020, and the Army by FY2025. In 2015, President Obama issued an executive order extending the DOD requirement to meet 25% of installation energy from renewable sources by FY2025 to other federal agencies. This executive order also extended the goal past FY2025, mandating that the government use renewable power to fulfill 30% of installation electricity needs by FY2030.⁵⁶³ DOD set its interim goal at 15% in FY2018.

Contracting authorities would be key to meeting these renewable energy targets. Renewable energy installations are capital-intensive, requiring up-front investment. While DOD could have used annual appropriations, the big up-front cost for renewable energy for 30 years is a difficult case to make to the appropriations committee, especially when the same funding could be used for ships or soldiers. Private industry could make the up-front investments, but only if they had a

⁵⁶¹ Pub. L. No. 112-81, § 2822, 125 Stat. 1691; § 2824, 125 Stat. 1694.

⁵⁶² The White House Office of the Press Secretary, "Obama Administration Announces Additional Steps to Increase Energy Security," The White House, April 11, 2012, <https://obamawhitehouse.archives.gov/the-press-office/2012/04/11/fact-sheet-obama-administration-announces-additional-steps-increase-ener>.

⁵⁶³ Exec. Order 13,693.

guaranteed consumer for the power they would generate, especially or DOD's more remote installations where other large customers are non-existent. The Pentagon had already had the authority to enter into 30-year agreements to buy power from energy produced by utilities on military installations or private land.⁵⁶⁴ Initially, only geothermal energy plans could be constructed on the approval of the Secretary of Defense. In 1987, the Navy brought its first – and still only – geothermal plant online, a 270 MW installation at Naval Air Weapons Station China Lake in the Mojave Desert. The limitation to geothermal was deleted in 1990, freeing DOD to contract for other types of renewable power without seeking explicit approval.⁵⁶⁵ However, this authority enter into long-term renewable power was rarely used. In the FY2008 NDAA, a Democratic SASC provision gave DOD authority to enter into 10-year contracts to purchase electricity generated from renewable sources.⁵⁶⁶ Although well-intentioned, this provision adds little to the existing 30-year authority.

Implementation

Despite the existing 25% renewable energy requirement and contracting authorities to make it happen, the Pentagon's renewable energy efforts only shifted into high gear

⁵⁶⁴ This contract type is a power purchase agreement (PPA). This authority was endowed by the 1982 Military Construction Codification Act (Pub. L. No. 97-214, 96 Stat. 153), and codified at 10 U.S.C. § 2922a. This provision only allows DOD to enter into 30-year agreements.

⁵⁶⁵ National Defense Authorization Act for Fiscal Year 1991, Pub. L. No. 101-510, 104 Stat. 1485 (1990).

⁵⁶⁶ National Defense Authorization Act for Fiscal Year 2008, Pub. L. No. 110-181, § 828 122 Stat. 229 (2008).

after President Obama's 1 GW challenge in April 2012, issuing guidance regarding financing of renewable energy policies in November 2012.⁵⁶⁷

The Pentagon dramatically increased its own renewable energy generation capability, but only slightly increased its total use of renewable energy. DOD added or planned to add about 621,000 MW of renewable energy generation capability between 2007 and 2017.⁵⁶⁸ DOD's on-site generation capability has increased nearly three-fold between FY2010 and FY2015, from 118,841 MW to 329,420 MW. (See Figure 34) DOD's overall use of electricity from renewable sources has remained relatively steady over the same timeframe, at about 1,120,000 MWh annually, suggesting that DOD-owned generation is supplanting the purchase of renewable energy generated elsewhere. (see Figure 35) When including both electric and non-electric renewable energy, DOD's renewable energy use topped 6,000,000 million Btu consistently after FY2011. (See Figure 36)

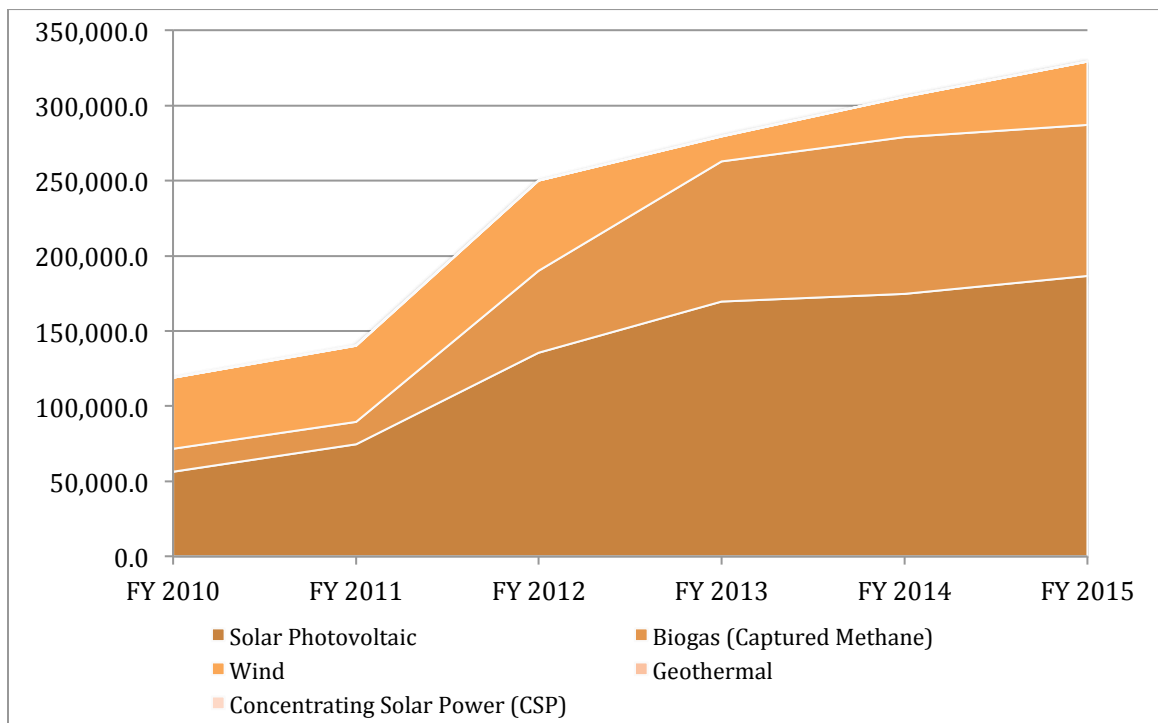
Each of the services included renewable energy generation projects in their strategic energy plans, specifically referencing the need to meet the congressional 25% goal and the 2012 White House 1GW challenge. But despite this increase in renewable energy generation capability, DOD's renewable energy use reached 12.6% of its

⁵⁶⁷ Conger, "Financing of Renewable Energy Projects." This incidentally fulfilled Section 2824 of the FY2013 NDAA (Pub. L. No. 112-239, 126 Stat. 2153), originally in the SASC mark of the bill (S. 3254, 112th Cong. § 2824, June 4, 2012), which required that DOD issue renewable energy project financing guidance, enacted in January 2013.

⁵⁶⁸ Department of Energy, Federal Energy Management Program, "Renewable Energy Projects at Federal Facilities" (web page), <https://energy.gov/eere/femp/renewable-energy-projects-federal-facilities> (accessed March 23, 2017; page no longer available).

overall facility energy use for FY2016. While this demonstrates progress since FY 2007, when just under 10% of its facility energy was from renewable sources, it lags behind the goal of 15% by FY 2018 and is far off pace for 25% by FY2025. ⁵⁶⁹ (See Figure 37)

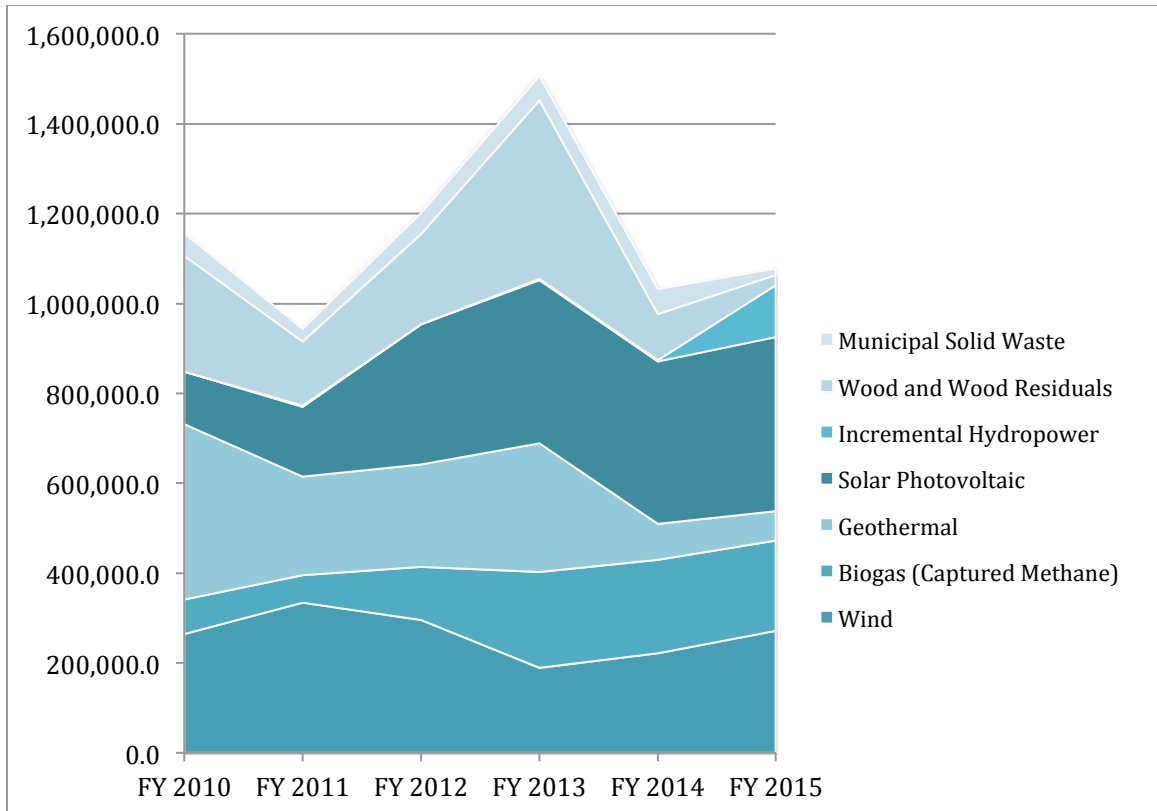
Figure 34: Department of Defense-Owned Renewable Electric Energy by Source (MWh)



Department of Energy, Federal Energy Management Program, “Renewable Energy Projects at Federal Facilities” (web page), <https://energy.gov/eere/femp/renewable-energy-projects-federal-facilities> (accessed March 23, 2017; page no longer available).

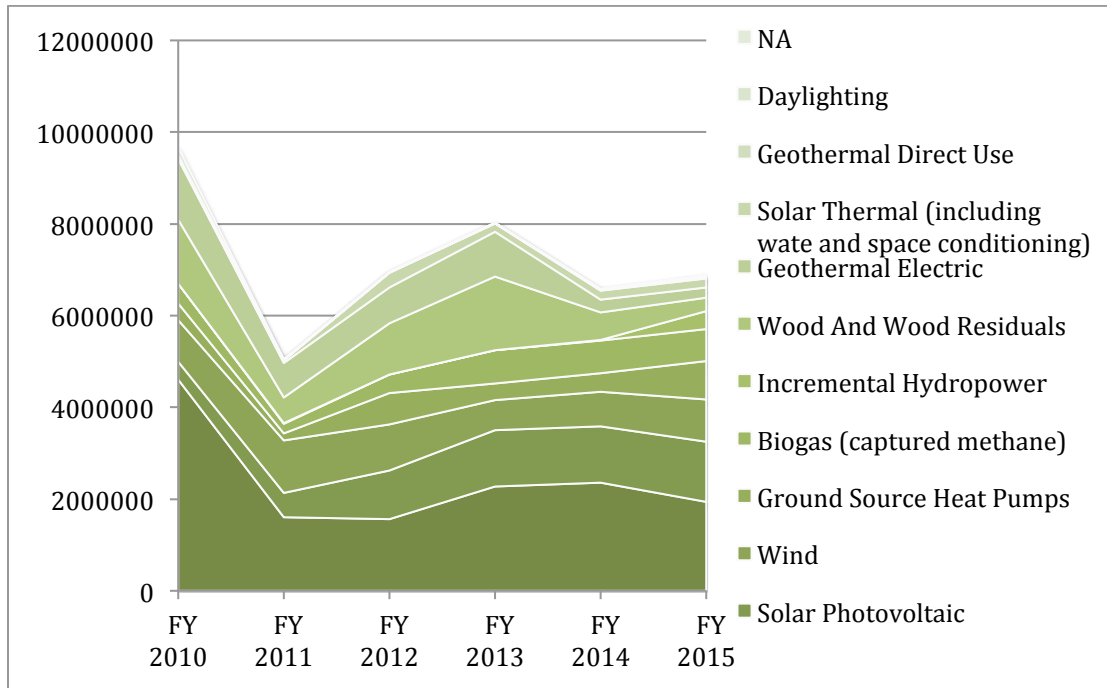
⁵⁶⁹ Department of Defense Office of the Assistant Secretary of Defense (Energy, Installations, and Environment), *Department of Defense Annual Energy Management and Resilience Report, Fiscal Year 2016* (Washington, DC: Department of Defense, July 2017), <http://www.acq.osd.mil/eie/Downloads/IE/FY%202016%20AEMR.pdf> (henceforth AEMRR FY2016).

Figure 35: Department of Defense All Renewable Electric Energy by Source (MWh)



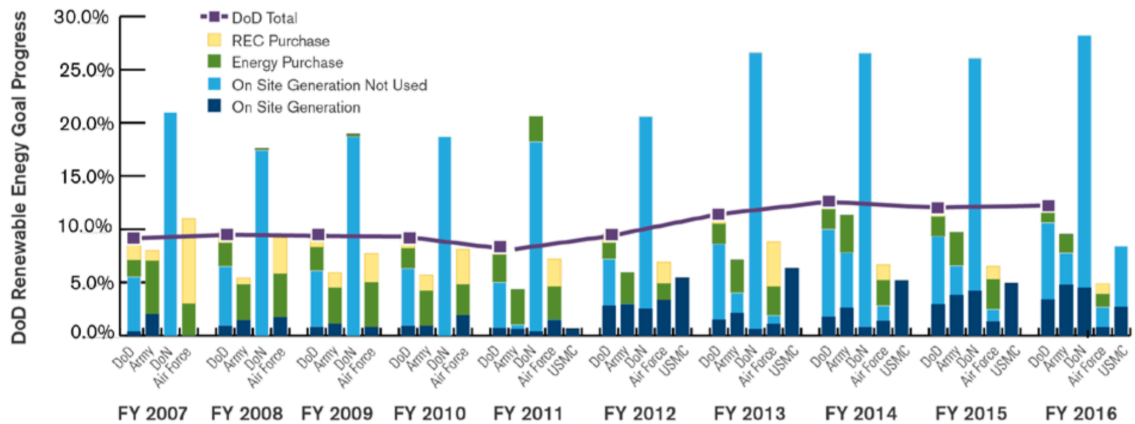
Department of Energy, "Renewable Energy Projects at Federal Facilities."

Figure 36: Department of Defense Total Renewable Energy (Electric/Non-Electric) by Source (Million Btu)



Department of Energy, "Renewable Energy Projects at Federal Facilities."

Figure 37: DOD 25% Renewable Energy Goal Attainment



Department of Defense Office of the Assistant Secretary of Defense (Energy, Installations, and Environment), *Department of Defense Annual Energy Management and Resilience Report, Fiscal Year 2016* (Washington, DC: Department of Defense, July 2017), 32, <http://www.acq.osd.mil/eie/Downloads/IE/FY%202016%20AEMR.pdf>; 10 U.S.C. §2911(e).

Notably, the Navy's renewable energy efforts were overwhelmingly characterized as responsive primarily to Secretary Mabus' 1 GW challenge, announced in January

2012 President Obama's State of the Union address, secondarily to President Obama's challenge that each of the services realize 1 GW in renewable energy capacity, and only intermittently to the congressional requirement to have renewable energy meet 25% of installation energy needs.

