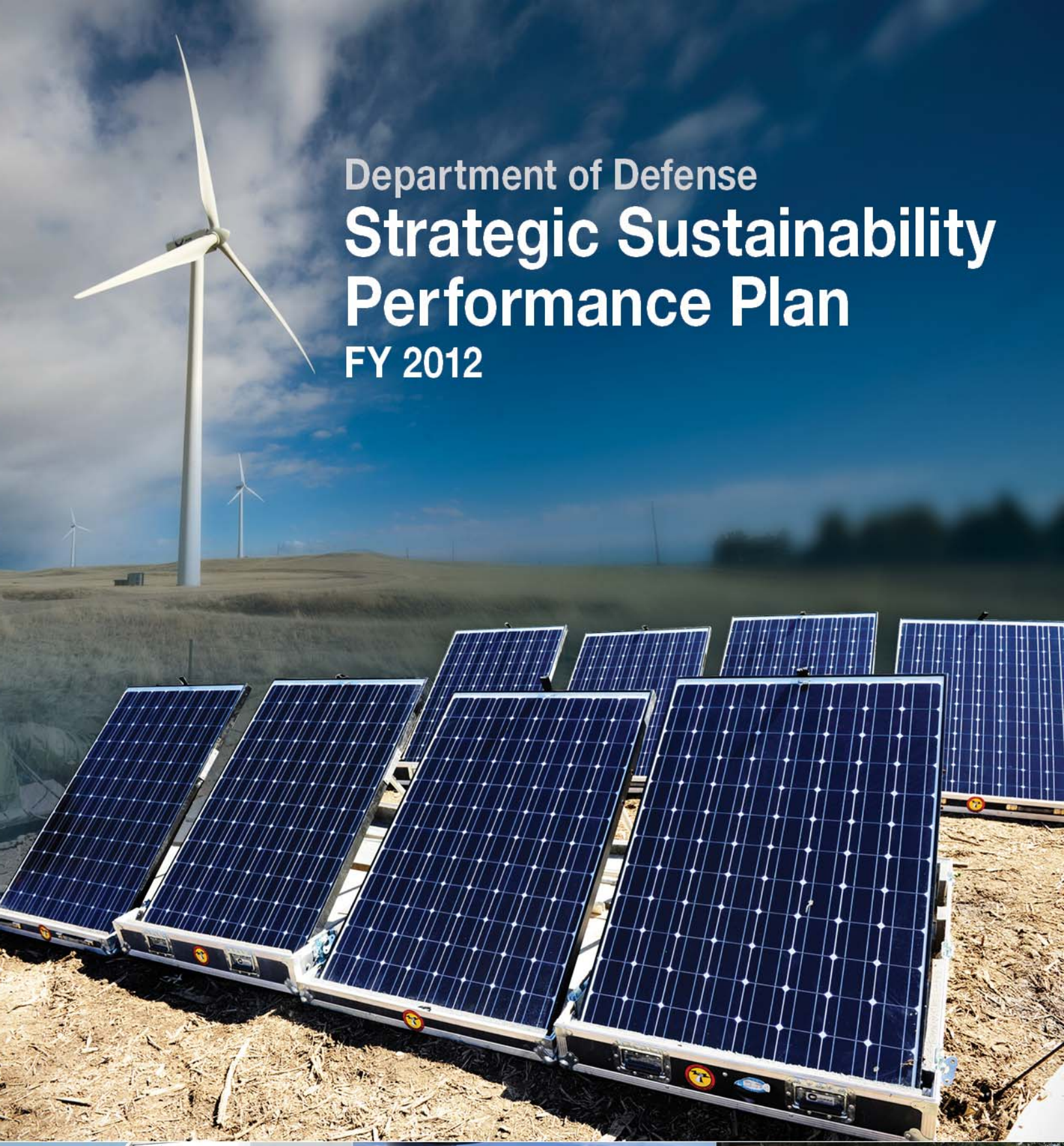
Department of Defense

Strategic Sustainability Performance Plan

FY 2012



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The mission of the Department of Defense (DoD) is to provide the military forces needed to deter war and protect the security of our country. To successfully execute the DoD mission, our Military Departments must have the energy, land, air, and water resources necessary to train and operate, today and in the future, in a world where there is increasing competition for resources. Sustainability provides the framework necessary to ensure the longevity of these resources by addressing energy, environmental, safety, and occupational health considerations. Incorporating sustainability into DoD planning and decision-making enables us to address current and emerging mission needs and consider future challenges.

This annual update of the DoD Strategic Sustainability Performance Plan (SSPP) lays out our goals and sustainability performance expectations through FY 2020, establishing the path by which DoD will improve our mission, lower life-cycle costs, and advance technologies and practices that further the sustainability goals of the Nation. In FY 2011, the Department continued to drive progress on sustainability by integrating it into the everyday course of DoD business. We did this by embedding sustainability concepts and requirements into our high-level strategies, policies, and guidance documents across the Military Departments.

We are committed to integrated risk management practices that advance our mission while protecting the environment and promoting sustainability. The Department is addressing sustainability concepts in our acquisition and procurement processes, as well as in the planning and management of our installations. For every DoD program, the Department actively seeks opportunities to continually improve its full range of operations through improved analysis, informed decision-making, and appropriate budgets to address sustainability.

DoD sustainability goals are aggressive, especially in energy and greenhouse gas emissions. In FY 2012 and 2013, our primary sustainability focus will be to reduce energy costs and improve the energy security of our fixed installations through energy efficiency and renewable energy. In support of this focus, the Department plans to execute roughly $465 million in performance-based, third-party contracts in FY 2012 and approximately $718 million in FY 2013.

The Department will meet or exceed the FY 2012 targets of many of its SSPP sub-goals. We will leverage sustainable technology development with other agencies and industry, and by doing so, will jump start commercial adoption and achieve payoffs that extend well beyond the defense sector. Although we still have much to do, the Department is committed to making the transformation necessary to continue our culture of excellence in environmental and fiscal stewardship while also improving national security. We are steadfast in achieving the transition needed to be ready for the challenges of tomorrow.

DoD Senior Sustainability Officer
Under Secretary of Defense for Acquisition,
Technology and Logistics

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Executive Summary

Sustainability as an Overarching, Cross-Cutting Paradigm

The Department of Defense (DoD) vision of sustainability is to maintain the ability to operate into the future without decline—either in the mission or in the natural and man-made systems that support it. DoD embraces sustainability as a critical enabler in the performance of our mission, recognizing that it must plan for and act in a sustainable manner now in order to build an enduring future. The DoD Strategic Sustainability Performance Plan (SSPP) is framed around four mission-oriented objectives whose successful implementation will make the Department more effective:

1) Ensuring the Continued Availability of Resources Critical to the DoD Mission
2) Maintaining Readiness in the Face of Climate Change
3) Ensuring the Ongoing Performance of DoD Assets by Minimizing Waste and Pollution
4) Continuously Improving the DoD Mission through Sustainability Management and Practices

All of the objectives, along with the six goals under them, relate to one another in synergistic ways.

Sustainability is not an individual Departmental program; rather, it is an organizing paradigm that applies to all DoD mission and program areas. For this reason, many DoD efforts to drive improved sustainability cut across topical and organizational boundaries, in keeping with the cross-cutting, interdisciplinary and synergistic nature of sustainability. The fact that so many aspects of sustainability are interrelated is reflected in recent actions by the Military Departments to embed sustainability into critical documents and take a more holistic approach to environmental and energy issues. For example, the Army conducted a comprehensive review of environmental programs in FY 2011, including an evaluation of environmental staffing levels across the Army, to ensure that Army organizations are successfully postured to support both the mission and sustainability goals. The Army also merged its energy and sustainability governance structures in October 2011 into a single Senior Energy and Sustainability Council that serves to institutionalize energy and sustainability in doctrine, policy, training, operations and acquisitions across the entire Army enterprise. The Army incorporated sustainability as a "foundation" concept embedded across the Army Campaign Plan strategy map, where one of the objectives is to "achieve energy security and sustainability objectives." Finally, the Army launched its cross-cutting Net Zero Initiative in April 2011, a holistic approach to energy, water, and waste that directly supports the Army's energy security and sustainability objectives.

In the Navy, the Chief of Naval Operations (OPNAV) Energy and Environmental Readiness Division was created in May 2010, combining the existing OPNAV Environmental Readiness Division and the Navy's Task Force Energy. Since then, the division has developed many cross-cutting sustainability initiatives, such as the incorporation of sustainability considerations into ship and weapons system design processes and promoting sustainability through Navy outreach efforts. The Department of the Navy (DON) is in the process of revising its Environmental Readiness Program Manual (OPNAV Instruction 5090.1C) to specifically include information on sustainability and the DoD SSPP. The revision is expected to be published in FY 2013.

The Air Force has moved to Sustainable Infrastructure Assessments, which combine energy and water audits, facility condition assessments, space optimization assessments, and High Performance and Sustainable Building assessments into a single activity. In October 2011, the Air Force issued its *Environmental Management System Standardization Methodology and Approach* policy memo, and in November 2011 updated its Environmental Management Instruction. These actions formally establish environmental management systems (EMSs) across the enterprise as the core framework for continual program and process improvement to achieve and attain sustainability and compliance goals. Later in FY 2012, the Air Force will issue a policy on achieving a "net zero" posture for Air Force installation water, energy and solid waste. The net zero actions will build upon and complement the new EMS policies and

other existing Air Force strategic sustainability policy and goals, providing a systemic, cross-cutting blueprint that embeds sustainability into Air Force operations.

By the Numbers

DoD's FY 2011 performance on the sub-goals in its SSPP, relative to the FY 2011 planning targets, is compiled in Table ES.1. (Progress toward the employee air travel sub-goal is not shown because its baseline year is FY 2011.) The table also shows which sub-goals are on track for FY 2012 and which are not. In four areas, the Department greatly exceeded the targets, by one-third or more. In seven other areas, DoD met the targets or came within 10%, and is well placed to meet or exceed the FY 2012 targets. DoD is not on track at this time for meeting six of its sub-goal targets by FY 2012.

Looking ahead to FY 2013, the Department has a high degree of confidence that it will meet targets for the nine sub-goals pertaining to: biogas recovery, water intensity, paper, solid waste (both sub-goals), toxic chemicals, electronics disposition, and pesticides (both sub-goals). In addition, DoD is tentatively on track for meeting FY 2013 targets for six other sub-goals: facility water use, vehicle petroleum use, Scopes 1 and 2 greenhouse gas (GHG) emissions, stormwater management, employee teleworking and sustainable procurement, if complete data is available.

Table ES.1. Summary of DoD Performance in FY 2011

	Result	Target
Exceeded FY 2011 Target		
Biogas Recovery	2	0
Facility Water Intensity	10.7%	8%
Use of Printing Paper	4	1
Solid Waste Diversion (C&D Debris)	77%	52%
Met FY 2011 Target or On Track for FY 2012[a]		
Vehicle Petroleum Use	12%	12%
Scope 3 GHGs[b]	-0.1%	0%
Solid Waste Diversion (Non-Hazardous)	40%	42%
Toxic Chemicals	2.5%	5% by FY15
Electronics Disposition	100%	100%
Certified Pesticide Applicators	99.2%	100%
Integrated Pest Management Plans	90.2%	100%
Not On Track for FY 2012		
Renewable Energy	8.5%	12%
Facility Energy Intensity	13.3%	18%
Scopes 1 and 2 GHGs	4.4%	5%
Sustainable Buildings	0.1%	7%
Sustainable Procurement[c]	82.6%	95%
Environmental Management Systems	red	green
Complete Data Not Yet Available		
Industrial and Irrigation Water Use	n/a	2%
Stormwater Runoff	n/a	100%
Employee Teleworking	n/a	10%
Air Travel GHG Emissions	Baseline is FY 2011	

[a]Considered on track if less than 10% from the target.

[b]Includes credit for hosting renewable energy facilities.

[c]Based on random audit of 987 contract actions in FY 2011.

Table ES.1 also shows sub-goals for which complete data is not yet available. DoD expects the issues relating to collecting accurate teleworking data to be resolved in time for complete FY 2013 reporting. The Military Services continue to make progress developing and deploying tracking systems for stormwater runoff compliance, and they expect close to 100% implementation of the systems in FY 2012. The availability of data is also an issue for the sub-goal pertaining to irrigation and industrial water, for which DoD cannot project performance with high confidence until enough meters are installed to better estimate a Department-wide quantity of irrigation and industrial water consumption separate from indoor use. Until more complete systems are available to rigorously track compliance with sustainable procurement requirements, DoD is estimating performance by conducting random audits on a large number of contract actions (987 of them in FY 2011). Meanwhile, system and process improvements are in progress at both the federal level and within DoD.

There are three sub-goals for which DoD is not on track for FY 2013:

- **Facility Energy Intensity**: DoD anticipates difficulty meeting its FY 2013 target for reducing the energy intensity of its facilities. The annual planning targets ramp up by 3 percent per year through FY 2015, while a more realistic progression would have lower targets in the early years to provide time for projects to be funded, designed, launched and completed. The Department expects to meet the FY 2020 goal for facility energy.
- **Environmental Management Systems:** For the implementation and maintenance of Environmental Management Systems (EMSs), DoD's performance has been improving, with 52 percent of EMSs scoring green in FY 2011, up from 48 percent in FY 2009, although the portion of red EMSs rose slightly over that period, from 14 percent to 15 percent. Since an overall green score for DoD requires that more than 80 percent of all EMSs be green and fewer than 5 percent be red, DoD is unlikely to score green by FY 2013, but it expects to do so by FY 2020 if not sooner.
- **Sustainable Buildings:** The greatest challenge for DoD will be meeting the sustainable buildings goal. DoD currently has almost 52,000 buildings larger than 5,000 square feet, meaning that approximately 7,800 buildings would have to be renovated by FY 2015—often extensively—in order to meet the Guiding Principles criteria. Aside from the sheer magnitude of the challenge, another issue is the Guiding Principles threshold. DoD has a rapidly increasing number of high performance, sustainable buildings that have LEED Silver certification or higher. However, these buildings often do not meet 100 percent of the criteria in the Guiding Principles, and therefore do not count toward the metric. The Department's facility investment strategy is focused on mission needs, not on upgrading buildings that already meet a mission need to meet the Guiding Principles. The Department is committed to ensuring our limited investments in new construction and major renovation are meeting the Guiding Principles and lowering life-cycle costs, although this is expected to yield only modest gains in the Guiding Principles metric. However, the steps described in the Vision section below will accelerate DoD's progress in improving the performance of its buildings.

Successes with Potential for Widespread Adoption

Notable successes from FY 2011 are highlighted throughout the SSPP. Four are briefly summarized here for their potential to be widely adopted by other federal agencies, as well as within the Department.

Installations as Test Beds for Next-Generation Energy Technologies

DoD's fixed installations offer an ideal test bed for next-generation energy technologies developed by industry, the Department of Energy (DOE) and university laboratories, filling the gap between research and broad commercial deployment. Emerging energy technologies hold the promise for dramatic improvements in energy performance but face major impediments to commercialization and deployment. DoD's built infrastructure and lands encompass a diversity of building types and climates in the United States, affording an exceptional opportunity to assess the technical validity, operating costs and environmental impact of advanced, pre-commercial technologies. As both a real and a virtual test bed, our facilities can serve as a sophisticated first user, evaluating the technical validity, cost and environmental impact of advanced, pre-commercial technologies. The Department is applying the energy test bed concept to improve the energy efficiency of buildings, improve renewable energy technologies on or in proximity to installations, and develop smart microgrids. The test bed approach is key to meeting the Department's needs, allowing DoD to leverage technology advances from the private sector while benefiting from the lower costs that occur once the private sector commercializes the technologies. Through its energy test bed program, DoD is helping create a market for emerging technologies that prove effective and reliable, accelerating the availability of next-generation energy technologies for other federal agencies.

Power Purchase Agreements for Large-Scale Renewable Energy

A critical path for DoD to meet its energy and GHG reduction goals is through large-scale renewable energy. The most time-and cost-effective approach for doing so is to partner with the private sector using creative financial mechanisms that require no upfront costs on the part of DoD. One example is a new solar photovoltaic (PV) array at Naval Air Weapons Station China Lake. Construction on the 13.8 MW PV array—the Navy's largest solar installation—began in January 2012. Under a 20-year power purchase agreement (PPA), a financier purchased the solar system that a private solar company designed and built, and will operate and maintain. The role of the installation is to provide the land for the project and purchase electricity from it, at a rate that is locked in for 20 years below the current retail utility rate. The 20-year term for the PPA—the first PPA of this duration with the federal government—gives the Navy a significantly better rate than 10-year PPAs. The Navy incurs no upfront costs. The array is projected to meet approximately 30 percent of the installation's annual energy needs and reduce its energy costs by about $13 million over the 20-year life of the contract. The components of the solar system are shipped in pre-assembled power block kits to facilitate rapid installation on the site.

Energy Efficiency Counteracts Increased Computing Density due to Data Center Consolidation

The Computing Services Directorate (CSD) of the Defense Information Systems Agency consolidated over 100 data centers down to 14. As a result, however, the remaining data centers became more densely loaded with equipment. To avoid the increased energy costs that would normally go with this increased computing density, CSD significantly improved the energy efficiency of its remaining data centers. CSD deployed a large range of energy efficiency strategies at the 14 remaining data centers, successfully preventing a significant increase in utility costs. The measures included the following, which are in keeping with Federal Energy Management Program (FEMP) recommendations for efficient data center best practices:

- A three-dimensional computational fluid dynamic software program called "TileFlow" to optimize the configuration of racks and other equipment.
- Airflow management devices, to better direct cooling air to the equipment that needs it and prevent cool air from mixing with the hot exhaust air from equipment.
- Hot aisle/cold aisle layout, where the rows of servers are oriented so the fronts of server racks always face one another (cold aisles) and backs of the racks always face one another (hot aisles).
- Outdated equipment—such as computer room air conditioners, uninterruptible power supplies, power distribution units, lighting, chillers and boilers—replaced with new, energy-efficient models.
- Building automation system improvements, such as controls for chillers and lighting.
- Electricity meter installation.
- Variable speed drives installed on pumps.

Approaches to Maximize the Diversion of Construction and Demolition (C&D) Debris

The Department diverted 77 percent of C&D debris from disposal in FY 2011. One proven approach DoD used in FY 2011 was to write the requirements for cost-effective and innovative C&D debris diversion into the contracts for construction projects, and make them apply to all contractors, vendors and suppliers involved. Another winning approach for diverting large portions of C&D debris away from disposal—which DoD repeatedly demonstrated in FY 2011—is to find high value uses for it. In some cases DoD did this through market research, raising awareness among contractors of ways they can make use of recycled or repurposed debris, and reaching out to local recycling facilities. The most common way DoD repurposes C&D materials in DoD is to use crushed concrete and asphalt for building materials. Installations across all four Military Services regularly reuse crushed concrete and asphalt from demolitions for a wide variety of projects, including foundations for buildings and pavement, curbs and gutters, roads and highways, airport runways, clean fill, landscaping and stormwater retention basins.

Joint Base Lewis-McChord, one of the Army's eight Net Zero Waste pilot installations, set aside an area on the installation to handle C&D debris on an ongoing basis. The base collects and stockpiles waste concrete and asphalt generated from in-house projects, and then reclaims the material to provide high-quality aggregate to Department of Transportation specifications for other projects on the base. The cost of this reclaimed material is generally around half the cost of new crushed rock and aggregate, and it eliminates the costs and pollution associated with transporting virgin material from the source. Another example is Naval Support Facility Diego Garcia, which developed a win-win solution by making landfill covers out of C&D debris mixed with pulverized recycled glass and clean sandblasting grit. This not only saved landfill space, but reduced the cost of importing fill material and reduced the risk of inadvertently importing non-native species in imported fill.

Vision for FY 2012 and FY 2013

The DoD SSPP applies across the Department as a whole, encompassing the Military Departments, Defense Agencies and DoD Field Activities, each with a distinct mission. The Office of the Secretary of Defense manages DoD's sustainability efforts on behalf of the Department as a whole, but in practice the individual Components realize most of the tangible progress. To provide the Components with a common sustainability vision and policy across the entire Department, DoD is in the process of developing a high-level Department of Defense Instruction (DoDI) titled *Sustainability in DoD*. The DoDI will state that sustainability is a mission imperative for all Components and that it is DoD policy for the Department to integrate sustainability into its day-to-day course of business. It will clearly define what sustainability means to DoD in practice. Although many elements of the DoDI already exist in policy, guidance and programs elsewhere within the Department, the DoDI will provide unambiguous, overarching policy and direction to ensure that everyone in the Department understands the high-level sustainability objectives toward which they are striving.

Within the realm of sustainability, the Department's near-term focus is on facility energy. DoD is pursuing an ambitious facility energy strategy to reduce its $4 billion annual facility energy bill and improve the energy security of its installations. The Department's facility energy strategy, designed to reduce energy costs and improve the energy security of our fixed installations, has four inter-related elements:

- reduce the demand for fossil fuels through conservation and improved energy efficiency;
- expand the supply of renewable energy and other forms of distributed (on-site) energy;
- enhance the energy security of our installations directly (as well as indirectly, through the first two elements); and
- leverage advanced technology.

The Department budgeted more than $1.1 billion in FY 2013 for energy conservation and efficiency, almost all of which will be directed to retrofits on existing buildings, such as more energy efficient lighting, double-pane windows, energy management control systems, new roofs, and high-efficiency heating, ventilation and air-conditioning systems. Included in these investments is the Energy Conservation Investment Program (ECIP), which DoD is reshaping to support projects that will have a major impact on the Services' energy efficiency and/or security, but that may not be justified under their internal funding strategies. The Department is also changing the way it will award ECIP funding: in the future, Services will be required to compete with one another for these funds. In addition to direct funding, the Department plans to rely heavily on third parties to finance its investments in energy and water efficiency. DoD set a goal to execute roughly $465 million in energy savings performance contracts and utility energy service contracts in FY 2012 and $718 million in FY 2013.

Another critical step in improving facility energy efficiency is to greatly increase the number of buildings that DoD meters for energy. By deploying a large network of advanced meters, DoD can gain a more accurate understanding of where its facilities energy budget is being consumed, identify under-

performing buildings, and develop investment strategy based on actual energy use data. Toward this end, DoD will issue an updated policy on metering this summer that will increase the number of buildings that Components must meter, and establish guidelines to ensure that installed meters securely deliver data to energy professionals in the field. Another significant development is a new set of building standards the Department is developing, to be issued in late 2012, to ensure DoD compliance with all federal requirements on high-performance, sustainable buildings. It will apply to all new construction, major renovations, existing buildings and leased facilities. Finally, in May the Department issued an updated Unified Facilities Criteria (UFC) titled *Installation Master Planning* to ensure that consistent planning processes are applied at all military installations. DoD expects implementation of the UFC to result in lower upfront and lifecycle costs, improved energy and land efficiency, improved safety and enhanced protection of DoD forces.

DoD has decided to focus on developing renewable energy on its own installations in lieu of the common past practice of purchasing renewable energy credits. Each of the Military Departments has set a target to develop one gigawatt of renewable energy by FY 2025. At the heart of the Department's vision for greatly expanding its renewable energy capacity—especially on military installations with their thousands of acres of land compatible with large scale renewable energy development—is a reliance on alternative financing. Another central theme of the Department's vision for facility energy is advanced microgrid technology. Advanced microgrids are a "triple play" for DoD's installations: they will reduce installation energy consumption and costs, facilitate the incorporation of renewable and other on-site energy generation, and—combined with energy storage—allow an installation to shed non-essential loads and maintain mission-critical loads if the grid goes down. Finally, the DoD budget in FY 2013 for the Installation Energy Test Bed is $32 million. The program helps firms overcome the barriers that inhibit innovative technologies from being commercialized and/or deployed on military installations by using installations as a distributed test bed to demonstrate and validate the technologies in a real-world environment.

Operational energy is the energy required to train, move and sustain forces, weapons and equipment for military operations. It accounts for approximately 75 percent of all energy used by the Department. Although operational energy is exempt from the SSPP sub-goals, it is vitally important for DoD to minimize the risk and maximize the capability that results from changing its use of energy. In 2010, the Department created the Office of the Assistant Secretary of Defense for Operational Energy Plans and Programs (OEPP) to strengthen the energy security of U.S. military operations. The mission of the office is to help the military services and combatant commands improve military capabilities, cut costs and lower operational and strategic risk through better energy accounting, planning, management and innovation.

In June 2011, OEPP released DoD's first *Operational Energy Strategy*, followed by a detailed *Operational Energy Strategy Implementation Plan* in March 2012. The strategy sets the overall direction for operational energy security for DoD, with the goal of assuring reliable supplies of energy for 21st century military operations. Secretary Panetta's top priority for DoD today is to support current operations. OEPP has, therefore, focused on identifying and promoting the technologies, techniques, tactics, and procedures that can best support deployed men and women, especially in Afghanistan. For FY 2013, OEPP will continue to focus on supporting current operations, including the documentation of lessons learned in Afghanistan, and continue to support efforts at the Pacific Command to integrate operational energy into command priorities, plans, and programs.

DoD has made considerable progress in the two short years since it issued the first version of its SSPP for the decade spanning FY 2011 through 2020. With the dual approach of high-level institutional changes that lay the foundation for a sustainable future, combined with actions and ever evolving innovations on the ground, the Department looks forward to a decade of continuous improvement on the path to a stronger and more sustainable DoD.

Part I: DoD Sustainability Policy and Organization

I.1 Sustainability and the DoD Mission

The Department's vision of sustainability is to maintain the ability to operate into the future without decline—either in the mission or in the natural and man-made systems that support it. DoD embraces sustainability as a critical enabler in the performance of our mission, recognizing that it must plan for and act in a sustainable manner now in order to build an enduring future. Sustainability is not an individual Departmental program; rather, it is an organizing paradigm that applies to all DoD mission and program areas. Applying a systematic framework for improving sustainability involves a wide range of practices that span much of the Department's day-to-day activities and military operations, and DoD personnel are learning to apply this mindset to improve mission performance and reduce lifecycle costs. The Department recognizes that it can address many key issues facing DoD through smart investments that improve sustainability as well as promote the mission, such as using energy and water more efficiently, acquiring more energy from renewable sources, designing buildings for high performance, reducing the use of toxic and hazardous chemicals, and optimally managing solid waste.

> '"Sustainability' and 'sustainable' mean to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.
>
> *— Executive Orders 13423 and 13514*

The DoD Strategic Sustainability Performance Plan (SSPP) provides a coherent approach both for complying with multiple federal requirements for sustainability and for ensuring the mission. The SSPP does not directly address combat and support operations, such as contingency basing, ships, aircraft, and tactical vehicles. However, this section of the SSPP will repeatedly touch upon the Department's operational activities because the linkages between sustainability and the DoD mission are strong and direct across the board, including for combat operations. For this reason, the Department is working to improve the sustainability of contingency basing as a means of enhancing force effectiveness and mission outcomes. This involves applying the principles of sustainability in policy, doctrine, organizations, training, materiel, leadership, personnel and facilities. The expected results are improvements in planning; the efficiency, effectiveness and interoperability of equipment; and the management and oversight of contingency basing. Improved contingency base sustainability will also enhance mission support by reducing resource consumption and the vulnerability of fuel and water supplies, preserving the health of warfighters, and improving environmental and safety performance. Lastly, to the extent DoD can share sustainable practices with partner nations, they build international resilience in the face of climate change. This resilience can contribute to the Department's goal of conflict prevention as outlined in the 2010 Quadrennial Defense Review.

