



# COMBAT VS CLIMATE

The Military and Climate  
Security Budgets Compared

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The Institute for Policy Studies (IPS) is a community of public scholars and organizers linking peace, justice, and the environment in the United States and globally. We work with social movements to promote true democracy and challenge concentrated wealth, corporate influence, and military power.



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# EXECUTIVE SUMMARY

**The planet is heating up.** Fifteen of the sixteen hottest years ever recorded have occurred during this new century, and the near-unanimous scientific consensus attributes the principal cause to human activity.

The U.S. military's latest National Security Strategy describes climate change as “an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources like food and water.”

What is the U.S. doing to respond to this urgent security threat? Among other things, undertaking the fourth in a series of National Climate Assessments analyzing the current state and future trends of our climate and how prepared we are for them. What the document won't address: how much the federal government either is spending, or needs to spend, to respond to the threat.

More importantly, the Obama administration has instituted a set of ground-breaking regulations to curb U.S. emissions. And in signing the historic Paris Agreement of 2015, the U.S. joined the rest of the world in committing to raise hundreds of billions of dollars for international climate finance. These commitments are non-binding, however, and are based on the commingling of public and private money. And Congress has so far declined to appropriate money to fulfill them.

**For Administration officials, spending public money on climate change is almost a taboo topic.** The reason, of course, is politics. Climate deniers in Congress have been working to block federal action on climate for years. The military has been a particular target. As one congressman put it this year, “The military, the intelligence community [and] the domestic national security agencies should be focused on ISIS and not on climate change.”<sup>1</sup> So a military that is always seeking to shape the environment to prevent conflict is going out of its way to emphasize that its actions to reduce its own emissions are about enhancing the military mission, not preventing climate change, and to obscure what it is spending to do so.

But an adequate response to this urgent security threat requires, first, knowing what we are currently spending, and second, assessing how much we need to spend to address it.

**We know less about this than we used to.**

## HOW MUCH WE SPEND ON CLIMATE CHANGE

Until recently, the executive branch periodically produced a Federal Climate Change Expenditures (FCCE) report, compiling figures on spending from multiple federal agencies. The Institute for Policy

Studies (IPS) has used it to produce our report series comparing expenditures on traditional instruments of military security and on climate security since 2008.<sup>2</sup> But the last FCCE report came out in August of 2013.

So IPS has stepped in to produce a climate change budget for the United States. This is a stopgap measure, filling in for a task that is properly the responsibility of the federal government. We have followed as much as possible the parameters, categories and methodology of the past Federal Climate Change Expenditures reports. We have relied only on government sources. We cover the budget years FY 2015-2017, that is, the years since the last FCCE was produced.

We have benchmarked our accounting to the President’s Budget Request. In the remarkably chaotic and dysfunctional budget process of recent years, the Request is the only component of the process that is completed and released at a reliable time, and in a consistent and reliable form.

Compiling a climate change budget has many challenges. As mentioned, spending for this purpose is spread over numerous federal agencies, and is embedded in programs that include other purposes. When federal government personnel and resources are again applied to producing an official climate change spending report, as they should be, the figures we offer here will be further refined. But since government is not currently performing this task, we have produced the best accounting now available.

**Table 1 – Federal Climate Change Expenditures (in millions \$)**

Summary of Climate Change Expenditures	FY 2015	FY 2016	FY 2017
U.S. Global Change Research Program (USGCRP)	2,459 <sup>3</sup>	2,682 <sup>4</sup>	2,800 <sup>5</sup>
Clean Energy Technologies	6,600 <sup>6</sup>	7,400 <sup>7</sup>	9,476 <sup>8</sup>
International Assistance <sup>9</sup>	839 <sup>10</sup>	1,290 <sup>11</sup>	1,334 <sup>12</sup>
Adaptation	1,551	1,597	1,837
Energy Tax Provisions That May Reduce Greenhouse Gases <sup>13</sup>	5,040	5,510	5,040
Energy Payments in Lieu of Tax Provisions <sup>14</sup>	2,300	1,200	640
<b>Total</b>	<b>18,789</b>	<b>19,679</b>	<b>21,127</b>

The trajectory of climate change expenditures lines up with the story of recent federal spending writ large. Following the financial meltdown of 2008, the U.S. passed a major stimulus package, the American Recovery and Reinvestment Act (ARRA), to boost the U.S. economy. A substantial portion of the new investment went to funding for clean energy and transportation projects for two years. Then a new Congress shifted the focus to deficit reduction, passing the Budget Control Act (BCA) in 2011. This 10-year budget framework put caps on federal spending, and ended the ARRA’s significant energy transition funding stream.

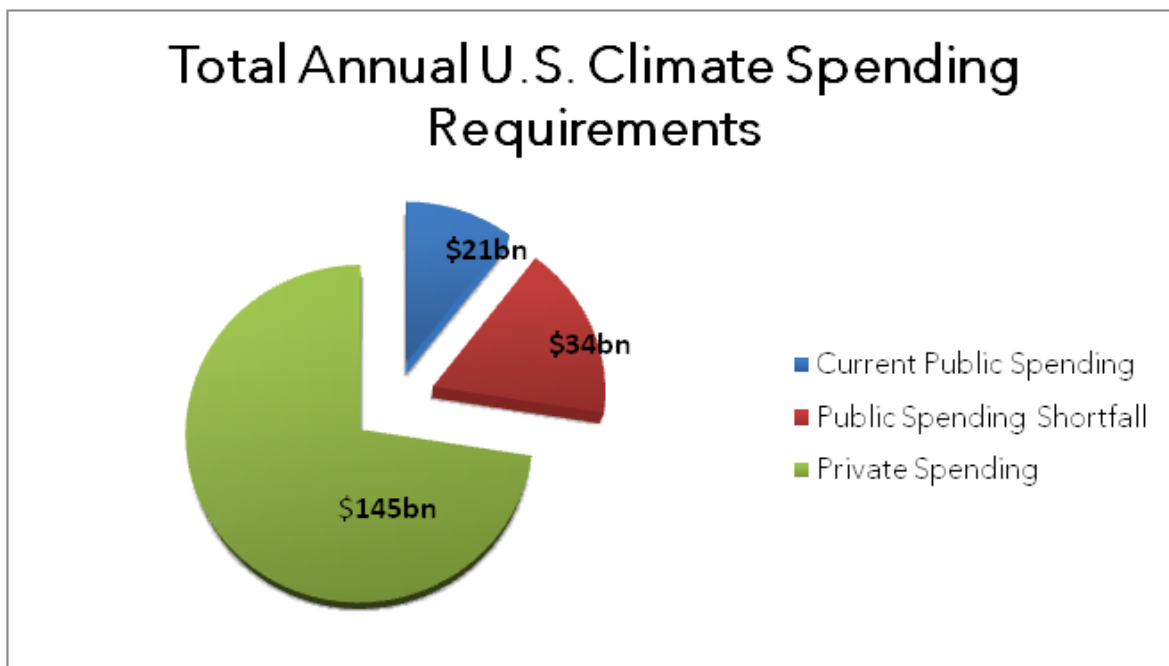
The Obama administration has managed to boost climate change spending modestly since then. But substantial new investment, such as existed with the ARRA, and would be commensurate with the magnitude of the climate crisis has been blocked.

## HOW MUCH WE NEED TO SPEND

The consensus from the Intergovernmental Panel on Climate Change (IPCC) is that global greenhouse gas emissions must be reduced by 40 percent from 2005 levels by 2035. A 2014 report by the Political Economy Research Institute at the University of Massachusetts and the Center for American Progress, entitled, “Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities” calculated the U.S.’ necessary contribution to this goal. It estimates that \$200 billion of investment per year across the public and private sectors will be required.<sup>15</sup> The funds should be sufficient, when invested in clean energy infrastructure, to reduce annual U.S. energy consumption to 70 quadrillion BTUs over the next twenty years, and thus reduce U.S. carbon emissions to the target 3,200 mmt over the next 20 years.<sup>16</sup>

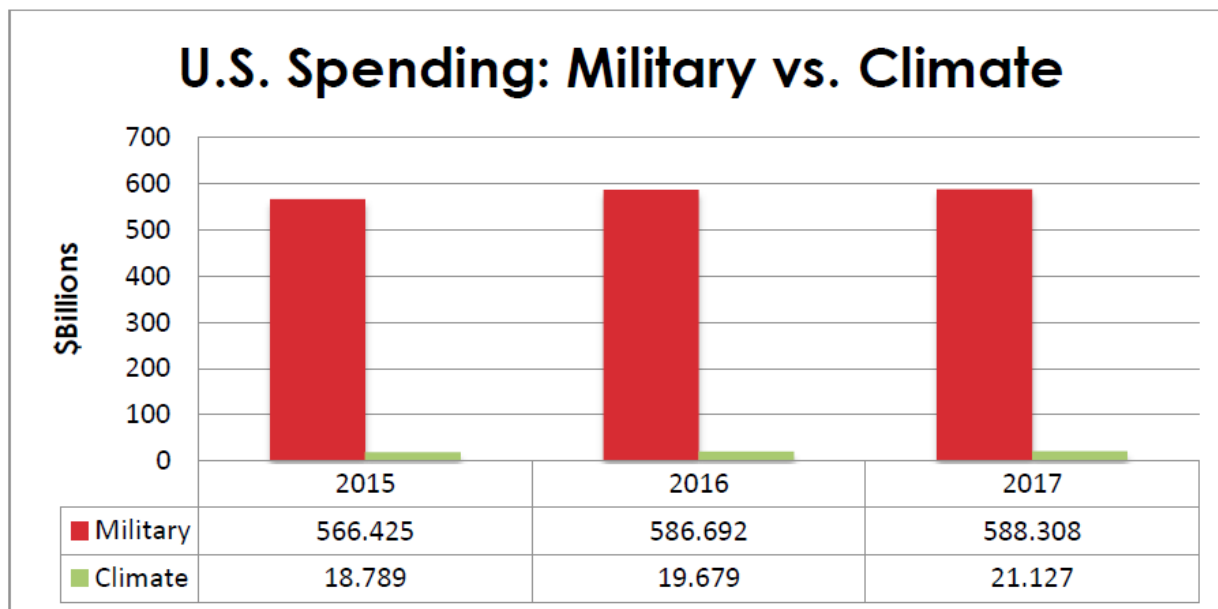
Of the \$200 billion total investment, the authors estimate that \$55 billion annually should come from the public sector. Public funding can be used to leverage private investment in clean energy technologies, energy-efficient buildings, and infrastructure improvements — projects that will protect the climate and create 2.7 million new jobs in the process.