The Navy announced the 1GW Task Force in January 2012.⁵⁷⁰ Helmed by the Navy's Assistant Secretary for Installations and Environment, Jackalyne Pfannensteil, the task force released a renewable energy strategy in October 2012, focusing on large-scale renewable generation projects, arguing that the Navy would have to go big to meet Secretary Mabus' goal of 50% of shore energy from renewable sources.⁵⁷¹ The strategy also laid out a clear implementation plan: each Navy installation meet Secretary Mabus' 50% renewable energy goal, and the Shore Energy Policy Board would locate additional viable large-scale renewable energy projects, and local commands and installations were tasked with identifying smaller projects (< 20MW). As of October 2012, the Navy had 271 MW of renewable energy capacity installed, and another 48MW in awarded projects, for a total of 319 MW. The Navy rapidly declared victory, claiming that the Renewable Energy Program Office, established in 2014, had over 1 GW of projects in the pipeline by the end of 2015.⁵⁷² The Renewable Energy Program Office details 14 contracted and completed projects, with a total generation capacity of 717 MW.⁵⁷³ Satisfied with their renewable energy contracting performance, the Navy in 2016 re-focused the office's mission, re-naming it the Resilient Energy Program Office, and adding energy security and resilience for Navy installations to the office's mission.⁵⁷⁴ Despite the Navy's declaration of victory, FEMP's accounting of the 400,000 MW worth of projects in the pipeline by FY2017 by is far short of the 1 GW goal. Still, the Navy's anticipated and contracted projects put it far ahead of the Air Force or the Army, accounting for about 63% of DOD's validated on-site renewable generation capacity. (see Figure 38).

Nevertheless, the Navy's renewable energy efforts have enabled the Department of the Navy to meet the 25% renewable energy generation goal in FY2015, FY2014,

⁵⁷⁰ Sam Shavers, "Navy's Commitment to Renewable Energy Takes the Nation's Center Stage," U.S. Navy, Story No. NNS120126-18, January 26, 2012, http://www.navy.mil/submit/display.asp?story_id=64995.

⁵⁷¹ 1 Gigawatt Task Force, *Department of the Navy Strategy for Renewable Energy* (Washington, DC: U.S. Navy, October 2012), <http://www.secnav.navy.mil/eie/Documents/DoNStrategyforRenewableEnergy.pdf>.

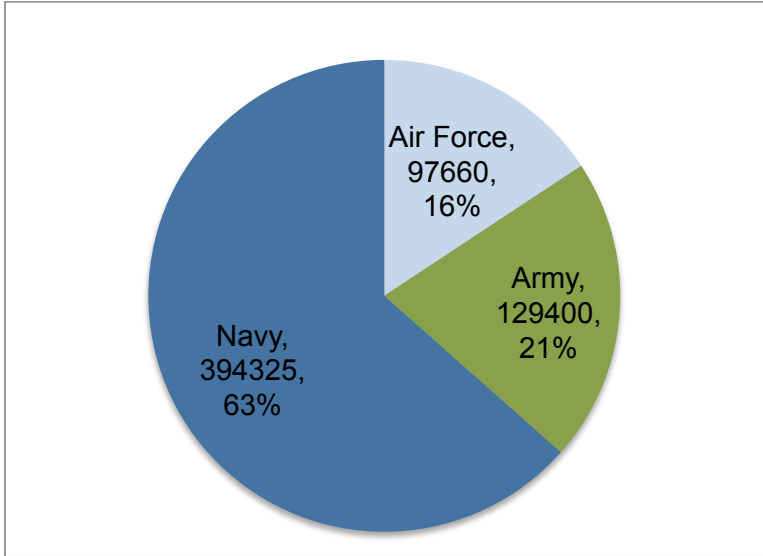
⁵⁷² John A. Kliem, "Renewable Energy Program Office" (PowerPoint presentation, Federal Utility Partnership Working Group, Cincinnati, OH, May 2016, https://energy.gov/sites/prod/files/2016/05/f32/fupwg_spring2016_kleim.pdf).

⁵⁷³ Resilient Energy Program Office, "Projects Page" (web page), <http://greenfleet.dodlive.mil/energy/repo-3/projects-page/> (accessed September 20, 2017).

⁵⁷⁴ Resilient Energy Program Office, "About" (web page), <http://greenfleet.dodlive.mil/energy/repo-3/> (accessed September 27, 2017); John A. Kliem, "FUPWG Fall 2016" (PowerPoint presentation, Federal Utility Partnership Working Group, Bellevue, WA, November 2, 2016, https://energy.gov/sites/prod/files/2016/11/f34/fupwg_fall16_kliem.pdf).

FY2015, and FY2016, far ahead of the FY2025 requirement. In FY2016, the Marine Corps reached 8.6%, and the Navy reached 28%, a steady improvement from about 20% in FY 2007. This high baseline is principally due to the Navy’s 270 MW geothermal plant at Naval Air Weapons Station China Lake, but an approximately 8% improvement is still substantial.

Figure 38: DOD On-site Renewable Energy Pipeline, 2007-2017



Department of Energy, “Renewable Energy Projects at Federal Facilities.”

The Army began focusing seriously on large-scale renewable energy projects in September 2011, establishing the Energy Initiatives Task Force, with a mandate to focus on pursuing opportunities for large-scale (>10 MW) renewable energy projects.⁵⁷⁵ The 168 different projects of 2011 had only advanced the Army 0.5% towards the 25% goal.⁵⁷⁶ In order to reach 25% renewable installation energy use by FY2025, the Army calculated that it would have to ramp up to 100 MW of large projects and about 20 MW of smaller projects annually by 2017 – a sharp break and steep learning curve from the previous approach, which focused exclusively on small-scale renewable projects.⁵⁷⁷ The Energy Initiatives Task Force secured an important early success – in September 2014 it was made permanent and renamed the Office of

⁵⁷⁵ Assistant Secretary of the Army (Installations, Energy, and Environment) Public Affairs, “U.S. Army Establishes Energy Initiatives Office Task Force for Large-Scale Renewable Energy Projects,” August 10, 2011, https://www.army.mil/article/63338/U_S__Army_establishes_Energy_Initiatives_Office_Task_Force_for_large_scale_renewable_energy_projects.

⁵⁷⁶ Assistant Secretary of the Army (Installations, Energy, and Environment), “Energy Initiatives Task Force” (PowerPoint presentation, ACORE Leadership Council, May 23, 2012, http://www.acore.org/wp-content/uploads/2012/06/EITF_ACORE-Presentation.pdf).

⁵⁷⁷ Assistant Secretary of the Army, “Energy Initiatives Task Force.”

Energy of Initiatives.⁵⁷⁸ In November 2014, it issued a best practices handbook for developing both small- and large-scale renewable energy projects.⁵⁷⁹ Similar to the Navy's 1 Gigawatt Task Force, this empowered office demonstrated strong results. As of March 2017, the Office of Energy Initiatives had 15 projects under contract, totaling 397 MW, and another 5 in the contract process, for a further 135 MW.⁵⁸⁰

The Army also created a first-of-its-kind contracting authority to purchase renewably generated energy, a \$7 billion, indefinite delivery/indefinite quantity contract under which multiple awards for renewable energy purchasing could be made.⁵⁸¹ In effect, this contract vehicle established a pool of pre-qualified bidders for renewable energy contracts for four technologies: geothermal, solar, wind, and biomass. In 2014, 90 companies received awards in the first round of contracting under this vehicle.⁵⁸² As of July 2016, the Army had identified or contracted for six projects, with a combined 56 MW of renewables generation, and was in the assessment stage for four more.⁵⁸³ Despite these renewable energy projects, the Army reached only 9.5% renewable energy towards the 25% goal in FY 2016, up just 2% from 7.5% in FY2007.⁵⁸⁴

The Air Force's efforts lagged both the Army and the Navy. The Civil Engineering Support Center was tasked with helming the Air Force's renewable energy efforts. In 2011, the Air Force anticipated a total investment of \$492 million in renewable energy projects between FY2010 and FY2016, 80% of which would come from 3rd party investments. This funding would grow the Air Force's renewable energy use to 1.5 million MWH, hitting about 9% of its overall installation energy use by

⁵⁷⁸ John M. McHugh (Secretary of the Army), *Establishment of the Office of Energy Initiatives* (Army Directive 2014-22) (Washington, DC: U.S. Army, August 1, 2014), http://www.apd.army.mil/epubs/DR_pubs/DR_a/pdf/web/ad2014_22.pdf.

⁵⁷⁹ U.S. Army Office of Energy Initiatives, *Army Guide: Developing Renewable and Alternative Energy Projects by Leveraging the Private Sector* (Washington, DC: U.S. Army, November 6, 2014), http://www.asaie.army.mil/Public/ES/oei/docs/2014_11_06_Army_Guide_to_Developing_Renewable_Energy%20Projects.pdf.

⁵⁸⁰ U.S. Army Office of Energy Initiatives, "Office of Energy Initiatives" (Fact Sheet) (Washington, DC: U.S. Army, February 2017), http://www.asaie.army.mil/Public/ES/oei/docs/fact%20sheet_OEI_15FEB2017.pdf.

⁵⁸¹ This Multiple Award Task Order Contract (MATOC) essentially notified the energy industry that there was a \$7 billion pot of money that the Army was setting aside to purchase renewable energy. Debra Valine, "USACE Announces New Action to Support Deployment of Renewable Energy on U.S. Military Installations," U.S. Army Engineering and Support Center, August 7, 2012, <https://www.army.mil/article/85114>.

⁵⁸² Assistant Secretary of the Army (Installations and Environment), "MATOC Renewable Energy Awards" (Fact Sheet) (Washington, DC: U.S. Army, October 7, 2014), http://www.asaie.army.mil/Public/ES/eitf/docs/FactSheet_MATOCAwardees.pdf.

⁵⁸³ U.S. Army Engineering and Support Center, "Power Purchase Agreement Program" (Fact Sheet) (Huntsville, AL: U.S. Army Corps of Engineers, July 2016), <http://www.hnc.usace.army.mil/Portals/65/docs/PAO/Fact%20Sheets/2016%20Fact%20Sheets/PPA07-16.pdf?ver=2016-07-07-093008-367>.

⁵⁸⁴ Department of Defense, *AEMR FY2007; AEMRR FY2016*.

FY2016.⁵⁸⁵ By 2014, with adjusted federal goals, the Air Force planned to use 2.1 million MWH of renewable electricity, far above the 1.5 million MWH required to meet the FY17 pro-rated requirement of 17%, on pace for the congressionally-mandated goal of 25% by FY2025.⁵⁸⁶ However, the pace of the Air Force's increased use of renewable energy lagged badly, hitting only 50-55% of the earlier projections in FY2013 and FY2014.⁵⁸⁷ By 2014, the Air Force had only 142 MW of total renewable energy generation capability, and another 114 of prospective projects in the pipeline.⁵⁸⁸ About 42MW of these projects appear to have been realized or underway as of December 2016. The Air Force diagnosed this underwhelming performance as the result of two main factors: multiple competing priorities for renewable energy projects, including meeting energy goals and reducing Air Force costs; and inefficiencies in the contracting process and a siloed, piecemeal approach.⁵⁸⁹ By FY2016, the Air Force had only reached 7.9% renewable energy generation.

Discussion

Based on the timing and scale of the renewable energy projects brought online, it was clear that the Navy's 1 Gigawatt Task Force and the Army's Energy Initiative Task Force were decisive in spurring the development of substantial renewable energy generation capability for their respective services. Only the Navy and Army made serious, focused efforts to pursue renewable energy projects on the scale that would be necessary to meet the 25% renewable energy requirement. Both services created specific offices whose sole mandate was pursuing large-scale (> 10 MW) renewable energy projects. These offices were able to develop the necessary expertise in

⁵⁸⁵ Ken Gray, "Air Force Renewable Energy Programs" (PowerPoint presentation, Federal Utility Partnership Working Group, Portland, OR, April 2011, https://energy.gov/sites/prod/files/2013/10/f4/fupwg_spring11_gray.pdf).

⁵⁸⁶ Air Force Civil Engineer Center, *Building the Air Force Renewable Energy Portfolio* (Lackland Air Force Base, TX: Air Force Civil Engineer Center, July 2014), <http://www.afcec.af.mil/Portals/17/documents/Energy/AFD-140722-006.pdf>

⁵⁸⁷ Air Force Civil Engineer Center, *Building the Air Force*.

⁵⁸⁸ Projects tallied from Air Force Civil Engineer Center, *Building the Air Force*.

⁵⁸⁹ Shawn Bennett (Office of the Assistant Secretary of the Air Force (Installations, Energy, and Environment)), "Energy as a Service," (PowerPoint presentation, Federal Utilities Partnership Working Group, Bellevue, WA, November 2, 2016, https://energy.gov/sites/prod/files/2016/11/f34/fupwg_fall16_bennett.pdf).

working with different installations, utility providers, renewable energy project developers, and contracting methodologies. The effectiveness of these offices was evident in their development of pipelines of renewable energy generation projects. The Navy's Renewable Energy Project Office claimed rapid success in getting at least 1.1 GW of projects into development, and their own project data page describes projects with a cumulative renewable energy capacity of least 717 MW of projects.⁵⁹⁰ The Army's Energy Initiative Task Force, made permanent as the Office of Energy Initiatives, had listed, confirmed projects totaling nearly 400 MW, with another 132 MW in development.⁵⁹¹ By contrast, the Air Force largely let individual installations take the initiative to develop renewable energy projects – or not. Air Force projects with signed contracts totaled just 141 MW, while the Air Force's website, scarcely updated since 2013, lists another 114 MW of potential projects.⁵⁹²

None of the services' efforts appear to have been prompted by the specific congressional requirement that DOD generate renewable energy equivalent to 25% of its facility energy consumption from renewable sources by FY2025. This requirement was passed as part of the FY2007 NDAA in 2006, but the Pentagon's utilization of renewable energy actually notched down between FY2007 and FY2011.

The Army's Energy Initiatives Task Force was established in September 2011 – potentially influenced by rising tide of defense energy provisions advanced by

⁵⁹⁰ Resilient Energy Program Office, "Projects Page." This figure includes only extant projects, confirmed via web searches for news of groundbreaking or completion of specific projects.

⁵⁹¹ Army Office of Energy Initiatives, "Projects and Opportunities" (web page), <http://www.asaie.army.mil/Public/ES/oei/projects.html>, accessed March 24, 2017 (updated August 18, 2017).

⁵⁹² Air Force Civil Engineering Center, "Renewable Energy" (web page) <http://www.afcec.af.mil/Home/Energy/Renewable-Energy/> (accessed March 25, 2017).

Congress between 2008 – 2011 (FY2009-FY2012) and the goal of fulfilling 25% of facility energy needs with renewable energy. However, there is no clear causal linkage. In the memorandum formally directing the creation of the office Secretary of the Army John Hughes justified the office’s mission with a vague reference to addressing the Army’s energy security challenges at home and abroad, “fulfill statutory requirements”, and “comply with Presidentially-directed mandates.”⁵⁹³ At best, the establishment of the EITF passes a hoop test for the Army’s general sensitivity to Congress’ renewable energy and broader defense energy efficiency and energy security goals.

By contrast, Secretary of the Navy Ray Mabus announced the creation of the 1 Gigawatt Task Force on January 24, 2012. This announcement came just two days after President Obama announced that the Navy would be committing to purchase enough clean energy to power 250,000 homes for a year.⁵⁹⁴ The tight causal linkage here between President Obama’s announcement and the creation of the 1 Gigawatt Task Force is doubly decisive, conclusively demonstrating that powering up of the Navy’s renewable energy contracting efforts derived from Secretary of the Navy Ray Mabus and a supportive and encouraging White House, rather than being responsive to the 25% goal set by Congress, which had already been law for over 5 years when the 1 Gigawatt Task Force was established.

⁵⁹³ John M. McHugh (Secretary of the Army), “Directive for Energy Initiatives Office – Task Force,” (Memorandum, August 29, 2011), <https://www.army.mil/e2/c/downloads/218391.pdf>.

⁵⁹⁴ Barack H. Obama, State of the Union Address, January 24, 2012, available at The White House (President Barack Obama) (website), <https://obamawhitehouse.archives.gov/the-press-office/2012/01/24/remarks-president-state-union-address> (accessed September 20, 2017).