This section discusses the link between sustainability and the DoD mission in terms of four key priority areas for the Department:

1) Energy and Reliance on Energy
2) Chemicals of Environmental Concern
3) Water Resources Management
4) Maintaining Readiness in the Face of Climate Change

> **DoD Facility Energy**
>
> "Facilities energy is critical to mission assurance. Our fixed installations support combat operations more directly than ever before, and they serve as staging platforms for humanitarian and homeland defense missions. These installations are largely dependent on a commercial power grid that is vulnerable to disruption due to aging infrastructure, weather-related events and a potential kinetic or cyber attack."
>
> *— Dr. Dorothy Robyn, Deputy Under Secretary of Defense for Installations and Environment, 2012*

I.1.A Energy and Reliance on Energy

The U.S. military's reliance on energy—and fossil fuels in particular—poses four broad security challenges. First is the growing operational risk to forces deployed around the globe. Attacks on fuel convoys and fixed energy supplies in Afghanistan and surrounding countries already demonstrate the vulnerability of our current supply networks, and future adversaries likely will possess additional capabilities to target global logistics and fuel infrastructure with even greater lethality. A second challenge is the security of petroleum distribution networks. Most petroleum products are transported by sea, and much of this trade passes through vulnerable chokepoints such as the Strait of Hormuz and the Straits of Malacca. Piracy, political instability and military action can threaten the free flow of energy resources through these vital channels. Additionally, the trend over the last thirty years to migrate refinement of petroleum products to fixed locations outside our country's borders increases vulnerability of usable petroleum products to physical attack, political unrest, and mismanagement. Energy supply vulnerability is, therefore, a strategic as well as a tactical threat. A third challenge is the price volatility of a valuable commodity such as petroleum. Political instability and tightening global oil supplies within some oil-producing nations create significant price volatility, raising DoD's costs and making budget and acquisition decisions more difficult. The effects of these costs are significant, both in terms of the billions of dollars the nation sends overseas and in the geostrategic consequences. The challenge will increase as the growing demand for energy—particularly in Asia— places pressure on projected oil production and refining capacity.

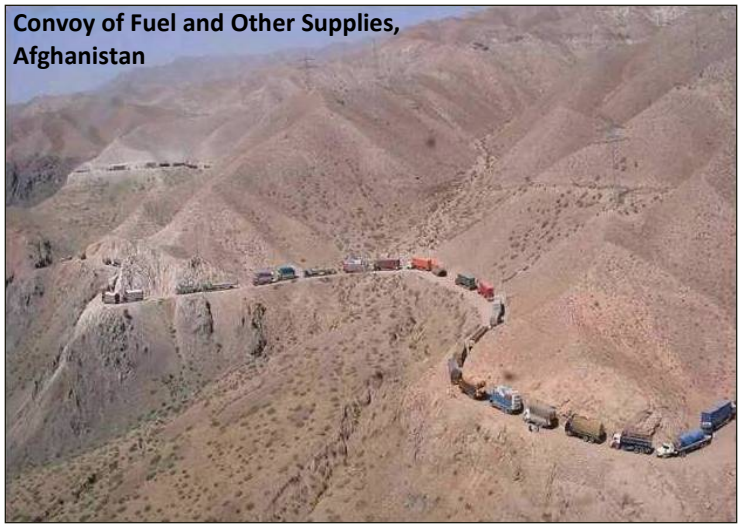

Convoy of Fuel and Other Supplies, Afghanistan

Photo: U.S. Army

Energy Management in Facilities

Relating specifically to the fixed installations under the purview of this SSPP, a final challenge is grid vulnerability. DoD's reliance on the commercial grid to deliver electricity to more than 500 major installations places the continuity of critical missions at risk. In general, installations lack the ability to manage their demand for and supply of electrical power, making them potentially vulnerable to intermittent or prolonged power disruption caused by natural disasters, attacks, or sheer overload of the grid. With the increasing reliance of U.S. combat forces on "reach back" support from installations in the United States, power failures at those installations could adversely affect power projection and homeland defense capability. This means that an energy threat to bases in the United States can be a threat to operations abroad. The Department is committed to renewable energy not only because it is dedicated to showing leadership in sustainability, but because on-site renewable energy improves resilience and thus mission readiness. Military installations are generally well situated to support solar, wind, geothermal and other forms of renewable energy, as long as the type of energy facility, its siting, and its physical and operational characteristics are carefully evaluated to avoid any impacts to the mission or readiness.

The Department continues to pursue an investment strategy designed to reduce energy demand in fixed installations, while increasing the supply of renewable energy sources. Efforts to curb demand for energy—through conservation and improved energy efficiency—are by far the most cost-effective ways to improve an installation's energy profile. A large fraction of DoD energy efficiency investments goes to retrofit existing buildings. Typical retrofit projects install high efficiency heating, ventilation and cooling systems, energy management control systems, more efficient lighting and green roofs.

The Department is taking advantage of the fact that DoD's fixed installations offer an ideal test bed for next-generation energy technologies developed by industry, the Department of Energy (DOE), and university laboratories, filling the gap between research and broad commercial deployment. Emerging energy technologies hold the promise for dramatic improvements in energy performance but face major impediments to commercialization and deployment. DoD's built infrastructure and lands encompass a diversity of building types and climates in the United States, affording an exceptional opportunity to assess the technical validity, operating costs, and environmental impact of advanced, pre-commercial technologies. As both a real and a virtual test bed, our facilities can serve as a sophisticated first user, evaluating the technical validity, cost and environmental impact of advanced, pre-commercial technologies. The Department is applying the energy test bed concept to improve the energy efficiency of buildings, improve renewable energy technologies on or in proximity to installations, and develop smart microgrids. DoD can help create a market for those technologies that prove effective and reliable by serving as an early adopter, as it did with jet engines, computers and the internet. The test bed approach is key to meeting the Department's needs, allowing DoD to leverage technology advances from the private sector while benefiting from the lower costs that occur once the private sector commercializes the technologies. In addition, the test bed is an essential element of the national strategy to develop and deploy the next generation of energy technologies needed to support the nation's infrastructure.

Convoy in Southern Afghanistan negotiates holes made by improvised explosive devices

Photo: U.S. Army

Energy Management in Operations

The fiscal year (FY) 2012 National Defense Authorization Act defines "operational energy" as the energy required for training, moving, and sustaining military forces and weapons platforms for military operations. It includes energy used by tactical power systems, generators, and weapons platforms. The Department has made clear at the highest levels the importance of reducing operational fossil fuel consumption. General David Petraeus issued a memorandum in June 2011 holding field commanders in Afghanistan responsible for the fuel demand of their units. This was followed by a memorandum from General John Allen, the senior allied commander in Afghanistan, who noted in December 2011, that "operational energy equates exactly to operational capability." In June 2011, the Department released its first operational energy strategy, followed by a detailed Operational Energy Strategy Implementation Plan in March 2012. The strategy sets the overall direction for operational energy security for DoD, with the goal of assuring reliable supplies of energy for 21st century military operations. The current DoD focus for operational energy is identifying and promoting the technologies, techniques, tactics, and procedures that can best support deployed forces, especially in Afghanistan. As one element of a broad operational energy strategy, OEPP is in the process of drafting a DoD-wide policy to promote the development of alternative fuels to diversify our supply. For FY 2013, OEPP will continue to focus on supporting current operations, including documenting lessons learned in Afghanistan.

> "Our [energy] posture is imposing costs at all levels, strategic, operational, tactical and financial."
> *—Sharon Burke, Assistant Secretary of Defense for Operational Energy Plans and Programs*

Along with integrating operational energy security into the future force, improvements in the end use and supply of operational energy will be force multipliers that increase the range, endurance, and effectiveness of DoD military missions. The Department is working to increase the fuel efficiency of both

legacy and future capabilities, including contingency bases, ships, aircraft, and tactical vehicles. DoD is also assessing, testing, and implementing a range of technologies and concepts to reduce the use of energy at expeditionary bases. Across the Department, the Services are employing a range of alternatives associated with power generation and distribution, shelter systems, and personnel and contingency base equipment for use at the tactical edge. Together, these efforts to reduce demand and expand supply will enhance combat effectiveness and reduce risk and cost. While a contributor to the Department's sustainability effort, operational energy is necessarily exempt from the targets of this Plan and Executive Order (EO) 13514.

I.1.B Chemicals of Environmental Concern

Chemicals are essential to DoD operations, but the Department faces long-term risks from the use of hazardous and toxic chemicals and materials. Use of these chemicals and materials of environmental concern can result in compliance and cleanup costs, generate health claims, and increase the lifecycle costs of weapon systems and facilities. The Department must protect people and readiness by reducing the use of such high-risk contaminants and hazards, both known and emerging. New restrictive laws and regulatory standards have implications for DoD's readiness, including training and supply chain effects. These restrictions can affect the availability of chemicals, which can impact the performance, cost, and schedule of acquiring new weapon systems and maintaining existing ones. Proper management of hazardous and toxic chemicals and materials protects the workers who handle them, as well as the range assets (land, air and water) needed for training, and the ecosystems under DoD's care, ensuring continued military access. Reducing the release of chemicals of environmental concern can also remove reporting burdens and lessen DoD costs associated with the use of these chemicals. The regulatory environment surrounding chemicals of environmental concern is highly complex and represents a significant resource burden on the Department in terms of labor and management time, as well as direct costs. Through the use of safer and greener chemicals, even if they have an higher purchase price than the chemicals they replace, the Department can realize savings in avoided compliance and other costs, and protect itself from the risk that restricted chemicals will become difficult and expensive to acquire, if not unavailable altogether.

Figure I.1 reflects the premise of the Department's chemical management strategy. The Department's Toxic and Hazardous Chemicals Reduction Plan, released in 2008, describes DoD programs, initiatives, and actions necessary to reduce the procurement, use, release, and disposal of chemicals of environmental concern. The Department is moving toward a lifecycle approach that considers the selection, management, use, and disposal of chemicals of environmental concern in all of its operations. Acquisition reform efforts include evaluating environmental, safety, and occupational health (ESOH) considerations earlier in the design phase, including chemical and material selections. Sustainment Plans, which address how a weapon system is maintained to ensure readiness, will also include life cycle risk assessments. For example, future regulatory restrictions must be taken into account, as they can affect the availability of materials and the costs of maintaining weapon systems.

The Department has an extensive array of protections against the risks posed by chemicals of environmental concern. One successful approach the Department employs to manage hazardous materials is the Consolidated Hazardous Material Reutilization and Inventory Management Program, also known as the Hazardous Material Pharmacy. The concept is based on a single point of control and accountability over requisitioning, distributing, issuing, and re-issuing hazardous materials, where the amount of material dispensed for a given purpose is specifically matched to the required quantity, and any remaining material is sent back (or picked up), drastically reducing hazardous waste. Another important approach is the use of Environmental Management Systems (EMSs). The EMS described in the DoD Toxic and Hazardous Chemicals Reduction Plan enables the Department to align and coordinate relevant programs for the purpose of reducing the procurement, use, and release or disposal of toxic and hazardous chemicals, at all organizational levels and across different functions. DoD also integrates an

EMS-based hazardous material business process into key activities at military installations.

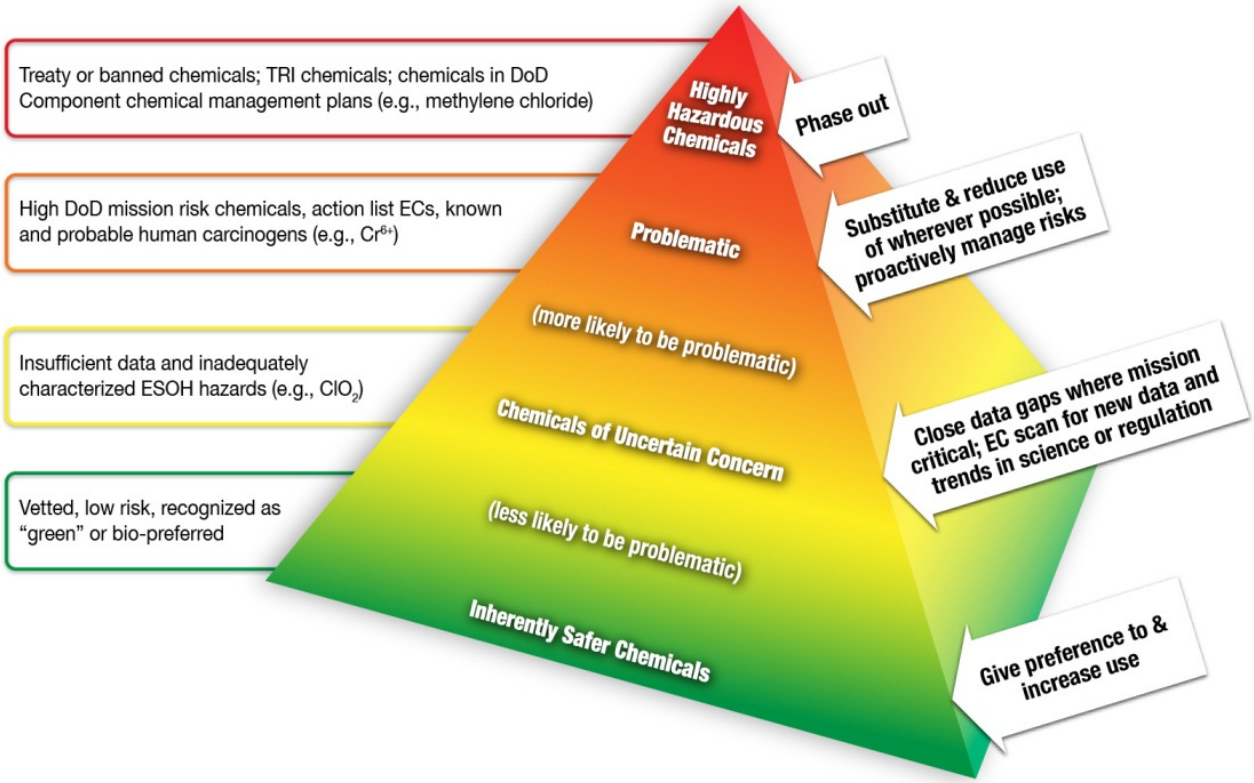


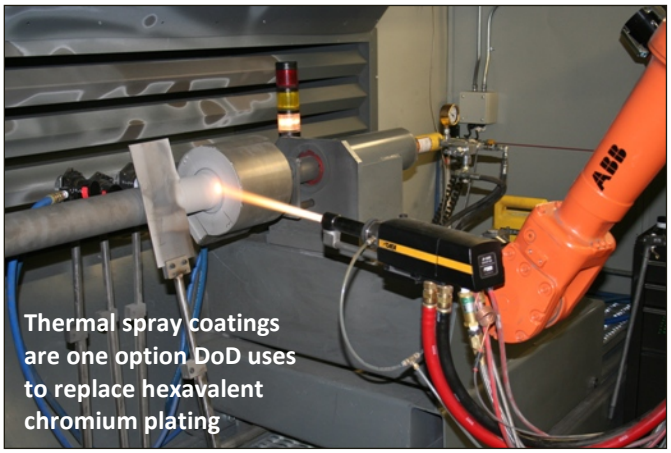
Figure I.1. DoD Chemical Risk Management Strategy
(ECs are emerging contaminants)

The enterprise-wide management of the selection, acquisition, distribution, use, and disposal of chemicals will better prepare DoD for potential future regulatory initiatives. This lifecycle approach of anticipating developments at the international, national, and state levels will inform the chemical usage decisions made by DoD today and promote military readiness for tomorrow. DoD's emerging contaminants program exists to minimize operational disruptions through proactive risk management of chemicals it expects to be regulated more strictly in the near future. The program has scanned hundreds of chemicals and identified over 50 risk management measures that have been or are being implemented by various programs across the Department.

While many of the proactive risk management measures focus on toxic chemicals, DoD is also managing substances that might not be toxic but impact global warming with a potency hundreds to many thousands times as much as carbon dioxide. For example, sulfur hexafluoride (SF_6) is critical as a dielectric material used in DoD weapon systems and components, including the Airborne Warning and Control System radar, the MK-92 fire control system, and transducers in torpedoes, submarines and submarine sonar systems. While it is nontoxic, it is also an extremely potent greenhouse gas (GHG), remaining in the atmosphere for 3,200 years and having 23,000 times the warming potential of carbon dioxide over a 100-year period. The State of California regulates SF_6 (California Code of Regulations, Subarticle 3.1, *Regulation for Reducing SF_6 from Gas Insulated Switchgear*, sections 95350 to 95359, title 17). DoD anticipates that SF_6 emissions will be regulated more in the future, which could threaten its availability over the long-term and will certainly increase its cost. In response, the Department issued a policy in October 2010 directing the Military Departments to develop and implement procedures to

reduce, capture, and recycle SF_6 where it is operationally, technically, and economically feasible. DoD has been researching ways to reduce SF_6 leakage and searching for alternatives to replace it.

Some hydrofluorocarbons (HFCs) also have high global warming potentials (GWPs). The Department has dedicated significant effort to deploying alternatives to substances that deplete earth's protective stratospheric ozone layer, but for many applications the only alternatives identified so far are HFCs. While some HFCs have less impact on atmospheric warming than the ozone-depleting substances they replaced, the international community is concerned about their relatively high GWP and expanded use, and has therefore made proposals to phase them out via an amendment to the Montreal Protocol on Substances That Deplete the Ozone Layer. HFCs are used for mission-critical applications in shipboard, aircraft, and ground tactical vehicle air conditioning, refrigeration, fire suppression, and explosion protection systems. For the majority of these applications, there are no known substitutes that meet DoD's unique performance and safety requirements. The commercial sector is working to develop low-GWP alternatives to HFCs, but in the meantime DoD continues to design and build weapon systems—which often have operational lifetimes of 30 to 50 years—using HFCs, and it is essential that HFCs continue to be available at a reasonable cost. Therefore, the Department continues to conduct research on low-GWP alternatives to HFCs, and it coordinates with the Environmental Protection Agency and Department of State on issues of substitution and availability.



Thermal spray coatings are one option DoD uses to replace hexavalent chromium plating

Photo: SprayTec Coating Solutions, LLC

Finally, to ensure the availability of chemicals needed for the DoD mission, the Department is promoting the use of more benign chemicals. This will protect the Department from mission risks associated with the removal of substances from the market, or significant increases in their cost. DoD supports research and development on an ongoing basis searching for safer and more environmentally-friendly products and processes that reduce the use and release of toxic and hazardous substances. The Department looks in particular for alternatives that deliver mission benefits in addition to environmental benefits, since mission benefits help drive the adoption of new products. Another essential approach for increasing the Department's use of safer chemicals and products is DoD's Green Procurement Program. To support its successful implementation, DoD developed a program framework that supports the testing and evaluation of environmentally preferable products, and provides green procurement metrics, a venue for sharing information and best practices, and green procurement education and training.

I.1.C Water Resources Management

Fresh water is a limited and mission critical resource essential for military operations, drinking, hygiene, sanitation, food preparation, and medical care. During military operations, water poses the same challenges as liquid fuel, requiring the protection of large, vulnerable convoys as it is transported to the troops. Also, the treatment and disposal of wastewater is a human health and environmental issue for our soldiers and the civilian populations we are protecting during military operations. To address the issues of water and wastewater in contingency basing, the Services and the DoD Strategic Environmental Research and Development Program (SERDP) are supporting research and development into technologies suitable for contingency bases that can reclaim potable and non-potable water from graywater and blackwater. Reclaiming contingency base wastewater will greatly reduce the amount of water that needs to be delivered to our troops, while reducing the volume of wastewater requiring

treatment and disposal. Additionally, the Department is leveraging cost effective commercial sector technology solutions used to reclaim contaminated water from heavy oil extraction processes.

At fixed installations, water is also a mission imperative. Water scarcity has caused a number of DoD installations in the U.S. to implement aggressive water conservation and reuse measures. So far, most of these installations have been located in arid portions of the West, but having assured supplies of water is becoming an issue in other parts of the country as well. DoD also faces potential water risks in its supply chain, should there be insufficient water for suppliers to produce the goods and services sold to DoD. Water supply and distribution, water use, wastewater treatment, and stormwater management are interrelated and influence energy and sustainability. For example, the extraction, treatment, and delivery of water to end users is a highly energy intensive process. Measures that use and distribute potable water more efficiently and with less leakage also result in significant reductions in energy consumption and therefore emissions of carbon dioxide. A low impact development approach to stormwater management reduces runoff from impervious surfaces at facilities, which reduces the flow of pollutants into water bodies and reduces the volume of stormwater entering the wastewater treatment system. Reducing the volume of wastewater helps prevent system overload problems such as combined sewer overflows, while also reducing the consumption of energy required to operate the wastewater treatment system.

I.1.D Maintaining Readiness in the Face of Climate Change

The 2010 Quadrennial Defense Review highlighted the importance of managing the effects of climate change, citing energy security and climate change as significant challenges requiring a change in how the Department operates. Climate change is predicted to affect the Department in many ways, including direct effects on installations and less direct impacts such as the destabilization of regions of the world already prone to conflict. Climate change can directly impact military installations and operations by limiting the availability and quality of ranges and other lands needed for operations, and increasing flood and fire hazards and energy grid vulnerability.

Climate Change and DoD

"Climate change will shape the operating environment, roles, and missions that we undertake. The Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required."

— DoD Quadrennial Defense Review, 2010

Some of the Department's low-lying coastal installations are threatened by coastal erosion and inundation due to sea level rise, which can damage or destroy infrastructure, reduce availability of land for operational needs, and impact water supply due to seawater intrusion. Scientists project that climate change will bring an increased frequency of heavy precipitation events, raising the threat of flooding. The more frequent and extreme heat projected to occur with climate change may limit outdoor training, strain personnel efficiency, and strain electricity supply due to the increased demand on the grid for cooling. Human health could also be impacted due to the connection between heat and air quality: heat accelerates the photochemical process that forms ground-level ozone from vehicle exhaust, which is why the most dangerous levels of ozone in urban areas occur during summer. Ozone, one of the primary components of smog, irritates and inflames the lining of the respiratory system. Ozone formation and its attendant health problems will likely worsen with the warmer temperatures projected to result from climate change.

In many areas, warmer temperatures will reduce the amount of snow pack in the mountains, and it is common in the U.S. and elsewhere for areas to rely on mountain snow melt for a significant amount of their water supply. Scientists project that higher temperatures will increase the risk of wildfire by reducing moisture in soil and plant material and, in some areas, by lengthening the fire season. Because a variety of military range activities can start fires, an increased risk of uncontrolled wildfires can have direct mission consequences. Scientists also expect the changing temperature and precipitation regimes accompanying climate change to cause shifts in the composition or geographic range of some species.

Among the species shifts anticipated are movement of wildlife to more favorable habitats, expansion of vector-borne diseases into the United States, and expansion of invasive grasses and shrubs. Invasive plants contribute fuel load for wildfires, which in turn increases the likelihood, range, and intensity of wildfires. Threats to federally-protected species may increase and additional species may become endangered, adding to the burden of species protection for some installations. Melting permafrost and a reduction in the sea ice that protects the coast from erosion by storms will impact DoD installations in the Arctic.

These impacts can directly interfere with an installation's ability to carry out its mission. For example, training can be limited through the occurrence of more red and black flag days (high heat and humidity conditions); by the loss of land to either sea level rise or the need to set aside more land for endangered species; and by more frequent restrictions on live fire training where heat and reduced rain increase the fire hazard. Another reason for DoD to prepare for a changing climate is that strategies to make the Department more resilient to climate change can also improve sustainability. For example, by increasing the generation and use of renewable energy, and institutionalizing energy and water efficiency into all DoD operations, the Department can decrease its vulnerability to fluctuations and shortages of these resources.

I.2 Greenhouse Gas Reduction Goals

Under EO 13514, federal agencies were required to establish FY 2020 reduction targets for non-operational GHG emissions, measured from a FY 2008 baseline. The EO requires separate targets for direct and indirect emissions from sources controlled by DoD (Scopes 1 and 2), and emissions from sources not owned or directly controlled by DoD (Scope 3). As the Department constitutes more than half of all federal government GHG emissions, DoD's targets have a great impact on government-wide reduction goals. The Department set an aggressive 34% goal for Scopes 1 and 2 emission reductions by FY 2020, compared to a government-wide goal of 28%. For Scope 3 emissions, DoD set a 13.5% reduction goal, versus a government-wide goal of 13%.

The Department will achieve its Scope 1 and Scope 2 GHG reductions (Sub-Goal 3.1 in the SSPP framework) primarily through more efficient facility energy use, reduced fossil fuel use by non-tactical vehicles, and increased use of renewable energy, as reflected by the following four sub-goals under Goal 1, "The Use of Fossil Fuels Reduced":

- Energy Efficiency: a 37.5% reduction in energy intensity (e.g., energy used per square foot of facility space) from FY 2003 to FY 2020.
- Vehicle Fleets: a 30% reduction in the use of petroleum products by non-tactical vehicle fleets from 2005 to 2020.
- Renewable Energy: a requirement that 18% of all facility electricity consumed be supplied from renewable energy sources (thermal as well as electrical).
- Biogas: a requirement that ten facilities will become operational by FY 2020 for the production, capture and use of methane from landfills and/or wastewater treatment plants.

DoD's Scope 3 GHG emissions reduction target (Sub-Goal 3.2) is supported in part by two other Goal 3 sub-goals pertaining to employee commuting and business air travel. Employee commuting constitutes the largest portion of the Department's Scope 3 emissions, as calculated using federal guidance. To address this, Sub-Goal 3.3 aims for 30% of eligible employees to be teleworking at least once per bi-weekly pay period on a regular, recurring basis by FY 2020. The second largest source of Scope 3 emissions is business air travel. Sub-Goal 3.4 plans to reduce these emissions 7% by FY 2020. As federal guidance is refined and data collection methods improve for Scope 3 emissions, additional sub-goals such as leased assets and supply chain emissions may be added. Such additions will constitute large increases to the DoD inventory and may require reevaluation of the DoD goal.

Additionally, some reductions in Scope 1 and 2 and Scope 3 GHG emissions will result from other DoD activities, including sustainable procurement, environmental management systems, high performance sustainable buildings, and increased diversion of solid waste from the waste stream.

It should be noted that in accordance with national security needs and EO 13514 , tactical GHG emissions from sources supporting combat operations, such as expeditionary bases and tactical vehicles and equipment, are excluded from GHG goals. However, the Department recognizes it can increase combat effectiveness through decreased energy use as discussed in Section I.1.A.

I.3 Plan Implementation

I.3.A Leadership and Accountability

The Department designated the Under Secretary of Defense for Acquisition, Technology and Logistics as DoD's Senior Sustainability Officer (SSO) responsible for ensuring the effective and successful implementation of the SSPP across the Department. Each Military Department and the Defense Logistics Agency (DLA) has designated a sustainability officer to ensure accountability for the SSPP's implementation. Also, each developed a plan for how they will implement the DoD SSPP. Additionally, the Department established the governance structure shown in Figure I.2 to ensure the accountability and coordination necessary to meet the Department's goals. Under the leadership of the SSO, the Senior Sustainability Council (SSC), Sustainability Implementation Work Group, and a set of relevant committees and work groups help execute the goals of the SSPP. The committees and work groups cover a wide range of sustainability topics, including: GHGs, energy, transportation and fuels, solid waste and recycling, green procurement, electronic stewardship, and sustainable manufacturing.

Figure I.2. DoD Sustainability Governance Structure

The Deputy Under Secretary of Defense for Installations and Environment and the Assistant Secretary of Defense for Operational Energy Plans and Programs lead the SSC and report directly to the SSO. The current membership of the SSC is listed in Table I.1. As stipulated in its charter, the four key tasks of the SSC are to:

1) integrate sustainability into policies, plans, budgets and decisions;
2) make recommendations on processes and procedures to implement the requirements of EO 13514 and other federal sustainability requirements;
3) continuously improve the Department's approach to the SSPP; and
4) review the adequacy of policies, resources, and performance in meeting goals, and make recommendations on changes required.