The \$21 billion that IPS has calculated is being requested for FY 2017 leaves a **\$34 billion shortfall**.<sup>17</sup>



## WHERE WILL THE MONEY COME FROM?

A perennial topic in defense policy circles is our government’s failure to connect its security strategy to the budgets that will pay for it. The U.S. military has identified climate change as an urgent security threat. Here is how U.S. spending to address this threat stacks up against the rest of the security budget that is focused on traditional instruments of military force:



*\* In order to avoid double counting, we have subtracted Defense Department expenditures on climate change from the military budget figures.*

The imbalance between spending to deal with conflict by means of military force and spending to prevent the massive conflict-multiplier of climate change from emerging has improved slightly: from 30:1 in FY 2015 and FY 2016, to 28:1 in the request for FY 2017. But spending 28 times as much on traditional military security as on climate security is hardly commensurate with the magnitude of this “urgent and growing threat to national security,” as the military has defined it.

The pound of cure still vastly outweighs the ounce of prevention. Indeed, applying the proportions of pound-to-ounce, that is, 16:1, would be a huge improvement.

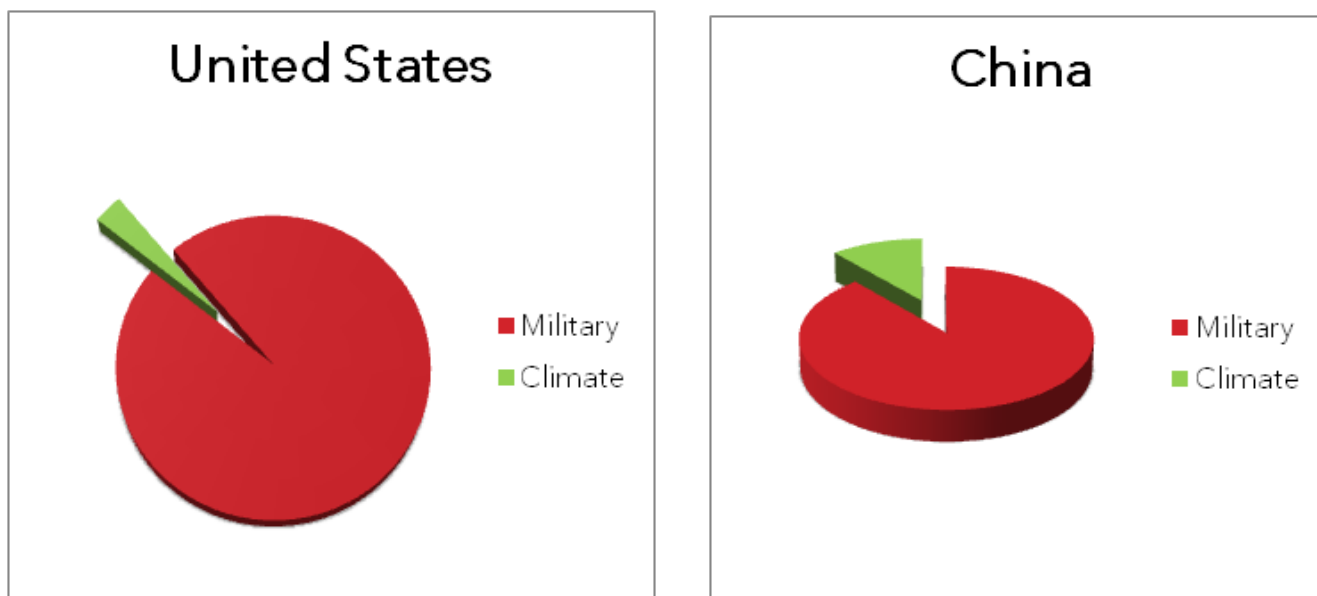
## THE U.S. VS. CHINA

According to the best available estimates, in FY 2016 the U.S. is spending more than two and a half times what China spends on its military forces. And China is spending about one and a half times what the U.S. spends on climate change, as follows:

	2015			2016		
	Military	Climate	Ratio	Military	Climate	Ratio
United States	595.472	18.789	32:1	586.692	19.769	30:1
China	214.485	30.302	7:1	230.786	29.31	8:1
US-China Comparison	2.78:1	1:1.61		2.54:1	1:1.48	

While the U.S. spends 30 times more on traditional instruments of military security than on climate security in 2016, China is spending just 8 times as much on its military forces as on climate security.

As is well known, the U.S. is far ahead of China in its commitments to reduce emissions. And China has now pulled ahead of the U.S. as the world “leader” in total current emissions. But it is not well known that **by the measure of federal spending**, as estimated, in China’s case, by independent United Nations sources, **China has committed substantially more financial resources to climate security**. It is making these investments not just out of a concern for the planet, but to take advantage of one of the major growth opportunities in the global economy. **And China’s overall security budget currently reflects a balance between expenditures on military and climate that more closely tracks the magnitude of the security threat posed by climate change.**



## INTERNATIONAL ASSISTANCE

As with the overall climate change budget, the Obama administration has managed an uptick in spending to assist other countries with their efforts to reduce emissions. Assistance to foreign militaries has fluctuated modestly, declining slightly in FY 2017. While the U.S. still spends far more to buttress foreign militaries than to prevent conflict by helping other countries with their energy transitions, it is in this category that the balance between spending on military as opposed to climate security has improved the most: a 10:1 balance in FY 2015 became a 6:1 balance in FY 2017.

Actually changing the shape of the spending pie will obviously require a much bigger shift of resources.

## RESEARCH AND DEVELOPMENT

This is even more true in the case of research and development spending. While spending on greenhouse gas-reducing technology development has increased modestly during this three year period, spending on military technology development has done the same. The imbalance, therefore, remains nearly unchanged.



## TOWARD A BETTER BALANCE

As the comparison of the budgets for traditional military force and for climate security make clear, climate change does not occupy space in the federal budget commensurate with the threat it poses to our security.

Bringing our security policy in line with our security budget therefore requires adjusting overall U.S. security spending to align it with the magnitude of the threat, by reapportioning security resources within the Department of Defense and beyond it to the other federal agencies responsible for managing a clean energy and transportation transition. While the military will have to deal with many of the consequences of climate change, this is a challenge that can only be met by governments, businesses, and communities working together to make changes that will reduce greenhouse gas emissions across the planet.

Our public debate includes much discussion of our “gutted” military. Yet, the military budget has actually climbed higher in recent years, in inflation-adjusted terms, than at any time since World War II—higher than during the Reagan buildup, higher than during the height of the Iraq and Afghan wars. The invocations of a “hollowed-out” military have as much to do with the profits of Pentagon contractors as with our security. The members of Congress whose campaigns are financed by those contractors are currently engaged in stuffing the Pentagon budget with funding the Pentagon didn’t even ask for and doesn’t want. And they are playing games to increase military spending beyond the caps imposed by the Budget Control Act by shifting more spending into the “Overseas Contingency Operations” account (the war budget), which is exempt from the caps — even though much of the spending has nothing to do with the wars we are fighting.

Within the FY 2017 military budget request, though, there is plentiful low-hanging fruit—cuts that can be made with no sacrifice to U.S. security. In April of this year a collection of government watchdog groups from across the political spectrum sent a list of such cuts to Congress.<sup>18</sup> They amount to \$38 billion—enough to make up the shortfall in necessary annual federal climate change expenditures, with \$4 billion left over.

Such cuts would make possible such trade-offs as the following:

## TRADE-OFFS

Cost	Military	Climate
\$4,431 Million	Cancel the F-35, the most expensive weapon system ever envisioned, which cannot perform as well as the systems it is designed to replace.	Build 15 more offshore wind projects like Block Island, RI. Total generating capacity: 458 MW, or enough to power 320,000 U.S. homes <sup>19 20 21</sup>
\$315 Million	Cancel Air Launched Cruise Missile Follow-On (LRSO)	Install 11.5 million square feet of solar panels on buildings, saving 210,000 tons of CO2 annually <sup>22</sup>
\$616 Million	Cancel B61-12 Life Extension Program	Plant 10,000 acres of trees, saving around 296 million pounds of CO2 and absorbing 6.1 billion gallons of rainfall <sup>23 24 25</sup>
\$22,354 Million	Reduce service contracting by 15%	First year of a 20-yr plan to retrofit buildings and improve infrastructure, reducing building energy use by 37% (34 Q-BTUs) <sup>26</sup>
\$1,598 Million	Cancel or Pause the Littoral Combat Ship	Retrain the 150,000 workers in the domestic coal industry (\$180mn – \$1.8bn) <sup>27 28</sup>

## RECOMMENDATIONS

1. Preparing a Federal Climate Change Expenditures report should again be a regular responsibility of the federal government.
2. This will require transparency on the part of all the relevant federal agencies, but in particular the Department of Defense, which has been the most resistant to providing clear figures for its spending on reducing its greenhouse gas emissions.
3. In addition, the federal budget itself should include a budget for these expenditures. We recommend that the Analytical Perspectives volume accompanying the federal budget include a Climate Change Funding analysis providing a comprehensive accounting of expenditures across federal agencies.
4. This analysis needs to become incorporated into the United States' overall security budget planning. A broader set of reforms to connect U.S. security policy planning with security budgeting has been laid out in a series of annual joint Institute for Policy Studies/Center for American Progress reports titled "A Unified Security Budget for the United States."<sup>29</sup> They include "establishing a small cohort across the NSC and OMB staff with the ... necessary breadth of experience to consider the tradeoffs inherent in a unified security budget," as well as changes in budget documentation and the structures of congressional oversight and the budget process.
5. This overall security budget planning must make it a priority to correct the imbalance between expenditures on military and climate security.
6. The reapportionment of funds within an overall security budget should include cutting unnecessary military programs that have more to do with security for contractor profits than for our nation.
7. The reapportionment of resources within an overall security budget should be benchmarked to an assessment of how much public investment in climate security is necessary to fulfill the U.S. commitment to the goal of keeping global warming below 2 degrees Celsius.

# INTRODUCTION: CLIMATE AND CONFLICT

This year the number of refugees stranded or on the move across the globe climbed higher than at any other time in recorded history. In June, the UN Refugee Agency's estimate was 65 million people — one in every 113 on earth. Heading the UNHCR's list of causes for this massive human displacement: war and other violent conflict.<sup>30</sup>

Currently at the white-hot center of the refugee crisis is Syria. After five years of civil war, the country is engulfed in what the European Commission identifies as “the world's worst humanitarian crisis since World War II.”<sup>31</sup> This war alone is responsible for 11 million of the global refugee total, along with 400,000 dead, again by the UN's estimate, including more than 4,200 dying at sea in their attempt to flee the fighting. The conflict has also brought U.S. and Russian fighter jets into dangerous proximity to each other, and created a major base of operations for ISIS. And beyond its costs in human misery, in the waste of human potential, and in its potential to spark an even wider war, the refugee flow is radically altering the politics of Europe.