Although the drive for the Navy's stepped-up renewable energy efforts came from the executive branch, the tools came from Congress. The authorities for DOD to use 30-year power purchase agreements, enhanced-use leases, energy services provider contracts, and utility energy service contracts, given by Congress step by step in the FY2005, FY2007, FY2010, and FY2013 NDAA's, discussed in the previous sections, were fundamental prerequisites to the private sector financing that made this surge in DOD's renewable energy projects financially viable.

Operational Energy

Congressional Action

The creators of the Operational Energy Plans and Programs office were appalled that no one in the Pentagon could answer the basic question: how much fuel are you using? In creating the office, they had a handful of major goals: to force the Pentagon to quantify and grapple with its fuel demand and the associated logistics tail, to “stir the conversation” on energy, and to change the Pentagon’s planning and eventually, acquisitions practices to consider energy demands natively. As described earlier, they viewed energy as both too important and too diffuse to trust the Pentagon to care about in its current organization structure. As a corrective, the staffers intended to create a powerful office to bring about a sea change in how the Pentagon viewed, used, and ultimately valued energy.⁵⁹⁵ The congressional dynamics behind the creation of the office are described in detail in Chapter 3.

The Office of Operational Energy Plans and Programs was created to tie together the disparate threads of the Pentagon’s energy use, be able to focus exclusively on operational energy, set decisive energy policy, and have the institutional authority to compel bureaucratic compliance. It had a swift and easy birth, a brief and contested life, a lingering convalescence and a partial reconstruction. The director of the operational energy office was endowed with significant powers: the office was modeled after the Director of Operational Test and Evaluation, a gatekeeping office

⁵⁹⁵ Interviews with HASC staffers, May 2015; June 2015; interview with a senior official closely involved with the creation of the Office of Operational Energy Plans and Programs (OEPP), January 2015.

in the Pentagon's weapons procurement process whose sign off on the readiness and fitness for purpose of weapons systems is required before full-rate production can begin. The HASC staffers gave the Director of Operational Energy Plans and Programs analogous responsibility to certify that the submitted budgets of the services were sufficient to meet the operational energy strategy and plan.⁵⁹⁶ This operational energy strategy and plan were to be drafted by the operational energy plans and programs office, effectively giving the director the authority to grade the service's budgets according to a yardstick of their own devising. While this was a potentially significant power, it was more powerful in abeyance rather than wielded - the director for operational energy had to tread lightly to avoid setting off a bureaucratic struggle that the relatively small office would inevitably lose.⁵⁹⁷

Implementation

The operational energy plans and programs office faced a cold welcome within the Pentagon. According to HASC staffers intimately involved in creating the office, part of the purpose in creating the office was to make sure that there was someone in the Pentagon who would be able to focus solely on and be responsible for operational energy efforts, rather than it being one of many responsibilities. As a key staffer said, "we really felt like we needed someone at a senior level with some weight to sit in on meetings and say, 'Hey - have we thought about this?'"⁵⁹⁸ Accordingly, it was created to be an independent office with the statutory responsibility and authority to

⁵⁹⁶ Interviews with HASC staffers; senior official.

⁵⁹⁷ Multiple interviews with OEPP staff.

⁵⁹⁸ Interviews with HASC staffers, May 2015 and June 2016.

report directly to the Secretary of Defense on operational energy matters, rather than being situated within another element of the Office of the Secretary of Defense.

According to the office's creators, there hadn't been any pushback by the DOD's legislative affairs office while they were considering the provisions, but DOD recoiled sharply after the office was actually legislative fact. After the office's creation in the FY2009 NDAA, the Pentagon declared its intent to establish the operational energy office within the Assistant Secretary of Defense for Acquisition, Technology, and Logistics – a powerful office responsible for much of the Pentagon's weapons buying, but a location that the staffers felt would have diminished and diffused the potential authority and impact of the operational energy office. As one staffer characterized it, “the challenge is that we're pulling some things that some people considered their responsibility and putting it somewhere else. You have to take some turf.”⁵⁹⁹

In the following year's bill, the office's creators tried to re-emphasize congressional support for the office, including a “Sense of Congress” about the operational energy office in the FY2010 NDAA, reasserting the need for a unitary senior energy official to tackle the crosscutting nature of energy use in the Pentagon.⁶⁰⁰ This section re-affirmed that the director for operational energy had direct reporting responsibility and to the Secretary of Defense. Although the director of the office was originally

⁵⁹⁹ Interview with HASC staffer, May 2015.

⁶⁰⁰ Pub. L. No. 111-84, § 903, 123 Stat. 2423.

endowed with authority equivalent to the three-star general, the staffers attempted to give the office a bit more organizational oomph (and a less-unfortunate acronym than DOEPP) by keeping the office in the same position in the Pentagon hierarchy, but formally re-designating the role as an Assistant Secretary of Defense.⁶⁰¹ This was intended to give the office a higher status within the many-layered DOD bureaucracy, as well as ensuring that the director was able to raise issues and advise the Secretary directly, rather than having their advice be diluted or buried on its way up the reporting chain. However, this lack of a bigger, more institutionally-powerful home was a double-edged sword. It led to the office risking marginalization and having to husband its influence in order to achieve the goals of actually prompting the consideration of operational energy requirements and use across the Pentagon.

The HASC staffers who created the office also belatedly realized that it needed funding, both for hiring staff and as a proxy for congressional support. As one staffer recalled, “we probably should have started with funding for it, but we didn’t.”⁶⁰² The Pentagon neglected to include funding for it in the FY2010 budget request, so the HASC staffers inserted a provision into the FY2010 bill authorizing \$5 million in appropriations upon the confirmation of a director for the office.⁶⁰³

But finding a director for the office was also a stumbling block, in part due to the imminent presidential transition. The FY2009 NDAA creating the office was enacted

⁶⁰¹ Interviews with HASC staffers, May 2015 and June 2016.

⁶⁰² Interview with HASC staffer, May 2015.

⁶⁰³ Pub. L. No. 111-84, § 331, 123 Stat. 2257.

on October 8, 2008. Rather than nominating a director for the office, President Bush opted to allow the incoming administration to fill the role. However, the incoming Obama administration had higher priorities, and the Operational Energy Plans and Programs office got lost in the shuffle. According to Rep. Giffords' staffer Ryan McKeon, Rep. Giffords was meeting with Rahm Emanuel, President Obama's chief of staff, approximately mid-way through 2009, when President Obama walked in. Rep. Giffords raises the topic to talk about operational energy and the newly-created office (and it's need for a director), President Obama says "so tell me all about it, and find me someone to pick." By their own account, McKeon and his colleague Gavi Begtrup, another Giffords staffer, worked with a HASC staffer who had been a driving force in the creation of the office to find a nominee to lead it. The staffers prepared an initial list of 6-7 names, then winnowed it to a short list.⁶⁰⁴ Though not the staffers' top pick, Sharon Burke was nominated to be the initial Director of Operational Energy Plans and Programs on December 11th, 2009, and confirmed by the Senate on June 22nd, 2010.⁶⁰⁵

As a new office, the Office of Operational Energy Plans and Programs had the usual bureaucratic growing pains: figuring out how to hire staff and stand up the office. Sharon Burke was able to draw on the skeleton staff of an extant Energy Task Force and some outside contractors who had been preparing to stand the office up. The Pentagon was also operating under a continuing resolution and a hiring freeze, which

⁶⁰⁴ Gavi Begtrup and Ryan McKeon in interview with the author, October 2015.

⁶⁰⁵ Nomination record P.N.1270 – Sharon E. Burke – Department of Defense.
<https://www.congress.gov/nomination/111th-congress/>

substantially gummed up the works. Then-Under Secretary of Defense for Acquisition, Technology and Logistics, Ash Carter, was committed to standing the office up, so some money was found for the operational energy office within the broader AT&L portfolio. Frictions with the contracting office of the Washington Headquarters Service made it difficult and slow to bid out contracts to bring in contractor support for the nascent office, but it was finally getting off the ground.

Action

Once it was actually created and staffed, the OEPP office still had to tread carefully. Not only did Burke have to negotiate an at-times oppositional Pentagon bureaucracy, she also had to strike the right tone with Congress – focusing on the military benefits of improving the Pentagon’s operational energy posture, and resisting having her offices’ efforts being framed as liberal tree-hugging energy conservation efforts that would defang the military. The operational energy office made a consistent effort to stay on message. Their goal was to seek fuel and energy efficiencies to improve mission effectiveness and reduce risk. *Not* for cost savings, and *certainly not* for environmental reasons.⁶⁰⁶ Beyond overcoming initial misapprehensions that her office was intended to promote environmental sustainability, Burke also had to accomplish the mission of her office: get the Pentagon to start thinking about how they relied on energy to accomplish their mission, and incorporate it into every phase of planning and training. This was a big ask. As an OEPP staffer with long experience in DOD energy recalled, “In 1999-2000, we wanted to talk about energy

⁶⁰⁶ Interview with OEPP staffer, January 2015.

with the Army. They were *not* interested. They told us to go talk to logistics for that. But the [logistics] tail exists because of the decisions made by the tooth! There's a relationship there. If the tooth thinks the tail is too big, they need to think about how their decisions affected the size of the tail.⁶⁰⁷

The operational energy office was set up with three divisions: policy, future forces development, and current operations. The policy team focused on getting operational energy incorporated into the energy policies and implementation guidance of the military services and Pentagon agencies. The future forces development group focused on getting energy considered in force planning and acquisitions – having logistical needs be considered as part of war games and operational planning, and having these insights eventually feed into acquisitions decisions. The OEPP office sent representative to as many wargames as they could, getting the games to stop assuming assured access to as much fuel as the players wanted. The current operations team were principally concerned with the war in Afghanistan and reducing the fuel needed in theatre. As part of that effort, the operational energy office had a staff member deployed to the ISAF headquarters in Afghanistan to work with the deployed troops and see if there were ways to reduce their fuel burden in the field. This person's responsibility was connecting the people who used the fuel to people who had equipment that needed less energy, ranging from solar systems to better electrical power generation for camps, to better shelter systems, better vehicles,

⁶⁰⁷ Interview with OEPP staffer, January 2015.

artillery generators on vehicles that could power the on-board systems without having to run the engines. The combat element was particularly critical for the office's long-term success. Demonstrating success in reducing fuel demands at the tactical edge in Afghanistan and having a validated field-use case would also be a critical tool for the office's long-term efforts to get operational energy considered in the planning and acquisition cycles. Moreover, the soldiers on the ground in Afghanistan would be the acquisition and budget decision-makers back in the Pentagon in 4 or 5 years.⁶⁰⁸

As a new, politically vulnerable office, Burke went to great lengths to cultivate supporters, both among the Pentagon and in the Congress. Unusually for such a senior appointee, she traveled extensively to members' districts, often with the Representative or Senator in question. For example, Burke visited a generator factory in Tulsa, Oklahoma, with Sen. Inhofe – a fierce critic of what he saw as the environmentalists' green agenda, and who famously brought a snowball to the Senate floor during a debate about the existence of global climate change.⁶⁰⁹ Nonetheless, Burke cultivated Sen. Inhofe, then the second-most senior Republican on the Senate Armed Services Committee, and other influential members of Congress. “[Sen. Inhofe] made a distinction in his statements. He knew the stuff that was advancing

⁶⁰⁸ Interview with OEPP staffer, September 2011.

⁶⁰⁹ Brian Ervin, “Inhofe Announces Defense Contract for L-3 Westwood,” *Tulsa Business and Legal News*, April 25, 2013, http://www.tulsaworld.com/business/tulsabusiness/business_news/inhofe-announces-defense-contract-for-l--westwood/article_5580f01b-58c7-544e-ae77-ec9f42f232a4.html; Ted Barrett, “Inhofe Brings Snowball on Senate Floor as Evidence Globe Is Not Warming,” *CNN*, February 27, 2015, <http://www.cnn.com/2015/02/26/politics/james-inhofe-snowball-climate-change/>.

military needs was fine, he didn't have a problem with it."⁶¹⁰ An OEPP staffer confirmed that Burke had a good working relationship with Sen. Inhofe, "as long as the conversation was focused on the logistics burden, safety, efficiency, etc."⁶¹¹ Burke also traveled extensively to the combatant commands and the services' regional commands, getting to know the commanders and pitching them on what the operational energy office could do to mitigate their tactical fuel burdens.

The originating statute also tasked OEPP with developing performance metrics to evaluate whether the Pentagon was meeting the goals laid out in the operational energy strategy. But developing analytically-sounds metrics was no simple task, and OEPP resisted mandating simple consumption metrics. A simple reduction of gallons or barrels of fuel used wouldn't address the crux of the problem – making the Pentagon more efficient and militarily effective for each gallon used. Beyond the analytical issue, focusing on overall consumption would have alienated the men and women in uniform whom and the rest the OEPP officials and staff had to persuade on the merits.⁶¹² The OEPP office worked to come up with a performance metric – something like the number of miles a platform could travel per gallon, scaled to the weight of the platform. However, they haven't been able to issue clear metrics. And without metrics, there is nothing to manage to. A senior OEPP official acknowledged this weak point in the office's track record, recalling that the then-Chief of Staff of

⁶¹⁰ Interview with senior OEPP official, August 2014.

⁶¹¹ Interview with senior staffer for Sen. Inhofe, October 2014; Interview with OEPP staffer, January 2015.

⁶¹² Interview with senior OEPP official, August 2014.

the Army, whom the official characterized as supportive of the operational energy office, advised OEPP to just issue an arbitrary metric: “You’ve gotta give them a mark on the wall to aim for, or they won’t be aiming for anything.”⁶¹³

As a new and fragile office, Burke had to be careful with the statutory authorities the congressional drafters had endowed the office with. One of the OEPP’s mantras in the early days of standing up the office was, “don’t fight against them, fight *with* them.”⁶¹⁴ As a senior OEPP official described, the power of the congressional authorities could become theoretical against the reality of the Pentagon bureaucracy. “If we use these authorities, if we act like they *have* do to stuff – in a place like the Pentagon people have a million ways of sandbagging you and slowing you down. ... You’ve *gotta* find the things that are gonna work and that are in other people’s interests, or you’ll never get anywhere.”⁶¹⁵ In particular, the senior OEPP official characterized the budget certification authority as “one of the most important authorities,” but “not particularly well thought out.”⁶¹⁶ The leadership within the Pentagon did not appreciate the precedent and inversion of the hierarchical authority that allowed a smaller office to have – at least on paper – broad authority to independently pass judgment on the President’s budget request that had been laboriously built and fought over by the services and the Office of the Secretary of Defense. If the Office of Operational Energy Plans and Programs had major

⁶¹³ Interview with senior OEPP official, August 2014.

⁶¹⁴ Interview with senior OEPP official, August 2014.

⁶¹⁵ Interview with senior OEPP official, August 2014.

⁶¹⁶ Interview with senior OEPP official, August 2014.

differences of opinion with the President's budget, "it means you're on the wrong side of the Secretary of Defense and the President."⁶¹⁷ As part of the mandate to certify the budget and report on the various operational energy efforts scattered around the Pentagon, OEPP staff did have the authority to work closely with the services and the various offices in the Office of the Secretary of Defense to identify energy-related line items in the budget. This was one of many areas in which OEPP had to persuade other offices to work with them, rather than coming in, authorities blazing, and demanding answers. As a senior OEPP official described, "It took an *immense* amount of partnership building. Because it meant that people in CAPE and elsewhere had to *want* to work with us to figure out where these programs and subprograms were, and it meant we had to work with the services to try and find all these things. If they don't want to work with you, it's almost impossible."⁶¹⁸

Despite the difficulty, the HASC staffers who created the office described this data collection as part of the point. As one put it, "the reporting requirement was overwhelming, and we knew it was overwhelming. The first step was gathering data, and it was *very* hard to get data to report."⁶¹⁹ The FY2016 budget certification report was the first to include a comprehensive listing of all the operational energy-related budget line items, an enormous improvement over the few programs highlighted in the FY2012 budget certification report. And OEPP did ultimately succeed in parsing the dense annual defense budget. In certifying the FY 2017 defense budget, the now-

⁶¹⁷ Interview with senior OEPP official, August 2014.