Table I.1. Senior Sustainability Council Membership

Deputy Under Secretary of Defense (Installations and Environment) - Co-Chair
Assistant Secretary of Defense, Operational Energy Plans and Programs - Co-Chair
Under Secretary of Defense (Comptroller)
Under Secretary of Defense for Policy
Under Secretary of Defense for Personnel and Readiness
Assistant Secretary of the Army (Installations, Energy and Environment)
Assistant Secretary of the Navy (Energy, Installations and Environment)
Assistant Secretary of the Air Force (Installations, Environment and Logistics)
Deputy Department of Defense Chief Information Officer
Assistant Secretary of Defense for Research and Engineering
Director, Defense Procurement and Acquisition Policy
Assistant Secretary of Defense (Logistics and Materiel Readiness)
Director, Cost Assessment and Program Evaluation
Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy
Director for Logistics, Joint Staff
Director, Defense Logistics Agency Installation Support
Deputy General Counsel (Environment and Installations)
Assistant Secretary of the Army (Civil Works)

The Sustainability Implementation Work Group reports to the SSC and is charged with drafting input to the SSPP and facilitating compliance and continual improvement in meeting the SSPP goals. The Department is using its existing structure of committees and work groups to address specific issues and engage subject matter experts where appropriate.

The Office of the Secretary of Defense (OSD) employs a number of mechanisms to ensure that sustainability factors are adequately addressed. Departmental planning and programming guidance lays out requirements that DoD Components must use to build their budgets; environmental and sustainability requirements are a part of this guidance. Another key feature of DoD's planning and budgeting process is the Future Year Defense Plan, which provides a six-year resource plan for achieving Department objectives, with major updates occurring every two years and the planning horizon rolling forward during each update cycle.

The SSC conducts annual Performance Management Reviews, and DoD Components are required to submit annual progress reports to OSD. The progress reports and Performance Management Reviews afford the Department the opportunity to alter strategies to better meet sustainability goals. Also, the environmental management systems used by the Military Service installations and DLA facilities provide a valuable framework to guide sustainability improvements and monitor and evaluate performance. The SSPP has a built-in performance monitoring system in the form of the 21 quantitative metrics for each of the sub-goals.

I.3.B Coordination and Dissemination

The Department is continually working to increase awareness of the SSPP among personnel, using normal internal channels of communication within the Department and within each individual DoD Component, such as web sites, newsletters, and announcements. Two conferences widely attended by DoD civilian and military personnel provide excellent outreach opportunities: GovEnergy and the Environment, Energy Security, and Sustainability Symposium. Annual updates of the SSPP will be used as opportunities to remind civilian, military, and contractor staff of the SSPP's goals and the Department's expectations. Every year DUSD(I&E) and the Assistant Secretary of Defense for Operational Energy Plans and Programs present the SSPP to senior managers within each DoD Component at the Deputy Assistant Secretary level and higher. Presentations stress the integration of sustainability activities within overall DoD strategic planning and budgeting.

The Department already has three platforms on the internet for communicating to both DoD employees and the public on sustainability performance:

- DENIX (DoD Environment, Safety and Occupational Health Network and Information Exchange, http://www.denix.osd.mil/sustainability/);
- the "DoD Goes Green" website at http://www.defense.gov/home/features/2010/1010_energy/; and
- an internal website created by the AT&L Operational Support Directorate entitled TechSpace.

DENIX offers a wealth of information on sustainability, including DoD and federal policy and guidance, useful technical information, and examples of DoD's sustainability activities. Topics covered include: alternative fuel vehicles, ESOH in acquisition, the Toxics Release Inventory, Environmental Management Systems, Green Procurement, Solid Waste and Recycling, and Sustainability. The DoD Goes Green site is focused entirely on energy: energy efficiency, renewable energy, and fuels from sources other than petroleum. In addition, the Whole Building Design Guide web site, www.wbdg.org, hosts a significant number of DoD documents pertaining to green buildings, including facility and construction criteria.

I.3.C Integrating Sustainability into DoD

The SSC is responsible for ensuring integration of the SSPP into the Department's enterprise management structure, an ongoing way of conducting business DoD-wide which DoD continually maintains, evaluates, and refines for optimal performance in all aspects of the DoD mission, including sustainability. The SSC is working to ensure that sustainability is reflected in relevant policies, program plans, guidance, and budget development within the Department. Table I.2 summarizes the status of the Department's efforts to incorporate sustainability into critical DoD reports and plans, in terms of a set of CEQ sustainability goals.

Table I.2. Critical Planning Coordination

Originating Report / Plan	Scope 1 and 2 GHG Reduction	Scope 3 GHG Reduction	Develop and Maintain Agency Comprehensive GHG Inventory	High-Performance Sustainable Design / Green Buildings	Regional and Local Planning	Fleet Management	Water Use Efficiency and Management	Pollution Prevention and Waste Elimination	Sustainable Acquisition	Electronic Stewardship and Data Centers	Agency Specific Innovation
FY 2010 Quadrennial Defense Review	Yes	n/a	n/a	n/a	n/a	Yes	n/a	n/a	No	n/a	n/a
Circular A-11 Exhibit 300s (Capital Asset Plan and Business Case	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Energy Independence and Security Act Section 432 Facility Evaluations Reporting	Yes	n/a	n/a	Yes	n/a	n/a	n/a	n/a	n/a	Yes	n/a
FY 2012 Budget	n/a	n/a	n/a	Yes	Yes	Yes	Yes	Yes	Yes	Yes	n/a
2007 Defense Installations Strategic Plan	Yes	No	n/a	Yes	No	Yes	No	Yes	Yes	No	n/a
Circular A-11 Exhibit 53 Agency IT Investment Portfolio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	No	n/a
Office of Management and Budget Scorecard on Sustainability/Energy	Yes	Yes	Yes	Yes	n/a	Yes	Yes	n/a	n/a	n/a	n/a
Defense Environmental Programs Annual Report to Congress	n/a	n/a	n/a	Yes	n/a	Yes	Yes	Yes	n/a	n/a	n/a
DoD Toxic and Hazardous Chemicals Reduction Plan (Jan 2009)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Yes	n/a	n/a	n/a
Data Center Consolidation Plan	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Yes	n/a
Green Procurement Strategy (2008)	Yes	n/a	n/a	Yes	n/a	Yes	Yes	Yes	Yes	Yes	n/a
Sustainable Ranges – 2011 Report to Congress	n/a	n/a	n/a	n/a	Yes	n/a	n/a	n/a	n/a	n/a	n/a
Readiness and Environmental Protection Initiative Annual Report to Congress	n/a	n/a	n/a	n/a	Yes	n/a	n/a	n/a	n/a	n/a	n/a
Unified Facilities Criteria	Yes	n/a	n/a	Yes	Yes	Yes	Yes	Yes	n/a	n/a	n/a
Annual DoD Energy Management Report	Yes	No	n/a	Yes	n/a	Yes	n/a	n/a	Yes	Yes	n/a
DoD Fleet Management Plan *(Note: Services & DLA separate)*	n/a	n/a	n/a	n/a	n/a	Yes	n/a	n/a	n/a	n/a	n/a

"Yes" indicates the Plan goal is relevant and incorporated into the report or plan; "No" indicates relevance but that it has not yet been incorporated; and "n/a" means the goal is not relevant to the report or plan.

DoD integrates environmental protection, pollution prevention, and sustainability policies into its planning, programming, and budgeting system at the requirements level, so these initiatives are often less visible as separate line items. For example, sustainable building design is part of the budget for a military construction (MILCON) project. Almost two decades ago, DoD realized the need to plan and budget specifically for environmental protection and established the Environmental Security budgeting structure within the existing DoD planning, programming, and budgeting system.

The functional categories established for environmental budgeting include: recurring and non-recurring environmental compliance, pollution prevention, cleanup, natural and cultural resources conservation, and research. More recently, DoD added a special category to capture resources budgeted for operational range sustainment. While the Environmental Security budget categories still exist today, OSD has emphasized the need for DoD Components to fully integrate environmental protection, pollution prevention, and sustainability into all DoD functions. Likewise, DoD integrates many pollution prevention efforts into the budgets for the operations and maintenance of installations and the procurement of equipment, including for new Navy vessels. OSD reviews the DoD Components' proposed Future Year Defense Plans to ensure they have programmed requirements and holds program reviews to evaluate progress. These reviews are an effective method to ensure appropriate resources are being applied to environmental and sustainability efforts, even if they are not shown as distinct items in the budget.

In FY 2011, the Department made initial refinements to budget exhibits that capture and track sustainability investments and resources across all of DoD. These exhibits will assist analysts and decision makers in identifying gaps between sustainability objectives and funding. OSD is updating its guidance for the Components to help in their development of plans, programs and budgets for sustainability in FY 2013 and beyond.

I.4 Incorporating Sustainability into Facility Investment Decisions

Photo: U.S. Air Force

New efficient chiller, Kadena Air Base, Japan

The design of facilities, and the evaluation and prioritization of activities, should consider environmental and societal factors in addition to mission, financial, and regulatory considerations. For example, the mission benefits of having an off-grid source of electricity can outweigh the higher cost of renewable energy. The creation of walkable retail destinations on bases reduces automobile usage, saves military families money, and improves health. Sustainability is also closely tied to the well-being of personnel, DoD's most important asset. The ability to recruit, retain, train, educate, and equip the All-Volunteer Force, and to sustain its readiness and morale, is fundamental to the mission. Adopting greener chemicals and materials limits potential exposure and can avoid the need to use hot, uncomfortable hazardous material suits, expediting operations and maintenance activities. In areas where air quality is a concern, an Installation Commander might prioritize investment and design decisions that lower vehicle emissions and reduce the heat island effect on the installation (e.g., by planting shade trees). Therefore, investment decisions should consider all the costs and benefits of incorporating sustainability. A cost-benefit analysis, including both monetary and non-monetary costs and benefits, should be performed on proposed projects so decision makers can best evaluate their anticipated effectiveness.

The sustainability principles promulgated in the SSPP are the policy of the Department, and should be incorporated into all DoD decisions pertaining to design, investments, and prioritization of activities. The Department recognizes the importance—and the challenge—of ensuring that sustainability is incorporated into decision-making across the organization. To make it understood that sustainability is part of every Component's mission, the Department is preparing a DoD Instruction (DoDI) on Sustainability. The DoDI will specify that it is DoD policy to ensure that the Department reflects its commitment to sustainability in all investment decisions, by considering the costs and benefits of factors impacting sustainability. The clarity provided by the DoDI will be important because individual commands and installations, not a central DoD office, make many of the decisions on budgeting and executing DoD projects. In practice, decisions made at the facility level do not always take into consideration the larger objectives of the Department as a whole, including its sustainability objectives. The challenge incorporating sustainability into investment decisions is exacerbated by the fact that many sustainability considerations are difficult to quantify, whether at the installation or Major Command level. The Department needs to find ways to help Installation Commanders and other decision-makers form an objective basis for making decisions on projects in a way that advances DoD's sustainability objectives, beyond simple, traditional return on investment calculations. Beyond the project level, the Department has a bigger picture view of promoting sustainability: investing in new and emerging technologies. These investments represent a risk at the individual project level, but when viewed across the entire Department they can significantly increase the return on investment.

DoD owns over 200,000 buildings, a real property inventory that generates a significant maintenance and repair requirement. Recognizing the need to improve the performance of these assets, the Department's FY 2013 budget includes more than $1.1 billion for investments in conservation and energy efficiency, and almost all of that is directed to existing buildings. Part of the challenge posed by DoD's existing buildings is that a large fraction of them are not metered, and return on investment calculations require accurate consumption data. To address this deficiency, DoD will issued an updated policy in the summer of 2012 to establish a size threshold for buildings that must be metered. Apart from straight return on investment considerations, DoD approaches real property asset management in a budget-constrained environment by focusing resources on the facilities with the greatest maintenance and repair needs, balanced by an evaluation of which assets are most crucial to the mission. For example, a storage facility may not need to be kept to the same level of condition as a runway, based on the consequence of a failure of the asset.

Rooftop PV at Fort Huachuca, AZ: Simple payback period is not the only consideration for energy investments

Photo: U.S. Army Corps of Engineers

A recent DoD innovation to accelerate the pace of improvements to the existing building stock is to reshape the role played by the Energy Conservation Investment Program (ECIP). Instead of simply funding the Services' routine energy projects, the Department has changed its approach so ECIP leverages the Services' energy-related investments in ways that will produce game-changing improvements in energy consumption, costs and/or security. ECIP is now part of a portfolio approach in which the Services pursue the most financially attractive energy projects, whether through third-party financing or their own budgets. As a result, projects having a major impact on energy efficiency and/or security can be funded even though they might not otherwise be justified under internal funding strategies. Another change in ECIP, to encourage long-term planning, is that Services are required to build a five-year program of projects proposed for ECIP funding. Finally, DoD is introducing inter-Service competition for ECIP funding, replacing formula-funding. In FY 2013, the Department will incorporate some competition but will still guarantee

each Service a minimum level of funding. Beginning in FY 2014, however, the Department will award funds based purely on competitive merit.

For all new construction, major renovations, existing buildings, and leased facilities, the Department is developing a new set of building standards, which it will issue in late 2012, that define how to construct High Performance Sustainable DoD buildings. The goal is to create a tool for facility project managers and their design teams -- based on existing commercial sustainability standards -- to ensure DoD facilities achieve a consistently high level of energy, water, and environmental performance that meets all relevant federal mandates. DoD has partnered with the National Research Council to conduct a thorough review of existing sustainable design and construction standards to determine the cost effectiveness of their application to DoD facilities. The study will ultimately provide recommendations to help DoD make more cost-effective capital investment decisions.

Sustainable Weapons Acquisition

While not included under the purview of this SSPP, operational energy has a significant influence on future capabilities. Program managers develop, design, and buy major systems and weapons platforms that can last 30 years or longer and have significant impacts on human health and the environment during their lifecycle. As a result, the Department is evaluating ways to better integrate the long-term resource, capability, and opportunity costs of energy consumption into acquisition decisions. One of these ways is a new Energy Key Performance Parameter being developed by the Department. Key Performance Parameters are a set of mandatory requirements the Department specifies for any new weapon system it sets out to acquire. The Energy Key Performance Parameter requires the decision-makers for weapon systems to stipulate requirements that limit the operational burden imposed by the new system's energy needs. DoD is also developing common methodological guidance for acquisition programs to estimate and apply the Fully Burdened Cost of Fuel to inform analysis and decision-making. In the past, the DoD requirements process addressed the range, weight, and payload of any new system assuming adequate and secure fuel logistics to support combat forces. Recognizing that this longstanding assumption is less valid now and in the future, the Energy Key Performance Parameter and Fully Burdened Cost of Fuel requires the personnel responsible for setting requirements for weapon systems to better manage the amount of energy and logistics demanded by new systems.

The Department continues to make progress in developing a methodology to better integrate sustainability thinking into the DoD acquisition process. DoD personnel have been investigating ways to adopt the life cycle impact assessment process into the DoD acquisition process and have been meeting with industry, academia, and other government agencies to benchmark best practices. DoD staff have developed a draft framework of inputs, outputs, and key impact categories. The overall objective is to develop a Military Standard for conducting life cycle impact assessments at the conceptual, developmental, and design stages of acquisitions. Use of the standard should result in lower total ownership costs and more sustainable systems—those that use less energy, water, and toxic chemicals, and that produce fewer emissions.

An essential component of sustainable weapons acquisition is sustainable manufacturing. Sustainable manufacturing is the creation of man-made products with processes that are economically sound, non-polluting, energy efficient, conserving of natural resources, and safe for warfighters, users, employees, & communities. As a keystone concept that integrates multiple sustainability elements, sustainable manufacturing can make weapons acquisition more affordable through cost avoidance of environmental, health, and safety liabilities. Every dollar spent on liabilities is one less for warfighter capabilities. Sustainable manufacturing has a place in both the acquisition of systems and in their logistics sustainment.

I.5 Transparency and Open Government

The Department is committed to clearly communicating progress on the SSPP because it advances DoD's mission. Ongoing communication about the SSPP and progress on it serves two purposes. First, the set of performance metrics in the SSPP is a tool for evaluating performance to ensure programs are on track and for deciding how to take corrective action as needed. Second, the SSPP enables the Department to continually instill into personnel, the public, and the international community DoD's commitment to sustainability and the fundamental principle that DoD's mission and sustainability are tightly coupled. As mentioned in Section I.3.D, DoD communicates about sustainability issues both internally and to the public through two web sites: DENIX and DoD Goes Green.

Each DoD Component provides annual progress reporting on the SSPP through the SSC to the SSO, including success stories from which others in the Department and the federal government as a whole can learn. DoD and military award programs consider outstanding achievements every year for individuals and teams contributing to the Department's sustainability goals. For more information on how the Department plans to engage agency staff regarding its progress and performance on the SSPP, refer to Section I.2.D, "Internal and External Coordination and Dissemination."

External communication takes three forms: the media, the internet, and venues such as conferences. The Department will take full advantage of the media to disseminate messages on sustainability performance to the public. OSD and Public Affairs will craft press releases for distribution through regular public relations channels and will also distribute them to the Military Departments for distribution as appropriate through local media outlets. The Department will issue a press release annually each time it submits the SSPP, and will continue to seek opportunities throughout the year to provide examples of DoD progress on sustainability efforts. All Department external communication will comply with the DoD Open Government Plan (http://open.dodlive.mil/open-government-plan/). The Department is already using venues such as conferences, seminars, workshops and external forums to raise awareness of the SSPP, report on progress toward its goals, and discuss updates.

I.6 Size and Scope of DoD Operations

Table I.3 provides basic information on the size and scope of the Department's operations.

Table I.3. Size and Scope of DoD Operations			
	FY 2010	**FY 2011**	**FY 2011 Comments**
Total # Employees as Reported in the President's Budget	2,328,937	2,330,178	Includes military personnel
Estimated # Onsite M&O Contractors in GOCO Facilities	n/a	n/a	
Total Acres Land Managed	28,372,751	28,504,343	DoD Base Structure Report. World-wide. GSA leases do not include Service leases directly with GSA.
Total # Facilities (Buildings) Owned	202,178	201,939	
Total # Facilities (Buildings) Leased (GSA)	123	125	
Total # Facilities (Buildings) Leased (non-GSA)	8,965	8,928	
Total Facility Gross Square Feet (GSF)	1,954,646	1,905,276	Thousands of gross square feet
Facility GSF Subject to Energy Intensity Reduction Goal	1,949,734	1,896,352	
Facility GSF Excluded from Energy Intensity Reduction Goal	4,912	8,924	
# of U.S. Locations in which Operates	4,337	4,214	with U.S. Territories
# of Locations Outside the U.S. in which Operates	662	661	
Total # Fleet Vehicles Owned	64,401	54,051	
Total # Fleet Vehicles Leased	127,869	72,406	
Total # Exempted-Fleet Vehicles	5,207	4,506	Not including tactical military vehicles
Total Discretionary Budget as Enacted for FY ($MIL)	691,000	687,000	
Total # New Contracts Awarded as Reported in FPDS	3,611,088	14,023,878	Increase due to newly reported USTRANSCOM orders in FPDS
Total Contracts Amount Awarded ($MIL) as Reported in FPDS	$366,432	$375,385	
Amount Spent on Facility Energy Consumption ($MIL)	$4,012	$4,123	
Amount Spent on Mobility and Other Non-Facility Energy Consumption ($MIL)	$11,197	$15,259	
Energy Intensity of Goal-Subject Buildings	102,929	100,268	Btu/GSF
Potable Water Intensity	52.1	53.2	Gallons/GSF
Total Industrial, Landscaping and Agricultural Water (non-potable, thousand gallons)	4,483,037	10,772,406	Preliminary data

Part II: Performance Review and Annual Update

Overview of Goals and Objectives

The SSPP consists of four high-level Departmental strategic objectives, each of which has one or two goals. Under the set of goals are 21 quantitative sub-goals. The framework of objectives and goals is as follows:

Objective #1: The Continued Availability of Resources Critical to the DoD Mission is Ensured

Goal #1: The Use of Fossil Fuels Reduced

Goal #2: Water Resources Management Improved

Objective #2: DoD Readiness Maintained in the Face of Climate Change

Goal #3: Greenhouse Gas (GHG) Emissions Associated with DoD Operations Reduced

Objective #3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution

Goal #4: Solid Waste Minimized and Optimally Managed

Goal #5: The Use and Release of Chemicals of Environmental Concern Minimized

Objective #4: Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community

Goal #6: Sustainability Practices Become the Norm

The DoD SSPP objectives, goals and sub-goals are summarized in Table II.1, along with results for FY 2010 and 2011, goals for FY 2020, and interim planning targets for FY 2012 through 2019. The set of sub-goals tracks closely with the sustainability requirements of EO 13514, EO 13423, the Energy Independence and Security Act of 2007 (EISA), and the Energy Policy Act of 2005 (EPAct).

All DoD Components are required to report on those SSPP sub-goals that are relevant to their operations. The reporting requirements for each Component are summarized in Table II.2. Apart from the Military Departments, nine Components are required to report on goals and sub-goals pertaining to energy, water and GHG emissions. These nine pay for utilities directly, whereas the other Components are tenants at host installations, contracting office space through fully serviced leases in which energy and water are provided based on square footage and occupancy, or through inter-service support agreements with the hosts.

Photo: Sierra Nevada Corporation

Solar runway edge lights, Fort Campbell Army Airfield's Destiny Heliport, KY

Table II.1. Summary of the DoD Objectives, Goals and Sub-Goals Comprising the DoD SSPP, and FY 2011 Results

#	Sub-Goal	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Objective #1: The Continued Availability of Resources Critical to the DoD Mission is Ensured												
GOAL #1: The Use of Fossil Fuels Reduced												
1.1	**Energy Intensity of Facilities Reduced by 30% from FY 2003 by FY 2015 and 37.5% by FY 2020**	11.4%	**13.3%**	21%	24%	27%	30%	31.5%	33%	34.5%	36%	37.5%
1.2	**By FY 2020, Produce or Procure Energy from Renewable Sources in an Amount that Represents at Least 18% of Electricity Consumed by Facilities**	9.6%	**8.5%**	12%	10%	11%	12%	13%	14%	15%	16%	18%
1.3	**Use of Petroleum Products by Vehicle Fleets Reduced 30% from FY 2005 by FY 2020**	5.3%	**11.8%**	14%	16%	18%	20%	22%	24%	26%	28%	30%
1.4	**Ten Landfills or Wastewater Treatment Facilities Recovering Biogas for Use by DoD by FY 2020**	1	**2**	2	3	4	5	6	7	8	9	10
GOAL #2: Water Resources Management Improved												
2.1	**Potable Water Consumption Intensity by Facilities Reduced by 26% from FY 2007 by FY 2020**	12.5%	**10.7**	10%	12%	14%	16%	18%	20%	22%	24%	26%
2.2	**Industrial and Irrigation Water Consumption Reduced by 20% from FY 2010 by FY 2020**	not appli.	not avail.	4%	6%	8%	10%	12%	14%	16%	18%	20%
2.3	**All Development and Redevelopment Projects of ≥5,000 Sq. Ft. Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible**	not avail.	not avail.	100%	100%	100%	100%	100%	100%	100%	100%	100%
Objective #2: DoD is a U.S. Government Leader in Reducing Greenhouse Gas Emissions												
GOAL #3: Greenhouse Gas Emissions Associated with DoD Operations Reduced												
3.1	**Greenhouse Gas Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020, Relative to FY 2008**	3.6%	**4.4%**	7%	10%	13%	16%	19%	22%	28%	30%	34%
3.2	**Greenhouse Gas Emissions from Scope 3 Sources Reduced 13.5% by FY 2020, Relative to FY 2008**	-6.0%	**-0.1%**	1%	2%	3%	4%	5%	7%	9%	11%	13.5%
3.3	**30% of Eligible Employees Teleworking at Least Once Per Bi-Weekly Pay Period on a Regular Recurring Basis by FY20**	not avail.	not avail.	10%	15%	17%	20%	23%	25%	27%	29%	30%

#	Sub-Goal	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
3.4	**Greenhouse Gas Emissions from Employee Air Travel Reduced 15% by FY 2020, Relative to FY 2011**	not appli.	not appli.	0%	1%	2%	2%	3%	4%	5%	6%	7%
Objective #3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution												
GOAL #4: Solid Waste Minimized and Optimally Managed												
4.1	**All DoD Components Implementing Policies by FY 2014 to Reduce the Use of Printing Paper**	3	**4**	6	9	13	18	24	29	29	29	29
4.2	**50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by FY 2015 and Thereafter Through FY 2020**	39%	**40%**	44%	46%	48%	50%	50%	50%	50%	50%	50%
4.3	**60% of Construction and Demolition Debris Diverted from the Waste Stream by FY15, and Thereafter Through FY20**	73%	**77%**	54%	56%	58%	60%	60%	60%	60%	60%	60%
GOAL #5: The Use and Release of Chemicals of Environmental Concern Minimized												
5.1	**Onsite Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% from CY 2006 by FY 2020**	2.8%	**2.5%**				5%			10%		15%
5.2	**100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner**	100%	**100%**	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	**100% of DoD Personnel and Contractors Who Apply Pesticides Are Properly Certified**	99.4%	**99.2%**	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.4	**All DoD Installations Have Integrated Pest Management Plans Prepared and Updated Annually by Professionals**	84.6%	**90.2%**	100%	100%	100%	100%	100%	100%	100%	100%	100%
Objective #4: Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community												
GOAL #6: Sustainability Practices Become the Norm												
6.1	**95% of Procurement Conducted Sustainably**	not avail.	**82.6%**	95%	95%	95%	95%	95%	95%	95%	95%	95%
6.2	**15% of Existing Buildings Conform to the Guiding Principles By FY 2015, and Thereafter Through FY 2020**	0.06%	**0.3%**	9%	11%	13%	15%	15%	15%	15%	15%	15%
6.3	**All Environmental Management Systems Effectively Implemented and Maintained by FY 2020**	red	**red**	green	green	green	green	green	green	green	green	green

Table II.2. DoD SSPP Goals and Sub-Goals for Which DoD Components Responsible

(dark cells: responsible; white cells: reporting covered separately or N/A)

	Component	Abbn	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2	5.3	5.4	6.1	6.2	6.3
MILDEPs	Department of the Army	Army	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Department of the Navy	DON	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Department of the Air Force	USAF	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
DEFENSE AGENCIES	Defense Advanced Research Projects Agency	DARPA										■	■	■				■			■		
	Defense Commissary Agency	DeCA	■	■	■		■			■	■	■	■	■				■			■		
	Defense Contract Audit Agency	DCAA										■	■	■				■			■		
	Defense Contract Management Agency	DCMA	■	■	■		■			■	■	■	■	■				■			■		
	Defense Finance and Accounting Service	DFAS	■	■	■		■			■	■	■	■	■				■			■		
	Defense Information Systems Agency	DISA										■	■	■				■			■		
	Defense Intelligence Agency	DIA	■	■	■		■			■	■	■	■	■				■			■		
	Defense Legal Services Agency	DLSA										■	■	■				■			■		
	Defense Logistics Agency	DLA	■	■	■		■	■		■	■	■	■	■	■	■	■	■	■	■	■		■
	Defense Security Cooperation Agency	DSCA										■	■	■				■			■		
	Defense Security Service	DSS										■	■	■				■			■		
	Defense Threat Reduction Agency	DTRA										■	■	■				■			■		
	Missile Defense Agency	MDA										■	■	■				■			■		
	National Geospatial-Intelligence Agency	NGA	■	■	■		■			■	■	■	■	■				■			■		
	National Reconnaissance Office	NRO	■	■	■		■			■	■	■	■	■				■			■		
	National Security Agency/Central Security Serv.	NSA	■	■	■		■			■	■	■	■	■				■			■		
	Pentagon Force Protection Agency	PFPA										■	■	■				■			■		
DoD FIELD ACTIVITIES	Defense Media Activity	DMA										■	■	■				■			■		
	Defense Prisoner of War/Missing Personnel Off.	DPW										■	■	■				■			■		
	Defense Technical Information Center	DTIC										■	■	■				■			■		
	Defense Technology Security Administration	DTSA										■	■	■				■			■		
	DoD Education Activity	DEA										■	■	■				■			■		
	DoD Human Resources Activity	DHRA										■	■	■				■			■		
	DoD Test Resource Management Center	DTRMC										■	■	■				■			■		
	TRICARE Management Activity	TMA										■	■	■				■			■		
	Washington HQ Services	WHS	■	■	■		■		■	■	■	■	■	■				■			■	■	

Cross-Cutting Initiatives

Sustainability inherently cuts across many sectors and functions of the Department. This is reflected by the many measures taken within DoD during FY 2011 that cannot be attached to any one of the SSPP's Goals or Sub-Goals, or even a single Objective. For example, the Army conducted a holistic review of environmental programs in FY 2011, including an evaluation of environmental staffing levels across the Army's commands and in the Army's technical support organizations. In October 2011, the Army merged its energy and sustainability governance structures into a single Senior Energy and Sustainability Council that serves to institutionalize energy and sustainability in doctrine, policy, training, operations, and acquisitions across the entire Army enterprise.