Though the conditions leading to the tragedy in Syria were laid by geopolitics and internal politics, there is growing recognition of the major role played by the drought that gripped the country from 2006 to 2010. A 2015 study published in the Proceedings of the National Academy of Science described it as “the worst long-term drought and most severe set of crop failures since agricultural civilizations began in the Fertile Crescent.”<sup>32</sup> Hungry people poured into cities that were unable to provide for them, creating the conditions for the conflicts that erupted in 2011 and have metastasized into a five-year civil war. Moreover, such a severe and persistent drought, they said, was predictable from a century of observed trends in precipitation, temperature, and sea-level pressure, as well as climate model results. “Human influences on the climate system are implicated in the current Syrian conflict,” the authors concluded. And given these long-term trends, the conditions favoring continued war and conflict in the region are likewise predictable unless the trajectory of climate change is reversed.

So far, within the boundaries of the United States, climate change has not produced significant violence. But the evidence of its effects is visible across the landscape. In June, while Houston was under water, grappling with its second “500-year flood” in two years, the rest of the southwest was suffering from a record-setting heat wave, followed by wildfires in seven states. And California, yearning for the water Houston had too much of, was still struggling to recover from an unprecedented five-year drought of its own. Climate scientists warn that, as in Syria, the long-term trends indicate that unless the global greenhouse gas buildup is reversed, the southwest U.S. will be facing persistent water shortages into the future, affecting, among other things, the food supply of the nation as a whole.

## OVERWHELMING CONSENSUS

The accelerating trends of global warming and extreme weather events are clear. 2015 was the hottest year on record, according to both NASA and NOAA, and 2016 is on track to exceed that record. Fifteen of the sixteen hottest years ever recorded have occurred during this new century. The year set a record for the number of major tropical cyclones in the northern hemisphere, including the most intense hurricane ever recorded in either hemisphere. As one veteran meteorologist for the website Weather Underground put it, “We didn’t see this kind of weather in the 20th century.”<sup>33</sup>

While no specific weather event can be definitively attributed to climate change, the science establishing such linkages has improved in recent years. A study this year from the National Academies of Science concludes that the recorded history of specific kinds of weather events combined with modeling make the causal connection increasingly possible to establish for events like droughts and heat waves, though less so for hurricanes.<sup>34</sup>

The near-unanimous scientific consensus attributes the principal cause of the warming trend to human activity. A review of peer-reviewed scientific journals this April found 97 percent agreement among climate scientists.<sup>35</sup> (If you factor out the climate scientists paid by fossil fuel interests, the percentage is even higher.)

- *From the American Geophysical Union, for example:*  
“Human-induced climate change requires urgent action. Humanity is the major influence on the global climate change observed over the past 50 years. Rapid societal responses can significantly lessen negative outcomes.” (Adopted 2003, revised and reaffirmed 2007, 2012, 2013.)
- *From the Geological Society of America:*  
“The Geological Society of America (GSA) concurs with assessments by the National Academies of Science (2005), the National Research Council (2006), and the intergovernmental Panel on Climate Change (IPCC, 2007) that global climate has warmed and that human activities (mainly greenhouse gas emissions) account for most of the warming since the middle 1900s.” (2006; revised 2010.)

## CLIMATE CHANGE AS A NATIONAL SECURITY THREAT

And though climate change within the U.S. has not yet produced significant violence, the U.S. military sees it as an urgent threat to our security. The military’s first official declaration as such came in the 2010 National Security Strategy, as follows: “The danger from climate change is real, urgent and severe...the change wrought by a warming planet will lead to new conflicts over refugees and resources.” Subsequent strategy reviews have elevated the threat assessment. The 2015 version read:

Climate change is an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources like food and water. The present day effects of climate change are being felt from the Arctic to the Midwest.

These impacts are already occurring, and the scope, scale, and intensity of these impacts are projected to increase over time.”<sup>36</sup>

These concerns on the part of U.S. national security agencies are not new. They go back at least to the 1990s when the Central Intelligence Agency set up its own Environmental Center and held Environmental Flash Points workshops discussing “Consequences of Environmental Change—Political, Economic, Social.”<sup>37</sup>

A raft of think tank projects have joined these federal national security agencies in identifying climate change as a major security threat. These include the Wilson Center’s Environmental Change and Security Program, the Truman Security Project, and the Center on Climate Change and Security. Here are the calls to action coming out of two more:

- *From the American Security Project:*

“Effective climate diplomacy means granting climate change the same level of concern in foreign policy as other security issues. Climate change poses too great a risk for the U.S. and the world to treat it as a secondary issue, and the U.S. should begin connecting it to other areas of foreign policy, similar to how human rights, nuclear proliferation, counterterrorism, and other global policy issues are addressed.”<sup>38</sup>

“We see the impacts of climate change every day all around the world. A melting Arctic, unprecedented droughts across the world, extreme flooding, and uncontrollable wildfires. In the longer term, rising seas, desertification, and extreme storms will reshape entire societies. These present a greater challenge than just new and different weather patterns: they challenge the world’s security architecture to prepare for and adapt to new security challenges.”<sup>39</sup>

- *From the Partnership for A Secure America*, which has assembled a bipartisan group of 48 former high-level military and civilian officials to speak out on the issue:

In April the group took out a full-page ad in the Wall Street Journal urging action on this “global threat multiplier.” One of its members, Thomas Kean, former Governor and Co-chair of the 9/11 Commission, commented: “There is no longer any daylight between national security concerns and climate change. Combating climate change and protecting our national security are one and the same, and it’s imperative that lawmakers start treating our warming planet with the same urgency that they treat other security threats.”<sup>40</sup>

There is clearly a strong chorus pushing national security policy in the direction of concerted action to address climate security, and also unanimity on the point that the military has an important role to play in addressing it. There is more of a diversity of opinion about what that action should be.

And collectively this chorus is almost wholly silent on two key areas: First, on the military's role in preventing this threat from emerging; And second, on what the budget for this role is, or should be.

## MILITARY "GREENING"

The Pentagon is the acknowledged world "leader" in both fossil fuel use and greenhouse gas emissions. During the past two decades, the U.S. military has embraced the idea of reducing its carbon footprint with varying degrees of enthusiasm. Its most prominent enthusiast has been Ray Mabus, retiring this year as head of the Navy. In 2009 he declared that it would be the Navy's goal to power half of naval operations with renewable energy sources by 2020.<sup>41</sup>

Contention over this goal and resistance to it within the military remains. The question has always been whether attention to emissions reductions would compromise or enhance the military's mission.

But the U.S. military's current official posture on this effort was clear in a July 12 briefing on Capitol Hill. Officials responsible for energy transition from all four service branches and two Assistant Secretaries of Defense, one for Operational Energy (powering military operations) and the other for Installations (powering bases), all testified. The speakers delivered a common message on what the purpose of this task was, and wasn't.

Here, for example is the Air Force's Deputy Assistant Secretary for Environment, Safety and Infrastructure, Mark Correll:

*I'm going to start off today by not talking about energy, because at the end of the day I am not in the energy business— I am in the defense business. And specifically, your Air Force is here to dominate the air, space, and cyberspace... From an energy standpoint, what we say is, energy powers the fight. "It allows us to fight farther, it allows us to stay on station longer, it allows us to transport more cargo, it allows us to operate our space assets, our cyber assets, all the things that we need to do and accomplish our mission completely, effectively, and efficiently.*

This message was reinforced by the speakers from each of the other branches: the military's purpose in embracing the goal of fossil fuel reduction is, front and center, about military objectives.

The military is doing its energy transition, they all said, because reducing fossil fuel use will save money that can be added to the budget for investments in the tools of military force. Savings will come from reducing the convoys protecting fossil fuel supply lines, for example. Insulating base buildings will save on the electric bill. And so on.

Here is how the Director of the Army's Office of Energy Initiatives, Michael McGhee, put it:

*Renewables can bring typically no fuel supply concerns; for solar and wind, for example, there are no resupply issues; there is distributed generation in renewable energy projects*

*that brings a reduced reliance on one source of power; getting renewable projects on or very near military land means there is a reduced supply chain.” He also reported that the Army’s 15 large-scale renewable energy projects had saved them \$250 million. In short, he said, “...we create renewable energy projects to benefit the army for energy-security resilience.*

Also testifying was Sen. Jack Reed, ranking Democrat on the Armed Services Committee, who made the message even clearer: “This is not to be “green” but to be an effective fighting force.”

A legislative director in the Energy, Installations and Environment office confirmed that climate change considerations are “not why spending decisions are made,” while agreeing that the reduction in energy use and use of renewables do ultimately contribute to protecting the planet. It’s a “cost driver to save money for the Department.”<sup>42</sup>

This message is consistent with what Retired Adm. Richard Truly, a former NASA chief, heard during his work on four Pentagon energy studies over the past decade. As he told a reporter in 2012, the objective of military greening was always clear: military readiness. "I don't remember a single conversation where we talked about spending any money for environmental reasons," he said.<sup>43</sup>

## **PREVENTION DEEMPHASIZED**

Responding to a congressional request, the Defense Department issued a report in July of 2015 on the “National Security Implications of Climate-Related Risks and a Changing Climate.”

The report is strong in its portrait of the dimensions of the risk. It reads for example:

*A changing climate increases the risk of instability and conflict overseas... The Department of Defense sees climate change as a present security threat, not strictly a long-term risk. We are already observing the impacts of climate change in shocks and stressors to vulnerable nations and communities, including in the United States, and in the Arctic, Middle East, Africa, Asia, and South America.*

*Case studies indicate that in addition to exacerbating existing risks from other factors (e.g. social, economic, and political fault lines), climate-induced stress can generate new vulnerabilities (e.g. water scarcity) and thus contribute to instability and conflict even in situation not previously considered at risk.<sup>44</sup>*

It reports on the measures being incorporated into the planning of each of the Geographic Combat Commands to stand up to the ravages of this threat, such as building and supplying disaster shelters and emergency operations centers. It alludes to the adaptation measures outlined in the 2014 DoD Climate Adaptation Roadmap.

When the authors refer to mitigation of the threat, they are talking about mitigating the damage to military installations by buttressing their defenses. In the framework of international climate agreements, mitigation is defined as the complement to adaptation. That is, mitigation refers to measures to reduce the threat by reducing greenhouse gas emissions. In this document, however,



mitigation and adaptation are essentially one and the same. Reducing emissions to reduce the threat, i.e. to do what is possible to prevent the worst effects of climate change from occurring, is not mentioned.