⁶¹⁸ Interview with senior OEPP official, August 2014.

⁶¹⁹ Interview with former HASC staffer, June 2016.

DASD(OE) office identified \$1.8 billion of investments in FY2017, and \$11.3 billion over the 5-year defense plan, for efforts that impacted DOD's energy demand, diversified energy supplies, or adapted future forces and technologies.⁶²⁰ This report is a testament not just to the efforts of the OEPP office, but of the HASC staffers' insight that that data would never be collected unless it was *someone's* job to collect it and analyze it.

Similarly, the operational energy office was also mandated to collect data on operational energy demands of the services, and how much their energy demands cost.⁶²¹ According to the HASC staffer who created this provision, this reporting requirement arose because no-one in the Pentagon could answer the apparently simple question, "how much fuel are you using?" While the Defense Logistics Agency-Energy could report how much fuel of which type they sold to the services, there was no data on how it was used, or which systems were the biggest fuel hogs. Without data on fuel use, the system's total logistics tail was invisible, as was a good portion of the total ownership cost. More critically, without data on fuel use, there was no way to include greater fuel efficiency or logistics needs in the requirements process or when deciding between procuring different systems.⁶²²

While the statute gave the OEPP office authority to coordinate and oversee "the consideration of operational energy demands in defense planning, requirements, and

⁶²⁰ FY2017 Operational Energy Budget Certification Report.

⁶²¹ Pub. L. No. 110-417, § 331, 122 Stat. 4419.

⁶²² Interview with former HASC staffer, June 2016.

acquisitions process,” actually exercising that authority and getting energy to be considered from the very beginning was challenging, and where Burke focused much of her offices’ efforts.⁶²³ As an OEPP staffer characterized it, “If [operational energy] is going to be successful, you need to look at the earliest force design. Look at where you need [energy] and how you use it.”⁶²⁴ As another OEPP official described it, simply having approval authority over a program in the acquisition process wasn’t helpful. “By the time you get to a defense acquisition board [decision point], the energy consumption of that program is already baked in. So, you need to get in much earlier in the process, in the planning process and the requirements process.”⁶²⁵ The overarching goal was to normalize thinking about energy needs early in the acquisitions process – when there was still room for trade-offs and decisions about force structure and requirements.⁶²⁶

One of the OEPP office’s successes was in pushing the services to include energy demands of their systems into their operational planning, via a somewhat Socratic method. When the services would talk about their plan to get forces in theatre or what the generation rate of combat sorties would be, the OEPP staffs’ job was to ask – “what is your fuel requirement? What is your logistics vehicle requirement? How does this play out in the course of the scenario?” One staffer described the deliberate strategy of the operational energy office to ask the types of practical, and above-all,

⁶²³ Pub. L. No. 110-417, § 902.

⁶²⁴ Interview with OEPP staffer, January 2015.

⁶²⁵ Interview with senior OEPP official, August 2014.

⁶²⁶ Interview with OEPP staffer, January 2015.

operational, logistics questions that prompted real attention from the operational folks in uniform: “Show me how you support your assets past 1 or 2 fuel re-supply cycles. How you support your enablers in theatre? In different threat environments?”⁶²⁷ Often, pulling this thread revealed some uncomfortable truths – that the planned logistics support was inadequate, or that the fuel available wouldn’t be sufficient to execute the plan, or that the fuel handlers were Reservists who wouldn’t arrive in theatre until at least 30 or 60 days after operations began.⁶²⁸ Revealing these baked-in assumptions about assured availability of fuel in combat to jar the planners was precisely the purpose that the OEPP office was created for.

OEPP also found supportive allies looking at fuel use in combat outposts, the so-called “tip of the spear.” In part, this was because the argument was self-evident: trucking fuel tankers to remote combat outposts in Afghanistan was dangerous. Air dropping fuel was possible, but was only feasible for relatively small amounts of fuel, and at high expense. Reducing the energy used by these outposts was a no-brainer, and an area where the operational energy office found allies, or at least fellow-travelers, with the Army and the Marine Corps, who were the most present and exposed on the ground in Afghanistan. In part, this reflected a strategy of pursuing the easy wins, where OEPP could demonstrate a real difference on the ground to the deployed men and women in uniform – and build support for her office and the concept of operational energy. Other operational energy staff concurred: “If you

⁶²⁷ Interview with OEPP staffer, January 2015.

⁶²⁸ Interview with senior OEPP official, August 2014.

can't show the impact that this issue has on winning the fight – you're not relevant.”⁶²⁹ But there were risks, the operational energy office had to avoid any initiatives that could leave soldiers on the ground in the lurch. When he was the commander of CENTCOM, with overall responsibility for the war in Afghanistan, General Mattis was supportive of rapid fielding of more energy efficient equipment downrange and understood its warfighting utility. However, his support came with an important caveat - any new equipment absolutely could not get in the way of tactical operations.⁶³⁰ The Army in particular started incorporated energy concerns into contingency basing, and ultimately baking it in to the standard directions for establishing a combat outpost.⁶³¹

On the tactical and operational levels, the Marine Corps' Expeditionary Energy Office made great advances in soldier power and expeditionary energy use. While the Army was “a harder get,” they ultimately got on board with reducing the energy used in outposts.⁶³² The program executive officer for combat services support, responsible for tents and all of the contingency base equipment was persuaded of the merits of reducing the Army's fuel footprint. This program executive officer was able to set up a proving ground for innovations to reduce the energy footprint of contingency bases, whether tent liners or solar chargers or other tech. In addition,

⁶²⁹ Interview with OEPP staffer, January 2015.

⁶³⁰ Interview with senior OEPP official, August 2014.

⁶³¹ Ashton B. Carter (Deputy Secretary of Defense), *Contingency Basing Outside the United States* (Department of Defense Directive 3000.10) (Washington, DC: Department of Defense, January 10, 2013), <http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300010p.pdf?ver=2017-08-18-132434-003>.

⁶³² Interview with senior OEPP official, August 2014.

this officer had a perennial open contract for all Army base support equipment – a huge bureaucratic advantage in the byzantine acquisitions process. Due to this open contract, the Army was able to buy contingency basing equipment that reduced the Army’s fuel demand right away as it proved its merits, rather than going through a protracted requirements, budgeting and acquisitions process for Tent B over Tent A.

Many of the OEPP’s successes in getting operational energy considerations implemented were the result of having the right conversation with the right person at the right time. OEPP was trying to get the Army to use more efficient generators in the field, but also to get the new equipment integrated into their pre-deployment training. The U.S. Army Commander in Europe, Lt. General Mark Hertling – who also was responsible for a training range he didn’t want to see eliminated due to base contracts - signed on.⁶³³ The Army’s Rapid Equipping Force stepped in, and created the Energy to the Tactical Edge (E2E) program, providing this new equipment to train with.⁶³⁴ Once the new generators were being widely used in training, it was an easier lift to get the new generators deployed to Afghanistan. One other factor greased the skids - the program Army manager for generator power had a similarly streamlined acquisitions pathway, which led to a rapid acceleration of more efficient generators

⁶³³ Interview with senior OEPP official, August 2014.

⁶³⁴ Ali Sanders, “Energy to Tactical Edge: Hybrid Power Saving Lives,” U.S. Army Rapid Equipping Force, March 16, 2012, https://www.army.mil/article/75884/Energy_to_Tactical_Edge__Hybrid_power_saving_lives.

entering service at Army bases in Afghanistan – reducing fuel needs by 40-60% compared to previous generators.⁶³⁵

Despite this early success in getting the Pentagon to incorporate energy into how it thinks about conflict and acquisitions, the OEPP office found a far less friendly reception when its energy focus ran up against service priorities. The Marines' Expeditionary Energy Office resolutely ignored the real drivers of the Marine's fuel use in Afghanistan: vehicles and aircraft. But the Marines had to start where they could and get support within their organization before tackling harder problems. They didn't want "greenies from the Obama administration coming in" and trying to "green the Marine Corps."⁶³⁶ While the Marine Corps' achieved a lot on the energy front, particularly the incorporation and formalization of energy capability gaps into an initial capability gaps document (discussed above), the Marines' turf-consciousness made the operational energy office's job harder.⁶³⁷

Ultimately, the seeds of the operational energy office's potential demise were already being sown when the office was germinating. The year after the office was created, Sen. Reid introduced an amendment on the Senate floor that would have added installation energy to the portfolio of the operational energy plans and programs

⁶³⁵ Interview with senior OEPP official, August 2014.; Summer Barkley, "Operation Dynamo—Power Forward," U.S. Army, March 21, 2013, https://www.army.mil/article/99262/Operation_Dynamo____power_forward.

⁶³⁶ Interview with senior OEPP official, August 2014.

⁶³⁷ Interview with senior OEPP official, August 2014.

office.⁶³⁸ The following year, trying to reduce the numbers of Deputy Undersecretaries of Defense, an earlier Senate version of the provision suggested combining the operational energy office with the Office of the Deputy Under Secretary of Defense for Installation and Environment.⁶³⁹ The Obama administration also supported merging the two offices, although operational energy and energy efficiency had been a prominent presidential priority.⁶⁴⁰ The merger was effected by the FY2015 NDAA, which folded the responsibilities of the Assistant Secretary of Defense for Operational Energy Plans and Programs into that of the Assistant Secretary of Defense for Energy, Installations and Environment (ASD(IE&E)).⁶⁴¹

This merger wasn't a specific effort to kill off the operational energy office, but it cut their efforts off at the knees. Sharon Burke left the role of Assistant Secretary of Defense for Operational Energy Plans and Programs in early 2014, in part due to this pending merger. Meanwhile, the DUSD (I&E) position had been filled on an acting basis for over two years, because it was pointless to get someone nominated and confirmed to a position that would shortly no longer exist. After the FY2015 NDAA mandating the merger was enacted in December 2014, the new ASD(IE&E) position never had a permanent nominee confirmed. Deputy Chief of Naval Operations Vice

⁶³⁸ S. Amdt. 1793 (Sen. Reid) to S. 1390 (National Defense Authorization Act for Fiscal Year 2010, 111th Cong. (2009)). The amendment was not voted on.

⁶³⁹ S. 3254, 112th Cong. § 902 (as reported by the Senate Armed Services Comm., June 4, 2012).

⁶⁴⁰ Office of Management and Budget, *Statement of Administration Policy: H.R. 4435 – Howard P. “Buck” McKeon National Defense Authorization Act for FY 2015* (Washington, DC: Executive Office of the President, May 19, 2014), https://obamawhitehouse.archives.gov/sites/default/files/omb/legislative/sap/113/saphr4435r_20140519.pdf.

⁶⁴¹ Carl Levin and Howard P. “Buck” McKeon National Defense Authorization Act for Fiscal Year 2015, Pub. L. No. 113-291, § 901, 128 Stat. 3462 (2014).

Admiral Phil Cullom, who had been deeply involved in the Navy's energy efforts, was nominated for the position in November 2015, but withdrew in January 2016.⁶⁴²

The position remained unfilled through the end of the Obama administration.

However, operational energy was a slightly brighter spot. A Deputy Assistant Secretary of Defense for Operational Energy was created within the ASD(EI&E), and Amanda Simpson was sworn in as the inaugural officeholder in September 2015.⁶⁴³

Discussion

The HASC staffers who created the operational energy office had clearly thought hard about its design, endowing it with a range of powerful authorities, and situating it in what was intended to be an influential perch within the Pentagon hierarchy. The growing pains of the office, combined with the continued tactical and operational relevance of fuel in the war in Afghanistan, kept operational energy on the forefront of the staffers' minds. However, there were occasional miscues and times when the Congress and the OEPP office were out of step.

One disjunction was in whether creating the OEPP office as a separate office within the Office of the Secretary of Defense helped or hurt the cause of energy in the Pentagon. The HASC staffers involved in creating the office intended to give it a

⁶⁴² The White House Office of the Press Secretary, "President Obama Announces More Key Administration Posts" (Washington, DC: The White House, November 19, 2015), <https://obamawhitehouse.archives.gov/the-press-office/2015/11/19/president-obama-announces-more-key-administration-posts>; Ariel Wittenberg, "Nominee for Energy and Environment Post Withdraws," *Energy and Environment Daily*, January 12, 2016, <http://www.eenews.net/eedaily/stories/1060030450/print>.

⁶⁴³ Washington Blade, "Pentagon Swears in Amanda Simpson," September 24, 2015, <http://www.washingtonblade.com/2015/09/24/pentagon-swears-in-amanda-simpson/>.

direct line to the Secretary of Defense, giving the OEPP a more powerful spot in the bureaucracy from which to upset the Pentagon's energy apple carts.⁶⁴⁴ But a senior OEPP official disagreed. "People think that it'll make [the office] more important if [the office is] under the Secretary, but if [the office] doesn't belong there, all it will do is orphan you, maroon you. . . . If you belong to the Secretary and you're not an actual secretarial priority, something that's on his frontal lobes for one reason or another – it'll kill you."⁶⁴⁵ Bureaucratic friction also hampered the operational energy office's efforts. In particular, the Navy's monofocus on alternative fuels put them at odds with OEPP, despite what should have been a strong alignment of mutual interests. Other points of conflict were more personal – between individuals in charge of services offices with the OEPP office or individual staffers.

Another recurring difficulty was in fending off well-intentioned ideas from Congress that were driven by vendor interests – vendors would be able to persuade offices that a requirement was a good idea, they would try and insert it into the bill, and – somehow – that company was the only one with a product that could meet the now-legislated requirement. In a senior OEPP official's view, citing several specific examples, this was a profound and unchanging feature of the gap between Congress and the Pentagon. As they put it, "They [the staffers] need to focus on what the outcome is they want, rather than telling you how to get there. They're *never* going to understand the military environment well enough to write [bills] that well. Never,

⁶⁴⁴ Interview with former HASC staffer, June 2014, interview with former HASC staffer, June 2016, interview with OEPP staffer, January 2015.

⁶⁴⁵ Interview with senior OEPP official, August 2014.

never, never, never. And if they're getting the advice from someone *else*, they're probably not disinterested."⁶⁴⁶ Another example of friction between OEPP and its well-meaning supporters illuminates the double-edged nature of requiring reports and studies as a routine part of congressional policymaking and agenda setting. A supportive SASC staffer had commissioned a GAO audit of DOD's fuel demand and fuel demand management at forward operating bases.⁶⁴⁷ Although the senior OEPP official acknowledged that the staffer's intentions were good, the critical audit ended up handicapping the infant office: ... It's [GAO's] job is to identify what's wrong. ... So it's *never* good news to have a GAO audit."⁶⁴⁸ While the OEPP official emphasized that the SASC staffer had thought that the operational energy office would be able to use it as a tool to spur action, the realities of the Pentagon bureaucracy meant that the faults identified just devolved back to the operational energy to address.

While the HASC staffers were very downbeat over the incorporation of operational energy into the ASD(EI&E), the senior OEPP official was more measured. While the merger with ASD(IE&E), under USD(AT&L) "was not a perfect solution, it was probably better than the other choices."⁶⁴⁹ As they described it, energy was never going to have the authority and heft of the Director of Operational Test and Evaluation – the office OEPP was modeled was modeled after. "DOT&E is a huge

⁶⁴⁶ Interview with senior OEPP official, August 2014.

⁶⁴⁷ GAO, *Defense Management: DOD Needs to Increase Attention on Fuel Demand Management at Forward-Deployed Locations* (GAO-09-300) (Washington, DC: U.S. Government Accountability Office, February 2009), <http://www.gao.gov/assets/290/286363.pdf>.

⁶⁴⁸ Interview with senior OEPP official, August 2014.

⁶⁴⁹ Interview with senior OEPP official, August 2014.

operation, with a huge budget, and they have a very well-defined responsibility, and it's an important one. Energy just doesn't work that way. ... You're never going to wholly own it the way you can test and evaluation, so it was never going to work as an exact parallel.”⁶⁵⁰

Despite universal praise for Burke's outreach and networking efforts to socialize the idea of operational energy across the Pentagon, the accomplishments of the operational energy office got mixed reviews by its creators in the HASC. One staffer saw the office as largely successful. In their view, the office had done what it was created to do: create an operational energy understanding and strategy, in a way that was generally supported across the aisle, and more or less embraced by DOD.⁶⁵¹

Another saw a more mixed picture. While they praised Burke's outreach and networking efforts to socialize the idea of operational energy across the Pentagon, they described the office as “not set up to succeed,” taking a lot of the blame for the office's shaky launch. “In terms of funding, authorization, staff – it was heavy requests on them.”⁶⁵² But the HASC staffer put the ultimate blame for the uneven results on the Pentagon bureaucracy. “In hindsight, the legislation was a good starting point. If the department had embraced it, it could have been very effective.” Part of that was simple bureaucratic resistance: “On the OSD side, they made OEPP feel unwelcome. AT&L felt that they were being infringed on, that energy was in

⁶⁵⁰ Interview with senior OEPP official, August 2014.