A fundamentally cross-cutting activity underway throughout DoD is the incorporation of sustainability into seminal documents. The Department of the Navy (DON) is in the process of revising its Environmental Readiness Program Manual—Chief of Naval Operations (OPNAV) Instruction 5090.1C—to specifically include information on sustainability and the DoD SSPP. The revision is expected to be published in FY 2013. The Army incorporated sustainability as a "foundation" concept embedded across the Army Campaign Plan strategy map and made one of the objectives to "achieve energy security and sustainability objectives". Another typical approach used by individual Components to embed sustainability is to establish a Component-wide team, task force, or working group to promote and communicate sustainability. In some Components, the teams or task forces play a strategic role, developing Component-level sustainability goals and strategies.

DoD is actively reaching out to its personnel to communicate the Department's sustainability goals and engage personnel in making DoD more sustainable. In their annual sustainability implementation plans, OSD requires each DoD Component to explain how it is communicating the DoD SSPP and sustainability to its personnel, apart from communications specific to individual topics and goals, such as energy and solid waste. Components communicate to their personnel on sustainability via their general internal website, in agency newsletters, internal websites dedicated to sustainability, and social media. The Navy extends its sustainability outreach to key stakeholders. In FY 2011, Navy commands and local installations hosted exhibits, delivered educational presentations, and participated in other outreach activities to highlight the Navy's focus on sustainability. Efforts highlighted included protecting natural and cultural resources, increasing recycling, reducing energy use, and incorporating alternative energy sources. The Army publically reports its progress on SSPP and EO 13514 implementation via a sustainability report based on the Global Reporting Initiative (http://www.aepi.army.mil/). The annual report, first published in 2008, was restructured in 2011 to improve alignment with the SSPP and EO 13514. The outreach strategy of one Component, the Defense Intelligence Agency (DIA), is described as a Best Practice on the next page. In addition to these Component-level activities, there are DoD-wide venues promoting sustainability, as discussed in Section I.4.B. The most prominent of these is the sustainability portion of the DoD Environment, Safety and Occupational Health Network and Information Exchange web site, http://www.denix.osd.mil/sustainability.

The Army's Net Zero Initiative is another example of a cross-cutting program, tackling energy, water, and non-hazardous solid waste on DoD installations. Launched in April 2011, the cornerstone of the initiative is the Net Zero hierarchy, which includes five approaches in descending order of preference: reduction, re-purpose, recycling and composting, energy recovery, and disposal. To start, 17 Army installations and one Army National Guard State (see Figure II.1) were identified as pilots to test approaches that enable installations to consume only as much energy as they produce, utilize only as much water as they collect or treat on-site in one year, and eliminate the disposal of solid waste in landfills by the year 2020. Three bases are net zero pilots for water or waste as well as energy, and two are integrated pilots for all three areas. The pilots have started their initial analyses—such as energy audits, water balance studies and material flow analyses—which they will use to develop installation-

specific Net Zero roadmaps. While these roadmaps are installation-specific, they will include strategies, potential projects, and potential funding sources that can be used by all Army installations. The Army is partnering on the initiative with the General Services Administration (GSA), Environmental Protection Agency, and Department of Energy (DOE). The Air Force plans to adopt a similar approach, issuing updated policies in FY 2012 to achieve efficiencies through pollution prevention and waste reduction and achieve a "net zero" posture for Air Force installation water, energy and solid waste.

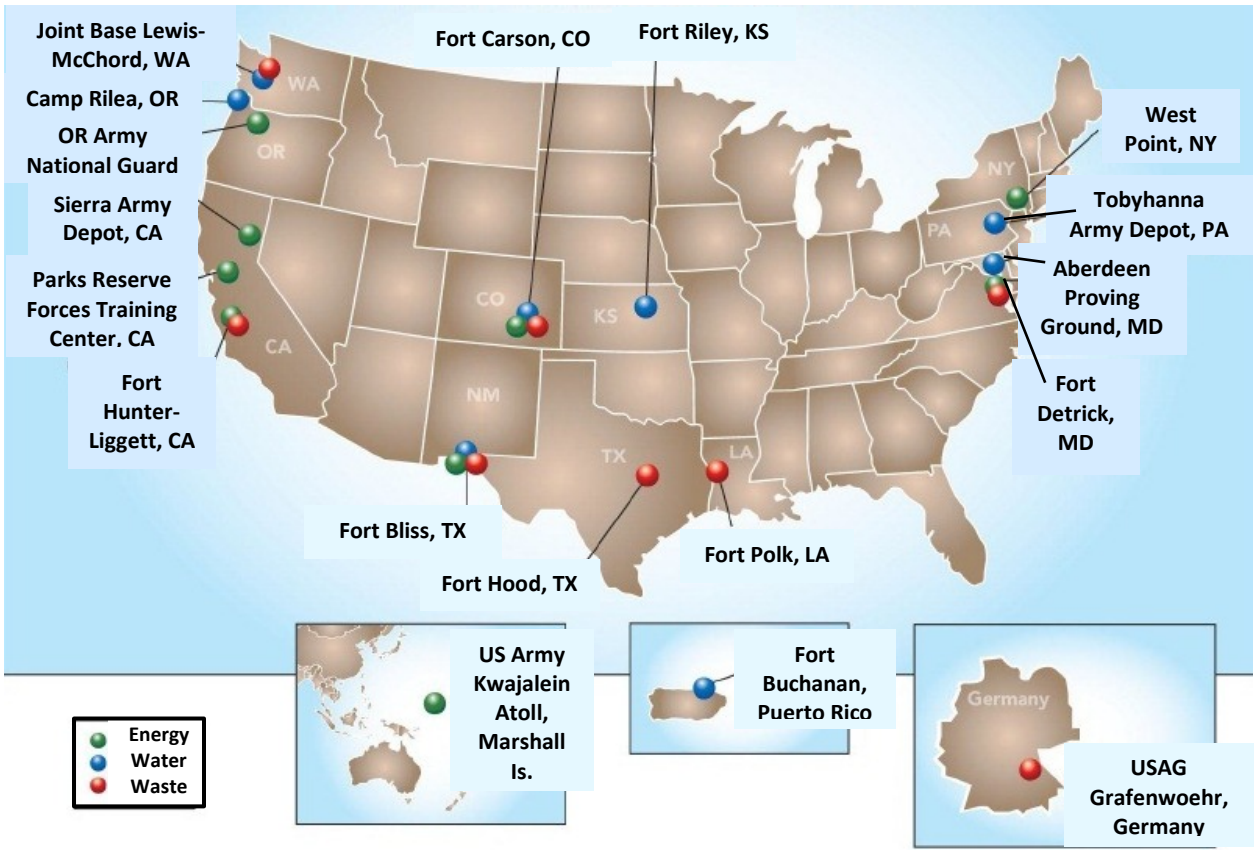


Figure II.X. Army Net Zero Bases

Best Practices

Multi-Pronged Sustainability Outreach by the Defense Intelligence Agency

DIA is a model for engaging its personnel on sustainability. The agency has had a Greening Council since January 2010, consisting of a volunteer from each directorate who is specifically responsible for sustainability outreach. Its activities include organizing green events and writing articles for publication in various DIA media. One type of event is Green Friday, where DIA highlights and markets a specific sustainability topic to employees. The Council also organizes Greening Competitions among employees for participating in greening activities at work and home. The other primary means to communicate sustainability is through DIA's internal website, which posts news, photos, announcements, tips, and information on DIA sustainability efforts. DIA also has a dedicated internal Greening web page on its classified website, which includes articles, the bulletin board for the Greening Council, and federal and DoD sustainability documents, including the DoD SSPP. Sustainability is included in the one-week orientation and training given to new DIA employees. In 2012, DIA plans to install an energy and sustainability board in the lobby, consisting of a TV monitor connected to the building energy management system. In addition to displaying real time electricity use and trends in an informative and entertaining way with graphics and energy facts, it will highlight sustainability activities of DIA and the Greening Council. DIA is considering developing mandatory online training on sustainability.

Objective 1: Ensure the Continued Availability of Resources Critical to the DoD Mission

Objective 1 seeks to ensure continued access to reliable energy and quality water to ensure no decline in readiness and training. Under Objective 1, the purpose of Goal 1 is to reduce fossil fuel consumption from stationary and mobile sources through improved facility and vehicle efficiency, increased reliance on renewable sources of energy, and the use of alternative fuels based on materials other than petroleum. The purpose of Goal 2 is to reduce the Department's reliance on potable water through improved efficiency and an increase in the use of non-potable sources and to minimize stormwater runoff from DoD properties. It is not uncommon for Department sustainability initiatives to address energy and water at the same time, conserving both of these critical resources. Examples of such successful approaches are shown on p. II-9.

GOAL 1 The Use of Fossil Fuels Reduced

Goal 1 Sub-Goals

SUB-GOAL 1.1 Energy Intensity of Facilities Reduced by 30% from FY 2003 by FY 2015 and 37.5% by FY 2020

Metric

The percent reduction relative to FY 2003 in the total energy consumed by DoD facilities per gross square foot of total DoD building space. A facility is defined by the Energy Independence and Security Act of 2007 (EISA) §432(1)(C) as any building, installation, structure, or other property (including any applicable fixtures) owned or operated by, or constructed or manufactured and leased to, DoD. The term facility includes a group of facilities at a single location, or multiple locations managed as an integrated operation, and contractor-operated facilities owned by DoD. It does not include any land or site for which the cost of utilities is not paid by the federal government.

Annual Planning Targets and Results

FY	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	15%	18%	21%	24%	27%	30%	31.5%	33%	34.5%	36%	37.5%
RESULTS	11.4%	**13.3%**									
Btu/GSF	102,929	100,268									
billion Btu	200,684	190,143									
000 GSF	1,949,734	1,896,352									
FY 2003 Baseline	115,647 Btu/GSF										
	220,215 billion Btu										
	1,904,202 000 GSF										

Note: the FY 2003 baseline was revised in FY 2011. The result shown for FY 2010 was calculated from the former baseline.

SUB-GOAL 1.2 By FY 2020, Produce or Procure Energy from Renewable Sources in an Amount that Represents at Least 18% of Electricity Consumed by Facilities

Metric

The numerator is the sum of renewable energy that DoD produced, a DoD controlled location produced, or a DoD component procured from another source. The denominator is the total electric consumption of facilities as published in the DoD annual energy management report. Renewable energy is defined in 10 United States Code (U.S.C.) §2924(7) as either thermal or electrical energy that is produced from renewable sources, including solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal (including electricity and

heat pumps), municipal solid waste, and new hydroelectric generation capacity if achieved from increased efficiency or additions of new capacity at existing hydroelectric projects.[1]

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	10%	11%	12%*	10%	11%	12%	13%	14%	15%	16%	18%
RESULTS	9.6%	**8.5%**									

**Title 10, U.S.C. §2911(e) (2) requires DoD to establish an interim renewable energy goal in FY 2018, adjusting future DoD renewable energy planning factors.*

SUB-GOAL 1.3 Use of Petroleum Products by Vehicle Fleets Reduced 30% from FY 2005 by FY 2020

Metric

The percent reduction in petroleum product consumption by DoD non-tactical motor vehicle fleets relative to FY 2005.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	10%	12%	14%	16%	18%	20%	22%	24%	26%	28%	30%
RESULTS	5.3%	**11.8%**									
million GGE	80.31	74.81									
FY 2005 Baseline		84.83	million GGE								

SUB-GOAL 1.4 Ten Landfills or Wastewater Treatment Facilities Recovering Biogas for Use by DoD by FY 2020

Metric

Cumulative number of qualifying landfills and wastewater treatment facilities:

a) that are owned by DoD and became operational for the production, capture and use of methane from biogas; and

b) that are owned by other parties, with which DoD has entered agreements to buy biogas (or energy from it), and became operational for the production and capture of methane from biogas for use by DoD.

A project will be counted toward the sub-goal if: 1) it came on-line during the reporting period (beginning with FY 2010); and 2) it results in the collection of at least 50,000 standard cubic feet per day of biogas, on average.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	0	2	3	4	5	6	7	8	9	10
RESULTS	1	**2**									

[1]DoD is subject to two renewable energy goals. The 10 U.S.C. §2911(e) goal measures the total renewable energy (electric and non-electric) production and procurement as a percentage of total facility electricity consumption, while the EPAct 2005 goal measures total renewable electricity consumption as a percentage of total facility electric consumption. Total production and procurement of renewable energy was 8.5 percent of the total facility electricity consumption for the 10 U.S.C. §2911(e) renewable energy goal. Renewable electricity consumption subject to the EPAct 2005 goal accounted for 3.1 percent of DoD's total electricity consumption.

Goal 1 Responsible OSD Office: Acquisition, Technology and Logistics/Installations and Environment (AT&L/I&E)

Table II.3 provides results for other performance metrics pertaining to Goal 1.

Table II.3. Results for Other Metrics Pertaining to Goal 1

	FY 2010	FY 2011
% EISA covered facilities evaluated through June 2012	95%	74.7%
% appropriate buildings metered for electricity	95%	75%
Alternative fuel use in fleet (% increase from FY 2005 base year)	58.2%	100.0%
		FY 2011
FACILITY ENERGY		
% EISA covered facilities that have an energy manager		tbd
% metered buildings that are (or are part of) EISA covered facilities that has been benchmarked through June 2012		tbd
% renewable energy that is "new"		22%
VEHICLES		
Total conventional fuel vehicles		88,564
Total alternative fuel vehicles		72,684
Executive fleet vehicles larger than a midsize sedan or that do not comply with alternative fueled vehicle requirements as posted on the agency website		14
ELECTRONIC STEWARDSHIP		
% of eligible PC, laptops, and monitors with power management actively implemented and in use *(estimate)*		52%

Sub-Goal 1.1 – FACILITY ENERGY INTENSITY

Performance

OVERVIEW

The performance of DoD installations is increasingly linked to the management and use of energy. In FY 2011, the Department's buildings consumed 197,000 billion British thermal units (Btu) of goal subject energy derived from fossil fuels. The use of electricity and combustion of natural gas to power and heat facilities accounted for nearly three quarters of this consumption. Building energy consumption also included smaller quantities of fuel oil, coal, and liquefied petroleum gas (Figure II.2).

DoD's progress reducing energy consumption is measured in terms of energy intensity, representing the total consumption of energy (in Btu) per gross square feet of facility space at DoD installations. The Department is subject to the EISA energy intensity reduction goal which mandates an annual decrease of 3% in energy intensity at facilities subject to the goal, leading to a 30% decrease by FY 2015 relative to a FY 2003 baseline. As shown in Figure II.3, DoD's energy intensity has been decreasing since FY 2003. While the Department did not meet its FY 2011 target of an 18% reduction compared to FY 2003, it did achieve a significant reduction in energy intensity from FY 2010 to FY 2011 of 1.9%, in spite of the fact that the area of its facilities declined by 2.7% during that period. While DoD expects to make continued

improvement in energy efficiency, energy intensity may be somewhat offset by increased consumption as deployed troops return to U.S. bases from Iraq and Afghanistan.

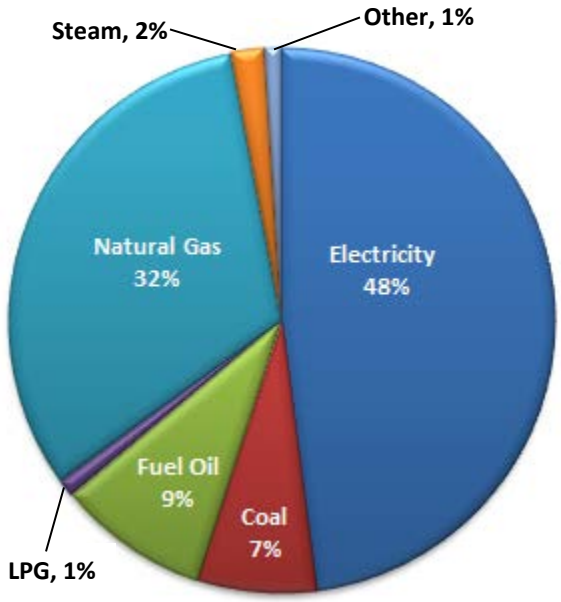


Figure II.2. DoD Facility Energy Consumption By Fuel Type, FY 2011

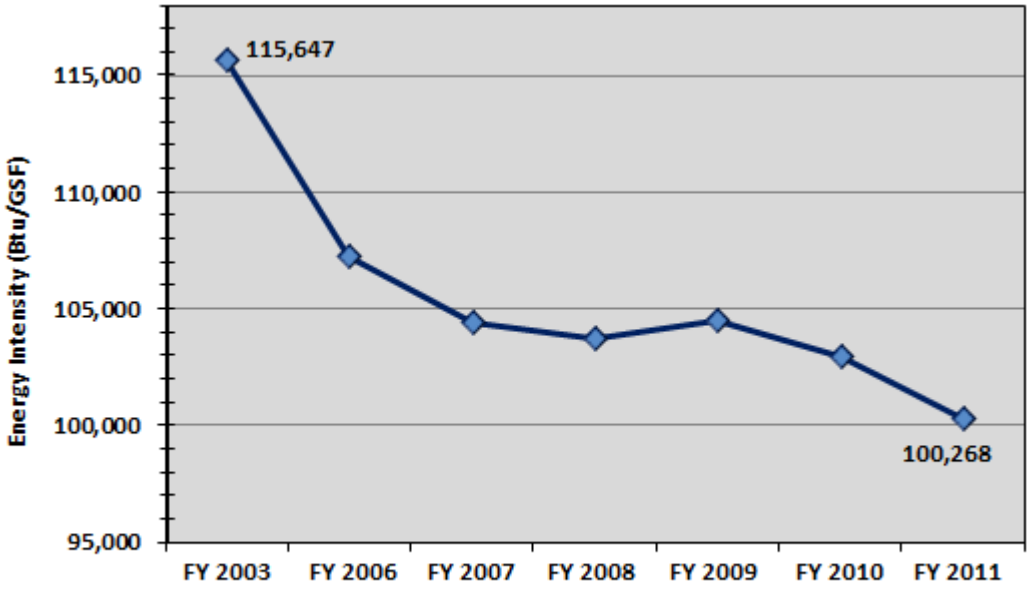


Figure II.3 DoD Facility Energy Intensity (Btu/gross square foot), FY 2003 - FY 2011

HIGHLIGHTS

Goal 1: Selected DoD Success Stories Reducing the Consumption of Both Fossil Fuels and Water

U.S. Marine Corps: MCAGCC 29 Palms
(2011 Federal Energy and Water Management Awardee)

Cross-cutting improvements implemented by the Marine Corps Air Ground Combat Center (MCAGCC) in FY 2010 achieved impressive results in facility energy and water consumption and renewable energy. The base increased the portion of its electricity met by renewable sources to 9.2% by installing 4.1 MW of solar photovoltaic (PV) capacity, 1.5 MW of which was installed through a power purchase agreement. The installation projects that the systems will save about $350,000 every year. The base also implemented energy efficiency improvements, including upgrades to its chilled water conversion and energy management control systems, resulting in a 15% reduction in energy consumption in FY 2010 from FY 2009, corresponding to a savings of 56 billion Btu. Water efficiency improvements yielded 448 million gallons in saved water, a 62% decrease in FY 2010 from FY 2009. All in all, the efforts generated more than $1 million in cost savings.

U.S. Air Force: Network Control System
(2011 Federal Energy and Water Management Awardee)

The energy and water management control system at Vandenberg Air Force Base, CA, relies on a local area network consisting of a wide area network spanning the base, wireless transceivers, and fiber optics to communicate with more than 400 advanced electric, gas, and water meters across 6.6 million square feet of space. With meters installed on substation circuits and the automated reading system installation, the base will have all the tools it needs to efficiently manage demand and optimize efficiency.

In addition, Vandenberg installed nearly 10,000 LED street light fixtures that are saving about $1 million every year. The base's efforts also include retrofits to lighting, motors, frequency drives, and HVAC controls. All told, energy consumption in FY 2010 was 4.4% lower than the prior year, or 145 billion Btu, and 14% lower over three years. The improvements yield over $3 million annually in energy cost savings.

U.S. Army: Systems Engineering Approach

Fort Bliss, TX took a base-wide systems engineering approach, combined with an energy savings performance contract (signed December 2011), to cost-effectively improve the resource efficiency and infrastructure of the installation. FY 2010 and 2011 measures include:

- 98% of appropriate facilities have advanced metering
- Heating the swimming pool with solar thermal, saving 3.2 million cubic feet of natural gas/year
- Daylighting avoids the need for 400 kW of electricity
- Window replacements and building envelope insulation
- Central HVAC controls (in progress; 285 base buildings to be done by the end of 2012)
- Lighting retrofits
- Waterless urinals, low-flow faucets and shower heads

FY 2010 results:

- Energy Intensity: 15% decrease from FY 2003
- Water Intensity: 33% decrease from FY 2007
- Cost Savings: $2.1 million per year

U.S. Navy: Resource Efficiency Manager
(2011 Federal Energy & Water Management Awardee)

The Puget Sound Naval Shipyard and Intermediate Maintenance Facility in Bremerton, WA used a resource efficiency manager to achieve continuous commissioning of its buildings. Most of the savings were realized by shifting from continuous operation of HVAC equipment, such as air handling units, exhaust fans, and heating coils, to single shift or daytime operation. The facility also implemented a systematic program to detect and repair leaks in the steam, water, and air systems. An investment of just over $303,000 yielded more than $750,000 in energy savings in FY 2010, and reduced energy and water consumption by 70 billion Btu and 11.5 million gallons of water compared to FY 2009. The facility acquired over 9,600 MWh of wind-generated electricity at no cost by using available credits available under the Bonneville Power Administration Conservation Rate Credit program.

In FY 2011, the DoD Installation Energy Test Bed run by SERDP/ESTCP (Environmental Security Technology Certification Program) chose 27 projects for FY 2012 awards spanning five focus areas:

1) smart microgrids and energy storage to increase the energy security of DoD's installations;
2) advanced component technologies to improve building energy efficiency;
3) advanced building energy management and control technologies;
4) tools and processes for design, assessment, and decision-making associated with energy use and management; and
5) technologies for renewable energy generation on installations.

In FY 2010 and 2011, the Navy invested significant funding into energy audits, and Commander, Navy Installations Command—the Navy authority responsible for shore installation management—developed energy reduction goals for installations. As a result, the Navy has developed and programmed a set of projects for FY 2012 and 2013 that will drive down the Navy's energy consumption once the projects are completed. The DoD Military Construction (MILCON) and Sustainment, Restoration and Modernization (SRM) programs will implement the projects.

The Commandant of Marine Corps considers energy efficiency the core strategy for reaching energy independence, and requires Installation Commands to annually submit an "Energy and Water Management Annual Report," signed by the installation energy manager as well as the Installation Commander. These documents report and evaluate the installation's energy management program, discuss future plans and funding requirements, and recognize achievements and success stories.

The Air Force energy strategy is to reduce demand through conservation and efficiency, increase supply through alternative and renewable energy sources, and create a culture where all Airmen recognize the importance of energy to Air Force operations and make energy a consideration in everything they do. The success of this approach is demonstrated by the fact that the Air Force was the recipient of nearly one quarter of the 2011 Department of Energy Federal Energy and Water Management Awards and reduced facility energy intensity by over 15% from the FY 2003 baseline.

In FY 2011, the Army awarded 22 performance contracts: 11 energy savings performance contract (ESPC) task orders with $74 million in investments and 11 utility energy services contract (UESC) projects worth $70 million. The resulting annual cost savings of almost $12 million—generated from a projected annual energy savings of 576 billion Btu—will be used to repay the third party investments over the life of the contracts. The FY 2011 total combined ESPC and UESC investment for energy efficiency and renewable energy is equivalent to more than 10% of the Army's annual energy utility costs. During FY 2011, the Army and Defense Logistics Agency (DLA) worked closely with the DOE Federal Energy Management Program (FEMP) to revise and enhance project facilitation and contract management practices for Army performance contracts, and to increase awareness of these mechanisms. The Army's pipeline of these types of contracts grew from 15 projects at the beginning of FY 2011 to more than 40 projects at the close of the fiscal year, representing a potential investment of more than $500 million during FY 2012 and 2013.

On 27 Oct 2010, the ASA(IE&E) issued an updated sustainable design and development policy that incorporates sustainable design and development principles, following the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 189.1, making energy and sustainability considerations a fundamental part of every component of a new facility design. While the benefits will vary based on location, preliminary Army analysis indicates the energy savings over a standard building will be 45% or greater. In October 2010, the Army issued policy, *Utilization of Efficient Lighting*, requiring lighting efficiency to meet the standards of EISA. The policy requires all inefficient lighting to be replaced within five years in all facilities owned, leased or controlled by the Army. In June 2011, the Army launched its Net Zero Energy pilot initiative, with eight pilot installations and one state-wide National Guard program serving as test beds for innovative energy management approaches. The Net Zero Energy hierarchy starts by maximizing energy efficiency and conservation in existing facilities,

then offsets demand with renewable sources of energy through capture and reuse of waste energy, energy recycling options, cogeneration, waste-to-energy, and the development of on-site renewable energy where feasible and cost-effective. Also in FY 2011, the Army instituted a continuous review process in which four to six energy policies will be reviewed and updated annually.

Smaller DoD Components are also making progress. In FY 2011, the National Security Agency (NSA) gave two of its buildings a lighting upgrade and rooftop PV arrays, with the larger building also getting a heating, ventilation and cooling (HVAC) upgrade. One green roof was installed and another is in progress. Washington Headquarters Services (WHS) recommissioned the mechanical systems of Wedge 1 of the Pentagon, with the savings projected to yield 25 billion Btu (nearly 2% of total Reservation use) and $800,000 every year.

DATA MANAGEMENT AND METERING

EPAct Section 103 requires that federal agencies meter 100% of electricity in buildings appropriate for metering by the end of FY 2011. EISA Section 434(b) requires full metering for natural gas and steam by the end of FY 2015. DoD continued to make progress on electricity metering in FY 2011, with meters installed and reporting on three quarters of the buildings deemed appropriate for metering. Table II.4 compiles DoD's metering progress as of the end of FY 2011 for electricity, steam, and natural gas. A sign of DoD's commitment to metering, and energy management overall, is the significant increase in the number of buildings it deemed appropriate for metering compared to last year, with a near doubling of the number of buildings deemed appropriate for electricity metering in just one year. In spite of progress, however, significant opportunities remain for DoD to meter more of its energy consumption.