Yet the goal of “shaping the environment” to prevent conflict is a staple of military strategy. Typical is Dick Cheney’s 1993 “Defense Strategy for the 1990s” citing the need to “help preclude conflict by reducing sources of regional instability.”<sup>45</sup>

This is a perfect description of what an overall reduction in global emissions would accomplish. But military planners don’t mean “shaping the environment” literally. The military’s most significant means of literal environment-shaping to prevent conflict, as the most prolific producer of these emissions on the planet, will be to do its part to reduce global greenhouse emissions by reducing its own. This conception of its task is not featured in military doctrine.

That the Defense Department does reduce its carbon footprint by investing in efficiency and renewable energy is far more important, of course, than its conception of the reason for doing it. All sorts of outcomes for the civilian sector — from Eisenhower’s National Security Interstate Highway system to Hillary Clinton’s case as Secretary of State for advancing the status of women around the world — have been usefully framed as matters of national security.<sup>46</sup>

It is also obviously true that the military acting alone will not solve the problem. The urgent task of reducing greenhouse gas emissions must be undertaken across all federal agencies, and across the American public and private sectors. And the U.S. must join with the rest of the world in forging and implementing international agreements and lead by example to cut emissions globally.

Preventing catastrophic climate change by drastically reducing global greenhouse gas emissions is a clear national and global security imperative. But though the military sees preventing conflict as a central part of its job, and sees climate change as a major vector of conflict, it deemphasizes its own role in prevention, that is, by reducing its own emissions.

## **CLIMATE SECURITY BUDGET OBSCURED**

Also missing from the military’s playbook is transparency about what the military either is spending, or should spend, to address this problem.

Rather, the military seems at pains not to put a number to their spending on climate change. Reports that can serve to disaggregate this spending from the rest of the Defense Department’s budget, DoD’s Annual Energy Management Report and the Operational Energy Strategy budget certification, are long delayed, with no ETA in sight.

DoD officials are happy to cite the Department’s overall budget for energy use — \$9.8 billion is budgeted for fuel in FY 2017 — but not what portion of that amount is devoted to increasing efficiency and use of renewable energy. In March 2016 testimony at the Installation, Environment, and BRAC Budget Overview Hearing conducted by the House Appropriations Committee, acting Assistant Secretary of Defense for Energy, Installations, and Environment Pete Potochney said that “Unlike the Department’s Military Construction and Environmental Remediation programs, where the budget request includes specific line items, our energy programs are subsumed into other accounts.”<sup>47</sup>

He then drove home the military's official purpose in making improvements to its energy use: "While there is no explicit budget request for Operational Energy, these investments across multiple accounts and appropriations are intended specifically to improve military capability."<sup>48</sup>

In response to our request for the Defense Department's budget for expenditures on climate change, a defense source with knowledge of the process who chose to be anonymous responded, "We don't have any specific numbers for climate change adaptation and resilience. Our goal is to integrate consideration of the effects of a changing climate into all our decision making. It is not a stand alone effort."<sup>49</sup>

The report to Congress on the "National Security Implications of Climate-Related Risks and a Changing Climate" makes almost no mention of budgets to pay for the climate change-related adaptations described. There are rather allusions to how expensive humanitarian assistance and disaster relief is going to be, and warnings that operations in the Arctic are "much more costly" than elsewhere in the Northern Command.<sup>50</sup> The Combat Commands "recognize the risk climate changes poses to existing resource allocation."<sup>51</sup> Climate change expenditures are going to be costly, in other words, but estimates of how costly are nowhere to be found.

These warnings that more money will be needed coexist in the report with assurances that "Resources for assessing and responding to the impacts of climate change are provided within existing DoD missions, funds, and capabilities."<sup>52</sup> Also emphasized are the ways the private sector is being tapped to pay for some of the new energy initiatives.<sup>53</sup>

## THE POLITICS OF CLIMATE SECURITY

In truth, the military's reticence about disclosing its spending on climate change, and its insistence on the military mission as the reason for doing so, are hardly surprising. Climate deniers in Congress have been working to block action on climate, by the government in general and the military in particular, for years.

This year, for example, the House version of the Defense Appropriations Act prohibited the Defense Department from spending money to implement DoD directive 4715.21.<sup>54</sup> This directive requires the Department to integrate climate change considerations into policy and risk management related to climate impacts.<sup>55</sup> The amendment characterizes its intent as preventing the Pentagon from "prioritiz[ing] climate change over national security." The sponsor of the amendment, Rep. Ken Buck (R-CO), said in a statement that "The military, the intelligence community [and] the domestic national security agencies should be focused on ISIS and not on climate change."<sup>56</sup>

The Senate version of this year's National Defense Authorization bill seeks to disallow Defense Department funds to be spent complying with portions of two 2013 Executive Orders: One relating to preparing the United States for the impacts of climate change, and the other relating to planning for federal sustainability in the next decade.<sup>57</sup>

At the July 2016 congressional briefing, the Deputy Assistant Secretary for Operational Energy, Amanda Simpson, said this kind of congressional interference harmed the military mission:

*I think that when we get language from the Congress telling us what we can or cannot do, that is an imposition on the Department that is not helpful. We look at what we must do, and what we need to do, and when we're told we can't do something that is critical to maintaining the readiness of our forces to plan for the future, for instance, the impacts of climate change — the current NDAA from the House says we cannot imagine or look at what those impacts can be in the future. And I think you heard several examples from Senator Reed and from others — those have impacts on the geopolitical scene, on our facilities, on how we are planning our equipment, what type of environments they have to operate in... If we can't do that, we're basically taking risk in areas that we should not be... exposing our forces to. It's things like that that, quite frankly, are politically driven, that are not keeping the welfare of our military and our nation in mind, and that really hurts us quite a bit.*

It's fairly clear that the military is trying to stay out of the line of congressional fire by disguising and deemphasizing their expenditures. It's no wonder, then, that officials in charge of the Defense Department's energy transition talk about the military necessity of what they are doing, and about integrating climate change into all their planning and operations, and not about what they are spending to accomplish the task.

It is also true that disentangling spending on climate change from spending for other purposes can in some cases be difficult and time-consuming. When the Deputy Assistant Secretary for Installation Energy was asked at the July congressional briefing how Congress could help her do her job, she responded "fewer reporting requirements."

The Defense Department is not the only target for members of Congress intent on preventing the government from taking action on climate, of course. Congressional staffers spend hours every year combing appropriations bills for climate change line items to excise. Though the Environmental Protection Agency is the primary target, it is hardly the only one.

## CONNECTING STRATEGY TO BUDGET

The disconnect between the military's commitment to preventing conflict and its near-silence on its role in preventing climate catastrophe can also be understood as part of the larger issue of the military's failure to connect its strategy to the budgets to pay for it. This failure is a perennial theme in military policy circles.

It is the principal theme of the book *Buying National Security: How America Plans and Pays for Its Global Role and Safety At Home* by Gordon Adams, who headed the national security division of the Office of Management and Budget during the Clinton administration, and Cindy Williams, who served during that time as Assistant Director for National Security at the Congressional Budget Office.<sup>58</sup> That theme is: "The United States still doesn't have a defense plan that is strategically driven."<sup>59</sup>

They describe the institutions of government that were "generally designed to help leaders exert control over policy by aligning resources to strategic priorities and coupling budgets to performance." Then they go on to describe the "variety of forces" including party politics, the tug of war between Congress and the executive branch, the bureaucratic interests and power of individual departments and agencies,

and the abilities and preferences of individual leaders” that in practice prevent such alignment. And they emphasize that security budgeting needs to be conducted in a unified way, incorporating all security instruments, including diplomacy and development, as well as military forces and homeland security, and seeking a more equal balance among them.

Between 2007 and 2012 Pemberton and Lawrence Korb of the Center for American Progress collaborated on a series of annual reports, titled “A Unified Security Budget for the United States,” laying out a blueprint for how this could be done. (Climate change spending was a major focus of the proposed realignment.)<sup>60</sup>

If climate change is a security threat of the magnitude our security agencies say it is, aligning a strategy to address this threat with a budget adequate to the task is a necessity. And the first step in this alignment of budget and strategy is knowing what we are currently spending, government-wide.

**We know less about this now than we used to.**

## **THE U.S. CLIMATE SECURITY BUDGET**

Until recently, the executive branch periodically produced a Federal Climate Change Expenditures (FCCE) report, compiling figures on spending from multiple federal agencies. We have used it to produce our report series comparing expenditures on traditional instruments of military security and on climate security.<sup>61</sup> But the last FCCE report came out in August of 2013. The Congressional Research Service also published its last assessment, “Federal Climate Change Funding from FY 2008 to FY2014,” compiling data from all the FCCE reports, in September of that year.

But to repeat, knowing what the government is spending to address this threat is a necessary first step toward deciding what the right level of spending for this purpose should be.

So IPS has stepped in to do the research and analysis to produce a climate change budget for the United States. This is a stopgap measure, filling in a task that is properly the responsibility of the federal government.

As in our previous reports, we have keyed our accounting to the President’s Budget Request. In the remarkably chaotic and dysfunctional budget process of recent years, the Request is the only component of the process that is completed and released at a reliable time and in a consistent and reliable form.

Producing a climate change budget is a challenging task. As mentioned, spending for this purpose is spread over numerous federal agencies, and embedded in programs that include other purposes. When federal government personnel and resources are again applied to producing an official climate change spending report, as they should be, the numbers we offer here will be further refined. But since government is not currently performing this task, we have produced the best accounting now available. We cover the budget years FY 2015-2017, that is, the years since the last FCCE was produced.

We have followed as much as possible the parameters, categories, and methodology of the past Federal Climate Change Expenditures reports. We have relied only on government sources

**Table 1 – Federal Climate Change Expenditures (in millions \$).**

Summary of Climate Change Expenditures	FY 2015	FY 2016	FY 2017
U.S. Global Change Research Program (USGCRP)	2,459 <sup>62</sup>	2,682 <sup>63</sup>	2,800 <sup>64</sup>
Clean Energy Technologies	6,600 <sup>65</sup>	7,400 <sup>66</sup>	9,476 <sup>67</sup>
International Assistance <sup>68</sup>	839 <sup>69</sup>	1,290 <sup>70</sup>	1,334 <sup>71</sup>
Adaptation	1,551	1,597	1,837
Energy Tax Provisions That May Reduce Greenhouse Gases <sup>72</sup>	5,040	5,510	5,040
Energy Payments in Lieu of Tax Provisions <sup>73</sup>	2,300	1,200	640
<b>Total</b>	<b>18,789</b>	<b>19,679</b>	<b>21,127</b>

Obtaining the numbers for several of these spending categories was quite straightforward. For example, a separate agency, the U.S. Global Climate Research Program, pulls together a solid accounting of expenditures on climate change research from 13 federal agencies. Likewise International Assistance spending on the Global Climate Change Initiative is compiled from spending reports supplied by the Departments of State and Treasury and the U.S. Agency for International Development.