⁶⁵¹ Interview with HASC staffer, May 2015.

⁶⁵² Interview with HASC staffer, June 2016.

their domain.”⁶⁵³ Another element was the winding down of the wars in Iraq and Afghanistan as the office was being stood up. As the staffer described it, without the combat imperative, the Pentagon’s willingness to think about energy was a window that was closing.⁶⁵⁴

Ultimately, the operational energy office did achieve some modest successes. Their efforts to incorporate more energy efficient and renewable energy equipment into theatre in Afghanistan had a direct impact on fuel consumption and reduced the amount of fuel that needed to be brought to these remote combat outposts. Many of these tactical programs appear to have strong legs. For example, the Marine Corps are incorporating microgrids to automatically balance loads between power generators into their expeditionary training.⁶⁵⁵ However, despite some early positive signs, the longer-term goals of incorporating energy into planning, force structure, and acquisitions considerations have yet to be robustly realized. But the groundwork has been laid, and there are bright spots in each of the services. The Navy is developing a fuel-saving tool to calculate the most efficient transit speeds for ships, and has created an energy module for their distance training education.⁶⁵⁶ The Air Force is putting winglets onto their C-17 Globemaster cargo jets to reduce drag and improve fuel

⁶⁵³ Interview with HASC staffer, June 2016.

⁶⁵⁴ Interview with HASC staffer, June 2016.

⁶⁵⁵ Robert Bliss, “Amping up the Marine Corps,” Defense Video Imagery Distribution System, September 23, 2016, <https://www.dvidshub.net/news/210455/amping-up-marine-corps>.

⁶⁵⁶ Kenneth Steward, “Face of Defense: Sailor Advanced Fuel-Saving Methods,” U.S. Department of Defense, November 19, 2015, <https://www.defense.gov/News/Article/article/630437/face-of-defense-sailor-advances-fuel-saving-measures>; U.S. Navy, “Navy Releases Energy General Military Training,” Story No. NNS151015-22, October 15, 2015, http://www.navy.mil/submit/display.asp?story_id=91550.

efficiency.⁶⁵⁷ And both the Air Force and the Army are investing in developing more efficient engines for aircraft and helicopters.⁶⁵⁸

⁶⁵⁷ Kenji Thuloweit, "C-17 Drag Reduction Testing Aims at Saving Fuel," U.S. Air Force, April 1, 2016, <http://www.af.mil/News/ArticleDisplay/tabid/223/Article/710968/c-17-drag-reduction-testing-aims-at-saving-fuel.aspx>.

⁶⁵⁸ Stephen Trimble, "Adaptive Cycle Engine Enters Final Phase of Development," *Flight Global*, July 1, 2016, <https://www.flightglobal.com/news/articles/adaptive-cycle-engine-enters-final-phase-of-developm-426886/>; Brendan McGarry, "Army Taps Firms to Design New Engines for Apaches, Blackhawks," *Defensetech*, August 23, 2016, <https://www.defensetech.org/2016/08/23/army-taps-firms-to-design-new-engines-for-apaches-black-hawks/>.

Energy Efficiency and Demand in Weapons Systems

Congressional Action

The enormous overall fuel demand of the services' tanks, planes, ships and helicopters, and the logistics tail needed to support them, was a core problem of how DOD used energy, in the view the staffers legislating on defense energy issues. The congressional advocates made several attempts to make DOD reckon with the consequences of its use of energy. One major line of attack was endowing the operational energy office with the authority to provide energy demand guidance in the acquisitions process. In addition, Congress attempted to legislate towards forcing DOD to use fuel more efficiently in weapons systems directly.

The earliest attempt was a straightforward section in the FY2007 NDAA, bluntly stating, "it shall be the policy of the Department of Defense to improve the fuel efficiency of weapons platforms, consistent with mission requirements." The provision also required some attempts at implementation – an assessment of creating a senior role in the department to oversee this effort (a role the Director of OEPP would later fill), a summary of DOD's progress, and an overall evaluation of whether the Pentagon's guidance and RDT&E and acquisitions processes were able to successfully carry out a policy of being more fuel efficient.⁶⁵⁹ Offered on the Senate floor by Sen. Clinton (NY-D) and Sen. Bingaman (NM-D), this measure was added to the bill by unanimous consent.

⁶⁵⁹ Pub. L. No. 109-364, § 360, 120 Stat. 2164.

Two years later, in 2008, HASC staffers would create the Operational Energy Plans and Programs Office, with the authority to have operational energy demands considered in the planning, requirements, and acquisitions process.⁶⁶⁰ For emphasis, HASC again mandated that DOD take the overall fuel support logistics requirements of weapons systems and platforms into account during the acquisitions process. Specifically, the section required that fuel consumption be included as a key performance parameter (KPP) in the acquisitions process, and that the fully-burdened cost of fuel be used in considering acquisition trade space and the analysis of alternatives in the early stages of deciding which weapons systems to procure to meet a capability need. The Pentagon was required to come up with a plan within 180 days and implement it within 3 years, with a progress report at the 2-year mark.⁶⁶¹

In the FY2011 NDAA, the HASC mandated both a follow-up report on whether the acquisition system appropriately considered “long-term sustainment and energy-efficiency measures” in the procurement process, and a review of the official defense acquisition guidance.”⁶⁶² These repeated bites at the apple grew more specific and sophisticated, both in the details of the instructions and in the requirements for reporting and follow-up. But did they have an impact? To what extent does DOD actually give the fuel and logistics demands of a system serious weight in the acquisition process?

⁶⁶⁰ Pub. L. No. 110-417, § 902.

⁶⁶¹ Pub. L. No. 110-417, § 332, 122 Stat. 4420.

⁶⁶² Pub. L. No. 111-383, § 861, 124 Stat. 4288; § 864, 124 Stat. 4295.

Implementation

In parallel to congressional interest, concerns about how to value fuel efficiency in acquiring platforms and weapons systems was evolving within the acquisitions leadership in the Pentagon. The concept of the fully-burdened cost of fuel meandered its way from the 2001 DSB report, “More Capable Warfighting through Reduced Fuel Burden,” into the acquisitions community.⁶⁶³ The 2001 report had called for the fully-burdened cost of fuel to be incorporated into the requirements and acquisitions process. However, its recommendations largely went unheeded, subsumed by the 9/11 attacks and the subsequent Global War on Terror. In May 2006, the Under Secretary of Defense for Acquisition, Technology and Logistics, Kenneth Krieg, tasked the Defense Science Board with relooking DOD’s energy use and recommending ways to reduce and transform its energy demands, and the institutional and organizational barriers to change. In 2007, Kenneth Krieg, the USD(AT&L) issued a memorandum calling for the development and use of a fully-burdened cost of fuel (FBCF) methodology in three acquisitions programs at different stages of the acquisition process, as a trial: the Joint Light Tactical Vehicle, then in the concept development phase, a ship propulsion analysis of alternatives, and the concept decision for the next-generation bomber.⁶⁶⁴ In December 2008, the USD(AT&L) issued updates to the DOD Instruction that governs the acquisition process,

⁶⁶³ Richard H. Truly and Alvin L. Alm, *More Capable Warfighting through Reduced Fuel Burden* (Washington, DC: Defense Science Board, May 2001), 13, <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA392666>.

⁶⁶⁴ Kenneth J. Krieg (Under Secretary of Defense (Acquisition, Technology and Logistics)), “Fully Burdened Cost of Fuel Program” (Memorandum, April 10, 2007), <http://www.acq.osd.mil/se/docs/USD-ATLMemo-Fully-Burdened-Cost-Fuel-Pilot-Program-10Apr07.pdf>.

mandating that the analysis of alternatives include approaches to improve energy efficiency, and that the fully-burdened cost of energy should be used in trade-off analysis.⁶⁶⁵ The DSB's follow-up report on DOD's energy use was published in 2008 (discussed in Chapter 3). One major finding related to tactical energy use were that the recommendations from the 2001 DSB energy report had not been implemented, specifically the energy as a KPP and the fully-burdened cost of fuel methodology. It also concluded that there were viable energy efficiency technologies being developed, but that DOD lacked the capacity to value them as part of the decisions about tradeoffs made in the acquisitions process, leading to a slow pace of scientific and technology development and adoption.⁶⁶⁶ By time of the creation of the Operational Energy Plans and Programs office in the FY2009 NDAA in October of 2008, the USD(AT&L) office was reaching the same conclusions about the importance of considering energy in the acquisitions and planning process. In 2014, the Acting Deputy Secretary of Defense also required energy considerations to be included in the capability and acquisitions planning process.⁶⁶⁷

However, efforts to bring energy considerations into the acquisition process stalled out. The 2015 update to the DOD Instruction that governs the acquisition process culled the line from the 2008 version that required an evaluation of approaches to

⁶⁶⁵ John J. Young Jr. (Under Secretary of Defense for Acquisition, Technology and Logistics), *Operation of the Defense Acquisition System* (Department of Defense Instruction 5000.02) (Washington, DC: Department of Defense, December 8, 2008), http://www.dami.army.pentagon.mil/site/ARTPC/docs/DoDI%205000_02p.pdf.

⁶⁶⁶ Defense Science Board, *Report of the Defense Science Board Task Force on DoD Energy Strategy, More Fight - Less Fuel* (Washington, DC: Defense Science Board, February 2008), <http://www.acq.osd.mil/dsb/reports/ADA477619.pdf>.

⁶⁶⁷ Fox, DoD Energy Policy.

improve energy efficiency. It also weakened the fully-burdened cost of energy requirement, mandating that it be considered in an analysis of alternatives only “in cases where ...[it] is a discriminator among alternatives.”⁶⁶⁸ A January 26, 2017 update weakened that requirement further, requiring the consideration of FBCE only when it would be a “significant” discriminator – although to how judge significance prior to an analysis was left unaddressed. Recent research by Kendig *et al* bluntly concludes “that the initiative to reduce reliance on fuel, quite clearly, has not gained tangible traction within the acquisition process.”⁶⁶⁹

However, the picture is much brighter in the earlier parts of the acquisitions process. Step by step, the Joint Capabilities Integration and Development System (JCIDS) (the process whereby the military determines what capabilities and requirements it needs), has incorporated analysis of the energy needs of potential new systems into its various procedures and decision-points. Kendig *et al* trace the emergence of energy considerations in this part of the acquisitions process to May 2007, when the JCIDS manual was updated to add instructions to “include fuel efficiency considerations.” In addition, the analysis of the how much the system would cost over its total operational lifecycle (acquisition, sustainment, and disposal), now needed to include

⁶⁶⁸ Frank Kendall (Under Secretary of Defense (Acquisition, Technology and Logistics)), *Operation of the Defense Acquisition System* (Department of Defense Instruction 5000.02) (Washington, DC: Department of Defense, January 7, 2015), <http://bbp.dau.mil/docs/500002p.pdf>.

⁶⁶⁹ Richard J. Kendig, Ashley D. Seaton, and Robert J. Rogers, “Evolution of the Operational Energy Strategy and Its Consideration in the Defense Acquisition Process” (master’s thesis, Naval Postgraduate School, 2016).

the fully-burdened cost of fuel.⁶⁷⁰ The next instruction update more explicitly directed considerations of the system's fuel logistics needs in theatre, including in irregular conflicts.⁶⁷¹ In 2012, another update brought the Operational Energy Plans and Programs Office explicitly into the requirements process and made the energy KPP analysis mandatory for every program.⁶⁷² The operational energy office also provided an initial methodology to support an energy KPP in July 2012.⁶⁷³ This 2012 update discusses the significance of operational energy at length and requires a full consideration of the system, its associated logistics requirements, and the protection of those logistics requirements in a variety of operational scenarios as part of the capability and requirements development process.⁶⁷⁴ In other words, fuel logistics in theatre could no longer be either ignored or assumed away with rosy scenarios. In 2015, the energy KPP received another update – with input from the operational energy office. Each system now needs an “Energy Supportability Analysis.” The updated manual includes a detailed guide to how to structure the methodology of the energy supportability analysis to test the energy needs of a system in different

⁶⁷⁰ Kendig, Seaton, and Rogers, “Evolution of the Operational Energy Strategy,” 43, citing *Chairman of the Joint Chiefs of Staff Manual* (CJCSM 3170.01C) (Washington, DC: Joint Chiefs of Staff, May 1, 2007), <http://dtn-wisdom.jp/J-personal%20use/CJCSI%203170.01C.pdf>.

⁶⁷¹ Joint Chiefs of Staff, *Manual for the Operation of the Joint Capabilities Integration and Development System* (Washington, DC: Joint Chiefs of Staff, February 2009, updated July 31, 2009), <https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbXhY3F1aXNpdGlvbnBvbGljeXxneDozMGE5Y2I1ZWRhYWZhY2Vk>.

⁶⁷² Joint Chiefs of Staff, *Manual for the Operation of the Joint Capabilities Integration and Development System* (Washington, DC: Joint Chiefs of Staff, January 19, 2012), <http://www.secnv.navy.mil/rda/Policy/The%20Joint%20Capability%20Integration%20and%20Development%20System%20JCIDS/20120119jcidsmannualreleasedversion2.pdf>.

⁶⁷³ Sharon Burke (Assistant Secretary of Defense (Operational Energy Plans and Programs)), “Issuance of Fully Burdened Cost of Energy Methodological Guidance” (Memorandum, July 23, 2012), <https://www.dau.mil/policy/policydocuments/the705fbcemg%2023jul12.pdf>.

⁶⁷⁴ Joint Chiefs of Staff, *Manual* (2012).

operational concepts. It also suggests some illustrative energy performance attributes, such as payload-ton-miles per gallon, or energy needed per amount of mission accomplished, or propulsion effectiveness gain, to allow for more quantitative comparisons between alternative systems.⁶⁷⁵

But did these changes to the JCIDS system impact the actual procurement of weapons systems and platforms, and compel the Pentagon to value operational energy efficiency? One early attempt was in the procurement of the Army's Joint Light Tactical Vehicle (JLTV) as a replacement for the Humvee. The analysis of alternatives explicitly included the fuel demands of the systems as one aspect of comparison. The program managers also planned to use a fully-burdened cost of fuel to calculate the total ownership costs.⁶⁷⁶ The Army laid out initial energy goals: the first set of vehicles would achieve an energy efficiency of 60 ton-miles per gallon, a 25-30% improvement over the Humvee. The second set would achieve an additional 10 ton-miles per gallon and further improvement in idling fuel consumption.⁶⁷⁷ To support the Army's inaugural attempt to use energy as a KPP in the acquisitions process, the operational energy office commissioned a report looking at the notional

⁶⁷⁵ Joint Chiefs of Staff, *Manual for the Operation of the Joint Capabilities Integration and Development System* (Washington, DC: Joint Chiefs of Staff, February 12, 2015), <http://www.acqnotes.com/wp-content/uploads/2014/09/Manual-for-the-Operations-of-the-Joint-Capabilities-Integration-and-Development-System-JCIDS-18-Dec-2015.pdf>.

⁶⁷⁶ U.S. Army, "Joint Light Tactical Vehicle Analysis of Alternatives" (PowerPoint presentation, 49th Army Operations Research Symposium, Fort Lee, VA, October 13-14, 2010, <https://www.dau.mil/cop/rqmt/dau%20sponsored%20documents/briefing%20army%20aoa%20jltv%20aors%2013%2014%20oct%202010.pptx>).

⁶⁷⁷ Army Capabilities Integration Center, *Power and Energy Strategy White Paper* (Fort Monroe, VA: U.S. Army Capabilities Integration Center, April 1, 2010), http://www.arcic.army.mil/app_Documents/ARCIC_WhitePaper_Power-and-Energy-Strategy_01APR2010.pdf.