Table II.4. DoD Energy Metering: Increase in Buildings Deemed Appropriate for Metering, and FY 2011 Metering Status

Energy Type	Increase in Appropriate Buildings	% Metered in FY 2011		
		Standard	Advanced	TOTAL
Electricity	95%	39%	36%	**75%**
Steam	54%	45%	8%	**53%**
Natural Gas	48%	22%	31%	**53%**

As of the close of FY 2011, the Air Force has installed 6,809 advanced meters. To provide clear guidance on how to report energy and utility data, in June of 2011 the Air Force issued Engineering Technical Letter 11-6, *Utilities Reporting for Air Force Facilities*, to establish roles, responsibilities, and procedures to standardize reporting on energy and water data for Air Force active duty, Reserve and National Guard installations and activities. As of the close of FY 2011, the Army had installed 62% of the advanced electric meters required per EPAct 2005 (covering 5,755 Army buildings). Similar to the Air Force, the Army issued Headquarters, Department of the Army Execute Order 028-12, *Program Management of the Army Central Meter Program*, for Army installations to meter energy and water use and incorporate the resulting data into energy monitoring systems to provide effective, accurate, and compliant collection and reporting for timely energy management and accountability. WHS is installing building-level energy meters of all types (electricity, natural gas, chilled water, and steam) throughout the Pentagon Reservation (which consists of the Pentagon and associated buildings and grounds), with an anticipated completion date in FY 2013.

Best Practices

Combined Heat and Power to Save Energy and Money While Ensuring Reliability

The Marine Corps Air Ground Combat Center (MCAGCC) at 29 Palms saves $5.8 million on its energy costs annually, while insulating itself from power outages, through a combined heat and power plant. Combined heat and power, also known as cogeneration, makes use of the heat contained in exhaust gases from the electricity generation portion of the system to produce hot water and/or steam for the facility. In a normal power generation system, the heat energy in the exhaust is lost to the atmosphere. In the case of MCAGCC, a combustion turbine generator produces up to 7.5 MW of electricity, with the turbine exhaust containing enough heat to provide domestic hot water to several hundred buildings on the base. Some of the hot water is also used to produce chilled water for air conditioning, through an absorptive refrigeration process. The efficiency of cogeneration enables the base to use 24% less fuel than a conventional system. In addition, the plant can operate independently from the grid when the power supply is interrupted, an event that is not uncommon for the base due to summer lightning strikes. A diesel generator can "black start" the plant when the grid is down, enabling critical base operations to be supported independently from the grid. Finally, the system was built and is being maintained under an energy savings performance contract with Johnson Controls, which guarantees a certain level of savings for the base while compensating Johnson Controls with the revenue generated by the energy savings. The company is also responsible for training base personnel who operate the plant.

Energy Efficiency Counteracts Increased Computing Density from Data Center Consolidation

The Computing Services Directorate (CSD) of the Defense Information Systems Agency consolidated over 100 data centers down to 14. As a result, however, the remaining data centers became more densely loaded with equipment. To avoid the increased energy costs that would normally go with this increased computing density, CSD significantly improved the energy efficiency of its remaining data centers. CSD deployed a large range of energy efficiency strategies at the 14 remaining data centers, successfully preventing a significant increase in utility costs. The measures included the following, which are in keeping with FEMP recommendations for efficient data center best practices:

- A three-dimensional computational fluid dynamic software program called "TileFlow" to optimize the configuration of racks and other equipment.
- Airflow management devices, to better direct cooling air to the equipment that needs it, and prevent cool air from mixing with the hot exhaust air from equipment.
- Hot aisle/cold aisle layout, where the rows of servers are oriented so the fronts of server racks always face one another (cold aisles) and backs of the racks always face one another (hot aisles).
- Outdated equipment—such as computer room air conditioners, uninterruptible power supplies, power distribution units, lighting, chillers, and boilers—replaced with new, energy-efficient models.
- Building automation system improvements, such as controls for chillers and lighting.
- Electricity meter installation.
- Variable speed drives installed on pumps.

Implementation Strategies

Overview

The Department plans major investments in energy efficiency over the next two years to drive down the energy use of its facilities. DoD set a goal to award approximately $465 million in ESPCs and UESCs in FY 2012, and $718 million in FY 2013, a significant increase over the $201 million level in FY 2011. DoD is also in the process of updating the December 2009 DoDI on *Installation Energy Management* (DoDI 4170.11), which provides guidance to installation commanders and energy managers on a range of energy security and energy efficiency matters.

DON plans to reduce shore energy consumption 50% by 2020 from a 2003 baseline, while providing reliable energy to 100% of Tier I and II Critical Assets. The Navy provided significant funding for energy audits in FY 2010 and FY 2011, and the Commander, Navy Installations Command developed initial tailored installation energy reduction goals. These steps resulted in quite a few energy reduction project proposals to be funded from FY 2012 and FY 2013 MILCON and SRM funds, which will generate considerable efficiency gains. Across the Future Years Defense Program, the Navy is planning to invest $1.6 billion in energy efficiency projects, with a projected average savings of 24.3 million Btu per year. The Navy will implement a phased approach, first dedicating funds for proven energy efficiency technologies, then focusing on renewable energy sources to decrease GHGs and increase energy security once the financial viability of these sources improve. If coupled with future investment in alternatively financed projects, DON will be on target to meet the FY 2015 sub-goal for energy intensity.

Another DON goal is for 50% of Navy installations to be net zero for electricity consumption by 2020. Over FYs 2012 and 2013, DON will determine which installations have the best opportunity to cost-effectively achieve net zero by analyzing installation data through software tools and onsite visits. The resulting recommendations will become part of each installation's energy consumption reduction strategy. DON is partnering on this initiative with DOE. Finally, the Navy will transform culture and behavior as a method of reducing energy. This will enable Navy energy consumption practices to evolve by directly linking consumption to behavior awareness and accountability at the individual, command, and functional levels.

The main path the Marine Corps is taking to reduce the energy intensity of its facilities is to directly fund energy efficiency measures when facilities are being constructed and repaired, augmented by some alternative financing through UESCs and ESPCs. All efficiency measures are informed by an annual review and analysis process in which Installation Commands submit a "U.S. Marine Corps Energy and Water Management Annual Report", signed by both the Energy Manager and the Installation Commander, to the Marine Corps Installation Command Facilities Directorate. The installation reports describe progress and future plans for the installation's energy management program, and the Facilities Directorate analyzes the plans and makes recommendations for improvements. Assisting the decision making process is the Marine Corps Installations and Environment Geospatial Program, more commonly known as GEOFidelis, that uses a Geographic Information System and the facility metering data to enable decisions based on nearly real-time information on operations and energy usage.

The Army is tackling energy on a number of fronts. It will update several policies in FY 2012 and issue several new ones, based on its holistic energy review last year. It will also issue *Energy Portfolio 2012-2018*, an update to the *Army Installation Management Energy Portfolio*, first published in August 2010. The Portfolio provides Army installations with an overview of programs and financing available to increase energy efficiency, reduce energy consumption, and expand the use of renewable energy, and it highlights successful installation-level projects. The Army will expand its use of ESPCs in FY 2012 and 2013, with more than 40 projects in the pipeline, representing a potential investment of approximately $800 million during the two-year period. Also in FY 2012, the comprehensive energy audits and renewable energy feasibility studies at all nine Net Zero Energy pilot installations will be completed, providing the basis for installation-specific roadmaps that will identify potential energy-related projects and funding sources.

Installation audits are the primary source for identification of Air Force energy conservation projects. The Air Force plans to complete Sustainable Infrastructure Assessments audits on 75% of its buildings in 2013 and expects to generate more than 1800 individual project ideas as a result. Once projects are identified and a business case analysis performed to determine costs and payback periods, the Air Force will tap into several different funding sources for capital investments, including MILCON, SRM, ECIP, and Energy Conservation Focus funds. Over the last two years, the Air Force has centrally funded 511 energy conservation projects, with FY 2011 Air Force ECIP and Energy Conservation Focus funding

Photo: U.S. Air Force

totaling $274 million. In FY 2011, the Air Force completed 15 ECIP projects at a cost of under $20 million. It is estimated that the projects will save more than 253 thousand million Btu annually and nearly $54 million over the life of the projects. The Air Force is also re-invigorating third-party financing to fund energy conservation projects through ESPCs and UESCs. The Air Force is targeting over $260 million in potential ESPCs and UESCs over the next two years. While the Air Force did not award any third-party financed projects in FY 2011, it expects to award five such projects in FY 2012 that would save approximately 1.1 million Btu and it is currently evaluating three additional projects for FY 2013.

In FY 2011, WHS submitted eight projects for FY 2012 ECIP funding. Two of the projects were awarded funding and will be implemented in FY 2012. They are to install revolving doors at Pentagon entrances and conduct a document destruction disintegrator pilot project to offset fuel use and emissions by the incinerator. WHS expects the combined projects to save a 45,000 million Btu annually. After completing the first phase of Pentagon recommissioning last year, WHS is moving on to other parts of the Pentagon in FY 2012 and expects to receive additional ECIP funding to continue recommissioning in FY 2013. WHS is also developing a green information technology (IT) policy, with implementation projected for FY 2012 to drive energy reductions beginning in FY 2013. The policy includes a focus on energy efficiency in data centers, including temperature and humidity set points. WHS expects to receive FY 2013 funding from ECIP to implement energy efficiency upgrades in its data centers. Finally, WHS is investigating the feasibility of combined heat and power as a means of improving energy security as well as improving energy efficiency.

DLA has many energy efficiency projects in progress, including replacements of chillers and lighting, refrigeration and HVAC systems; boiler retrofits; and installing motion sensors. DIA, through the DLA Energy Office, will issue an ESPC in 2012 for their headquarters facility. The National Geospatial-Intelligence Agency (NGA) developed a 2012 – 2017 Energy Master Plan, which includes commissioning, monitoring and tracking energy efficiency through metering, conducting energy audits and assessments, and using automation and balancing to optimize building system performance. NSA is in the process of conducting investment grade audits and, if funding can be obtained, it intends to implement any opportunities identified if they have a payback period of less than ten years. NGA is planning to install a waterside economizer, an energy-efficient cooling system, in one of its data centers in FY 2012.

DATA MANAGEMENT AND METERING

In the summer of 2012, the Department will issue an updated policy on the metering of DoD facilities to lowering the size threshold for buildings that must be metered and establish guidelines to ensure that installed meters can securely deliver data to energy professionals in the field. DoD will continue to network the Department's smart meters in a cyber-secure manner, so that installations as well as Service headquarters can analyze the information. In FY 2012, DoD is continuing to develop the Enterprise Energy Information Management capability, which will leverage the data being collected by its large network of meters. The system will provide advanced analytic tools to all energy professionals throughout the DoD enterprise, and ensure that investment strategies are based on accurate and relevant information. The purpose is to provide the appropriate information on energy consumption at various levels of aggregation, including individual buildings, installations, the geographic region, and the military service as a whole. With accurate management, control, collection, and analysis of energy data,

DoD can more effectively monitor, measure, manage and maintain energy systems at their optimal performance levels. The system will also allow DoD to collect renewable energy generation and performance data, and compare performance across facilities and across the Military Departments.

The Navy currently collects energy data using the Defense Utility Energy Reporting System, where data is entered manually at the installation level, making it subject to human error. To obtain more accurate data, the Navy is leading an effort to implement and deploy the Centralized and Integrated Reporting for the Comprehensive Utilities Information Tracking System. This enterprise-wide software and integrated metering system will allow the Navy to collect and pay utility invoices, allocate consumption and bills to tenants, and incorporate metered data for energy management purposes in a centralized and accessible database. The system will ensure the efficient and effective use of energy by enabling usage to be tracked and managed. Data from DON advanced meters will feed directly into the system and enable Installation Commanding Officers, tenant activities and other responsible parties to track their energy usage in real time. This transparency in consumption information will inform decision-making on facility and utility upgrades and facilitate behavioral changes. The system is expected to be deployed Navy-wide by the end of FY 2012. The Navy is assigning Resource Efficiency Managers and energy managers to review metered data, trend reports, benchmark facilities, and allow management to make energy decisions using the metered data.

Reconfiguring circuitry for advanced metering, NAVFAC HI

Photo: U.S. Navy

The Navy intends to capture 95% of its electrical consumption upon completion of its ongoing installation of advanced metering infrastructure. Advanced metering enables measurement and verification, provides transparent energy consumption data, facilitates operational decisions, influences individual behavior, and supports accurate cost capture and billing. Advanced metering infrastructure integrated with the Centralized and Integrated Reporting for the Comprehensive Utilities Information Tracking System and Public Safety Net form the initial phase for a Navy installations smart grid. The Navy's follow-on efforts will integrate other industrial control systems, such as Direct Digital Controls and Supervisory Control and Data Acquisition Systems.

Air Force energy program analysts at the Air Force Facility Energy Center must have reliable access to accurate energy data to evaluate and make decisions on energy-saving projects. In FY 2011 the Air Force replaced the 30-year old Defense Utility Energy Reporting System with the Air Force Energy Reporting System (AFERS). AFERS will serve as an interim bridging system between the legacy system and the future Air Force information technology system. The AFERS platform collects the same data from the same sources but collects it in a single modernized repository. Energy program analysts no longer have to spend time gathering and analyzing base, major command, and other data from different locations, read data off a computer screen in the old system, and manually enter it into another system. Instead they are able to analyze it all in one location in a manner that provides less opportunity for erroneous data entries, allowing for more robust analysis, verification, and validation of energy data. AFERS also allows Air Force energy analysts to act on the data more quickly. For instance, a typical report that would take two days to generate in the former system now takes just a few hours with AFERS. This time savings will allow energy analysts to quickly get into the more important phase of analysis, allow for greater focus on finding energy project opportunities, and highlight where the Air Force can maximize its return on investment.

Sub-Goals 1.2 & 1.4 – RENEWABLE ENERGY

Performance

OVERVIEW

In FY 2011, DoD's total production and procurement of renewable energy (electric and non-electric) was 8.5% of total facility electricity consumption, as compared to 9.6% in FY 2010. The main contributor to the decline was a substantial decrease in purchases of renewable energy certificates (RECs), in keeping with DoD's decision to meet its renewable energy goals by adding supply on its installations as opposed to buying RECs. The Department cut its REC purchases by more than 50% in FY 2011, with RECs accounting for about 10% of the total renewable energy towards it's SSPP sub-goal and that of 10 U.S.C. §2911(e), on which the SSPP sub-goal is based. Figure II.4 shows the relative amounts of the various categories of renewable energy comprising DoD's production and procurement.

In FY 2011, DoD had more than 467 operational renewable projects. These projects generated more than 5,300 BBtu per year, which represents 60% of the total amount of renewable energy produced or procured in that year. Coupled with purchases of renewable energy and RECs, which represent 30% and 10% of the total supply mix respectively, DoD produced and procured more than 8,800 BBtu of renewable energy in FY 2011. Geothermal electric power is by far the most significant renewable energy source in DoD, accounting for more than three quarters of the Department's renewable energy goal attainment. Biomass and biogas from captured methane make up 12% of the supply mix, followed by more than 280 solar photovoltaic (PV) systems contributing approximately 5% of the supply mix. There are 83 ground source heat pump projects throughout DoD, contributing to 3% of the total renewable energy produced on DoD installations. Figure II.4 illustrates DoD's renewable energy supply mix by technology type.

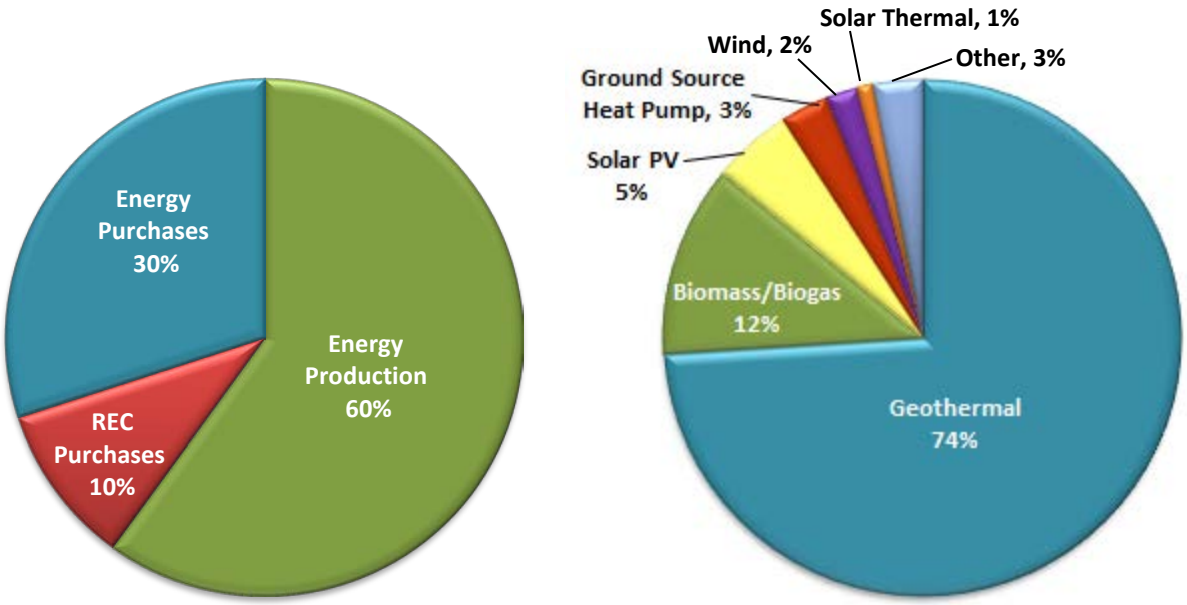


Figure II.4. DoD FY 2011 Renewable Energy, Broken Down by Production versus Procurement (left) and Technology Used for Production (right)

To become a constructive partner in renewable energy development in the U.S. generally, as well as on installations, the Department has been active recently in streamlining the process for determining whether proposed projects will be incompatible with DoD's mission. In FY 2010 it established the DoD Siting Clearinghouse to use a transparent process to review project applications filed under the Federal Aviation Administration Obstruction Evaluation/Airport Airspace Analysis process, to assess whether

the project might impact DoD missions, such as training and flight operations. The Clearinghouse also coordinates the review of non-DoD renewable energy projects proposed on property not owned or controlled by DoD. The Clearinghouse also provides a mechanism for all parties involved to resolve any conflicts. So far the Clearinghouse has overseen the evaluation by technical experts of 506 proposed energy projects. Of these, 96% have been cleared, having been found to have little or no impact. More than half of these projects were in a backlog that existed when the Clearinghouse was created, representing 24 gigawatts of potential energy from wind, solar and geothermal sources. The 20 projects that have not been cleared are undergoing further study, and the Department is working with industry, state and local governments, and federal permitting and regulatory agencies to identify and implement mitigation measures wherever possible. DoD published the interim final rule on its Mission Compatibility Evaluation Process in the Federal Register in October 2011. To further assist in siting renewable energy projects where they will not interfere with military activities, DoD partnered with the National Resources Defense Council on a mapping tool that identifies those locations with the potential to conflict with DoD activities. The tool also shows locations that are unsuitable for other reasons, such as environmentally sensitive areas, congressionally designated wilderness areas, national monuments, and areas without roads. The tool was announced in November 2011.

ONSITE RENEWABLE ENERGY

The Department has stressed the importance to mission readiness of increasing the amount of renewable energy generated on or adjacent to its installations, to ensure an uninterrupted supply of electricity in the event of disruption to the electric grid. Military installations across the United States and overseas have been steadily adding renewable energy to make this vision a reality, with hundreds of renewable energy projects now on DoD properties.

1 MW wind turbine, Fort Huachuca, AZ

Photo: AmySunseri for the U.S. Army

A study funded by ESTCP found that DoD installations in the Mojave and Colorado Deserts of California can support 7 GW of technically feasible and financially viable solar energy. The determination was made after excluding land area that was unsuitable for any reason, such as interference with military mission activities, unsuitable terrain due to steep slope or flash flood hazards, and potential conflicts with species or cultural resources. The study noted that the private sector could develop projects with no upfront capital investment required from DoD, with potential financial rewards totaling about $100 million per year in avoided energy costs and leasing revenue.

As described in the April 2009 USMC Facilities Energy & Water Management Campaign Plan, the Marine Corps is committed to taking a leadership position in on-site renewable power development, with the assistance of private sector financing and development expertise. The factors the Marine Corps is considering to ensure that on-site projects are financially viable and otherwise suitable include:

- proximity to transmission lines;
- cost effectiveness (e.g., utility rebates and tax incentives);
- current credit markets that impact ability to obtain project financing;
- suitable contracting instruments (such as enhanced use leasing, power purchase agreements, and public-private ventures).
- the non-dispatchable nature of renewable energy (inability to turn it on or off, or significantly adjust it, at the request of power grid operators); and
- storage issues.

On 15 September 2011, the Secretary of the Army established the Energy Initiatives Task Force under the Office of the Assistant Secretary of the Army (Installations, Energy and Environment). The Task Force's goal is to facilitate the development of large-scale, cost-effective renewable energy projects on Army installations. It is doing the upfront work needed to identify available land, assess natural resources, and determine what state and local incentives may be available to developers. The Army hopes the resulting streamlined acquisition processes will attract more private sector interest. A facility's energy security will be one of the considerations in choosing which projects to prioritize. Initially, the Task Force will focus on projects with the potential for at least 10 MW of generation. In FY 2011, the Army had 168 active renewable thermal and electric energy projects operating, with the vast majority of the energy produced being used on-site.

PV array on top of closed landfill, Ft Carson, CO

Photo: U.S. Army

The Air Force looks to renewable energy to improve its energy security and diversify its energy supply. More than 6% of the electrical energy used by the Air Force in FY 2011 was produced from renewable sources, and the Air Force had approximately 181 renewable energy projects on 77 sites either installed and in operation or under construction across a wide variety of renewable sources, including 8.7 MW from wind energy, 26.2 MW from solar, and 2.4 MW from waste-to-energy projects. The Air Force Facility Energy Center will manage renewable energy assessments of almost every Air Force installation in the continental United States to identify possible renewable energy projects. The projects will be owned by either the Air Force or a third party. The Air Force established the Renewable Energy Project Development Subpanel to coordinate renewable efforts and to leverage knowledge and resources across the Air Force. The Subpanel provides leadership for and coordination of renewable energy projects by providing a forum, process, and tools for evaluation and decision-making. Currently over 60% of the active Air Force MILCON program is pursuing on-site renewable energy generation and/or incorporating energy efficient roof designs. Key to incorporating renewable components into new facilities is the identification and analysis of opportunities at the earliest stages of project development. The Subpanel's efforts will allow an information exchange facilitating the identification of viable renewable options for new building construction, and it will explore the role of ECIP in augmenting the MILCON funds available for renewable energy development on new buildings—an essential component to achieving net-zero energy buildings.

RECOVERY OF BIOGAS

In FY 2011, DoD added one new methane recovery system, in Fort Benning, Georgia. Along with the landfill gas cogeneration project at Marines Corps Logistics Base Albany, also in Georgia, the cumulative total number of DoD biogas utilization projects brought online since FY 2010 is two. Three more projects, representing all three Military Departments, are in the pipeline:

- Joint Base Elmendorf-Richardson in Anchorage, AK entered into a partnership on a landfill gas recovery project with the Municipality of Anchorage Solid Waste Services Department and the base's Utility Privatization Contractor. The project will divert landfill gas, currently being flared, to a scrubber facility located at the landfill which will purify the gas enough for use in an electric power generating plant located on the base. The power plant, designed to use either landfill gas or commercial natural gas, will initially consist of four 1.2 MW units generating a total of 4.8 MW. As the waste in the landfill continues to degrade over the course of the next five years, a fifth 1.2 MW unit will be added. The plant is anticipated to be operational in 2013, at which time it will provide approximately 23% of the base's electricity demand, as well as providing emergency power.

HIGHLIGHTS

Sub-Goals 1.2 and 1.4: Selected DoD Success Stories with Renewable Energy Generation

U.S. Air Force: Wind Energy

Two new, 1.5 MW wind turbines were installed in October 2011 at the Massachusetts Military Reservation. The new turbines, in conjunction with an existing one, will offset 93% of the energy needed for the groundwater remediation systems, savings over $1.5 million every year.

U.S. Army: Solar Parking Canopy

The Army National Guard Training Center in Sea Girt, New Jersey installed 230 kW of PV on top of a parking canopy with an area of more than 20,000 square feet. The system has an anticipated life of 30 years and will pay for itself in less than 10 years.

DON: On-Site Renewables via Private Sector Contracts

In FY 2011, under the Navy Facilities Engineering Command, four contracts were awarded to purchase electricity from renewable energy generation sources to be financed, built, and operated by private companies (with the amount of annual electric load covered by the new generation shown in parentheses):

1) 13 MW of PV at Naval Air Weapons Station China Lake (30%);
2) 1.1 MW of PV at MCAGCC 29 Palms (2.5%);
3) 1.6 MW of PV at Marine Corps Logistics Base Barstow (15%);
4) 3 MW from a generator powered by biogas from the landfill at Marine Corps Air Station (MCAS) Miramar, to be purchased by the USMC (30%).

USMC: Landfill Gas Cogeneration

In FY 2011, Marines Corps Logistics Base Albany, GA partnered with Chevron Energy Solutions to construct DON's first cogeneration plant powered with landfill gas. The 1.9 MW combined heat and power generator is LEED Silver certified. The base entered a 20-year partnership with the county government to purchase the landfill gas, over which time the base is projected to save $64 million in energy costs (for electricity as well as natural gas for steam production). The project brought the base's total renewable energy use to 22%. In addition to improved efficiency, reduced conventional energy use, and renewable energy generation, the cogeneration plant is capable of powering critical loads that are essential to supporting various Marine Corps missions worldwide. The plant can run on either landfill gas alone or a mixture with natural gas.

U.S. Army: Money-Saving Solar Runway Lights

Fort Campbell Army Airfield's new solar lighting system offers a state-of-the-art solution to enhance troop training and reduce power consumption at the same time. More than 130 solar runway edge lights, meeting Federal Aviation Administration standards, were installed at Destiny Heliport and on the installation's secondary runway. Each light contains its own individual solar PV panel and battery pack and can last five to six years , depending on use. The Army saved $2.5 million by installing the solar lights instead of conventional lighting, due not only to reduced electricity costs, but because of reduced maintenance costs due to the lack of wiring. The most important benefit, however, is that the system has a Night Vision Device mode that allows pilots to land in the same conditions they will experience when in Iraq or Afghanistan.

U.S. Air Force: Plasma Waste-to-Energy

In April 2011, a transportable plasma waste-to-energy system began operating at Hurlburt Field, FL. The system is capable of converting 11 tons of unsorted municipal solid waste per day into a gaseous fuel called syngas, consisting of a mixture of elemental gases. The syngas is used to generate electricity, and the solid slag byproduct from the process can be sold commercially. Since the system is the first of its size to be built, it is currently being tested to determine the amount of energy it is capable of generating. The developer of the Plasma Resource Recovery System technology, PyroGenesis Canada Inc., is operating and maintaining the facility during the testing period. The system can be transported to other installations, including to deployed locations overseas.

- The Marines Corp, under a contract awarded through the Navy Facilities Engineering Command in July 2011, will purchase up to 3 MW of electricity from a landfill gas generator to be built on the landfill located at Marine Corps Air Station Miramar. The biogas generator will provide 30% of the base's annual electricity load.
- The Air Force has begun the procurement process for a power purchase agreement for the Dyess AFB waste-to-energy facility, in which a vendor will design, build, own, and operate an electricity generating facility on property leased from Dyess AFB, TX, fueled from municipal solid waste and/or biomass. The Air Force anticipates purchasing the entire output of the facility, which is expected to have a capacity of four to six MW.

Efforts are underway throughout the Department to take better advantage of this source of renewable energy. ESTCP sponsored a study of landfills owned and operated by DoD to determine which are worthy of further evaluation for biogas potential. From the preliminary screening of 471 sites, 103 were deemed to have potential for sufficient methane production for energy production. The analysis of potential specifically considered the Flex Microturbine™ and did not consider economics. The Flex Microturbine uses a thermal oxidizer that reportedly allows the turbine to operate on landfill gas having far lower energy content than that normally required by landfill gas to energy systems.

The Army is evaluating the methane recovery potential at 43 open or recently closed landfills on Army installations and has requested FY 2014 funding to conduct a similar evaluation at Army owned or operated wastewater treatment plants. The landfill evaluation, which will be completed in FY 2012, will include a feasibility study of the top-ranked sites, based on methane generation potential, cost, the feasibility of methane capture, and local utility rates. The Air Force is investigating additional landfill gas recovery projects at Tinker AFB and Beale AFB.