## **CLEAN ENERGY TECHNOLOGY**

Getting solid numbers for the Clean Energy Technology category was the biggest challenge. In the absence of an FCCE, there is no unified accounting of this critical element of the climate change investment agenda. It incorporates spending from ten departments: the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, and Transportation, plus the Environmental Protection Agency, NASA, the National Science Foundation and the Nuclear Regulatory Commission. For FY 2017, the budgets for five of these (USDA, DoE, HUD, NASA and NSF) were made available by a White House fact sheet on Mission Innovation.<sup>74</sup> The other numbers were obtained directly from the budget justifications of the individual departments.

**Table 2 – Clean Energy Technology Expenditures (in millions \$)**

Clean Energy Technology Expenditures	FY 2017
Department of Agriculture (USDA)	106 <sup>75</sup>
Department of Commerce (COC)	47 <sup>76</sup>
Department of Defense (DOD)	1,034
Department of Energy (DOE)	5,856 <sup>77</sup>
Housing and Urban Development (HUD)	10 <sup>78</sup>
Department of Transportation (DOT)	37 <sup>39 80</sup>
Environmental Protection Agency (EPA)	101 <sup>81</sup>
National Aeronautics and Space Agency (NASA)	348 <sup>82</sup>
National Science Foundation (NSF)	512 <sup>83</sup>
Nuclear Regulatory Commission (NRC)	90 <sup>84</sup>
<b>Subtotal</b>	<b>8,141</b>
21st Century Clean Transportation Plan	1,335 <sup>85</sup>
<b>Total</b>	<b>9,476</b>

For reasons discussed above, numbers from the Defense Department were the most difficult to obtain. Though the Defense Department does not provide them, a 2012 Congressional Research Service report, “Department of Defense Energy Initiatives: Background and Issues for Congress,” itemizes the costs of Department of Defense clean energy initiatives projected over a five-year period: FY 2013-FY 2017.<sup>86</sup> By annualizing the five-year spending number for each branch of the armed forces, we arrived at a total of \$1.034 billion spent on these initiatives per year.

## ENERGY TAXES

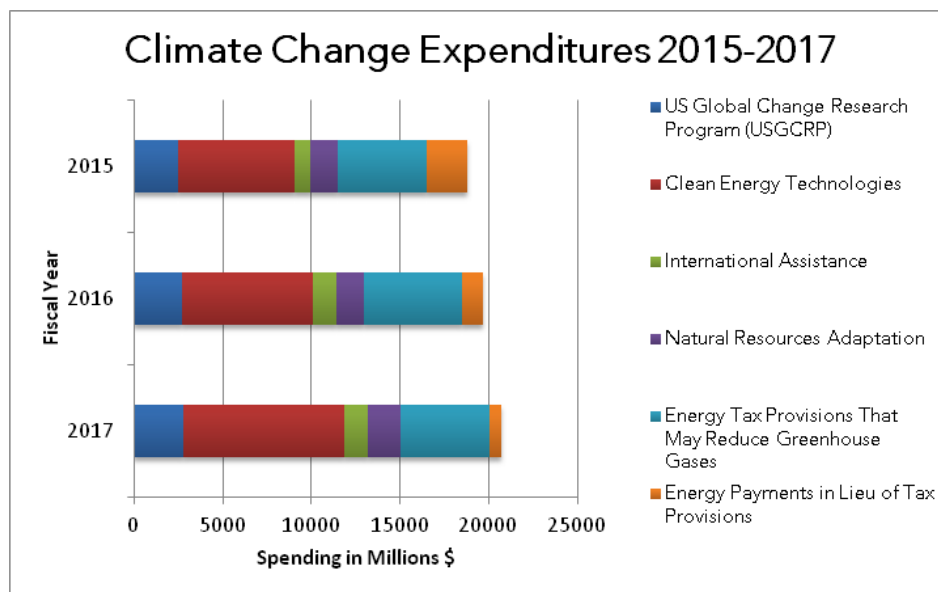
Since 2009 the FCCE’s accounting of energy taxes funding investment in renewables has had two parts: “Energy Tax Provisions That May Reduce Greenhouse Gases” and “Energy Payments in Lieu of Tax Provisions.” This is why:

The Government promotes investment in renewable energy sources primarily through tax credits. In the wake of the 2008 financial crisis, the use of these credits dried up drastically. To preserve the country’s nascent transition to renewables, the American Recovery and Reinvestment Act, colloquially known as the stimulus package, created a temporary fund offering direct grants. These funds are now being phased out as the viability of the tax credit program is restored.

**Table 6 – Tax Credits that may Reduce Greenhouse Gases (in millions \$)**

TAX CREDITS	2015	2016	2017
Energy Production Credit	1,550	1,950	2,250
Energy Investment Credit	1,010	1,470	970
Tax credits for clean-fuel burning vehicles and refueling property	540	550	670
(Tax credit for alternative motor vehicles and refueling property)			
Exclusion of utility conservation subsidies	430	450	470
Credit for holding clean renewable energy bonds	70	70	70
Allowance of deduction for certain energy efficient commercial building property	30	-10	-30
Credit for construction of new energy efficient homes	60	20	0
Credit for energy efficiency improvements to existing homes	270	0	0
Credit for residential energy efficient property	850	770	460
Qualified energy conservation bonds	30	30	30
Industrial CO2 capture and sequestration tax credit	80	110	150
Credit for energy efficient appliances	120	100	0
<b>Tax Provisions Subtotal</b>	<b>5,040</b>	<b>5,510</b>	<b>5,040</b>
Energy Payments in lieu of energy investment credit	2,300	1,200	640
<b>Tax Provisions plus Energy Payments Total<sup>87</sup></b>	<b>7,340</b>	<b>6,710</b>	<b>5,680</b>

Here is what the recent trajectory of total federal climate change expenditures looks like. It shows funding for most components holding relatively steady during this period, while nearly \$3 billion is added to the budget for clean energy technology, and the special grant program in lieu of tax credits is being phased out. Overall, the Obama administration has managed to enlarge the budget for Federal Climate Change Expenditures modestly, but has been constrained by the budget stalemate from making serious investments in this critical security priority.



## THE U.S. MILITARY SECURITY BUDGET

Accounting for what the U.S. spends on the traditional instruments of military force is, relatively speaking, straightforward. National Security is the first major category in the federal budget, and the Defense Department’s allocation is wholly contained within it, constituting about 95 percent of the total. Unlike U.S. spending on climate security, in other words, spending on military spending is mostly consolidated in one place in the budget.

There is a strong case to be made, though, that the category of military security spending should include other budget line items outside the National Security, or 050, budget. The Project on Government Oversight has recently computed the total at close to \$1 trillion.<sup>88</sup>

We have used the more standard accounting, including only the Defense Department’s base (051) budget plus the separate funding for war operations contained in the Overseas Contingency Operations fund, plus International Security Assistance. This is a very conservative accounting, excluding, for example, the Department of Energy’s nuclear weapons budget. By this measure, military security spending includes the following:

Military Expenditures <sup>89 90</sup>	FY 2015	FY 2016	FY 2017
Military Personnel	134,962	135,330	135,269
Operation and Maintenance	195,364	197,469	205,860
Procurement	93,587	110,737	102,567
Research, development, test and evaluation	63,500	68,778	71,392
Revolving, management, and trust funds and other	2,134	1,176	1,372
Military construction	5,431	6,910	6,124
Family housing	1,127	1,261	1,320
<b>Subtotal – DoD Base Budget</b>	<b>496,106</b>	<b>521,662</b>	<b>523,904</b>
Overseas Contingency Operation (OCO)	64,334	58,638	58,798
International Security Assistance <sup>91</sup>	8,419	8,831	8,106
Adjustments for programs included in the climate change expenditures section <sup>92</sup>	-2,436	-2,436 <sup>93</sup>	-2,500
<b>Total (may not add due to rounding)</b>	<b>566,425</b>	<b>586,692</b>	<b>588,308</b>

Though they are clearly military-related expenditures, International Security Assistance accounts are funded out of the State Department and therefore not usually included in accountings of military spending. We have included them here in order to compare U.S. assistance to foreign militaries with assistance to foreign countries responding to climate change.

There is of course an important area of overlap between the budgets for military and for climate security: what the Defense Department is spending on the climate security mission. We have outlined above the difficulties of determining this figure since the department resists supplying one. While emphasizing that “our energy programs are subsumed into other accounts,” acting Assistant Secretary of Defense for Energy, Installations and Environment Pete Potochney, testified in March to a House



Appropriations subcommittee that “the FY 2017 budget request included \$2.5 billion for adaptations and improvements in our use of operational energy.”<sup>94</sup> Therefore, in order to avoid double counting this spending in both the military and climate security budgets, we have subtracted this figure from the U.S. military security budget. Though this is probably a low estimate — it does not include emissions-reductions spending within the installations budget, which has not been released — it is a substantial increase over the \$2.3725 billion reported in 2014.<sup>95</sup> Since this range of spending constitutes less than one half of one percent of the total military budget, this deduction changed the proportions imperceptibly.

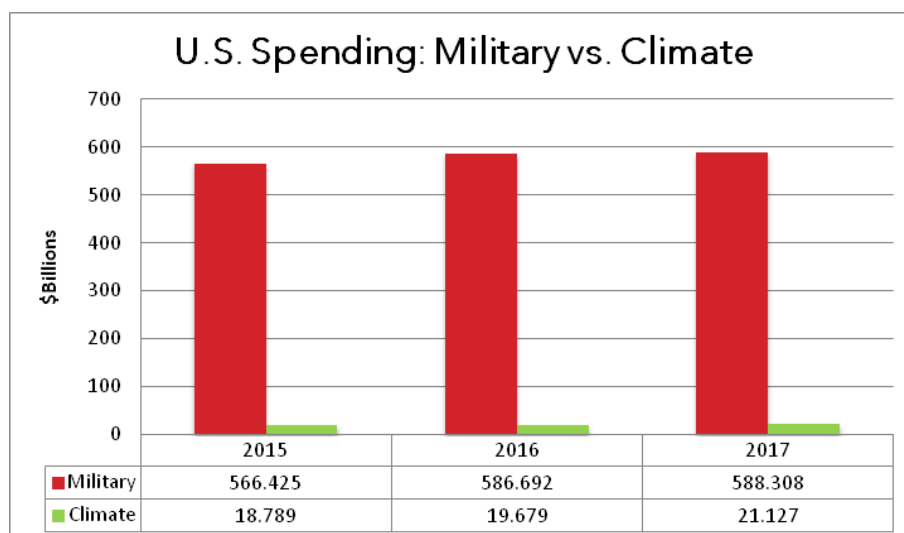
# THE U.S. MILITARY & CLIMATE SECURITY BUDGETS COMPARED

The trajectory of climate change expenditures lines up with the story of recent federal spending writ large. Following the financial meltdown of 2008, the U.S. passed a major stimulus package, the American Recovery and Reinvestment Act (ARRA), to boost the U.S. economy. A substantial portion of the new investment went to funding for clean energy and transportation projects for two years. Then a new Congress shifted the focus to deficit reduction, passing the Budget Control Act (BCA), in 2011. This 10-year budget framework put caps on federal spending and ended the ARRA's significant energy transition funding stream.