Brigade Combat Team of the 2020s, in order to model the JLTV's operational energy demands and combat effectiveness – and to demonstrate that factoring energy in didn't result in diminished combat capability.⁶⁷⁸ Although the Army in 2010 envisioned a JLTV with a fuel efficiency topping 60 ton-miles per gallon (for the vehicle and payload weight combined), the current Oshkosh JLTV achieves a fuel efficiency rate of 10 payload-ton miles per gallon – far lower. While this is still about 15-15% better than the Humvees the JLTV is replacing, it is far short of the dramatic improvement originally envisioned.

Discussion

If judging solely from the JCIDS manuals, operational energy has been relatively well- incorporated into the requirements and capability-setting process.

Unfortunately, the extent to which this changes in the JCIDS process is actually driving improved fuel efficiency and reduced logistics demand is difficult to discern.

Documentation of the early-stage analysis and choices between systems and capabilities is very closely held, and specific information on the parameters of weapons systems is classified. However, energy considerations do seem to be at least partly impacting the Pentagon's acquisition systems. The 2016 operational energy report notes that the development of the Marine Corps' CH-53K heavy lift helicopter and the Navy's Arleigh Burke-class Flight III destroyer were informed by

⁶⁷⁸ Endy M. Daehner et al., *Integrating Operational Energy Implications into System-Level Combat Effects Modeling* (Santa Monica, CA: RAND Corporation, 2015), https://www.rand.org/content/dam/rand/pubs/research_reports/RR800/RR879/RAND_RR879.pdf. This modeling would to inform the acquisitions decisions of the various component systems, including the JLTV and the Future Combat Vehicle.

energy supportability assessments.⁶⁷⁹ In 2016, the operational energy office competed energy supportability assessments for 13 major acquisitions programs' energy KPP analyses.⁶⁸⁰ The Marine Corps also conducted an energy-focused extension of a major wargame, including ground vehicles, ships, and helicopters, in order to provide information to develop the energy KPP metric.⁶⁸¹

Despite these steps towards incorporation of operational energy considerations into the capability planning documents, energy has not been fully incorporated into the rest of the acquisitions system. Energy-related analyses, “are often conducted on systems long after many critical design tradeoffs have already been made.” The 2016 operational energy strategy calls for the Pentagon to shift parts of the energy analyses even earlier in the capabilities development process, before any specific capability gaps are identified.⁶⁸² The strategy also lays out goals for improving energy efficiency: conduct energy-supportability analyses for all new acquisitions and ensure that all new programs are more energy-supportable than the current systems by the end of FY2018.⁶⁸³

⁶⁷⁹ Office of the Assistant Secretary of Defense (Energy, Installations and Environment), *2016 Operational Energy Strategy* (Washington, DC: Department of Defense, January 2016) 11, <http://www.acq.osd.mil/eie/Downloads/OE/2016%20DoD%20Operational%20Energy%20Strategy%20WEBc.pdf>.

⁶⁸⁰ Office of the Assistant Secretary of Defense (Acquisition Technology and Logistics), *Fiscal Year 2016 Operational Energy Annual Report* (Washington, DC: Department of Defense, July 24, 2017), <http://www.acq.osd.mil/eie/Downloads/OE/FY16%20OE%20Annual%20Report.pdf>.

⁶⁸¹ Alan Bohnwagner, *Considering Energy Logistics in Force Development*, Operational Energy Office, Office of the Assistant Secretary of Defense (Energy, Installations, and the Environment) (Washington, DC: Department of Defense, September 16, 2015), <http://www.acq.osd.mil/eie/Downloads/OE/Considering%20Energy%20Logistics%20in%20Force%20Development%2020150916.pdf>.

⁶⁸² Office of the Assistant Secretary of Defense, *2016 Operational Energy Strategy*, 11.

⁶⁸³ Office of the Assistant Secretary of Defense, 16.

The Operational Energy Plans and Programs office, though re-organized into the Office of the Assistant Secretary of Defense for Energy, Installations and Environment in 2014, has been absolutely critical to advancing energy considerations in the acquisitions process. Operational energy staff enabled the implementation of energy as a Key Performance Parameter by updating the JCIDS process manual to include operational energy factors and helping the services conduct energy supportability analyses. The operational energy office has also recently begun working to improve energy efficiency and supportability for the existing force.⁶⁸⁴ Marshaled by the operational energy office, each service has created a method to their existing force structure to identify energy-hungry systems that have a long service life remaining for targeted energy improvements, and is supposed to have presented an initial list of systems for prospective upgrades in March 2017.⁶⁸⁵

While the administrative groundwork has now been more-or-less laid, the energy efficiency KPP requirement created by Congress in 2008 is only lately beginning to impact the current and future force. Due to the lengthy and protracted acquisition process, almost none of the current force reflects any energy concerns. It will take another 5-20 years of consistent effort and consideration of systems' energy demands and the associated logistics needs to before energy concerns are realized in the weapons systems and platforms actually in the force. The drawdown in the overall defense budget between record highs of FY2010 and what appears to be a low in

⁶⁸⁴ Office of the Assistant Secretary of Defense, 16.

⁶⁸⁵ Office of the Assistant Secretary of Defense, *FY2016 Operational Energy Annual Report*.

FY2016 means that there have been fewer new weapons systems programs traversing the capability, requirements, and acquisitions processes. Because the new energy KPP and energy sustainability assessment requirements would typically be done during the earliest stages of developing a weapons system, they do not impact programs that were already into the later phases.⁶⁸⁶ In the meantime, absent the imperatives of major ground conflicts in Iraq and Afghanistan, or high fuel prices, the risks that the acquisitions process will return to considering energy and fuel demand as an afterthought, at best, remains high. While Congress set the bureaucratic framework necessary to incorporate energy considerations into the procurement of weapons systems, it would have gone nowhere without the continued efforts of the operational energy office and the buy-in of the Joint Chiefs of Staff (who are responsible for the JCIDS process) and the military services.

⁶⁸⁶ The KPPs, including the energy KPP, would typically be utilized before Milestone A in the acquisition process, as part of the Analysis of Alternatives and Material Solutions Analysis. This is the phase of the acquisition system where a wider array of potential systems is considered, before the Milestone A review selects one or more systems to move into the technology maturation and risk reduction phase.

Conclusion

There are several major conclusions to be drawn from this close study of the implementation of these congressional provisions and prescriptions by the Pentagon.

First, having a bureaucratic champion in the Pentagon is essential for moving policy prescriptions into an implemented reality. Without the topic being important to one or more senior leaders within the Pentagon bureaucracy, it will struggle to gain traction. Implementation efforts may be halfhearted. Congressional policy dictates can be rapidly incorporated into DOD policy, but this incorporation may mean little. For example, the goal that the Pentagon would meet 25% of its energy needs with renewable energy was clear, and easily incorporated into the reporting metrics and official Pentagon policies. However, it wasn't important to anyone in the building, and so little action was taken. Judging from the scant congressional follow-up, it was not a priority for any legislators, either, and so the topic lay fallow until the reorganization of the Assistant Secretary of Defense for Operational Energy into the Office of the Assistant Secretary of Defense for Energy, Installations, and Environment as the Deputy Assistant Secretary of Defense for Operational Energy (Energy, Installations & Environment) was completed in September 2015 with the swearing-in of Amanda Simpson. By contrast, the speed with which Navy and Army senior leaders moved after President Obama declared that each service now had to contribute to \$2 billion in energy finance contracting and achieve 1GW in renewable energy generation. Renewable energy was now a presidential priority, and that

mattered. But even the presidential imperative had to fall on fertile bureaucratic ground. The 1GW initiative was closely aligned with the Secretary of the Navy Ray Mabus' broader set of Navy energy initiatives. The Army had created the Energy Initiatives Task Force in September 2011, perhaps in an effort to meet more of the congressional energy requirements, and the Army's Engineering and Support Center was already skilled in energy contracting. Once renewable energy generation became a presidential special interest program, the services re-doubled their efforts. The Pentagon nearly doubled its renewable energy generation in one year, reaching about 250,000 MW hours in FY2012. While that rapid pace was unsustainable, the Navy and Army brought far more renewable generation assets online than the Air Force did. Overall, the Air Force mostly ignored these energy contracting and renewable energy goals. The key discriminator was senior leadership attention within the services and the establishment of a bureaucratic structure with clear, well-defined goals and authorities. Renewable energy generation had a bureaucratic home in the Army and the Navy, which meant that it was *someone's* responsibility.

Without this bureaucratic scaffolding, implementation of any policy is far more difficult. If there is not a clear office responsible for implementing a policy, for responding to congressional directives and requests for updates, then it is no-one's responsibility. The hoped-for effect will go unrealized, as the Pentagon responds to congressional interests in an ad hoc rather than routinized way. The creators of the Operational Energy Plans and Programs office understood that the bureaucracy was

the key to action by the Pentagon. While there may be points of disagreement about the appropriate bureaucratic home and set of legal authorities for the office, the offices' creators understood that the deep change in the Pentagon's energy mindset that they were trying to spark would have to have a strong and empowered champion within the building. This was evident in the uneven adoption of the energy as a KPP requirement by the acquisitions and requirement community. Without the operational energy's office involvement in the re-drafting of the capabilities process manual and deep involvement in the energy as a KPP standard, it is doubtful that the effort to get the Pentagon to factor energy demands into capabilities, acquisitions, and force structure planning would have progressed as far as it did. Due to the conflicting timeframes and inability of congressional offices to get into the weeds on implementation, operational energy issues would have likely remained as superficial concern for the Pentagon absent the creation of the operational energy office.

Secondly, the very thing that makes it possible – its relative orthogonality to the core missions of the Pentagon – may make implementation of small-bore defense policymaking within the Pentagon more difficult. It is easier for legislators to make defense policy on less consequential issues, which are less likely to attract a higher degree of scrutiny or conflict with another member's policy preferences than policymaking on more core defense issues. However, this remove also means that any successful small-bore legislative policymaking is, definitionally, not a priority to the Pentagon. However, it would be premature to conclude that congressional

policymaking on areas more important to the Pentagon are easier to implement – as they raise the chances of internal opposition or sandbagging within the Pentagon. There may be a sweet spot, or this may be a problem only tractable by advance thought about how their policy would be effected by the congressional policymakers.

A third lesson is the importance of receptive senior civilian leaders at the highest levels of the Pentagon. While partisanship wasn't predictive of congressional support for defense energy provisions in the HASC and SASC, or in the House and Senate, the impact of senior leaders in the Pentagon who were supportive of advancing these energy concerns was enormous. That largely-friendly bureaucracy was the product of the Obama administration. Many of the most significant provisions were passed by Congress between 2006 and 2011, which meant that their implementation largely fell to the Obama administration senior Pentagon officials, who were far more likely to be supportive or at least neutral towards energy initiatives than their prospective Republican counterparts. It is difficult to imagine even the most bipartisan of Congress' defense energy efforts gaining much traction in a hostile bureaucracy, whether the bureaucracy was civilian or uniformed. Even the limited successes of congressional defense energy policies described above may have foundered entirely if landing on the more hostile ground of a Pentagon staffed with Republican political appointees. While Congress can mandate a policy, require an implementation plan and follow-up report, and ask for studies or GAO audits, they cannot actually

implement policy on DOD's behalf. At most, they can re-work the bureaucracy – as they did with the operational energy office, within the constraints of small-bore defense policymaking. On the grander scale, this can come with the bare-dagger political fighting of the Goldwater-Nichols reforms in the mid-1980s.⁶⁸⁷

Fourth, the congressional imperative to *do* something, *anything* to demonstrate that the Representative or Senator was taking action and advancing their constituents' interests was also very powerful, and something that at times had to be carefully managed. A persistent refrain of congressional legislative activity was the tendency to call for a report or a study on an issue – although one often suspected that it wouldn't even be read. One example of the costs and complexities of the congressional knee-jerk study impulse, and the nuances of Pentagon oversight by Congress, came from the OEPP office. Early in the OEPP's lifespan, a SASC staffer added a provision to the annual NDAA requiring a study the utility of small modular nuclear reactors for contingency operations – something that had no near, or even medium-term, viability. Conducting this study fell to the OEPP, but there was no-one on staff with small nuclear reactor expertise. OEPP would have had to contract a private firm for the study, to the tune of at least \$250,000. When the senior OEPP official pushed back on the staffer about the necessity of the study, the answer was unexpected: “We have members who are just absolutely adamant that this is important, and it has to happen.” The staffer's mandate for a study was not an

⁶⁸⁷ The Goldwater-Nichols reforms were very well and thoroughly chronicled by James R. Lochner III in *Victory on the Potomac: The Goldwater-Nichols Act Unifies the Pentagon*, Williams-Ford Texas A&M University Military History Series 79 (College Station: Texas A&M Press, 2002).

indiscriminate burden to the operational energy office. Rather, it was intended to fend off bad legislation. As the senior OEPP official put it, “Then I understood why [the staffer] needed it and that it was worth our trouble.”⁶⁸⁸ Given the lag time between enacting a policy, its implementation, and any actual change occurring, it is understandable that legislators would not limit their trumpeted accomplishments to longer-term policy successes, working from a “what have you done for me lately?” theory of voters. The demanding tempo of elections, particularly in the House, and an apparent lack of voter decisionmaking guided by legislative outcomes rather than output, efforts, personality, name recognition, or other factors, may also account in part for the surprising lack of interest by the personal staff working on DODESA in the longer-term follow-through of their pet legislation.

Two other factors apply more narrowly to Congress’ ability to impact DOD’s energy use. First, one factor working against sustained change in the Pentagon is the amazing achievements of the logisticians and the supply chain. As a senior OEPP official described it, “In part, the success of the logisticians in getting fuel to the fight in Afghanistan, though some of the worst supply chains imaginable, masked the problem [of operational energy] and underplayed its significance. After all, the fuel arrived, so there couldn’t be a problem.”⁶⁸⁹ Another OEPP staffer concurred, “For 70 years, we haven’t had to care about logistics.”⁶⁹⁰ Even given the difficult terrain and non-existent infrastructure in Afghanistan, the fuel more or less got where it needed

⁶⁸⁸ Interview with senior OEPP official, August 2014.

⁶⁸⁹ Interview with senior OEPP official, August 2014.

⁶⁹⁰ Interview with OEPP staffer, September 2011.

to go. This success hid a deeper issue – a full-spectrum conflict would need much more fuel, and the system that had stretched almost to the breaking point by counterinsurgency operations could not deliver it.

A final factor impacting the successes and failures of Congress's attempts to reform DOD's energy policy is the timing. When many of the operational energy provisions were created and enacted between 2006 and 2011, the wars in Iraq and Afghanistan were still major ground conflicts, with obvious fuel logistics vulnerabilities and casualties. However, U.S. forces withdrew from Iraq in 2011. U.S. forces in Afghanistan drew down from about 100,000 in 2011, to about 50,000 in late 2013, to about 10,000 in 2015. This drawdown in forces made the operational risks of fuel convoys – a major motivating factor for several congressional efforts – less urgent and compelling. While the staffers and members of Congress partly worked to create their own narrative of why energy actions were needed – to create their own timing opportunity, per Kingdon – the real dangers of the war in Afghanistan made their arguments much more evident, both within Congress and within the Pentagon. Even though OEPP's arguments about the importance of operational energy were only unevenly adopted, it is doubtful that senior uniformed commanders would be as receptive to the same set of arguments today. Without the immediate pressures of the war in Afghanistan, there is a significant risk that the painful and often deadly lessons of the military's fuel dependence will be blurred and ultimately forgotten. It remains to be seen whether the reformulated operational energy office, or the so-far nascent

inclusion of energy as a real KPP will be enough to keep these lessons in the forefront of the planners' minds in the Pentagon.

Conclusion

This close analysis of the enactment and incomplete implementation of defense energy policies illustrates some important elements of the policy relationship between Congress and DOD.