Best Practices

Power Purchase Agreement for Large-Scale Renewable Energy – In January 2012, construction began at Naval Air Weapons Station China Lake on what will be the Navy's largest solar installation: a 13.8 MW PV array consisting of 31,680 panels. Under a 20-year power purchase agreement (PPA), a financier (an affiliate of MetLife, Inc.) purchased the solar system that a private solar company (SunPower Corp.) designed and built, and will operate and maintain. The role of the installation is to provide the land for the project and purchase electricity from it, at a rate locked in for 20 years below the current retail utility rate. The 20-year term for the PPA—the first PPA of this duration with the federal government—gives the Navy a significantly better rate than 10-year PPAs. The Navy incurs no upfront costs. The array is projected to meet approximately 30% of the installation's annual energy needs and reduce its energy costs by about $13 million over the 20-year life of the contract. The components of the solar system are shipped in pre-assembled power block kits to facilitate rapid installation on the site.

Implementation Strategies

One of the ways the Department is advancing it's use of renewable energy is by improving advanced, or "smart," microgrid technology. Advanced microgrids are a "triple play" for DoD's installations. Such systems will reduce installation energy costs on a day-to-day basis by allowing for load balancing and demand response. They will also facilitate the incorporation of renewable and other on-site energy generation. Most important, the combination of on-site renewable energy and energy storage, together with the microgrid's ability to manage local energy supply and demand, will allow an installation to shed non-essential loads and maintain mission-critical loads if the grid goes down. Also in the realm of cutting edge technology, as part of the Installation Energy Test Bed, ESTCP will demonstrate a new highly efficient solar PV technology at the 1 MW scale on two separate bases. DOE, as part of its SunShot Initiative, will provide the PV modules to the bases at no cost, and ESTCP will pay for the balance of system and its installation on the bases. The bases will get a cutting-edge solar array at a discount, and

DOE will benefit from having its chosen technology tested at scale in a real-world setting with the prospect of the military as a major customer.

The Air Force approach to renewable energy focuses on developing on-base renewable energy projects that are cost competitive. Direct funding of renewable projects through MILCON or other Air Force capital sources has rarely been cost-effective when compared to commercial utility rates because the Air Force cannot retain the benefits of REC sales, tax rebates, or incentives. Based on experience with recently installed projects, the Air Force estimates it would have to invest more than $4 billion to reach its renewable energy targets with direct funding alone. In light of the limitations of direct funding, the Air Force has chosen to focus its attention on existing authorities such as enhanced use leasing and power purchase agreements to attract private industry to develop renewable energy projects on underutilized land on Air Force installations. The Air Force anticipates that third-party investments could reach more than $1 billion over the next five years to construct on-base renewable projects, allowing the Air Force to reach its renewable energy goals while minimizing upfront funding.

The Army's renewable energy efforts will proceed on two fronts in FY 2012 and 2013: large-scale projects developed by the Energy Initiatives Task Force and smaller-scale projects initiated at installations. The Task Force is streamlining existing acquisition processes and will leverage private-sector industry capabilities to execute projects on Army installations. In summer 2012, the Task Force will publish the *U.S. Army Renewable Energy Development Guide* describing the process for developing large-scale renewable energy projects financed by the private sector. The U.S. Army Corps of Engineers, working with the Task Force, plans to issue a Multi-Award Task Order Contract Request for Proposal to acquire reliable, locally-generated wind, solar, biomass, and geothermal energy in partnership with the private sector. The awards will be in the form of power purchase agreements for electricity payments for periods generally ranging between 20 and 30 years, over which time the projects are expected to pay for themselves. For smaller-scale renewable energy systems, the Army is aggressively incorporating projects for MILCON funding, with renewable energy elements present in 195 FY 2012 – 2014 projects.

Aluminum dome to capture biogas from wastewater, Joint Base Pearl Harbor-Hickam, HI

Photo: U.S. Navy

The Secretary of the Navy set two goals for FY 2020 that are driving an increased reliance on renewable sources of energy in the Navy and Marine Corps: to meet at least half of all shore-based energy requirements with alternative sources and for half of all DON installations to be net-zero. Already the Navy meets almost 23% of its electricity needs with renewable energy. The Marines Corps is continuing to incorporate solar systems into the design and construction of buildings on its installations, as stipulated in the policy issued in FY 2010 (Engineering and Construction Bulletin No. 2010-5).

DLA does not currently have any significant renewable energy production or power purchase agreements, but the agency is in the process of developing a number of renewable energy projects that will come online in FY 2012. These include solar walls, solar integrated roofs, solar water heating, and ground source heat pumps that are projected to save 62,683 million Btu annually, with an associated cost savings of $1.38 million dollars. DLA is evaluating the feasibility of a 13 MW PV project and a 1.6 MW wind installation, and it is in the process of developing third party financing and contracting for a 1 MW PV system. It also has a wood chip biomass combined heat and power plant coming online in 2012, and a number of other projects.

WHS is reviewing responses to a Request for Information it issued in FY 2011 to determine if any private sector entities have the capabilities to support a renewable energy project on the Pentagon Reservation using third party financing. WHS is also investigating the cost-effectiveness of purchasing RECs. The ESPC that DIA will issue in 2012 for its headquarters will include an evaluation of the potential for renewable energy. Systems to be considered include solar PV (on walls and/or parking lots as well as rooftop) and a ground source heat pump. If any renewable energy is installed, DIA will purchase power from the energy service provider through a power purchase agreement, at a price competitive with grid electricity. During 2012, NGA is actively working with electricity providers and REC brokers to evaluate potential purchases of RECs.

Sub-Goal 1.3 – VEHICLE FLEETS

Performance

The Department reduced its consumption of petroleum-based fuels for its non-tactical vehicle fleet by 11.8% from the baseline year of FY 2005, meeting its planning target of a 12% reduction. Of the total fuel consumption reported for fleet vehicles, 5.8% of it was alternatives fuels.

The Department is reducing its reliance on petroleum-based vehicle fuel through various avenues:

- using smaller and more efficient vehicles,
- replacing petroleum-dedicated vehicles with alternative fuel vehicles (AFVs),
- replacing standard sized vehicles with limited-speed electric vehicles (EVs),
- exploring options for replacing heavy-duty vehicles with emerging electric-diesel hybrids,
- increasing infrastructure for electric vehicle charging and alternative fuels, and
- annually reviewing vehicle assignments in order to reduce the size of the overall fleet.

As of FY 2011, almost 28% of the Air Force light duty, non-tactical fleet consisted of hybrid electric or alternative fuel vehicles, with 942 E-85 vehicles and 477 hybrids added to the fleet in this period. At the same time, 370 Class III and IV vehicles were downsized to smaller, more efficient models. The Air Force now has 28 E-85 and 63 B-20 on-base fueling stations, with one E-85 station added in FY 2011. (B-20 is a mixture of 20% biodiesel and 80% petroleum-based diesel.) The Air Force continues to develop and use tools launched in FY 2010 to improve fleet efficiency. One is a vehicle validation tool that will support "right-sizing" its vehicle fleet by balancing mission requirements with base-specific demands and vehicle availability, emphasizing alternative fuel use, fuel-efficient hybrid technology, and reduced GHG emissions. The other is the use of radio frequency identification tags, which it is deploying on its non-tactical fleet throughout the continental United States, to more effectively track fuel consumption and monitor and reduce vehicle idling.

Photo: U.S. Army

Electric vehicle for trips on-base, Fort Bliss, TX

With the support of other private and public stakeholders, the Air Force is currently working to develop an all plug-in EV fleet at Los Angeles AFB, California. When the initiative is completed in 2012, Los Angeles AFB will be the first federal facility to replace 100% of its general purpose vehicle fleet with plug-in EVs. An ESTCP project in progress at Los Angeles AFB to develop and apply a tool to manage and optimize plug-in electric vehicle fleets is supporting this effort. The project also seeks to develop the hardware needed for DoD fleet managers to schedule charging and discharging of electric vehicles to take optimal economic advantage of demand response and ancillary services markets, while ensuring the vehicles operate in conjunction with other base electrical loads and

generation resources. Working with OSD and the other Services, the Air Force has identified 15 other potential locations where such vehicles will support the mission and improve energy security. The Air Force will use lessons learned to continue to refine the business case and operational analyses to determine where to employ EVs most effectively.

To promote the use of alternative fuels on installations, the Navy has formed partnerships with the Navy Exchange—the Navy's on-base retail operations—to provide B-20 and E-85 fuels to all parties with access to the installation's Navy Exchange fueling stations. Some Navy installations are partnering with local communities for AFV fueling or are acquiring flex-fuel vehicles with plans to locate necessary alternate fueling infrastructure in the future. Although the Naval Facilities Engineering Command (NAVFAC) and the Navy Exchange have completed several recent E-85 fueling infrastructure projects, a number of installations still lack E-85 fueling infrastructure. E-85 vehicles are the most common new AFV configuration, with very limited availability of other alternative fuel models.

In addition to the limited-speed neighborhood electric vehicles used on bases, the Navy is interested in full size EVs, and it is leasing eleven small EVs as a part of a GSA pilot. If performance and cost results from the pilot are favorable, the Navy will purchase additional full-size EVs. In anticipation of this, the Navy is developing the technical specifications, budget estimates, and contracting approach to develop the comprehensive network of level 2 chargers (240 V AC) needed by full size EVs. As part of the planning, the Navy is testing the capabilities of early commercial chargers. Due to the availability of higher solar resources, Navy sites in the Southeast have begun mounting photovoltaic panels to support off-grid charging with sustainable electricity.

The Marine Corps expanded its practice of reviewing its vehicle inventory annually for opportunities to dispose, downsize, or replace with alternative fuel vehicles. Installations consider each vehicle's acquisition method, proximity to alternative fuel, utilization, efficiency, special equipment, potential for vehicle sharing, and mission. In FY 2011, the Marines Corps Garrison Mobile Equipment (GME) made progress on the persistent issue of petroleum consumption by the recruiting fleet, whose vehicles tend toward high mileage and are often on business away from E-85 fueling infrastructure. GME worked with Headquarters Marine Corps Recruiting Command to increase the overall efficiency of its recruiting vehicle fleet, and improved recruiters' awareness of ethanol fueling stations in their areas. The fleet's petroleum consumption dropped 6.5% in FY 2011 (21.6% since FY 2008) and AFV consumption increased by over 700%.

HIGHLIGHT

U.S. Marine Corps E-85 Biofuel Success

The Marine Corps GME, in charge of non-tactical vehicles that support the day-to-day operations at Marine Corps installations, achieved a dramatic increase in E-85 use in FY 2011. Camp Lejeune increased its use of E-85 by 142% from FY 2009, and the new E-85 infrastructure installed in FY 2009 on bases in the Southwest Regional Fleet Transportation region has increased the use of E-85 by 158,382 GGE from FY 2009 through 2011. Marines Corps Base Kaneohe Bay, HI, began using its new E-85 and biodiesel fuel infrastructure in FY 2011, resulting in a 27% reduction in petroleum use.

The Army continues to use the annual GSA vehicle replacement cycle to downsize and right size its non-tactical vehicle fleet by eliminating Class IV or large vehicles (such as Suburbans and Crown Victorias), and downsizing Class III SUVs not required for missions such as law enforcement, fire, and emergency services. For FY 2011, 560 such vehicles were identified for replacement with more fuel-efficient vehicles, with only 74 approved for retention. In FY 2011, 50.2% of the Army's 48,880 sedans and light-duty trucks were alternative fuel vehicles. For vehicles leased through GSA, the Army continues to require that vehicles have the highest mileage and lowest GHG emissions available on the market, and that vehicles configured to run on E-85 (a fuel consisting of 85% denatured ethanol) utilize the fuel exclusively and are only located where E-85 is available. These efforts contributed to an 8.3% reduction in the Army's non-tactical fleet petroleum fuel consumption in FY 2011.

In FY 2011, the portion of AFVs in DLA's fleet reached 48%. The agency also increased its use of E-85 in FY 2011 by 40% over FY 2010 levels, largely by educating field activities on the requirement to increase the portion of alternative fuels consumed. DLA corrected an issue that arose when drivers stopped using E-85 because it caused vehicle check engine lights to turn on. The cause was found to be excessive idling, which when curtailed eliminated the problem. For vehicles that need to idle for mission reasons, the problem can be addressed by using gasoline for every third tank of fuel. All new vehicle acquisitions made by NSA during FY 2011 were AFVs, taking the portion of AFVs in the fleet to more than half. NSA also replaced five campus shuttle buses with buses running on AF.

Implementation Strategies

Each year the Navy replaces some conventional vehicles with hybrids, but due to limited model availability, most of these have been light duty vehicles. As new models of medium and heavy diesel hybrid trucks are emerging, in early 2011 the Navy began testing pairs of vehicles consisting of hybrid and conventional versions identical in make and model. The test is evaluating benefits of both the electric and hydraulic hybrids. To date, the multi-service project team has completed control testing at Aberdeen Proving Grounds, MD. The test trucks are currently at Naval Station San Diego and Naval Base Kitsap Bangor for real-world assessment of fuel economy, maintainability, reliability, and in-use performance. The expected completion date for the project is late 2012, including modifications and certifications of trucks to meet minimum site requirements. Other Navy approaches to reduce vehicle petroleum use are:

- the placement of AFVs where AF pumps currently exist or are planned;
- acquiring hybrid electric vehicles in cases where their use justifies the higher cost;
- replacing gasoline vehicles confined to the base with neighborhood electric vehicles, to the maximum extent practical; downsizing vehicles and the vehicle fleet wherever possible; and
- installing AF infrastructure or partner with others to install it.

The Marine Corps GME is piloting, and has plans to incorporate, an automated fuel tracking and dispensing technology that allows the fuel infrastructure to communicate with each vehicle and with the USMC's Fleet Management Information System. This technology will make data collection more accurate and allow Fleet Managers to spend more time managing fleets and less time tracking fueling records. The Marine Corps plans to reduce its inventory of non-tactical vehicles over the next few years through downsizing, disposing, pooling, and the use of public transportation.

The Army anticipates exceeding the EO 13514-mandated fossil fleet fuel reductions by FY 2016, four years ahead of the goal year (FY 2020), primarily through major changes in fleet composition (using the annual GSA vehicle replacement cycle), and minor reductions in fleet size. The Army is applying three requirements to its leased vehicles: (a) vehicles will have the highest rating for GHG emission reductions, (b) E-85 vehicles will only be located where E-85 fuel is available and all E-85 vehicles will utilize the fuel exclusively, and (c) vehicles will have the highest MPG available on the market. Where E-85 fuel is not available, existing E-85 vehicles will be replaced with low GHG-emitting vehicles and hybrids. Efforts will also continue in FY 2012 and 2013 to transition the fleet to hybrid, plug-in hybrid, and all-electric vehicles as the technology becomes economically feasible.

The Air Force is in the process of evaluating the logistical aspects of relocating AFVs to areas where the Air Force already has access to alternative fuels, and to install new alternative fuel infrastructure on-base where there is demand. The Air Force Fleet Management Plan submitted to GSA in February 2012 applies to all Air Force-owned, GSA leased vehicles and commercially leased vehicles. The plan addresses procedures to achieve the minimum, most fuel efficient, and economical to maintain inventory necessary to accomplish the mission; the number and types of vehicles owned/leased, and the purpose each vehicle serves; plans for acquiring AFVs; and vehicle sourcing decisions for vehicle acquisitions

compared to leasing vehicles through GSA or commercially. Tools such as the Logistics, Installations and Mission Support-Enterprise View and Financial Management Decision System Services are integral to the ability of the Air Force to achieve its petroleum reduction goals. The former system provides a single-source business intelligence environment that delivers information and capabilities to Air Force fleet managers, including vehicle size and mileage. The latter system uses this data, via web based business intelligence technology, to determine an optimum fleet size.

The Fleet Management Plan DLA issued in February 2012 will create a fleet Management Council to develop and execute the strategy to reduce petroleum consumption and increase the use of alternative Fuels in DLA's fleet. DLA is continuing with plans to install E-85 fuel dispensers at two DLA host sites and will, where applicable, acquire AFVs through GSA for locations where alternative fueling is available.

WHS recently developed a Pentagon Master Plan and Transportation Management Plan that identified long-term strategies (2017 to 2030) for reducing vehicle petroleum use, and it is in the process of putting in place an FY 2013 pilot project to replace one of the Pentagon Reservation circulator buses with a hybrid bus. If the pilot study shows that the benefits outweigh the costs of a hybrid bus, WHS replace all of the buses in the fleet with hybrids. In FY 2012 and 2013, WHS will develop strategies for reducing petroleum use in the largest WHS user of vehicle fuel, the fleet of the Pentagon Force Protection Agency. The goal is to have a policy or memorandum of understanding in place by the end of FY 2013. In FY 2013, the Defense Contract Management Agency (DCMA) will relocate all AFVs stationed without AF infrastructure to locations where there is infrastructure to support AFVs. By FY 2015, it plans to replace all gasoline vehicles with AFVs in those locations where there is AF infrastructure. The agency is also is the process of replacing mid-size and larger vehicles in its fleet with sub-compact or compact vehicles.

GOAL 2 Water Resources Management Improved

Goal 2 Sub-Goals

SUB-GOAL 2.1 Potable Water Consumption Intensity by Facilities Reduced by 26% from FY 2007 by FY 2020

Metric

The percent reduction relative to FY 2007 in total water consumed by DoD facilities per gross square foot of total building space. Consumption includes the loss of water after it is delivered (e.g., though leaking or malfunctioning fixtures such as toilets). A facility is defined as per EISA §432(1)(C).

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	6%	8%	10%	12%	14%	16%	18%	20%	22%	24%	26%
RESULTS	12.9%	**10.7%**									
gal/GSF	52.09	53.18									
million gal	101,824	101,328	*estimated (see narrative)*								
000 GSF	1,954,646	1,896,352									
FY 2007 Baseline	59.81 gal/GSF										
	116,748 million gal										
	1,952,056 000 GSF										

SUB-GOAL 2.2 Industrial and Irrigation Water Consumption Reduced by 20% from FY 2010 by FY

2020

Metric
The percent reduction relative to FY 2010 in total water consumed by DoD for irrigation (agricultural and/or landscaping) and industrial purposes (for industrial processes that do not require potable water).

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	*base*	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%
RESULTS	n/a	n/a	*(see narrative)*								
million gal	4,483	10,722									

SUB-GOAL 2.3 All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible

Metric
The percent of covered projects (those development and redevelopment projects of 5,000 square feet or greater) that can demonstrate with documentation that stormwater design objectives were met through practices that infiltrate, evapotranspire, and/or harvest and use the rainfall to the maximum extent technically feasible. The criterion for maximum extent technically feasible is the full employment of accepted and reasonable stormwater infiltration and reuse technologies subject to site and applicable regulatory constraints.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
RESULTS	n/a	**n/a**	*(see narrative)*								

Goal 2 Responsible OSD Office: AT&L/I&E

Sub-Goals 2.1 & 2.2 – REDUCING POTABLE WATER CONSUMPTION

Performance

The consumption of water by DoD's facilities was more than 15.4 billion gallons lower in FY 2011 than in FY 2007, a drop in water intensity of 10.7% (from 59.6 gallons per GSF to 53.2 gallons per GSF). However, the overall DoD water consumption data for FY 2011 is an estimation, pending more thorough metering of consumption. The status of potable water meter installation throughout DoD is in Table II.5. The Department is ratcheting up its commitment to water metering, with a 72% increase in the number of buildings deemed appropriate for metering over last year. For industrial and irrigation water, the lack of DoD-wide metering for this sub-set of water consumption precludes an estimate of FY 2011 progress against this sub-goal. DoD continues to collaborate with DOE to establish guidance and policy for industrial and irrigation water. DOE policies will help establish guidance for Component reporting, establish appropriate baselines, and collect data to track performance.

Table II.5. DoD Water Metering as of the End of FY 2011

Increase in Appropriate Buildings from FY 2010	% Metered in FY 2011		
	Standard	Advanced	TOTAL
72%	43%	10%	**53%**

The Army conducted intensive studying and planning to inform the way forward for improving installation water management. In FY 2011, it published Water Reuse and Wastewater Recycling at U.S. Army Installations, as well as a study on the availability of water in ten installations within the continental U.S., and one on three installations outside the Continental U.S. Also to aid planning, the Army developed Comprehensive Energy and Water Master Plans for 44 installations, providing installation-specific road maps for assessing, measuring, defining, and implementing current and future energy and water strategies and making broad project recommendations for energy and water sustainability. In April 2011, it published the Army Installation Management Water Portfolio 2011-2017, an overview of the Army's water management toolbox capabilities and a set of detailed water efficiency best management practices in 14 key areas. Finally, the Army's Net Zero Water pilot initiative was launched in FY 2011, with eight pilot installations serving as test beds for innovative water management approaches. Net Zero Water involves reducing freshwater demand through water efficiency and conservation, using alternatives to potable water, and managing stormwater through low impact development.

Low water landscaping at Fort Bliss, TX

Photo: U.S. Army

On an ongoing basis, the Navy implements energy efficiency approaches—such as low-flow plumbing fixtures, artificial turf, and plants requiring little water—in thousands of applications. Navy also continues to implement FEMP's Federal Water Efficiency Best Management Practices to the greatest extent possible, which have proven to be valuable tools in the Navy's overall water reduction strategy. The Air Force regularly conducts leak detection and repair activities, incorporates LEED design principles into new construction, and utilizes low-flow bathroom fixtures at locations across the enterprise. Similar to the Navy, the Air Force also implements FEMP's best management practices as part of its comprehensive water use reduction strategy.

In three out of four sites for which DLA is responsible for energy and water consumption (those for which it is the host), DLA has completed site surveys for water metering and put in place contracts to install smart water meters.

In FY 2011, NSA initiated a study on the feasibility of using reclaimed water from the local county wastewater treatment plant for the campus chilled water systems. The move would not only save large amounts of water, but would cost less on a per gallon basis.

Implementation Strategies

The Navy conducts energy and water evaluations for its facilities covered by EISA every four years. Based on these, it identifies potential water efficiency measures and submits them for funding. Proposed water efficiency projects are evaluated based on return on investment, legal requirements, and impact to critical infrastructure. The Navy funds and implements those that rank well, with the results tracked by periodic measurement and verification.

Like the Navy, the Marine Corps water management program uses the four-year evaluation cycle to find and repair problems and identify opportunities for improvements such as installing advanced meters, replacing plumbing fixtures with more efficient options, and increasing the use of xeriscaping. In addition to its ongoing improvement of existing facilities, another critical path for the Marine Corps is to ensure that new construction is water-efficient.

HIGHLIGHTS

Sub-Goal 2.1 and 2.2: DoD Success Stories in Reducing the Use of Potable Water

U.S. Army: Improvements with Rapid Paybacks

Tobyhanna Army Depot, PA, one of the Army's Net Zero Water pilot installations, replaced potable water with process wastewater for foam reduction in two locations at its wastewater treatment plant. With a project cost of only $1,200, and monthly savings of 300,000 gallons of potable water, the project paid for itself in just over one month. The installation also installed a water chiller to replace a single-pass cooling system in an Industrial Operations Facility. The monthly savings of more than two million gallons of potable water are expected to cover the $125,000 project costs in eight months. *(Photo: Tobyhanna Army Depot Wastewater Treatment Plant; credit: U.S. Army)*

DLA: Water Consumption Halved

In FY 2011, DLA's Defense Supply Center Richmond eliminated water storage tanks that required frequent flushing and replaced significant portions of leaking underground cast iron water pipes. Daily water consumption dropped by 51%.

U.S. Navy: Wastewater Reuse for Irrigation

Naval Air Station Jacksonville, FL constructed a new wastewater reuse pump station and installed more than 12,000 feet of pipeline to irrigate the golf course with reclaimed water rather than discharging it to the St. Johns River. This $1.9 million project avoids the discharge of 18,000 pounds of nutrients per year into the river and eliminates the need to withdraw approximately 37 million gallons per year of potable water from the Florida aquifer.

U.S. Navy: Changing Water Supply Procedures

Naval Air Station Meridian, MS, found a way to reduce the amount of water required to backwash the filters at their water processing plant by 40% by instead conducting intensive testing of water quality. The installation worked with the state of Mississippi to gain approval to use the water-saving procedure.

U.S. Air Force: Replacing Thirsty Turf

Ellsworth AFB, SD has identified approximately 50 acres of land which is growing water-dependent blue grass and is in the process of replacing it with a drought-resistant prairie grass mix that requires less irrigation. The resulting annual savings are estimated at 11 million gallons of water and $113,000 in water costs.

U.S. Navy: Fleet Readiness Center Southwest

Fleet Readiness Center Southwest in San Diego, CA installed a highly efficient sub-surface irrigation system that reduced outdoor water use by 30% to 40%. The installation also increased water efficiency at its manufacturing and painting facilities by installing a Mini-Max waterless steam cleaning system and low-water steam assist rinse and retrofitting the aircraft washing hoses to be low volume. The improvements are saving in excess of 110,000 gallons of water and industrial wastewater annually and over $151,000 per year in savings due to reduced water purchases and reduced costs to treat and dispose of industrial wastewater.

U.S. Air Force: Wastewater Reuse for Irrigation

Until FY 2011, the 47-acre golf course at Holloman AFB in New Mexico was the only portion of this desert installation that the base irrigated with potable drinking water. Then the base installed a treated wastewater reuse system to irrigate the golf course, replacing more than 70 million gallons of potable water per year, and reducing Holloman's annual water demand by 15%.

The Army will issue water awareness and water goal attainment policy memos in FY 2012 in support of the water-related sub-objectives in the FY 2012 Army Campaign Plan. The Army's water sub-objectives target: reducing potable water consumption intensity at permanent installations; reducing industrial, landscaping, and irrigation water consumption; increasing the use of alternative water sources; considering water lifecycle costs and savings in acquisition and contracting decisions; and expanding the number of water-saving technologies that are available to operational forces. The Army is developing design guidelines to implement its sustainable design and development policy that requires all new construction to reduce outdoor potable water consumption by 50% over conventional means, beginning in FY 2013. It is also collaborating with DOE's Pacific Northwest National Lab to develop an estimating tool for industrial and irrigation water use and to expand water data tracking methodologies in FY 2012. To date, the Lab has developed one Excel-based tool for estimating unmetered landscape water use and one for estimating unmetered industrial water use. At its eight Net Zero Water pilot installations, the water balance assessments will be completed in FY 2012, facilitating installation-specific roadmaps.

The Air Force achieves program efficiencies through the inclusion of water conservation and efficiency in its energy audits. It submits measures identified in the audit for funding, and vets them based on projected return on investment, legal drivers or requirements, and impact to mission and critical infrastructure. In addition to traditional potable water consumption reduction measures, the Air Force implements a variety of measures to reduce the consumption of water used for landscaping and industrial purposes. They include: xeriscaping practices that group together plants with similar watering requirements and/or utilize drought resistant native plant species; the use of more water efficient drip versus sprinkler irrigation systems; collection and use of rain water; and recycling gray water from laundry, dishwashing and bathing for use in landscaping and irrigation.

WHS is currently implementing an overall building-level metering initiative, which will install water meters throughout the Pentagon Reservation by FY 2013 and measure the majority of water used for landscaping. WHS is also planning to install meters to measure irrigation water separately, at which point it will set a new water baseline. In FY 2012 and 2013, NGA will be monitoring all the systems involving water in its new Leadership in Energy and Environment Design® (LEED) Gold main facility to ensure that their performance is optimized for potable water supply, distribution and consumption. In FY 2012, NSA will make a decision on whether to begin using reclaimed wastewater for its Maryland facility, based on the feasibility study underway, and it intends to develop a system to track the number of low-flow and regular-flow plumbing fixtures. An NSA project is underway to install 25 water meters on its cooling water towers. In 2012, DIA plans to commission a non-potable water well to provide a backup supply of industrial water in case of a loss of water pressure and to replace the use of potable water for chillers and landscaping.