The other major force constraining significant change in the proportion of spending on military and climate security has been the extraordinary period of budget dysfunction of recent years. The stalemate between defense hawks who want to increase defense spending at the expense of the domestic agenda, and domestic hawks who want to do the opposite, plus the deficit hawks who want to cut or hold the line on both, has led to a series of failures to pass a budget. Last year's "Cromnibus," combining the fallback budgetary maneuvers of a Continuing Resolution and an Omnibus spending bill, locked in spending at essentially the previous year's levels, with minimal room for maneuver. This year's budget may be headed toward the same fate.

The Obama administration has managed to boost climate change spending modestly. But substantial new investment, such as existed with the ARRA, and would be commensurate with the magnitude of the climate crisis, has been blocked. On the military side, special legislation has twice relaxed the caps on Pentagon spending mandated by the BCA in two-year increments.

The result is visible here:



The imbalance between spending to deal with conflict by means military force and spending to prevent the massive conflict-multiplier of climate change from emerging has improved slightly: from 30:1 in FY 2015 and FY 2016, to 28: 1 in the request for FY 2017. But the pound of cure still vastly outweighs the ounce of prevention. Indeed, applying the proportions of pound-to-ounce, that is, 16:1, would be a huge improvement.

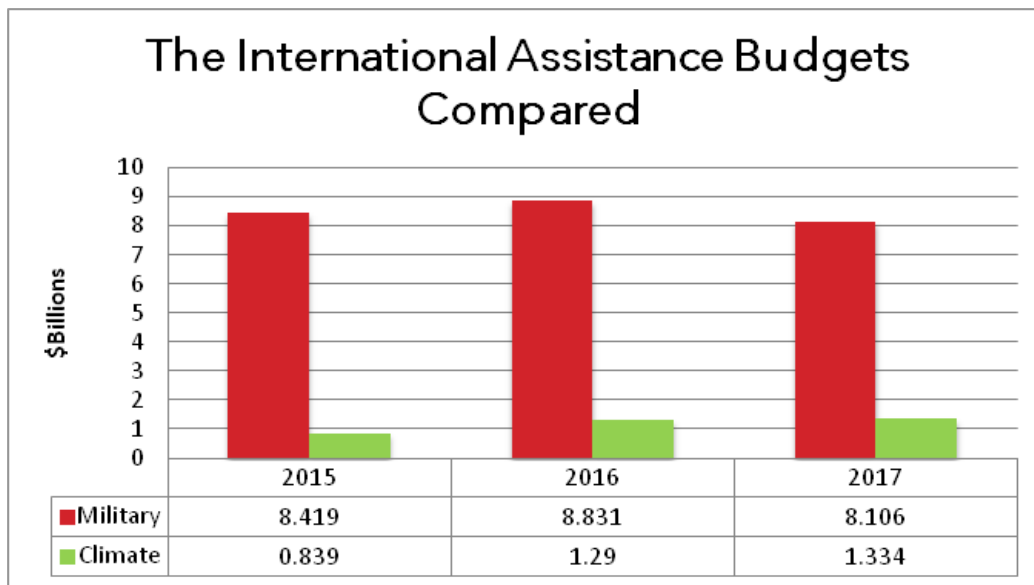
Two subsets of the comparison between military and climate security spending deserve special attention: international assistance and research and development.

## INTERNATIONAL ASSISTANCE

The military has three major programs for assisting foreign militaries:

1. The Foreign Military Financing Program (FMF) provides grants and loans primarily for purchases of U.S. weapon systems.
2. Peacekeeping Operations (PKO) funds international peacekeeping missions.
3. The International Military Education and Training Program (IMET) funds training for foreign troops.

As noted above, International Assistance spending on climate change is compiled from spending reports supplied by the Departments of State and Treasury and the U.S. Agency for International Development.



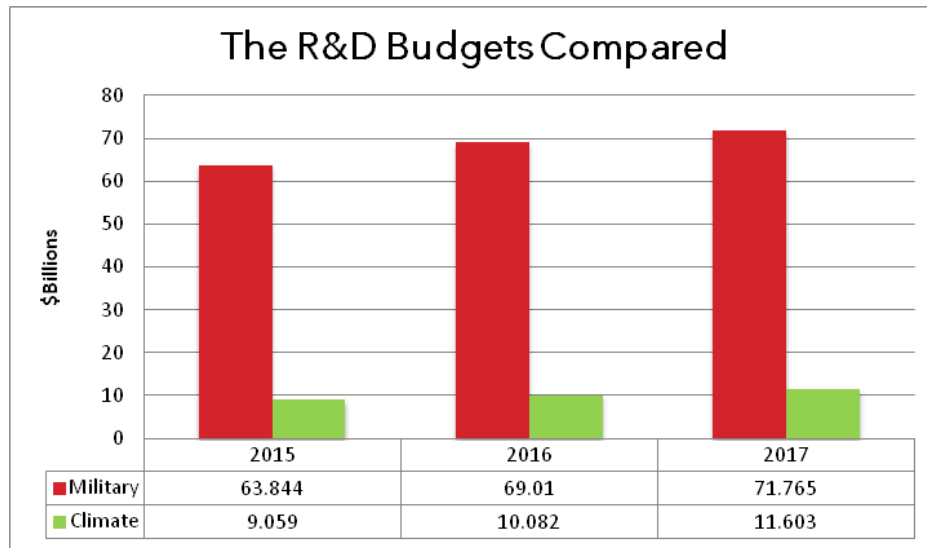
As with the overall climate change budget, the Obama administration has managed an uptick in spending to assist other countries with their efforts to reduce emissions. Assistance to foreign militaries has fluctuated modestly, declining slightly in FY 2017.

While the U.S. still spends far more buttressing foreign militaries than preventing conflict by helping other countries with their energy transitions, it is in this category that the balance between spending on military as opposed to climate security has improved the most: a 10:1 balance in FY2015 became a 6:1 balance in FY2017.

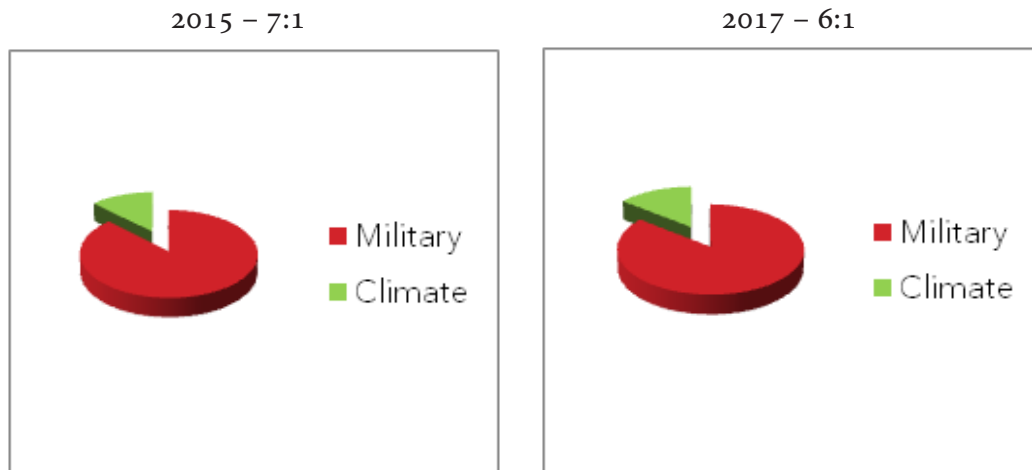
Actually changing the shape of the spending pie will obviously require a much bigger shift of resources.

## RESEARCH AND DEVELOPMENT

This is even more true in the case of research and development spending. Military R&D is funded out of the Research Development Testing and Evaluation account. Climate change R&D is accounted for by combining the research budget and the budget for clean energy technologies.



While spending on greenhouse gas-reducing technology development has increased modestly during this three year period, spending on military technology development has done the same. The imbalance, therefore, remains nearly unchanged.



# THE U.S. VS. CHINA

As the globe's two largest polluters, accounting for over 40 percent of global CO2 emissions annually,<sup>96</sup> the U.S. and China are the biggest players in the global challenge to keep global warming within the 2°C that scientists argue is needed to keep the planet livable. Both countries have identified climate change as a major security threat,<sup>97</sup> and they have signed and reaffirmed bilateral agreements committing to targets for greenhouse gas reductions.

Yet the numbers showing what each government is spending to achieve these goals, stacked up against what each is spending on its military forces, tell a different story.

## CHINA'S CLIMATE CHANGE EXPENDITURES

Transparent data on Chinese government expenditures, either on climate change or on its military forces, is hard to come by. For climate change we have obtained preliminary numbers for 2016 from the National Center for Climate Change Strategy and International Cooperation in Beijing, China, an agency of the UN Environment Program, and final numbers for 2015 from the UN Development Program's report *China: Climate Public Expenditure and Institutional Review*. The methodology for both includes classifying public expenditure as of high, medium, and low climate relevance. For the purposes of our report, we have used the most conservative accounting (listing only programs with high climate relevance).

We have, on the other hand, included both local and central Chinese government spending on climate. This is because in China local and central government spending is so profoundly intertwined. In 2013, for example, 70.2 percent of the central government's budget went to transfer payments to local governments.<sup>98</sup> We have struck what we believe to be a reasonable balance by including both federal and local spending totals, but only those labeled of high climate relevance.