Defense Policymaking

Within the halls of Congress, this dissertation provides insight into what defense policy is made, who makes it, why, and how. Following Towell, this research affirms that Congress both can and does make substantive defense policy, far from the abdication of military and foreign policy responsibility seen by Fischer and Hinckley.⁶⁹¹ As the only must-pass annual policy bill – despite the need for more and more creative legislative engineering and arm-twisting to get it across the finish line each year – the NDAA is *the* legislative vehicle for policy. Even the Chairman of HASC doesn't bother to attempt to shepherd a separate bill through both houses, preferring to attach his legislation reforming the DOD's acquisition system to the committee's version of the NDAA after the press blitz.⁶⁹² The predictable recurrence of the annual NDAA gives members on the HASC and SASC the privileged positions as the primary loci for congressional defense policy making, and the chance to

⁶⁹¹ Louis Fisher, *Congressional Abdication on War and Spending* (College Station: Texas A&M Press, 2001), and *Presidential War Power*, 3rd ed. (Lawrence: University of Kansas Press, 2013); Barbara Hinckley, *Less Than Meets the Eye: Foreign Policy Making and the Myth of the Assertive Congress* (Chicago: University of Chicago Press, 1994).

⁶⁹² Chairman Mac Thornberry (R-TX) introduced the Defense Acquisition Streamlining and Transparency Act (H.R. 2511, 115th Cong.) in the House on May 18, 2017. The bulk of the bill was folded into the HASC mark of the FY2018 NDAA (H.R. 2810, 115th Cong., as reported by the House Armed Services Comm., July 6, 2017). Rep. Thornberry also introduced the Acquisition Agility Act (H.R. 4741, 114th Cong.) on March 15, 2016. It too was incorporated in the HASC mark of the FY2017 NDAA (H.R. 4909, 114th Cong., as reported by the House Armed Services Comm., May 4, 2016) and much of it was enacted as part of Pub. L. No. 114-328 (130 Stat. 2000 (2016)).

develop expertise in defense policymaking. As quantified in Chapter 4, 71% of SASC-originated provisions and an astonishing 81% of HASC-originated defense energy provisions were in the final enacted versions of the bills.

However, the legislative vehicle of the NDAA does impose some important limitations – shaping and incentivizing a style of policymaking I term “small-bore defense policymaking.” Subject to the structural constraints on congressional oversight cogently laid out by Lindsay (1990), this kind of low-profile congressional defense policymaking tends to be episodic, non-comprehensive, and driven more by the interests of individual legislators rather than any platonic ideal of systemic oversight over defense policy. In order to succeed, this kind of small-bore defense policy-making needs to be low-profile and bipartisan enough to succeed in either the defense committees or on the floor during the bill’s consideration, avoiding high-profile and contentious issues either by being of special interest to one or a few Members, with the others unopposed, or by attracting general support across party lines. Low- or no-cost, short-term or once-off provisions, requirements for DOD to evaluate a policy or write a report, or incremental changes to current policies, are all far easier to pass the various congressional hurdles than major or costly changes.

These limitations – that attempts to set or shift defense policy be uncontroversial, incremental, clearly related to national security, and free or nearly so, derive from the central role of the committees in the NDAA, and the practice of *en bloc* floor amendments. For a provision to be accepted into the committee’s mark of the bill –

after a pro-forma markup lasting a handful of minutes – it must be pre-socialized by the provisions’ authors, typically the members defense staffers or committee staffers, among the staffers of the other members and the professional staff members of the committee or subcommittee having jurisdiction. At the subcommittee mark stage, each staffer has an effective veto. Like the Senate hold, this veto is a matter of tradition and courtesy. Unlike the broader Senate, it remains in place due to a deliberate cultivation of bipartisanship among the members and staff on the HASC and SASC.⁶⁹³ While a provision need not inspire powerful support, it must pass the policy gut-check of a dozen or so other defense policy staffers, and not provoke any outright opposition. This essential procedural step shapes what measures can succeed via small-bore policymaking. Although lack of HASC subcommittee markup records prior to the 112th Congress and the SASC’s closed mark-up prevent certainty, it is highly likely that the majority of the HASC and SASC-originated provisions emerged from the subcommittee marks and markup process rather than as votes during the full committee’s markup. Similarly, all 10 of the House provisions and 13 of the 16 offered Senate amendments that were offered on the floor were enacted as part of *en bloc* amendment packages. This *en bloc* packages, bundling up to a dozen or more amendments together at the discretion of the bill’s floor manager, most often voted on via a simple voice vote, are a substantial mechanism for action within the NDAA, and possibly in other bills. However, the *en bloc* amendments are usually pre-agreed by the majority and minority floor managers for the bill, and thus, like the subcommittee

⁶⁹³ Colleen Shogan, “Defense Authorization: The Senate’s Last Best Hope” (Paper presented at the American Political Science Association Conference, Seattle, WA, September 1-4, 2011, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1900866).

mark provisions, must both seem reasonable enough and attract at least lukewarm bipartisan support, reinforcing the contours of potential small-bore defense policymaking within the boundaries described above.

Within these limitations, the NDAA process provides an avenue for defense policymaking that can have substantial impacts on the Pentagon. While many of the provisions examined in Chapter 4 were apparently slight, like those that required reports to Congress, these provisions must be evaluated as attempts to set a baseline for the Pentagon's energy use, or as part of an incremental approach to lay the groundwork for further congressional action in later years. Others aimed to shift the fundamentals of how DOD valued, and therefore used, energy. In particular, the creation of the Operational Energy Plans and Programs office, the requirement to consider the fully-burdened cost of energy as a Key Performance Parameter, and the mandate for nuclear-powered surface ships were areas in which the expected benefits would be decades in the making, but offered the opportunity to impact DOD's energy use over the long term. Because these policy constraints derive from the processes of the NDAA, the chairmen of the HASC and SASC may have greater latitude to use the NDAA to enact more radical policy shifts or new policies than the rank-and-file committee members could. The relative defense policymaking power differentials between the chairs of HASC and SASC, the component subcommittees, and rank-and-file committee members would be a productive area for further study.

Small-bore defense policymaking, as a mechanism for substantive legislative activity and oversight actually makes up the bulk of day-in, day-out defense oversight in the contemporary Congress. Enabled by the annual passage of the National Defense Authorization Act and centered on the congressional defense committees, small-bore policymaking relies on being broadly tolerable to committee membership, especially the committee Chairman and Ranking Member. It must not attract strong disagreement or attention from congressional colleagues, the Pentagon, or the White House, whether due to cost, parochialism or infringement on another's priority project. Attempted policymaking on core defense priorities or hot-button issues (a shifting and politically contingent set of topics) is also unlikely to survive into statute. The small-bore policymaking demonstrated by congressional oversight of DOD energy – bipartisan, acceptable to or at least tolerated by other members, and relatively cheap – remains a viable and growing area of congressional action. Because the institutional hurdles for this type of small-bore defense policymaking are relatively low, it is far easier for various policy shifts or oversight initiatives to be enacted. Therefore, small-bore policymaking and defense oversight may actually be both more consistent and more effective – as well as more accessible to rank and file committee members – than major defense policy initiatives.

The annual recurrence of the bill also incentivizes an incremental approach. As long as a member of Congress expects to be on that committee next year, the near-certainty that the NDAA will pass every year makes an incremental approach a

fruitful strategy, even if the ultimate goal is a larger shift in policy. If each provision is a small shift, with a clear connection to national security, one's staff or member colleagues will have scant grounds to object to its inclusion into the subcommittee mark. The prior year's efforts then become the grist and the justification further efforts – the strategy of legislative incrementalism and momentum pursued by Giffords' staffers in their Department of Defense Energy Security Act bill.

The incremental approach of this of small-bore defense policymaking is more closely aligned with Lindblom than with the major policy efforts described by Kingdon.⁶⁹⁴ However, it is not clear that the incremental *results* achieved by the policymakers outlined in this dissertation derive from the simplified decision-making heuristic described by Lindblom. Congressional policymakers may have considered a broader array of possible solutions – the root and branch – but been limited to making incremental policy shifts due to the absolute requirement for non-controversiality in advancing provisions through the NDAA. The incentives to incrementalism in the NDAA – its annual recurrence and consensus-driven procedural tradition – may result in a greater degree of incrementalism, or at least apparent incrementalism, than in other policy areas where the opportunity for a policy shift comes more rarely, incentivizing bolder action and allowing for a broader theatre of potential policies. Kingdon's analysis focuses on the ebbs and flows of possibility for major legislative initiatives – broad efforts that require a consensus regarding the existence of the

⁶⁹⁴ Charles E. Lindblom. "Muddling through" Kingdon, *Agendas, Alternatives, and Public Policies*.

problem and a set of solutions. In Kingdon's terms, the alignment of the problem, policy and politics streams are necessary for major policy shifts to occur. However, the annual recurrence of the National Defense Authorization Act (NDAA) as a vehicle for a broad set of legislative provisions obviates the need for a convergence between the problem, policy and politics streams, and allows for an array of incrementalist policy changes instead of waiting for the infrequent tidal (re)alignments Kingdon describes. The emergence and growth of defense energy as an area of congressional interest and policy-making over this decade illustrates the incremental, cumulative process knitting together what would independently be isolated provisions in the annual defense policy bill. Rather than waiting for the three streams of Kingdon's model – problem, policy, and political – to converge and make major legislation possible, small-bore defense policymaking relies on a Goldilocks approach: Important to our national security, but not too important; impactful, but not controversial or expensive. Members and staff must aim for a narrow and moving target to advance substantive defense policymaking and oversight.

In Kingdon's parlance, defense energy quietly became both a problem stream and a policy/solution stream. Without the need to convince the majority of members of Congress that major legislation was necessary, the hurdles to clear were far lower. However, in Kingdon's terms, the narrative case studies in Chapter 3 illustrated that the staffers and legislators involved did put in effort to develop and frame the problems they saw in DOD's conceptualization and use of energy as a national security and operational effectiveness problem. In part, these framing efforts were

necessary to justify their provision's inclusion in the NDAA. But they were also necessary to avoid the topic of DOD's energy use from being seen as an *environmental* effort – something sure to spark fierce partisan sentiment. As described in Chapter 3, framing strategies included designing and holding hearings and commissioned reports that would support their desired framing of DOD energy as a national security and operational capability issue, and emphasize findings, like the \$400/gallon cost of fuel delivered to the battlefield, and the 1 casualty per 49 supply convoys, that supported their framing. In other words, the staffers worked to create a specific framing of DOD energy as a problem stream while offering provisions to the NDAA as solution stream. The staffers also actively tried to keep it out of the more contentious politics stream. To a large part, this focused framing effort was possible because the NDAA is an elite bill, with scant public interest or attention. In that respect, the staffers used the self-perception the armed services legislators have that politics does stop at the waters' edge, and that their efforts are designed to enhance national security rather than for political benefit. (Naturally, being able to emphasize their own legislative accomplishments to improve national security has its own political benefit).

The broad remit of personal and committee staffers to make defense policy, given a sufficiently permissive boss, is also striking. The role of congressional staff, especially the professional staff on the committees, has been examined only scantily

and hardly at all since the late 1990s.⁶⁹⁵ The literature on the impact of personal and committee staffers on legislation and policy is even thinner, despite their central role in creating and managing the policymaking process within the legislature.⁶⁹⁶ The central role of committee staff in particular, considering their privileged legislative process positions, long tenures and deep subject-matter expertise, is worth of further study. It is also worth examining whether committee staff pose their own principal-agent problem within Congress, much as sections of the bureaucratic politics literature frames the relationship between Congress and the bureaucracy as a principal-agent problem.

Finally, the close qualitative and quantitative analysis of the proffered defense energy provisions in Chapter 3 and 4 demonstrates that the bulk of the policymaking process happens well before the bill is put on the floor of the House and Senate. Moreover, the annual NDAA, while formally one bill, isn't just one strand of legislative effort. For example, Rep. Thornberry's Acquisition Agility Act of 2016, although introduced

⁶⁹⁵ See Robert H. Salisbury and Kenneth A. Shepsle, "Congressional Staff Turnover and the Ties-That-Bind," *American Political Science Review* 75, no. 2 (1981): 381-96; Richard L. Hall, "Participation and Purpose in Committee Decision Making," *American Political Science Review* 81, no. 1 (1987): 105-127; Christine DeGregorio, "Professional Committee Staff as Policymaking Partners in the US Congress," *Congress and the Presidency* 21, no. 1 (1994): 49-65; Christine DeGregorio, "Professionals in the U.S. Congress: An Analysis of Working Styles," *Legislative Studies Quarterly* 13, no. 4 (November 1988): 459-76; Christine DeGregorio, "Staff Utilization in the U.S. Congress: Committee Chairs and Senior Aides," *Polity* 28, no. 2 (Winter 1995): 261-75; Barbara S. Romzek and Jennifer A. Utter, "Congressional Legislative Staff: Political Professionals or Clerks?" *American Journal of Political Science* 41, no. 4 (October 1997): 1251-79; David E. Price, "Professionals and 'Entrepreneurs': Staff Orientations and Policy Making on Three Senate Committees," *Journal of Politics* 33, no. 2 (1971): 316-36.

⁶⁹⁶ James P. Hill, "The Third House of Congress versus the Fourth Branch of Government: The Impact of Congressional Committee Staff on Agency Regulatory Decision-Making," *John Marshall Law Review* 19 (1985): 247.

as a separate bill, was designed to be incorporated into the FY2017 NDAA. A glance at the “related bills” tab in Congress.gov for any years’ NDAA shows dozens of related bills – many of which were incorporated in whole or in part into the NDAA text. The unique status of the NDAA as a guaranteed-to-pass, predictable annual legislative opportunity leads to it hosting a broad assortment of remora-like secondary bill and sets of provisions. However, the trend of Congress passing fewer, and less substantive bills over the past decade means that any other bill that looks as if it will make it across the finish line, like the annual appropriations bills, will have similar appeal as a legislative vehicle, and a potentially similar policymaking process, with ancillary bills, provisions, and policy riders included during the bills initial drafting or via *en bloc* amendments, rather than via floor votes. This tendency is further strengthening the power and authority of majority leaders in the house, discussed above.

Implementation

Crossing the Potomac, this research also sheds light on how policy is – and is not – implemented in the worlds’ largest bureaucracy, and deepens the understanding of the relationship between Congress and DOD.

The key thing that makes small-bore defense policy successful – its smaller scope, incrementalism, and absence of the carrot (or stick) of funding, makes its success in the Pentagon an uphill battle. Absent money, would-be congressional defense

policymakers are forced to rely on policy dictates and the DOD bureaucracy as their primary means of effecting their legislative goals. More often than not, this results in a slow, incomplete, or half-hearted implementation efforts by the Pentagon. While the concentration of committee power over the Pentagon means that the Pentagon must at least appear to be responsive to congressional interests, the Pentagon has an enormous ability to sandbag and drag its collective feet.⁶⁹⁷ Moreover, the cost of congressional enforcement in time and attention limits the ability of Congress to call the Pentagon to account for deniable disobedience, particularly on areas that aren't core policy priorities of the armed services committees.⁶⁹⁸ In addition to the overt oversight actions of hearings, budget reductions, and periodic investigations, much of the literature on the relationship between Congress and the bureaucracy focuses on the development of covert congressional strategies to check the federal bureaucracy through procedural mandates that empower external stakeholders and allow them to pull "fire alarms" and trigger congressional oversight.⁶⁹⁹ Much rarer are theoretical explorations of congressional efforts to empower a new element within an agency or

⁶⁹⁷ Joshua D. Clinton, David E. Lewis, and Jennifer L. Selin, "Influencing the Bureaucracy: The Irony of Congressional Oversight," *American Journal of Political Science* 58, no. 2 (2014): 387-401.

⁶⁹⁸ John D. Huber and Charles R. Shipan, "The Costs of Control: Legislators, Agencies, and Transaction Costs," *Legislative Studies Quarterly* (2000): 25-52.

⁶⁹⁹ See, for example, Mathew D. McCubbins, Roger G. Noll, and Barry R. Weingast, "Administrative Procedures as Instruments of Political Control," *Journal of Law, Economics and Organization* 3, no. 2 (1987): 243-77; Kathleen Bawn, "Political Control Versus Expertise: Congressional Choices about Administrative Procedures," *American Political Science Review* 89, no. 1 (1995): 62-73; Kathleen Bawn, "Choosing Strategies to Control the Bureaucracy: Statutory Constraints, Oversight, and the Committee System," *Journal of Law, Economics, and Organization* 13, no. 1 (April 1997): 101-26; Steven J. Balla, "Administrative Procedures and Political Control of the Bureaucracy," *American Political Science Review* 92, no. 3 (1998): 663-73; Mathew D. McCubbins and Thomas Schwartz, "Congressional Oversight Overlooked: Police Patrols Versus Fire Alarms," *American Journal of Political Science* 28, no. 1 (1984): 165-79.

other bureaucratic element in an effort to change that bureaucracy's broader orientation, as the creation of the Operational Energy Plans and Programs office did.