Sub-Goal 2.3 – STORMWATER RUNOFF

Performance

Systems are not yet in place to definitively track compliance with this sub-goal, but due to DoD policy already in place requiring that the installation maintain the hydrology of a development site to the maximum extent possible, the Department anticipates full compliance.

FY 2011 is the first year DON has used the project management tool called "eProjects", developed by NAVFAC, to electronically track compliance with stormwater runoff and low impact development (LID) requirements in the Navy and USMC. DON is working with project managers in the field to ensure that they upload data for appropriate construction projects, as per Engineering and Construction Bulletin 2011-01. Entries into the system are in three phases: planning, design, and construction. For the planning phase, the tool indicates estimated costs for incorporating LID features; in the design phase, eProjects captures LID features incorporated into the design; and for the construction phase, project managers explain the LID features installed. Of the 21 projects that have been entered in the planning

HIGHLIGHTS

Sub-Goal 2.1 and 2.2: DoD Success Stories Reducing Stormwater Runoff

USMC: Underground Detention & Infiltration

The new Intermediate Maintenance Activity Facility being constructed at MCAS Yuma, AZ occupies 2½ acres of previously undeveloped land. To prevent stormwater runoff, the facility includes an underground detention and infiltration system that detains stormwater until it can infiltrate into the ground. The capacity of the system is large enough to handle 100% of the stormwater from a 100-year storm.

U.S. Air Force: Tool to Evaluate Options

Choosing among the various options for managing stormwater—such as vegetated swales, green roofs, and porous pavement—requires careful evaluation prior to design and construction. Personnel at the Air Force Center for Engineering and the Environment developed a tool in FY 2011 to assist base civil engineering staff in evaluating a project's pre-development and post-development hydrology parameters. The tool enables engineers to run different scenarios quickly to find the best solutions for a specific project. The tool is available to users on a ".mil" domain at: https://cs.eis.af.mil/a7cportal/eDASH/Documents/AF_Section 438_EISA2007_v1-9-1_COMPLIANCE_TOOL.xlsm.

Photo: AmySunseri

Stormwater basin under construction, Fort Huachuca, AZ

U.S. Air Force: Stormwater Pollution Prevention Plan

Andrews Air Force Base, MD, developed a Stormwater Pollution Prevention Plan in FY 2011 to ensure that redevelopment on Andrews AFB reduces stormwater runoff from the site. The plan includes water quality monitoring requirements and Best Management Practices to minimize the potential for contaminants to reach nearby surface waters. The existing Malcolm Grow Medical Center is being replaced by a new ambulatory care clinic with a smaller footprint, resulting in more green space and pervious surfaces in the developed area. Apart from this benefit, a number of other measures will result in a net decrease in runoff. The new clinic, and parking garage and parking lots with it, will be built with low impact development features such as detention basins and infiltration structures. Also, the total parking lot footprint is being reduced due to the addition of a four-story parking garage.

Photo: U.S. Army

Stormwater retention basin, Humphreys Garrison, Korea

WHS: Pervious Concrete Instead of Asphalt

WHS had originally planned to use asphalt for the parking areas, driveways, and walkways in the construction of the Pentagon Emergency Response Center. Instead the project team used pervious concrete, reducing the two-year storm peak flow rates by 44%.

phase, so far 16 have estimated the LID cost. For the design phase, 38 projects have been entered, 24 of which show LID features incorporated into their designs. Twenty-three projects have been entered in the construction phase, 12 of which indicate that LID features have been installed. A lack of LID information does not necessarily indicate an absence of LID in these projects. In some cases information is not yet available or entered in the system; for example, if the design is too preliminary to determine LID features. A few projects identified EISA technical constraints such as high groundwater, shallow bedrock, or contaminated soils and obtained waivers. Some in the construction phase did not include LID features because their construction award dates preceded the LID policy.

The Air Force issued detailed *Air Force Sustainable Design and Development Implementing Guidance* in June 2011 to establish the implementation, management, and reporting methods to comply with EISA § 438. The guidance reinforced the Air Force commitment to incorporate sustainable concepts, including low impact development and stormwater management, in the planning, programming, design, construction, and operation of 1) new projects with a footprint greater than 5,000 ft^2 and 2) existing facilities that expand their footprint by more than 5,000 ft^2. Importantly, sustainable elements necessary to comply with the requirements cannot be eliminated to save scope or cut cost. Beginning in FY 2012 and regardless of funding source, all permanent construction activity on Air Force installations in the United States and its territories on permanent Active Air Force installations, resulting in Air Force Real Property Assets, are required to comply. Compliance is also required of DoD or other federal agencies with applicable construction projects on Air Force installations. The policy applies to overseas construction activities to the extent practical, considering mission objectives and Host Nation agreements.

In Oct 2010, the Army issued an updated sustainable design and development policy requiring all master planning, project development, and project site planning to follow ASHRAE Standard 189.1 Section 5. The policy also stipulated that developments incorporate LID criteria, maximize use of the topography, and minimize site clearing and the removal of roots from soil to the greatest extent possible. While the updated Army policy does not require implementation until the FY 2013 MILCON program, the Army applied the policy to a limited number of MILCON projects in FY 2011, and will apply it to most MILCON projects in FY 2012.

As part of the development of its new LEED Gold campus in Springfield, VA, NGA implemented a re-vegetation plan involving 130 acres that re-established pre-development grades and vegetative cover conditions. Native plant species with low fertilization and irrigation requirements were used, complementing the native flora.

Implementation Strategies

A new DON LID policy is forthcoming that will modify the original DON LID policy signed in November 2007. The new policy will be applied more broadly to include all development or redevelopment projects over 5000 square feet, not only large projects. Tracking of stormwater LID compliance is a dual effort between NAVFAC and Headquarters Marine Corps (Facilities and Services Division). The Air Force recently identified the Automated Civil Engineer System Program Management platform as an existing tool to collect and assess compliance with the requirement, and during the remainder of FY 2012 it will ensure that it tracks, collects, and reports the necessary Air Force data for next year.

In FY 2012, the Army will host three formal LID training courses for 150 installation-level master planners and project designers. It also plans to incorporate LID at the project development (DD 1391) stage, using stormwater runoff calculations to drive considerations of the type and size of applicable LID features early in the planning and design process. Specific projects in FY 2012 and 2013 include daylighting a stream buried in the 1940s at Fort Meade, MD and constructing a permeable surface runway for unmanned aerial vehicles at Aberdeen Proving Ground, MD. Both projects will help protect the sensitive

Chesapeake Bay watershed. The Army is also working with the U.S. Army Corps of Engineers to develop a feasible compliance tracking mechanism for use in FY 2012.

DIA will be redeveloping a 39-acre site that currently has extensive paved area, which in the past has caused substantial erosion and other surface water runoff issues. DIA will remove much of the pavement, replace parking lots with a parking garage, and capture garage runoff in cisterns for non-potable uses. The goal is to restore the hydrology of the site to its original state before the site was originally developed. At another site, DIA will construct a three-acre parking lot in 2012 with permeable paving. WHS is developing an LID policy, with accompanying manual, which it expects to implement by the end of FY 2012. In FY 2011, a stormwater management study to target opportunities for improvement at the NSA headquarters campus found that it could reduce impervious surfaces by more than 25%. NSA plans to implement the recommendations of this study over the next several years.

Objective 2: DoD Readiness Maintained in the Face of Climate Change

GOAL 3 Greenhouse Gas Emissions Associated with DoD Operations Reduced

For those DoD GHG emissions targeted by the Department's GHG reduction commitment, DoD reduced FY 2011 emissions by more than 1.16 million metric tons (3.4%) from the FY 2008 baseline (which the Department revised in FY 2011). DoD's FY 2011 targeted emissions, taking into account third-party operated renewable energy generation, totaled 33.1 million metric tons of CO_2-equivalent emissions during FY 2011.[2] The relative contributions to DoD's FY 2011 GHG inventory from different sources are shown in Figure II.5, illustrating the significance of traditional energy sources to DoD's GHG emissions across all Scopes. Scope 1 emissions in Figure II.5 are green, Scope 2 are purple, and Scope 3 are blue.

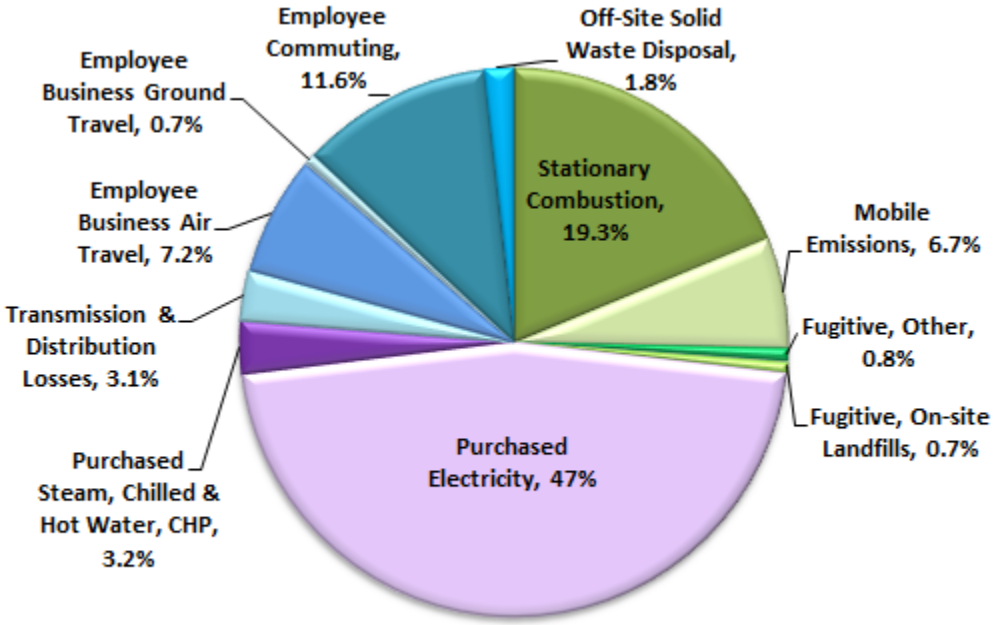


Figure II.5. FY 2011 GHG Inventory

[2] This total reflects the inclusion of Scope 3 renewable energy credit DoD receives for third-party operated renewable energy generation hosted on DoD land, for which DoD does not retain the RECs. Without this credit, target subject emissions totaled 33.8 million metric tons of CO_2-equivalent.

Goal 3 Responsible OSD Offices:

Sub-Goals 3.1 and 3.2: AT&L/I&E
Sub-Goals 3.3 and 3.4: AT&L/Personnel and Readiness

Goal 3 Sub-Goals

SUB-GOAL 3.1 Greenhouse Gas Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020, Relative to FY 2008

Metric

The percent reduction of GHG emissions from combined Scopes 1 and 2 sources from the FY 2008 baseline.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	3%	5%	7%	10%	13%	16%	19%	22%	28%	30%	34%
Results	3.6%	**4.4%**									
MMT CO_2(e)	27.012	**25.681**	[All GHG emissions in units of million metric tons (MMT) CO_2(e)]								
FY08 Baseline for FY11		26.855									
FY 08 Baseline for FY10		28.021									

SUB-GOAL 3.2 Greenhouse Gas Emissions from Scope 3 Sources Reduced 13.5% by FY 2020, Relative to FY 2008

Metric

The percent reduction of GHG emissions from Scope 3 sources from the FY 2008 baseline.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	0%	0%	1%	2%	3%	4%	5%	7%	9%	11%	13.5%
Results	+4.8%	**(0.1%)**	*including credit for renewable energy generation operated by third-parties*								
Results	(6.0%)	**(9.0%)**	*without including the credits*								
MMT CO_2(e)	7.360	**7.424**									
FY08 Baseline for FY11		7.413									
FY08 Baseline for FY10		6.940									

SUB-GOAL 3.3 30% of Eligible Employees Teleworking at Least Once Per Bi-Weekly Pay Period, on a Regular, Recurring Basis, by FY 2020

Metric

The percent of DoD employees eligible to telework who are doing so at least once per bi-weekly pay period on a regular, recurring basis. Telework can be at any approved location: home, a telework center, and/or a secure telework site meeting the additional requirements for facility construction, network security, and access control for employees needing access to classified networks. An employee's day off during a compressed work schedule cycle does not count as a telework day.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	-	10%	15%	17%	20%	23%	25%	27%	29%	30%

RESULTS	n/a	**n/a**

SUB-GOAL 3.4 Greenhouse Gas Emissions from Employee Air Travel Reduced 7% by FY 2020, Relative to FY 2011

Metric

The percent reduction of GHG emissions from air travel by DoD employees on DoD business, relative to FY 2011, as calculated from travel data captured by the Defense Travel Management Office.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	0%	0%	1%	2%	2%	3%	4%	5%	6%	7%
RESULTS	n/a	**n/a**									
MMT CO_2(e)	n/a	**2.385**	*baseline*								

Table II.6 provides results for other performance metrics pertaining to Goal 3.

Table II.6. Results for Other Metrics Pertaining to Goal 3

	FY 2008	FY 2010	FY 2011
Total Comprehensive Scope 1&2 GHG emissions, MT CO_2(e)	77,225,335	79,123,428	74,433,979
Total Comprehensive Scope 3 GHG emissions, MT CO_2(e)	7,486,491	7,166,734	8,159,246

Sub-Goal 3.1 – SCOPES 1 AND 2 GHG EMISSIONS

Performance

As shown in Table II.7, Scopes 1 and 2 emissions declined 4.4% from FY 2008 to 2011, driven by continued declines in stationary, on-site fossil fuel combustion, the use of purchased forms of energy, and mobile combustion.

Implementation Strategies

Reductions in Scopes 1 and 2 GHG emissions are mainly achieved through Goal 1: a reduced consumption of fossil fuels by facilities and vehicles, and an increased use of renewable energy.

Sub-Goal 3.2 – SCOPE 3 GHG EMISSIONS

Performance

Scope 3 emissions in FY 2011 were essentially equal to FY 2008 levels, with declining solid waste disposal and employee ground travel counteracting the effects of increased commuting and more accurate reporting of emissions from employee air travel (Table II.7). As permitted under Section 4.1.3 of the *Federal Greenhouse Gas Accounting and Reporting Guidance*, the Scope 3 total includes credits for DoD facilities hosting renewable energy installations on federal lands, where DoD does not retain the RECs. If this credit is not applied, DoD's Scope 3 emissions rose from FY 2008 to FY 2011 by 9%.

Implementation Strategies

The Department's main approach to reducing Scope 3 GHG emissions is through reduced emissions from employee commuting and air travel (Sub-Goals 3.3 and 3.4, respectively).

Table II.7. Change in DoD GHG Emissions From FY 2008 to FY 2011

Scope and Category		DoD GHG Emissions, MT $CO_2(e)$[a]			% Decrease (FY 2008 - 2011)
		FY 2011	FY 2010	FY 2008	
Scope 1	Stationary Combustion	6,402,835	6,675,076	6,734,998	
	Non-highway Vehicles, Aircraft, Ships, Equipment	1,563,140	985,176	1,735,215	
	Passenger Fleet Vehicles	640,371	677,659	728,564	
	Fugitive[b], Fluorinated Gases and Other	231,000	298,923	222,646	
	Fugitive, On-site Wastewater Treatment	6,430	6,356	6,088	
	Fugitive, On-site Landfills	255,782	1,098,382	216,438	
	Manufacturing, Industrial Process Emissions	3,776	3,324	3,401	
Scope 2	Purchased Electricity	15,740,309	15,908,249	16,349,506	
	Purchased Biomass Energy	5,357	9,815	0	
	Purchased Steam and Hot Water	1,016,069	1,764,419	858,252	
	Purchased Chilled Water	1,681	0	0	
	Purchased CHP Electricity, Steam & Hot Water	27,966	0	0	
	Reductions from Renewable Energy Use	-213,944	-415,117	0	
	Scopes 1 and 2	**25,680,773**	**27,012,262**	**26,855,109**	**4.4%**
Scope 3	Transmission & Distribution Losses[c]	1,012,183	1,037,453	1,048,500	
	Employee Business Air Travel	2,385,019	1,886,311	2,017,582	
	Employee Business Ground Travel	241,877	328,140	306,763	
	Employee Commuting	3,842,157	3,473,736	3,397,097	
	Off-site Wastewater Treatment	7,444	7,493	7,727	
	Contracted Municipal Solid Waste Disposal	593,355	621,689	635,325	
	Credit for Hosting Renewable Energy Facilities	-658,473	-747,641	0	
	Scope 3[d]	**7,423,562**	**6,607,213**	**7,412,992**	**-0.1%**
	Total Emissions	**33,104,335**	**33,619,474**	**34,268,101**	**3.4%**

[a]Metric tonnes of carbon dioxide equivalents. Does not include excluded emissions

[b]Fugitive emissions are escaped gases that cannot be directly measured, such as leaks from refrigeration systems.

[c]Losses in electricity when transported over power lines.

[d]A 9% increase in emissions from FY 2008 to 2011 when renewable energy hosting credits not included.

SUB-GOAL 3.3 – TELEWORKING

Performance

DoD is not able to report a Department-wide percentage of teleworking employees for FY 2011 because some Components do not yet have the systems in place to accurately track the number of eligible employees and/or telework participation. However, the Department has been actively making improvements that should enable DoD to report a value for FY 2013. On October 21, 2010, the Department issued DoDI 1035.01, titled Telework Policy, that establishes policy, assigns responsibilities, and prescribes procedures for implementing DoD telework programs. On April 4, 2012, DoD issued a revised DoDI 1035.01 to integrate the requirements of the Telework Enhancement Act of 2010. The revision incorporates the requirements of the Act and creates conditions for DoD to increase telework utilization to facilitate emergency preparedness; employee recruitment and retention; increased employee job satisfaction and engagement; and reduced energy use and decreased commuter miles. The Deputy Assistant Secretary of Defense, Civilian Personnel Policy is in the process of implementing a strategic communication plan to market the revised telework policy.

To ensure that the Department identifies telework eligibility for all DoD employees, in July 2011 the Department coded and activated telework eligibility in the Defense Civilian Personnel Database System. Eligibility coding at this stage was based solely on the duties of the position, with employees in eligible positions further evaluated for their eligibility to participate in telework based on performance or disciplinary action-based criteria. The position eligibility coding provided the starting point for DoD Components, who then reviewed their positions for telework eligibility and changed the system to appropriately reflect position eligibility status. Subsequently, a process was implemented where supervisors identified the individual eligibility of each of their employees to participate. As of March 2012, both supervisors and employees were able to view position telework-eligibility status in a self-service web-based application that allow employees to access and manage personnel records. These advances promote teleworking in two ways: 1) all employees eligible to telework will be aware that teleworking is an option, and 2) DoD Components will know how many of its employees are eligible to telework, providing the basis to calculate the percentage of eligible employees meeting the requirements for this sub-goal.

During FY 2011, DON expanded its telework program by developing on-line training for supervisors and employees, identifying and documenting telework eligibility for all employees, and developing a department-wide telework policy. In May 2011, the Deputy Assistant Secretary of the Navy (Civilian Human Resources) issued a fact sheet outlining information on the DON telework program and key elements of the Telework Enhancement Act of 2010. In August 2011, the DON Office of Civilian Human Resources issued a job aid to assist supervisors in determining position and person telework eligibility.

Over 73,400 Army employees were classified as telework-eligible at the end of FY 2011, and all new Army position descriptions include a telework eligibility determination. The Army is in the process of reviewing Defense Civilian Personnel Data System records to determine and code the eligibility of personnel to telework, and it is updating its telework policy to conform with the new DoDI. Because of unique requirements of the Air Force military mission, many supervisors are unable to support telework due to the need to have the employee at the worksite. The Air Force is committed, however, to maximizing employee participation in telework to the extent that mission is not disrupted or jeopardized. As of September 2011, approximately 1,100 civilian Air Force employees (about 7% of the eligible workforce) teleworked at least one day per pay period, a 1% increase from the previous year.

In September 2011, 31% of eligible DLA employees regularly teleworked at least once a week, with participation at or above 30% each month from January through September 2011. The visibility of telework was elevated by requiring each DLA activity to include a telework target in its Annual Operating Plans for FY 2012; this is expected to increase future participation. Employees of the NGA face

challenges associated with communicating classified information from alternate work locations. In FY 2011, NGA developed and began implementing a telecommuting policy, teleworking agreements, and the use of the Sensitive Web Accessible Account Network, all of which provide Secure Remote Access on its unclassified network.

In December 2011, TMA refined the telework guidance it had established in the form of an April 2010 Administrative Instruction, establishing further policy and procedures for teleworking and collecting telework statistics. Almost 13% of eligible MDA employees had signed telework agreements to telework either situationally or regularly, once a week. In FY 2012, MDA will revise the electronic Telework Agreement form so telework agreements for situational or regular teleworkers can be tracked electronically, and it will issue a data call to better define "eligible" employees (and omit those employees who routinely handle classified information or are otherwise prevented from regular teleworking).

Implementation Strategies

In July 2011, DoD's Defense Civilian Personnel Advisory Service launched an application in the Defense Civilian Personnel Data System to track DoD-wide telework eligibility among DoD's civilian personnel, by position and employee. In March 2012, telework position eligibility information became available in My Biz, the self-service feature in the system that allows employees to view information in their official personnel records. These features will allow telework eligibility information to be included in position vacancy announcements and helps to achieve greater acceptance of telework as a normal way of accomplishing work in the Department. The Department is exploring options for future automation enhancements to track and report telework. DoD will use the U.S. Office of Personnel Management annual Employee Viewpoint Survey to assess improvements in employee recruitment, retention, job satisfaction, and engagement.

The Department tracks teleworking via the work hours reported in DoD's time and attendance systems. To minimize the underreporting of telework in 2012 and 2013, DoD will use marketing strategies to remind employees to report their telework hours.

In addition to efforts at the DoD-level, many activities are underway and planned within the individual Components. DLA launched a six-month hoteling pilot in February 2012 in their DLA Energy activity to explore flexible workplace alternatives including telework. If successful, the pilot may be expanded both within DLA Energy and to other DLA organizations. In addition to marketing telework as a mission-centric tool, DLA has a number of specific initiatives planned during FY 2012 to increase awareness and acceptance of telework: hosting an Executive Telework Summit in October 2011 for senior leaders; encouraging participation in Telework Week during March 2012; publishing answers to frequently asked questions; and customizing mandatory training for delivery via DLA's Learning Management System. DIA intends to issue a revised telework program in 2012. DCMA plans to implement training for managers to ensure they understand that telework is a tool and not a hindrance to management. NGA established a pilot program with another member of the intelligence community to explore opportunities for expanding remote access to its classified information systems. It is administering a survey of employees and supervisors to calibrate NGA's teleworking program with internal policy, and it is teaming with DIA, the National Reconnaissance Office (NRO), the Office of the Director of National Intelligence, and other DoD agencies to provide increased work opportunities at alternative locations.

TMA will be promoting teleworking in three ways: 1) creating an intranet page with information on teleworking; 2) studying companies with successful teleworking programs for possible adaptation of their approaches; and 3) conducting surveys with employees who are currently teleworking to learn how to improve the program. MDA's goals for regular teleworking are 14% and 18% for FY 2012 and 2013, respectively. To reach these goals, MDA will define telework eligibility for all new positions and discuss telework options during on-board processing for new employees. MDA's plans for reducing employee

air travel, discussed above, will also support teleworking: procuring telecommunications technology and a new module for MDA's environmental awareness training that will include teleworking. MDA will use Employee Viewpoint Survey results to measure and evaluate telework outcomes. The Air Force may issue a new Instruction in FY 2012 that reflects programmatic requirements of the Telework Enhancement Act of 2010.

Sub-Goal 3.4 – EMPLOYEE AIR TRAVEL

Performance

Although FY 2011 is the base year for Sub-Goal 3.4, reported air travel emissions increased approximately 2% from FY 2010 to FY 2011 not because of increased travel, but due to improvements in data collection methods. The Defense Travel Management Office (DTMO) is using a database known as Commercial Travel Information Management Master. The calculations are based on an integrated canonical data model that incorporates data from several sources, including nearly real-time Passenger Name Records and reservation data (Travel Daily data), monthly reports of tickets issued from the DoD Commercial Travel Offices, and transaction data from the travel card vendor (Travel Card). At the time the travel report was generated last year, DTMO had not yet fully integrated into the database either the Travel Daily or travel card data. DTMO incorporated both of those during calendar year (CY) 2011, providing a more accurate view of FY 2011 air travel than the report provided for FY 2010.

The Army formalized a more rigorous screening process for business travel in an updated travel policy issued in February 2011. The policy requires the Approving Official to approve proposed travel only after determining that other forms of communicating such as teleconferencing are not available or not sufficiently effective and that the travel is essential to the mission. DLA issued a more stringent process in FY 2011 for temporary duty, requiring that all travel requests be supported with justification that a physical presence is required in lieu of alternative means such as a Secure Video Teleconference or other web-based communication. If the Approving Official rejects the justification, the employee must accomplish the mission through other means or submit a stronger justification. Single day travel is discouraged, with Approving Officials required to screen such requests more stringently.

Video Conferencing, NAS Pensacola, FL

Photo: U.S. Navy

Implementation Strategies

On March 14, 2012, the Track Four Efficiency Initiatives Decisions issued by the Secretary of Defense included mandates that all travel requests include justifications that alternate means such as video teleconferencing or other web-based communication are not sufficient to accomplish travel objectives.

DTMO is evaluating whether to use the recent Federal Travel Regulation guidance to modify the DoD travel regulations: the Joint Federal Travel Regulations (which applies to uniformed personnel) and Joint Travel Regulations (which applies to DoD civilian employees and others traveling at DoD expense). DTMO is also evaluating whether to develop an online Green Travel training course and the potential for including a session dedicated to more sustainable travel at the annual Defense Travel Seminar.

WHS is in the pre-feasibility stage of considering a policy for reducing business travel and the carbon emissions from it. It plans to conduct working groups with applicable WHS stakeholders in FY 2012 and FY 2013. The Tricare Management Activity (TMA) is tentatively planning to reduce employee travel by 20% in FY 2013, relative to FY 2011, pending completion of a review of travel data. DCMA will publish a new version of its Travel Policy in FY 2012 that will encourage employees to combine trips when possible

to reduce the need for multiple flights to a particular region. It will also explore the feasibility and benefits of using vehicles instead of flying for travel from headquarters to locations such as Philadelphia and North Carolina. The Missile Defense Agency (MDA) plans to reduce GHG emissions from air travel 2% in FY 2013 relative to 2012. To do so, in FY 2012 and 2013 MDA will plan for and procure the technology necessary to support meetings with geographically dispersed participants, such as laptops, workstations, and videoconferencing and teleconferencing capability. It will also develop a module for MDA's environmental awareness training, discussing the need to reduce air travel by employees and promoting meetings using technology.

Objective 3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution

GOAL 4 Solid Waste Minimized and Optimally Managed

Goal 4 Sub-Goals

SUB-GOAL 4.1 All DoD Components Implementing Policies by FY 2017 to Reduce the Use of Printing Paper

Metric

The number of DoD Components that: 1) have issued a policy that establishes a program for reducing the use of printing paper, where the program consists of two or more initiatives that drive the transition to a culture of reduced paper and 2) are actively implementing that program. Components counted are the Departments of the Army, Navy, and Air Force, the National Agencies, and the DoD Field Activities.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	1	6	9	13	18	24	29	29	29	29
RESULTS	3	**4**									

SUB-GOAL 4.2 50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by 2015 and Thereafter Through 2020

Metric

The percent of the total non-hazardous solid waste stream generated and collected by DoD facilities (by weight), without construction and demolition debris, that is directed away from the waste stream, for example by reuse, recycling, and/or composting.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	40%	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%
RESULTS	39%	**40%**									
Generated	2.014	2.245	million tons								
Diverted	0.777	0.909	million tons								

SUB-GOAL 4.3 60% of Construction and Demolition Debris Diverted from the Waste Stream by FY 2015, and Thereafter Through FY 2020

Metric
The percent of construction and demolition materials and debris generated and collected by DoD facilities (by weight) that is directed away from the waste stream, for example by reuse, recycling, and/or mulching.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	50%	52%	54%	56%	58%	60%	60%	60%	60%	60%	60%
RESULTS	73%	**77%**									
Generated	4.108	4.140	million tons								
Diverted	2.984	3.195	million tons								

Table II.8 provides results for other performance metrics pertaining to Goal 4.