	2015	2016
Central	\$6.475bn	\$4.769bn
Local	\$23.827bn	\$24.541bn
Total	\$30.302bn	\$29.31bn

*Dollar amounts converted from RMB using the exchange rate at January 1 of the year for which figures are given. 2016 is the most recent year for which Chinese public climate spending data is available.*

As the globe's two largest polluters:

	2015	2016
China	\$30.302bn	\$29.31bn
United States	\$18.789bn	\$19.679bn
Ratio	1.61:1	1.49:1

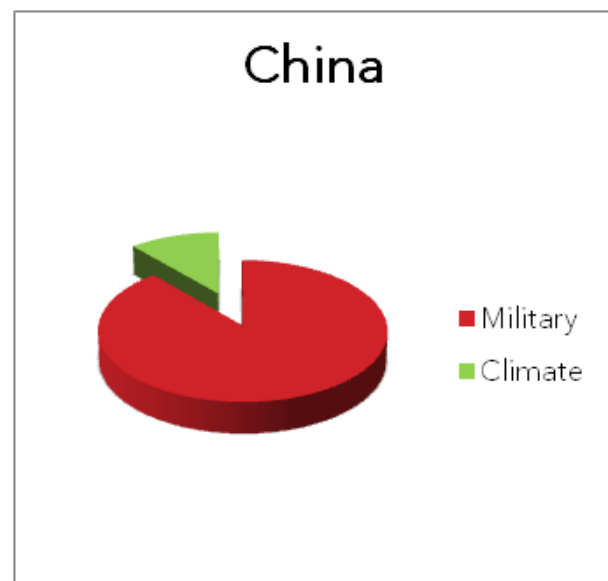
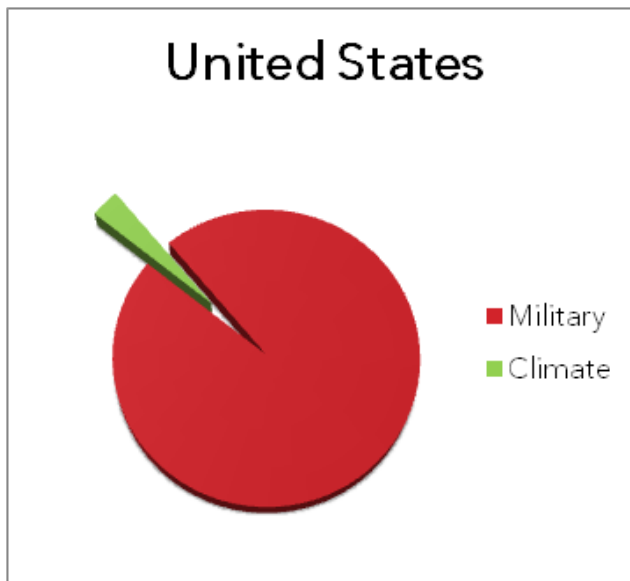
And compare U.S. and Chinese military expenditures:<sup>99</sup>

	United States	China	Ratio
2015	595.472	214.485	2.77:1
2016	586.692	230.786	2.54:1

## THE BALANCE

Thus, according to the best available estimates, in FY 2016 the U.S. is spending more than two and a half times the amount China spends on its military forces. And China is spending about one and a half times what the U.S. spends on climate change.

While the U.S. spends 30 times more on traditional instruments of military security than on climate security in 2016, China is spending just 8 times as much on its military forces as on climate security.



In the joint statement issued before the signing of the Paris Agreement, the U.S. and China asserted that “Both countries have taken strong measures at home to build green, low-carbon and climate-resilient economies.”<sup>100</sup> For the U.S., this statement is true primarily with respect to the Obama administration’s efforts to spur private investment through regulation. Since the end of the green investment made possible by the American Recovery and Reinvestment Act (ARRA), Congress has failed to appropriate significant funds to strengthen U.S. green infrastructure. If left unchecked, current infrastructural weaknesses become increasingly expensive. “The Department of Energy estimates that disruptions to the power supply, caused by weather incidents or technical malfunctions in our old, brittle grid, cost Americans more than \$100 billion annually in economic losses.”<sup>101</sup>

Meanwhile, China has been investing more heavily in infrastructure, not only in installing resilient green infrastructure, but also in clean energy R&D and lower-emission manufacturing processes.<sup>102</sup> As such, our “peer competitor” is arguably the global leader in renewable energy technologies, a major source of growth in the global economy.

The U.S. is far ahead of China in its commitments to proceed quickly to reduce emissions. And China has now replaced the U.S. as world “leader” in total current emissions. But by the measure of federal spending — putting your money where your mouth is — China’s commitment to climate security is markedly superior. And China’s overall security budget currently reflects a balance between expenditures on military and climate that more closely tracks the magnitude of the security threat posed by climate change.

## CHILE

An even stronger comparison of the military v. climate security balance is Chile. Since 2013, when President Michele Bachelet came back into office, Chile has been ramping up its renewable energy, from 11MW of solar at the end of 2013 to 402MW at the end of 2014 to 848MW at the end of 2015, and now projected to grow to 16 GW this year.<sup>103</sup> For comparison, the US is currently at 29.3 GW.<sup>104</sup> Meanwhile, Chile’s military spending was just \$5.071bn in 2015.<sup>105</sup>

# FUNDING CLIMATE SECURITY

Last December 195 nations of the world agreed in Paris to take action to prevent climate catastrophe. The U.S., a strong proponent of the agreement, has been unable to undergird the major actions it has taken to regulate emissions with adequate public funding that would spur a transition to low-emissions energy and transportation. Domestic politics has so far stood in the way. But the upcoming election may break the stalemate.

This report has prepared for that possibility by establishing current levels of federal climate change expenditures. To determine what level of spending is necessary to address the climate crisis it is necessary to have a baseline of current spending to work from. Since the federal government is not currently providing this baseline, we have done the job.

But how much should we be spending, and where should the money come from? The remainder of this report will be devoted to laying out an answer to this question.

## **First, what public expenditures are necessary to ensure that the U.S. will be doing its part to prevent global climate catastrophe?**

The consensus from the Intergovernmental Panel on Climate Change (IPCC) is that global greenhouse gas emissions must be reduced by 40 percent from 2005 levels by 2035.

A 2014 report by the Political Economy Research Institute at the University of Massachusetts and the Center for American Progress, entitled “Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities” calculated the U.S.’ necessary contribution to this goal. They estimate that it will take \$200 billion of investment per year across the public and private sectors.<sup>106</sup> The funds should be sufficient, when invested in clean energy infrastructure, to reduce annual U.S. energy consumption to 70 quadrillion BTUs over the next twenty years, and thus reduce U.S. carbon emissions to the target 3,200 mmt over the next 20 years.<sup>107</sup>

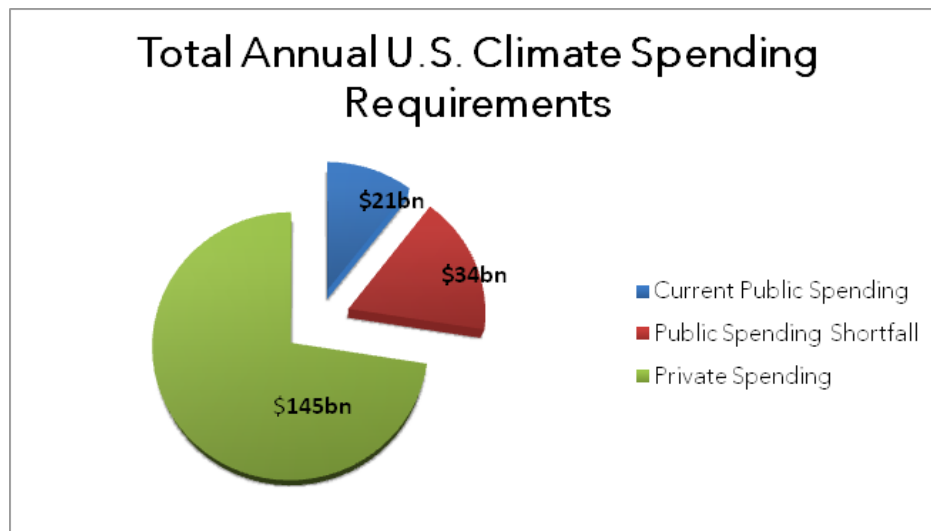
Of the \$200 billion total investment, the authors estimate that \$55 billion annually should come from the public sector. Public funding can be used to leverage private investment in clean energy technologies, energy-efficient buildings, and infrastructure improvements — projects that will protect the climate and create 2.7 million new jobs in the process.

The report’s policy agenda spreads the \$55 billion of government investment across 19 items that, together, meet the carbon dioxide emissions reduction target. The first category is “market-shaping rules,” including a carbon cap, fuel efficiency standards, and enforcing the Clean Air Act. Second is “direct public spending,” which involves government investment in energy efficiency, procuring



renewable energy, and research and development related to energy efficiency and renewable energy. Thirdly, federal government funding should be used to incentivize private investment through such measures as tax credits, green banks, and Property Assessed Clean Energy (PACE) financing. Finally, training and adjustment assistance should be provided to help workers and communities transition to a clean energy economy.

Our accounting of federal climate change expenditures calculates public spending budgeted for FY 2017 at approximately \$21 billion. Therefore another \$34 billion annually is required to meet the total specified by the “Green Growth” report to meet the IPCC’s target.



## SO WHERE WILL THE PUBLIC INVESTMENT COME FROM?

In an era still preoccupied with deficit-cutting, and still governed by the constraints of the 10-year framework of the Budget Control Act, it has been hard to come by. Public spending proposals almost never come without “payfors” attached.

As noted above, it is axiomatic that U.S. security policy should be connected to security budgeting. U.S. security policy has officially and repeatedly identified climate change as one of the major security threats facing our country and the world. Indeed, among the major national security threats identified by the Pentagon, climate change is the one that, unchecked, will multiply conflicts across the entire globe. And its action as a source of global instability and conflict will extend beyond any particular war into the planet’s foreseeable future.

Yet as the comparison of the budgets for traditional instruments of military force and for climate security make clear, climate change does not occupy space in the federal budget commensurate with the threat it poses to our security.

Bringing our security policy in line with our security budget therefore requires adjusting overall U.S. security spending to align it with the magnitude of the threat. Federal national security

spending needs to be realigned to invest in this mission of building U.S. energy and transportation infrastructure that is consistent with this national security imperative. While the military will have to deal with many of the consequences of climate change, this is a challenge that most evidently cannot be solved through military force, but only by governments and communities working together to make changes to reduce greenhouse gas emissions across the planet.

Therefore, this realignment requires reapportioning security resources within the Department of Defense and beyond it to the other federal agencies responsible for managing an energy transition.

## HOW MUCH REAPPORTIONMENT IS POSSIBLE?

As Adam Smith, the lead Democrat on the House Armed Services Committee, put it at a breakfast with reporters in early July, “Six hundred and 10 billion dollars [he was counting the nuclear weapons budget, funded out of the Department of Energy] is not a small amount of money. If we can’t spend \$610 billion to provide for the national security of the United States, then we just aren’t any good at spending money.” One might add that the same is true if we can’t secure the country by spending more than the next seven countries put together.