The possibility (or probability) of Pentagon foot-dragging and the high cost of enforcement should make congressional policymakers think hard about how their policy provisions will be implemented. Given the byzantine Pentagon bureaucracy, congressional staffers would do well to read Durant's advice to new political appointees about how government really works and how to avoid the most common pitfalls.⁷⁰⁰ However, the narrative case studies in Chapter 3 reveal that the creation of the policy is often treated as the end goal by the congressional actors, with little or thought as to how – and by whom – a policy will be implemented.

The exception was the creation of the Office of Operational Energy Plans and Programs, which was explicitly modeled after the powerful Director of Operational Test and Evaluation by its originators. Both the originating HASC staff and senior OEPP staff and officials acknowledged that the office had been endowed with powerful authorities, although they had differences in opinion about how useful they were, as well about the most appropriate institutional home within the Pentagon. As Sherri Goodman noted about her own tenure in the Pentagon, you need real authorities to get anything done.⁷⁰¹

⁷⁰⁰ Robert F. Durant, "Getting Dirty-Minded: Implementing Presidential Policy Agendas Administratively," *Public Administration Review* 69, no. 4 (2009): 569-85.

⁷⁰¹ Sherri Goodman (former Deputy Under Secretary of Defense for Environmental Security) in interview with the author, June 2014.

The HASC staffers' creation of the Operational Energy Plans and Programs office was the most successful of the policy initiatives discussed, and has the greatest likelihood of substantially impacting how DOD uses and thinks about energy over the long term. There were several keys to their success. First, the staffers made a concerted effort to win support from as wide a swath of members on the HASC as possible. To this end, they made smart use of the legislative tools at their disposal – holding hearings and requesting CRS and GAO reports that showed that there was a national security and operational effectiveness problem with DOD's energy use, and that their proposed solution would help address the problem. Second, the HASC staffers had a clear understanding of what the problem was – DOD's inability or refusal to factor energy into their acquisitions decisions, campaign plans, and operational analyses – and *how* to fix it. The OEPP was designed to cut across the various fiefdoms of DOD in order to focus attention on operational energy issues. As such, the office and its leader were endowed with substantial authorities and institutional power. Even so, the office got off to a rocky early start. However, the recurrent nature of the NDAA allowed the HASC staffers to shore up the office, clarifying its responsibilities and providing dedicated funding to stand it up. The staffers also attempted to instrumentalize operational energy concerns in the uniformed services, mandating the designation of an operational energy official within each service and within the Joint Chiefs of Staff, and requiring operational energy goals and plans from each service. As detailed in Chapter 7, the OEPP

appears to be shifting DOD's use and conception of energy, via their seat in the acquisitions and planning processes. Even so, OEPP is presently on shaky bureaucratic ground, having been re-organized into the acquisitions directorate, which it itself is undergoing a foundational realignment of responsibilities.

This case offers some broader lessons about successful legislative policymaking more generally. First, the staffers must have both a clear vision of the problem, and how to persuade others that it merited legislative action. In this case, the staffers made savvy use of the legislative tools available to persuade the key committee actors. Second, the staffers should have a good understanding of the bureaucratic landscape of how and where their policies would be implemented. In the OEPP case, the HASC staffers had prior DOD and committee expertise, and were aided by an individual with substantial experience on DOD energy issues within the Pentagon. To put it bluntly: expertise matters. Third, closer oversight at the beginning of OEPP's lifespan gave the staffers repeated chances to bolster the fragile office and make it clear that the Pentagon *would* shift its energy policy. This support and legislative follow-up was enabled by the annual nature of the NDAA. Policymakers in other issue areas wouldn't likely have this recurrent opportunity for follow-up. Finally, the operational energy efforts landed on fertile soil. Not only might DOD be more inclined to show deference to the defense committees because of the annual prospect of more onerous oversight, the Pentagon was stocked with Obama appointees. Even so, the operational energy office had to persuade the uniformed personnel, as well as the

civilians. Policymaking in other issues doesn't need to account for the parallel bureaucracy of the uniformed military, but the receptivity of the bureaucracy of congressional initiatives and oversight may vary more widely depending on partisan control of the executive and the legislature.

The impact of an empowered bureaucracy can be seen in the progress the Operational Energy Office made in cajoling the rest of the Pentagon to consider energy in the decisions that mattered. Although the office had some growing pains and was effectively left rudderless for two years while it was being reorganized as the Office of the Deputy Under Secretary of Defense for Operational Energy within the Office of the Assistant Secretary of Defense for Acquisition, Technology, Logistics, the operational energy office has been essential to the progress that has been made in incorporating energy tradeoffs and logistics sustainability into acquisition decisions, planning scenarios and wargames. This limited success was made possible by the authorities Congress endowed the office with – especially a seat at the acquisitions table – but also the energy and initiatives of the office's leadership and staff and the tacit support of the Pentagon's senior-most civilian leadership. The essential role of the bureaucracy in enabling policy to become reality – and again, the need for supportive senior leadership – can also be seen in the services' different responses to the Obama White House's 1GW renewable energy generation challenge. The Navy and Army, which put bureaucratic resources towards the effort, achieved far more than the minimal efforts and results of the Air Force.

While the presidency does not have a direct impact on either the specific congressional defense energy provisions, the impact of the Obama administration in shaping the relatively receptive Pentagon civilian bureaucracy that congressional defense energy policymaking attempted to shape should not be understated. While partisanship didn't play a significant role in the armed services' committee's defense energy provisions, a Pentagon bureaucracy with senior civilian leaders who were openly dismissive of or opposed to the efforts would have been a much more difficult environment, and one in which the effort of the operational energy office and the various efforts to improve installation energy may have borne less fruit. The delays of the executive branch also handicapped the office's leadership and ability to sustain their efforts. Sharon Burke was confirmed as the Director of the Operational Energy Plans and Programs Office in June 2010, two years after the office's creation. She left the role early in 2014, due to the pending re-organization of the office into the ASD (EI&E) within the USD(AT&L). Amanda Simpson was sworn in as the inaugural leader of the reorganized operational energy office in September 2015, and had just 18 months to drive organizational change in the Pentagon before the inauguration of Donald Trump ended her tenure. The new administration hasn't yet nominated a new head of the office, and appears unlikely to – potentially ending its tenure, and certainly crippling its ability to impact Pentagon policy. Possibly robust, explicit support from either powerful legislators or senior DOD or administration officials could strengthen the office's bureaucratic standing, but that is a faint hope.

The swift change in significant of the operational energy office indicates the bigger-picture challenges of implementation, even for savvy legislative operators. The HASC staffers who created the operational energy office could do little to speed the Obama Administration's appointment for either the original or the re-organized, demoted office. Although they have moved on from their HASC, positions they would be similarly unable to compel the Trump administration to fill the leadership position, now vacant. Similarly, the operational energy office's creators and supporters were either unaware of the implications of reduction in the number of Assistant Secretaries of Defense in the FY2015 NDAA for the office they had created, or lacked sufficient pull to prevent it or save their pet office. This bureaucratic diminishment may ultimately kill the operational energy office. The parallel with the Director of Energy, established in 1974, is gloomy. Similarly-shifting tides may account for the its slide into irrelevance just over 6 years after its 1974 creation. If the sustained focus of the senior-most official in the Pentagon, a months-long international relations and economic crisis were insufficient in the 1970s, what bureaucratic implementation could possibly be sufficient to yield durable institutional shifts in the Pentagon's energy use?

Directions for Future Research and Implications for the Discipline

The NDAA relies on the deep bipartisan cooperation between the majority and minority in the HASC and SASC to function. This bipartisan cooperation is enabled

by the relatively narrow ideological gap between the Republicans and Democrats on the committees, as measured by the mean DW-NOMINATE scores (discussed in Chapter 4). However, what DW-NOMINATE does not measure is how large (or small) the policy differences are between the majority and minority are *on defense issues*. While there is no research on this precise topic, anecdotal evidence suggests that the defense policy goals of Republicans and Democrats on HASC and SASC are far closer than their counterparts on other committees – a shared defense policy orientation that undergirds, and allows, the kinds of bipartisan cooperation that enables the annual NDAA. It is difficult to imagine the Republicans and Democrats on House and Senate Energy and Natural Resources Committee sharing a common view on resource extraction on federal lands, nor would their opposed views allow for amiable consideration of an annual, or even biannual, policy bill, as the regular order process envisioned. Even when the committees are able to find sufficient common ground to advance a bill, the partisan gulfs in the wider Senate, and in the House, prevent it by being taken up by leadership and pose last minute-stumbling blocks to passage in the form of various poison pill amendments. While it would require a well-thought-through methodology, a multi-dimensional analysis of the *policy preferences*, rather than the *ideologies* of committee members would provide a more nuanced idea of the extent of the bifurcations within committees, and possibly predictive leverage as to the committees’ ability to advance substantive legislation – even if the fate of that legislation would ultimately be decided by the chambers’ partisan leadership.

Generally, the role of committee staffers in setting policy priorities and drafting legislation is woefully understudied. The HASC staffers' strategy of making defense energy into an actionable national security problem via reports, studies, and hearings, in a years-long influence campaign, created the groundwork for their legislative entrepreneurship of creating the Operational Energy Plans and Programs office and the related operational energy mandates. Given the scope of professional staffers' autonomy, it is likely that other policy changes, new programs or offices, and other legislative accomplishments with potentially significant impacts originated with the staffers of other committees. An analysis of the role and impacts of professional staffers would be difficult, requiring a deep dive into the legislative process across multiple policy areas, but informative.

Along the same lines, while legislator effectiveness is understudied, staffer effectiveness has not been studied at all from the academic vantage point. HASC and SASC staffers may have an advantage over the professional staff of other committees. The NDAA comes every year, providing a recurring opportunity to make and implement policy changes. Even so, it takes several NDAA cycles before new professional staffers have the requisite policy chops and procedural skills, according to several current and former HASC and SASC staffers. Lacking the regular opportunity for policymaking afforded by the NDAA, other committee's staffers may be less skillful in successful policymaking.

A deeper study of how staffers and members acquire legislative skill, in addition to providing insight onto effectiveness, would also inform the debate about the relative balance of power between the Congress and the federal bureaucracy. Scholars of the game-theory bent could also analyze how the recurring Pentagon oversight exercised by the HASC and SASC, as compared to the intermittent oversight of other committees, impacts the incentives for bipartisan cooperation or partisan defection within the committees. Recurring vs. single-shot games could also yield insights into divergent optimal strategies for congressional oversight of the bureaucracy.

In many respects the NDAA is unique, but the unique longevity of the NDAA may not persist much longer. As the pace of substantive legislation has slowed over the past decade and the partisan gulf between the Democrats and Republicans and between the somewhat more conservative Senate and the fractious House has widened, members of Congress are left with limited vehicles for their legislative aims.⁷⁰² Thus, they attempt to shoe-horn unrelated provisions into defense bills, notably leading to a repeated months-long stand-off over the sage grouse instead of a timely defense policy bill for FY 2016 and FY 2017. This shift and the shrinking legislative pipeline has potentially shifted the balance of power on defense policymaking from the HASC and SASC (the modified inside game chronicled by

⁷⁰² Tyler Hughes and Deven Carlson, "Divided Government and Delay in the Legislative Process: Evidence from Important Bills, 1949-2010," *American Politics Research* 43, no. 5 (2015): 771-92; Thomas E. Mann and Norman J. Ornstein, *It's Even Worse Than It Looks: How the American Constitutional System Collided with the New Politics of Extremism* (New York: Basic Books, 2016).

Lindsay), to a modified inside-leadership game.⁷⁰³ One illustration of this tension between the defense hawks – powerful committee chairmen in their own right – and the Republican leadership occurred during the FY 2016 and FY 2017 NDAA processes. Despite the frustrated public complaints of the HASC and SASC Chairmen Rep. Thornberry (R-TX) and Sen. John McCain (R-AZ), Speaker Paul Ryan (R-IL) and Senate Majority Mitch McConnell (R-KY) refused to allow the defense bill to come to the floor for months, while the battle over the sage grouse, and other provisions at best tenuously connected to defense policy, were negotiated amongst congressional leadership.⁷⁰⁴ While the House and Senate leadership has great ability to influence which provisions from the floor are able to attach to the bill, they also face considerable pressure to satisfy the different elements of their governing coalitions.

The singular status of the NDAA as the must-pass bill make it an irresistibly attractive vehicle to which to attach policy riders, but adding policy riders jeopardizes the must-pass status of the bill. With growing brinksmanship over defense policy over the past half-decade leading to ever-more-lengthy delays in passing the NDAA and funding the Department of Defense, an outright failure to pass the annual bill may come sooner rather than later. This would be a body blow for the HASC and SASC leadership, shaking the foundations of their committees' power laid by Sen.

⁷⁰³ James M. Lindsay, "Congress and Defense Policy: 1961 to 1986," *Armed Forces and Society* 13, no. 3 (1987): 371-401.

⁷⁰⁴ Joe Gould, "Grouse About This: A Funny-Looking Bird is Holding Up key National Defense Legislation," *Defense News*, September 27, 2016, <http://www.defensenews.com/articles/sage-grouse-ndaa-holdup>.

Tower in the early 1960s. The conflicting political and institutional imperatives of the leadership and the committee chairmen would be an interesting avenue for future study. Contrary to the modeling turn in legislative studies, this is also a question where the political skills and temperaments of a small number of legislators become salient to the future contours of the institution.

With perhaps the bulk of policymaking happening via legislative agglomeration, the discipline should move away from over-reliance on roll-call votes and counts of distinct bills sponsored or passed as the prime indicators of legislative intent, action, and accomplishment. Recent work on how roll-call votes are used as *political* instruments strengthens the argument for de-centering roll call votes as the predominant dataset.⁷⁰⁵ Volden and Craig take a step towards counting legislators' actions earlier in the legislative process as part of measuring overall legislative accomplishment. Although their method attempt to weight the significance of various bills, it still relies on the individual bill as the unit of analysis – something this analysis and Sinclair's' work on unorthodox lawmaking for major bills demonstrates is an unrealistic assumption.⁷⁰⁶ Not all bills, votes, or provisions are equivalent. The

⁷⁰⁵ See Joshua D. Clinton, "Lawmaking and Roll Calls," *Journal of Politics* 69, no. 2: 457-69; Jason M. Roberts, "The Statistical Analysis of Roll-Call Data: A Cautionary Tale," *Legislative Studies Quarterly* 32, no. 3 (2007): 341-60; Frances E. Lee, "Agreeing to Disagree: Agenda Content and Senate Partisanship, 1981–2004," *Legislative Studies Quarterly* 33, no. 2 (2008): 199-222; Stephen A. Jessee and Sean M. Theriault, "The Two Faces of Congressional Roll-Call Voting," *Party Politics* 20 no. 6 (2012): 836-48; William T. Egar, "Tarnishing Opponents, Polarizing Congress: The House Minority Party and the Construction of the Roll-Call Record," *Legislative Studies Quarterly* 41, no. 4 (2016): 935-64.

⁷⁰⁶ Craig Volden and Alan E. Wiseman, *Legislative Effectiveness in the United States Congress* (Cambridge: Cambridge University Press, 2014); Barbara Sinclair, *Unorthodox Lawmaking: New Legislative Processes in the U.S. Congress*, 4th ed. (Washington, DC: CQ Press, 2011).

discipline lacks a sound methodology to measure policy changes, rather than bills, for evaluating legislative output and effort. Analyzing earlier stages of bill drafting and tracking individual provisions in the subcommittee markup process, as Chapter 4 does, is methodologically cumbersome, relying on close analysis of bills' content at various legislative stages. Moreover, an intimate grasp of the relevant policy domain is essential to determine the relative significance of provisions and legislative policymaking. Analyzing the more-significant earlier elements of legislative drafting, bargaining, and innovation is an area ripe for methodological improvement.

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