We need to spend what is necessary to protect our security. But a military budget that climbed higher in recent years, in inflation-adjusted terms, than at any time since World War II — higher than during the Reagan buildup, higher than during the height of the Iraq and Afghan wars — has as much to do with the profits of Pentagon contractors as with our security. The members of Congress whose campaigns are financed by those contractors are currently engaged in stuffing the Pentagon budget with funding the Pentagon didn’t even ask for and doesn’t want. And they are playing games to increase military spending beyond the caps imposed by the Budget Control Act by shifting more spending into the war budget (known as the Overseas Contingency Operations account), which is exempt from the caps, and much of which isn’t even spent on the wars we are fighting. Within the FY 2017 military budget request, though, there is plentiful low-hanging fruit — cuts that can be made with no sacrifice to U.S. security. In April of this year a collection of government watchdog groups from across the political spectrum sent to Congress a list.<sup>108</sup> As follows:

- **Cancel M1 Tank upgrades.** Since 1990, over 7,500 M1 tanks have been built for the U.S. Army and Marines, more than the Pentagon requested. *Savings: \$558.7 million*
- **Cancel or pause the Littoral Combat Ship.** The LCS is too lightly armored to survive in a combat environment, and has doubled in price relative to initial estimates. Four of the six littoral combat ships in service have suffered mechanical failures in the past nine months. *Savings: \$1,598.9 million*
- **Cancel JLENS.** The Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS) is supposed to track flying objects, but tests have found that it cannot consistently track high priority targets or distinguish friendly aircraft from potential threats. *Savings: \$45.5 million*
- **Cancel Air Launched Cruise Missile Follow-On (LRSO).** The Long Range Standoff (LRSO) Weapon does not add to the United States’ already robust strategic deterrent. *Savings: \$315.9 million*
- **Cancel B61-12 Life Extension Program.** The cost is more than twice the original estimate, most European nations are unwilling to cover the costs of hosting these weapons, and

there is major uncertainty about tactical nuclear weapons' continued presence in Europe.

**Savings: \$616.1 million**

- **Reduce service contracting by 15 percent.** Service contracting has contributed to an ever-expanding “shadow government” that costs hundreds of millions of dollars annually. A study by the Project On Government Oversight found the average annual contractor billable rate was much more than the average annual full compensation for federal employees performing comparable services. Judicious cuts to service contracts would increase efficiency and effectiveness. **Savings: \$22,354.5 million**
- **Cancel the F-35.** The Joint Strike Fighter, the most expensive weapon system ever envisioned, is unaffordable, and testing has shown that it cannot perform as well as the legacy systems it is designed to replace. **Savings: \$4,431 million**
- **Defense Business Board Moderate Efficiency Savings Scenario.** Modest early retirement option and limited backfill of retirements and attrition of the Defense Department's work force could result in significant savings. **Savings: \$9,170.3 million**
- **Cancel GBSD.** This system is redundant to the current fleet of intercontinental ballistic missiles (ICBMs). **Savings: \$113.9 million**

**Total FY 2017 savings: \$38.6 billion.**

## TRADE-OFFS

Shifting this amount into the budget for climate security and adding it to our calculation of current Federal Climate Change Expenditures would cover the cost of the U.S. public investments in climate security that are required to meet the IPCC target, with about \$4 billion left over.

It would allow budget trade-offs such as the following:

Cost	Military	Climate
\$4,431 million	Cancel the F-35	Build 15 more offshore wind projects like Block Island, RI. Total generating capacity: 458 MW (1.5 billion BTUs per hour), or enough to power 320,000 U.S. homes <sup>109 110 111</sup>
\$315.9 million	Cancel Air Launched Cruise Missile Follow-On (LRSO)	Install 11.5 million square feet of solar panels on buildings, saving 210,000 tons of CO2 annually <sup>112</sup>
\$616.1 million	Cancel B61-12 Life Extension Program	Plant 10,000 acres of trees, saving around 296 million pounds of CO2 and absorbing 6.1 billion gallons of rainfall <sup>113 114 115</sup>
\$22,354.5 million	Reduce service contracting by 15%	First year of a 20-yr plan to retrofit buildings and improve infrastructure, reducing building energy use by 37%
\$1,598.9 million	Cancel or Pause the Littoral Combat Ship	Retrain the 150,000 workers in the domestic coal industry (\$180mn – \$1.8bn) <sup>117 118</sup>

# RECOMMENDATIONS

1. Preparing a Federal Climate Change Expenditures report should again be a regular responsibility of the federal government.
2. This will require transparency on the part of all the relevant federal agencies, but in particular the Department of Defense, which has been the most resistant to providing clear figures for its spending on reducing its greenhouse gas emissions.
3. In addition, the federal budget itself should include a budget for these expenditures.

The challenge is that spending for this purpose is spread over many federal agencies, and embedded in programs that include other purposes. Making climate change a separate budget category, alongside, for example, the National Defense (050) and International Affairs (150) would require a major reorganization of the federal budget. Despite the existential importance of these expenditures to our nation and its people, this is unlikely. There are, however, other solutions. We recommend that the Analytical Perspectives volume accompanying the federal budget include a Climate Change Funding analysis providing a comprehensive accounting of expenditures across federal agencies. It would follow the example of the Homeland Security Mission Area budget that is part of that volume, which pulls together homeland security-related expenditures from the Departments of Energy, Human Services, Justice, State and a few others, in addition to the budget for the Department of Homeland Security itself.

4. This analysis needs to become incorporated into the U.S.' overall security budget planning. A broader set of reforms to connect U.S. security policy planning with security budgeting has been laid out in a series of annual joint Institute for Policy Studies/Center for American Progress reports titled "A Unified Security Budget for the United States." They include "establishing a small cohort across the NSC and OMB staff with the ... necessary breadth of experience to consider the tradeoffs inherent in a unified security budget," as well as changes in budget documentation and the structures of congressional oversight and the budget process.
5. This overall security budget planning must make it a priority to correct the imbalance between expenditures on military and climate security.

6. The basis for the reapportionment of funds within an overall security budget should include cutting unnecessary military programs that have more to do with security for contractor profits than for our nation.
7. The reapportionment of resources within an overall security budget should be benchmarked to an assessment of how much public investment in climate security is necessary to fulfill the U.S. commitment to the goal of keeping global warming below 2 degrees centigrade.

## THE FUTURE

This is our status quo: As global temperatures hit one record after another, the stalemate in Congress over funding to respond continues. Meanwhile, plans to spend \$1 trillion to modernize our entire nuclear arsenal remain in place, and projected costs of the F-35 fighter jet program continue to climb past \$1.4 trillion. Neither side of this equation is sustainable.

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<sup>2</sup> See for example Miriam Pemberton and Ellen Powell, “Combat vs. Climate: The Military and Climate Security Budgets compared,” September 2014, <http://www.ips-dc.org/combatsvclimate/>.

<sup>3</sup> U.S. Global Change Research Program, “Our Changing Planet,” May 2015, page 46, [https://downloads.globalchange.gov/ocp/ocp2016/Our-Changing-Planet\\_FY-2016\\_full.pdf](https://downloads.globalchange.gov/ocp/ocp2016/Our-Changing-Planet_FY-2016_full.pdf)

<sup>4</sup> Ibid, 46.

<sup>5</sup> Office of Management and Budget, “Analytical Perspectives: Budget of the U.S. Government Fiscal Year 2017,” February 2016, page 300, [https://www.whitehouse.gov/sites/default/files/omb/budget/fy2017/assets/ap\\_19\\_research.pdf](https://www.whitehouse.gov/sites/default/files/omb/budget/fy2017/assets/ap_19_research.pdf)

<sup>6</sup> Office of Management and Budget, “Government-Wide Funding for Clean Energy Technology,” June 2015, Page 2, [https://www.whitehouse.gov/sites/default/files/omb/budget/fy2016/assets/fact\\_sheets/government-wide-funding-for-clean-energy-technology.pdf](https://www.whitehouse.gov/sites/default/files/omb/budget/fy2016/assets/fact_sheets/government-wide-funding-for-clean-energy-technology.pdf)

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<sup>8</sup> See Table 2

<sup>9</sup> This number does not include indirect climate assistance nor development finance and export credit agencies.

<sup>10</sup> Department of State, “Congressional Budget Justification Foreign Operations Appendix 2: Fiscal Year 2015,” 4 March, 2014, Page 25, <http://www.state.gov/documents/organization/224069.pdf>

<sup>11</sup> Department of State, “Congressional Budget Justification Foreign Operations Appendix 2: Fiscal Year 2015,” February, 2015, Page 31, <http://www.state.gov/documents/organization/238221.pdf>

<sup>12</sup> Department of State, “Congressional Budget Justification Foreign Operations Appendix 2: Fiscal Year 2015,” February, 2015, Page 27, <http://www.state.gov/documents/organization/252733.pdf>

<sup>13</sup> Office of Management and Budget, “Analytical Perspectives: Budget of the U.S. Government Fiscal Year 2017,” February 2016, page 228, [https://www.whitehouse.gov/sites/default/files/omb/budget/fy2017/assets/ap\\_14\\_expenditures.pdf](https://www.whitehouse.gov/sites/default/files/omb/budget/fy2017/assets/ap_14_expenditures.pdf)

<sup>14</sup> Ibid, 232

<sup>15</sup> Pollin, R., Garrett-Peltier, H., Heintz, J. and Hendricks, B., 2014. “Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities,” [http://www.peri.umass.edu/fileadmin/pdf/Green\\_Growth\\_2014/GreenGrowthReport-PERI-Sept2014.pdf](http://www.peri.umass.edu/fileadmin/pdf/Green_Growth_2014/GreenGrowthReport-PERI-Sept2014.pdf) p. 3

<sup>16</sup> Pollin, R., Garrett-Peltier, H., Heintz, J. and Hendricks, B., 2014. “Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities,” [http://www.peri.umass.edu/fileadmin/pdf/Green\\_Growth\\_2014/GreenGrowthReport-PERI-Sept2014.pdf](http://www.peri.umass.edu/fileadmin/pdf/Green_Growth_2014/GreenGrowthReport-PERI-Sept2014.pdf), p. 6

<sup>17</sup> Pollin, R., Garrett-Peltier, H., Heintz, J. and Hendricks, B., 2014. “Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities,” [http://www.peri.umass.edu/fileadmin/pdf/Green\\_Growth\\_2014/GreenGrowthReport-PERI-Sept2014.pdf](http://www.peri.umass.edu/fileadmin/pdf/Green_Growth_2014/GreenGrowthReport-PERI-Sept2014.pdf) p. 3. Figures adapted to mesh with the \$21 bn that we have calculated as FY 2017 federal climate change expenditure (IPS, 2016)

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