Table II.8. Results for Other Metrics Pertaining to Goal 4

	FY 2011
% of agency, eligible electronic printing products with duplexing features in use	86%
Estimated total weight of materials managed through waste-to-energy (tons)	122,800
Number of sites or facilities with on-site or off-site composting programs	76
Estimated total weight of materials diverted to composting (tons)	38,085
% agency-operated offices/sites and offices located in multi-tenant buildings with a recycling program	N/A

Goal 4 Responsible OSD Office

Sub-Goal 4.1: OSD Director of Administration
Sub-Goals 4.2 and 4.3: AT&L/I&E

Sub-Goal 4.1 – REDUCING THE USE OF PAPER

Performance

By the end of FY 2011, the following four DoD Components had issued and are implementing policy to reduce the use of printing paper: DON, DLA, MDA, and TMA.

DLA Document Services continually seeks to reduce the use of paper throughout DoD, through the promotion of duplex printing, scanning & conversion, electronic document management, print on demand, and distribute and print approaches. As a result of its efforts, the number of impressions and hard copies produced by DLA Document Services decreased by 20% (280 million units) and the number of sheets of paper purchased decreased by 20% (134 million) in FY 2011 compared to FY 2010. Specific approaches used by DLA Document Services are below:

1) *Duplex Printing* – During FY 2011, DLA Document Services competitively placed 5,500 multi-functional devices within the DoD Components. The devices were pre-configured with duplex printing as the default, saving 41.2 million sheets of paper in FY 2011.
2) *Equipment Management Solutions* – This program of DLA Document Services makes recommendations that help the Military Services, its commands, and supporting defense agencies save significant money on their copying and printing requirements. The program's assessments drive savings by reducing the number of stand-alone devices, recommending default duplex settings, leveraging the cost advantages of multi-functional devices, creating valuable space reutilization, enhancing document production efficiencies via print optimization, and using green

initiatives to reduce energy consumption.

Scanning and Conversion – In FY 2011, DLA Document Services took aggressive actions in promoting, monitoring and tracking hard copy documents to be converted to digital format across DoD, resulting in a 77% increase in documents converted to digital format over FY 2010. In FY 2011, DLA Document Services converted 69.4 million hard copy pages to digital format, reducing storage requirements for over 34 million sheets of paper (assuming double sided printing).

3) *Print On Demand* – Print on Demand is "print what you need, as you need it" output. Total FY 2011 Print on Demand output totaled 48 million pages, a 33% increase over FY 2010, as a direct result of performing work that DLA Document Services previously outsourced and warehoused in FY 2010.

4) *Electronic Document Management* – DLA Document Services provides digital storage of original digital documents and the storage of documents scanned and converted at its field locations. Combining all of these requirements into its varying archiving systems has resulted in the digital storage of nearly 389 million pages in FY 2011. Assuming all pages would be printed double-sided, this prevents over 194 million sheets of paper from being printed and stored. DLA Document Services provides and actively markets to customers in the DoD Components multiple customized options to store, retrieve, and transmit documents in electronic format. It has invested approximately $500,000 in advanced document management technology to further enhance moving paper documents to digital format and storage for DoD.

5) *Distribute and Print* – The Distribute and Print approach prints exactly what is required at a given time by distributing document files electronically and printing to the DLA Document Services at locations closest to the end-user, which virtually eliminates the historical over-ordering of publications, estimated at approximately 10%. This saves the government shipping and warehousing costs and millions of sheets of paper normally disposed because the DoD Components ordered too many hard copies. FY 2011 Distribute and Print technical orders totaled 40.7 million pages.

In 2011, DLA Document Services distributed a set of four brochures explaining all of these services.

U.S. Naval Supply Systems Command (NAVSUP) released its first ever Enterprise-wide Energy Management Program Instruction in June 2011, which included an Electronic Stewardship plan with guidance on duplex printing. The guidance directed Activities to publish guidance that directs the use of duplex-printing on all duplication devices (printers, copiers, and multifunction and facsimile machines) to the maximum extent possible. The DON Records Management Manual is in the process of being rewritten to, among other things, describe business with the National Archives and Records Administration as based on digital documents rather than paper.

DCMA implemented new printer purchasing, printing, and security standards in FY 2011 that are projected to significantly reduce the use of paper. One aspect of the new standards is to reduce the agency's reliance on desktop and desk side printers in pursuit of a more network centric output strategy. DCMA will use acquisition strategies to purchase and place the optimum number, type, and mix of network printers across the enterprise instead of desk side printers. An important element of the strategy is Confidential Print Release, which allows network-attached printers to print confidential documents that only when released with the sender's Common Access Card and Personal Identification Number. DCMA now also requires printers be set to default to duplex printing. NGA made a number of changes in FY 2011 to reduce the reliance on paper: initiated a program to replace paper forms with electronic versions, procured scanning equipment, and eliminated automatic cover sheets on printed documents.

TMA issued an Administrative Instruction in FY 2011 for monitoring and reducing the cost of duplicating and printing. Two steps in particular are reducing the use of paper: strictly limiting the number of personal desktop printers and converting the routing and signature process for all packages, documents,

HIGHLIGHTS

Sub-Goal 4.2: Selected DoD Success Stories with Municipal Solid Waste Diversion

NSA: Being Sustainable While Being Secure

For many years NSA has been recycling official paper waste through a pulping operation to render the waste unclassified. Nearly 1,750 tons of paper is pulped each year, with the resulting pulp used to make a wide variety of paper products such as cardboard boxes, egg cartons, and gift boxes. The conversion produces pulp weighing the equivalent of three pickup trucks every day. Every ton of pulp recycled saves about two tons of wood. This process is a vital part of the NSA's ongoing mission and is a great example of incorporating sustainable processes into daily functions.

Eglin Air Force Base

Through an aggressive education and outreach program, Eglin AFB increased base recycling by 24% in FY 2011, diverting an estimated 17,000 tons of waste that would otherwise be landfilled. Successful diversion of combined municipal solid waste and C&D waste streams reduced disposal costs at the base by an estimated $3 million. By procuring recycling containers made from recycled material, the installation reduced initial setup costs for its recycling program by approximately 90%, or $5,000 per building. Eglin AFB also installed plastic bag collection points at all Defense Commissary Agency/Army and Air Force Exchange Service locations, diverting an estimated 400 pounds of plastic per month from the waste stream.

U.S. Navy: U.S. Fleet Activities Yokosuka

U.S. Fleet Activities Yokosuka, Japan realized a remarkable increase in solid waste diversion from 37% in FY 2009 to 74% in FY 2011. The achievement was possible due to improved data tracking and expanded collection of thousands of tons of recyclable material.

U.S. Marine Corps Mattress Recycling

Marine Corps Recruit Depot (MCRD) Parris Island, SC collaborates with a small business, Nine Lives, to process old mattresses into six marketable product streams: four fabric types, metal, and wood. This project saves MCRD Parris Island landfill disposal costs while extending the life of the local landfill. In FY 2011, MCRD Parris Island recycled 5,853 mattresses, diverting approximately 117 tons (or 53,000 cubic feet) of waste from the landfill.

Marines Corps Base Hawaii has a similar contract to recycle used mattresses, which it awarded in FY 2010. Prior to beginning the mattress recycling initiative, the base discarded 1,000 mattresses annually as part of the barracks' furnishings replacement process. The mattress recycling program is in its third year.

MCAGCC Twentynine Palms started a mattress recycling program in FY 2011. With 2,000 mattresses being replaced annually, MCAGCC's initiatives will keep 65 tons (or 34,400 cubic feet) out of the landfill every year, saving the installation disposal costs and extending the landfill life.

Award Winning Waste Management

Joint Base Lewis-McChord is one of the Army's eight Net Zero Waste pilot installations. In FY 2011, the base diverted 68% of its non-hazardous solid waste from disposal through a comprehensive recycling program that includes composting food waste, putting readily accessible recycling points at all events, and an Illegal Dumping Investigator. The base also requires military and tenant organizations assigned to the installation to appoint Green Procurement Officers to help the base meet their goals on Net Zero Waste, environmental management systems, and sustainability.

Photo: U.S. Army

Recycled paper bailed for resale, Camp Shelby, MS

and correspondence from paper to digital. The latter measure has already reduced the amount of paper for this function by 90%. TMA organizations following the Instruction requirements are seeing up to 30% cost savings. During 2011, NGA initiated an electronic forms program that is replacing paper forms with electronic copies. The library of the National Reconnaissance Office (NRO) switched to the web browser Safari to make e-books available to the NRO, and it reduced the number of hard copy periodical subscriptions by 50, using one way transfer to move periodicals and technical journals to recipients on secure networks.

Best Practices

Reducing Printing Costs and the Use of Paper – In FY 2011, DLA Document Services supported the Naval Nuclear Propulsion Programs by standing up two on-site Print on Demand facilities, one in Mechanicsburg, PA and one in Charleston SC. This eliminated the need for advance printing and storage of over 24 million sheets of paper, saving almost 50,000 square feet of warehouse storage space and eliminating wasteful disposal of preprinted technical manuals due to outdated versions.

Also during FY 2011, DLA Document Services worked with the Air Force Material Command to improve the Technical Order Distribute and Print Gateway system to make it more efficient and to increase participation at Air Force Customer sites. The system's automated logic produced the distributions at the closest of the 60 participating DLA Document Service sites to the end customer, often on the same Air Force Base (AFB). This resulted in an increase of 64% or 95,600 additional Technical Orders distributed throughout the system in FY 2011 over FY 2010. The Gateway was so successful, Air Force policy AFTO 00-5-3 was implemented on 1 May 2011 making it the mandatory source for reproduction and distribution of physical Technical Orders.

A recent example of DLA's Document Services Equipment Management Solutions will save nearly $1 million each year if the customer follows the recommendation of consolidating their stand-alone print devices, such as expensive inkjet and laser jet printers, into networked multi-functional devices in key work areas, and allowing them to make duplex printing the default.

Reducing Desktop Printers by Enabling Secure Printing of Confidential Documents on Network Printers
Some agencies allow employees to keep printers on their desktops out of security concerns around printing confidential documents to network printers. DCMA addresses this issue by using by Confidential Print Release, which allows network-attached printers to print confidential documents that can only be released with the sender's Common Access Card and Personal Identification Number.

Implementation Strategies

DLA Document Services ensures that all multi-function devices it places are set to print double-sided as the default. It anticipates placing 6,600 such devices in FY 2012 and approximately 7,920 in FY 2013. In FY 2012, DLA Document Services has been implementing a marketing campaign to raise awareness that their Equipment Management Services assessments yield paper and energy savings benefits, with the associated cost savings averaging 29%. DLA Document Services plans to conduct 15 Equipment Management Services assessments in FY 2012 and 18 in FY 2013. Also slated to begin in FY 2012 is the digitization (scanning, conversion, and indexing) of millions of Army classified paper documents. DLA Document Services is in the process of completing a needs assessment for the records management department at Travis AFB to digitize and store over 5 million pages and digitize their records management moving forward. DLA Document Services invested approximately $500,000 to acquire advanced document management technology in FY 2012 to further enhance its ability to convert paper documents into digital format and storage for DoD in FY 2012 and 2013. Based on historical trends, DLA Document Services expects hardcopy to digital conversion to increase by at least 25% annually over the next five years. It expects Distribute and Print Technical Orders to increase by 31% in FY 2012 relative to FY 2011.

HIGHLIGHTS

Sub-Goal 4.3: Selected DoD Success Stories with Construction and Demolition Debris

U.S. Marine Corps: Increasing Diversion via the Acquisition Process

MCAS Yuma has achieved success in C&D diversion—85% in FY 2011—by addressing the issue early in the acquisition phases of construction projects. At the request of the installation, NAVFAC Southwest incorporated into contract requirements cost-effective and innovative methods to reuse or divert C&D debris from landfills. The requirements apply to all contractors, vendors, and suppliers. Most of MCAS Yuma's C&D debris is concrete and asphalt from things like foundations, curbs and gutters, roads, highways, and airport runways. The installation crushes this debris and re-uses it for applications such as foundations for buildings and roadways, clean fill, landscaping, and the reinforcement of stormwater retention basins. MCAS Yuma has also processed and reused asphalt as aggregate base course for roadways and access roads on the main station and training ranges.

U.S. Air Force: Recycling and Repurposing

Shaw AFB demolished military family housing in FY 2011, which resulted in the removal of over 44,000 tons of material. More than 80% of it was recycled, including 33,901 tons of concrete, 95 tons of metal and 2,250 tons of asphalt. Rather than being discarded, Shaw found new homes for playground equipment, gazebos, a bus stop and street lamps.

Joint Base Lewis-McChord

Joint Base Lewis-McChord is one of the Army's eight Net Zero Waste pilot installations. The base is a leader in diverting C&D debris from disposal. It collects and stockpiles waste concrete and asphalt generated from in-house projects, then reclaims the material to provide high-quality aggregate to Department of Transportation specifications for other projects on the base. The cost of this reclaimed material is generally around half the cost of new crushed rock and aggregate, and it eliminates the costs and pollution associated with off-site disposal of the C&D debris and transporting virgin material from the source.

U.S. Navy: Finding Uses for Debris

A number of Navy installations accomplished notable diversion rates for their C&D debris in FY 2011 by identifying high value uses for it.

- The C&D Recycling Program of NWS Seal Beach and Detachments Fallbrook and Norco achieved a disposal cost avoidance of $141,214, by researching the regional recycling market and raising awareness among contractors who may have been unaware of avenues for construction debris reuse and recycling.
- Naval Support Facility, Diego Garcia diverted 1,181 tons of clean C&D debris by using it as landfill cover rather than disposing of it in the landfill itself. The installation mixed the debris with pulverized recycled glass and clean sandblasting grit. This not only saved landfill space and reduced the cost of importing fill material, it also reduced the risk of inadvertently importing unwanted, non-native species that might be harbored in imported fill.
- U.S. Fleet Activities Yokosuka, Japan accomplished a 91% diversion rate for its C&D debris due in large part to using local Japanese recycling facilities for material that could not be recycled through the installation Qualified Recycling Program and by scrutinizing the contracting process to ensure the tracking and recycling of waste.

U.S. Air Force: Roof Shingles to Parking Lot

When hailstorms damaged the roofs on several homes in the Peterson AFB area, the shingles were ground up and added to recycled concrete and used to repave a parking lot. The existing parking lot was milled up, with 30% of the millings mixed with recycled concrete to provide a foundation for the pavement. The remainder was transferred to the Peterson AFB recycle yard to be used for other projects on base. The base also demolished an aging commissary, repurposing more than 550 tons of steel and using the concrete slab as backfill, providing a stable surface for future projects on the site.

The Army's policy to promote a reduction in the use of paper will be issued in FY 2012 in the form of an update to Army Regulation (AR) 25-1, *Army Knowledge Management and Information Technology*. Many Army organizations (including Secretariat, Army Staff, and Command offices) have implemented digital staff action systems and electronic filing systems to eliminate paper systems. Most Army organizations have replaced, or are in the process of replacing, older printers with duplex-capable units and have set the default to dual-sided printing.

WHS is developing a green IT policy and program that it expects to implement by the end of FY 2013. The paper reduction elements of it will be to require IT groups to set all existing capable printers to print duplex by default and to require new printers to have duplex printing capabilities and be set to duplex printing as the default. Both TMA and MDA have issued and are implementing policies to reduce the use of printing paper. For FY 2012, TMA set a goal to reduce printing costs by 20% from FY 2011. MDA will determine its FY 2011 baseline for paper use, and it plans to reduce use by 5% in FY 2012 and 7% in FY 2013, relative to the FY 2011 baseline.

Sub-Goals 4.2 & 4.3 – INCREASING SOLID WASTE DIVERSION

Performance

During FY 2011, DoD diverted 40% of its non-hazardous solid waste away from the waste stream, and 77% of its construction and demolition (C&D) debris. Through the Department's solid waste diversion program, it avoided $148 million in disposal costs. In FY 2011, DoD continued development of the DoD Instruction for integrated solid waste management (ISWM). This Instruction will establish DoD-wide policy, assign responsibilities, and prescribe procedures for diverting solid waste. The Instruction specifically provides guidance for managing installation Qualified Recycling Programs. DoD continued to provide training for recycling managers in FY 2011.

Figure II.6. Army Net Zero Hierarchy

The Army launched its Net Zero Waste Initiative in FY 2011 and identified eight installations to serve as pilot test beds for innovative waste avoidance, reuse, and recycling approaches. The initiative establishes a waste management hierarchy that places the greatest emphasis on avoiding the creation of waste, then seeks to reuse, re-purpose, and recycle, with the last option being disposal via waste-to-energy or other non-landfill disposal options where feasible and cost-effective (Figure II.6). The Army is conducting material flow analyses at six of the pilot installations to identify major waste generators, their procurement streams, and major purchasers. They will use information to identify opportunities for improved procurement practices and additional materials that can be re-purposed, recycled, and composted. The Army will also evaluate potential technologies for energy recovery from waste. They will synthesize this information into a Net Zero Waste roadmap for each of the six installations, which will also serve as models for all Army installations. In addition to planning efforts, the Army has already achieved some concrete results: four pilots have expanded end-of-life furniture donations; five have improved practices around food waste; and two are working on modifying solid waste services contracts to incentivize recycling.

During FY 2011, the Navy conducted an in-depth study of its Qualified Recycling Programs to determine whether they are meeting legal requirements for recycling and to assess their role in the Navy's ISWM programs. The Navy is in the process of reviewing the findings and recommendations to inform policy improvements to increase diversion. The study heavily influenced revisions to the ISWM portions of the draft revision of OPNAV Instruction 5090.1C, "Environmental Readiness Program Manual", scheduled for release in FY 2013. The June 2011 Energy Management Program Instruction issued by NAVSUP

directs each Activity to formalize a recycling program for printer toner cartridges and promulgate the procedures developed command-wide. To ensure that contractors handle C&D debris properly, NAVFAC has established requirements for contractor reporting through the Unified Facilities Guide Specification "Construction and Demolition Waste Management". Contracts must include the requirement to establish plans for meeting waste management and demolition requirements and to submit the results to the project contracting officer.

Best Practices

Successful Approaches to C&D Diversion

DoD diverted 77% of C&D debris from disposal in FY 2011. This success was due to some recurring approaches across the Department, suitable for adoption throughout DoD and the federal government. One proven approach was to write the requirements for cost-effective and innovative C&D debris diversion into the contracts for construction projects and make the manufacturer apply to all contractors, vendors, and suppliers involved. Another winning approach for diverting large portions of C&D debris away from disposal—which DoD repeatedly demonstrated in FY 2011—is to find high value uses for it. In some cases this involved market research, reaching out to local recycling facilities, and raising awareness among contractors of ways they can make use of recycled or repurposed debris. The most common way of repurposing C&D materials in DoD is to use crushed concrete and asphalt for building materials. Installations across all four Military Services regularly reuse crushed concrete and asphalt from demolitions for a wide variety of projects, including foundations for buildings and pavement, curbs and gutters, roads and highways, airport runways, clean fill, landscaping, and stormwater retention basins. For example, Fairchild AFB recycled an estimated 90,000 tons of concrete, 106,500 tons of asphalt, and 125 tons of metal as part of its recent runway reconstruction project. The base donated the balance of the concrete not used in the new runway to the local community, where they expect the community to re-use it as road foundation material. This practice is not limited to concrete and asphalt: Peterson AFB mixed in milled roof shingles with recycled concrete to make the foundation for new parking lot pavement.

Implementation Strategies

In FY 2012, DoD will begin the formal review to finalize the Instruction for ISWM. DoD plans to review and refine its solid waste diversion metric to consider tracking material sent to composting and waste to energy facilities. DoD will also conduct a course review in FY 2012 of the Qualified Recycling Program Management Training class hosted by the Air Force.

Photo: U.S. Army

In FY 2012, the Air Force will review installation solid waste management programs to identify issues associated with performance measures and targets. One of the top priorities is to provide guidance on solid waste reporting to enable installations to better define economically feasible measures and their operating costs. The Air Force can then determine if and how the program is cost effective and make an informed business case analysis on how to improve the ISWM program. Also in FY 2012, the Air Force plans to issue updated policies to improve efficiencies through pollution prevention and waste reduction and to achieve a "net zero" posture for Air Force installation water, energy, and solid waste.

The Army plans to issue updated solid waste management guidance in FY 2012 to improve its solid waste diversion performance. The Net Zero Waste pilots will complete the material flow surveys in FY 2012, with the information consolidated into installation-specific roadmaps and success stories and lessons learned widely distributed to all Army installations. Opportunities for improved procurement practices are expected to include elimination of packaging materials, procurement of products with higher recyclable content, re-purposing of materials, expanded recycling and composting, and technologies for energy recovery from the waste stream.

In FY 2012, the Navy will develop and implement a plan of action and milestones to address the findings and recommendations of the FY 2011 ISWM study (see Status section). Potential actions include establishing a Navy working group on ISWM, revising the Navy's Qualified Recycling Program guide, and updating methods and guidance for collection of ISWM data.

The Marine Corps is planning to implement several initiatives to support installation efforts to increase diversion of solid waste:

- Periodically publish a newsletter to engage the installation solid waste community in discussions to increase awareness of diversion goals, current and future initiatives, and success stories.
- Conduct a review of installation solid waste management plans to identify areas for improvement, as well as successful initiatives that can be shared among installations.
- Survey a representative set of installations to identify areas where Headquarters Marine Corps can provide support by issuing policy or guidance to help improve diversion.

DLA plans to hold contractors accountable for the contract requirements to collect C&D debris data and provide these data monthly to the contracting representative. In the past this has not been done rigorously, making complete data difficult to obtain at the end of each year. In the future, DLA will collect data in a standard format throughout the year. DLA's field activities will continue to work with the contracting officer representatives to include reuse and recycling in installation contracts. Where possible, installations will consider the contractor 's recycling procedures and successes during the selection process.

GOAL 5 The Use and Release of Chemicals of Environmental Concern Minimized

Goal 5 Sub-Goals

SUB-GOAL 5.1 Onsite Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% from CY 2006 by FY 2020

Metric

The toxic chemicals released into the environment and transferred offsite (in total pounds), as a percentage of the CY 2006 baseline. The chemicals reported are the sum of releases reported on EPA Form R Part II from: 1) Section 5 (Quantity of the Toxic Chemical Entering Each Environmental Medium Onsite), 2) Section 6.1 (Discharges to Publicly Owned Treatment Works, and 3) Section 6.2 (Transfers to Other Off-Site Locations) for disposal and treatment. This sub-goal does not include releases and off-site transfers from operational range activities. DoD toxic chemical reporting to EPA is done by calendar year, so fiscal year reporting on this sub-goal corresponds to data for the previous calendar year (e.g., FY 2012 reporting is CY 2011 data).

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-					5%			10%		15%
RESULTS	2.8%	**2.5%**									

pounds	20126484	20198710
CY 2006 Baseline		20710301

SUB-GOAL 5.2 100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner

Metric

The percent of excess or surplus DoD electronic products disposed of in an environmentally sound manner, where environmentally sound is either:

- donating to a charitable cause;
- using a manufacturer's take-back or trade-in service; or
- trading-in, recycling (including refurbishment and resale), or disposal through a facility that is fully licensed for treatment and disposal and in a manner consistent with the EPA guide titled "Plug-In to eCycling: Guidelines for Materials Management" (http://www.epa.gov/osw/partnerships/plugin/pdf/guide.pdf).

Electronic products are defined as computers (desktops and laptops), monitors, personal digital assistants, phones, and televisions.

Annual Planning Targets and Results

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
RESULTS	100%	**100%**								

SUB-GOAL 5.3 100% of DoD Personnel and Contractors Who Apply Pesticides Are Properly Certified

Metric

Percent of personnel who applied pesticides on DoD installations during the fiscal year who were properly certified. Direct hire employees, certified in accordance with DoD 4150.07-M, volume 1, have a maximum of two years to become certified after initial employment. Contracted employees shall have appropriate State or host-nation certification in the appropriate categories at the time the contract is effective. These certifications are in accordance with Environmental Protection Agency rules and regulations and are accepted as valid certifications.

Annual Planning Targets and Results

Fiscal year	2010	2011	2013	2014	2015	2016	2017	2018	2019	2020
Targets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
RESULTS	99.4%	**99.2%**								

SUB-GOAL 5.4 All DoD Installations Have Integrated Pest Management Plans Prepared, Reviewed, and Updated Annually by Pest Management Professionals

Metric

The percent of DoD installations that maintained integrated pest management plans that a DoD-certified pest management consultant and/or the installation pest management coordinator prepared, reviewed and updated annually. These plans describe how the installation will prevent, manage, and control animal and plant pests while following the principles of integrated pest management and federal, state, and local laws. The plans are generated by the installation, are updated annually, and are reviewed and approved by the respective Military Department senior pest management professional(s).

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
RESULTS	84.6%	**90.2%**									

Goal 5 Responsible OSD Offices

Sub-Goal 5.1: AT&L/I&E
Sub-Goal 5.2: DLA
Sub-Goal 5.3 and 5.4: Armed Forces Pest Management Board (AFPMB)

Sub-Goal 5.1 – CHEMICAL USE, RELEASES AND TRANSFERS

Performance

DoD decreased toxic chemical releases, as defined by Sub-Goal 5.1, 2.5% in CY 2010, compared to the CY 2006 baseline. The Department has continued its work to identify and certify more benign materials and chemical processes and to get them approved under military specifications and technical orders. For example, in FY 2011 DoD's joint committee on green procurement approved a "green" designation for flares that do not contain perchlorate and made the official request to DLA to make an environmentally-preferred designation for perchlorate-free safety signal devices. DLA added the corresponding environmental attribute code for non-perchlorate road flare alternatives to the Federal Logistics Information System Procedures Manual (Table 194), DoD 4100-39-M. In April 2011, OSD made available an online training course it designed on selecting inherently more benign chemicals and materials.

Photo: U.S. Army

Helicopter coating without hexavalent chromium, Fort Hood, TX

In FY 2011, DON started revising OPNAV Instruction 5090.1C, "Environmental Readiness Program Manual", to include policies to increase the accuracy and reliability of TRI data reported. The Air Force Center for Engineering and the Environment issued a Broad Agency Announcement to identify cost-effective technologies or methodologies to further reduce Air Force releases and transfer of toxic chemicals to the environment.

The Army's chemical reduction targets for FY 2013 include 15% reductions in both trichloroethylene and methylene chloride. One installation, Anniston Army Depot, accounts for 94% of the Army's total use of methylene chloride and 86% of the Army's total use of trichloroethylene. In FY 2011, Anniston began replacing paint strippers containing methylene chloride with an alternative free of the chemical, and it anticipates nearly eliminating it in FY 2012. Through process modifications and identification and use of alternative cleaning technologies and substances, Anniston's trichloroethylene reduction to date is 83%. FY 2012 and 2013 efforts will focus on right sizing all remaining processes still reliant on trichloroethylene. More details are in the success story below.

In April 2012, the Air Force issued its *Air Force Policy on Achieving Efficiencies through Pollution Prevention and Waste*, to further incorporate pollution prevention into the Air Force EMS. The policy builds off of Air Force policy on environmental management systems (EMSs), and directs commanders to utilize the standardized EMS aspect/impact identification methodology to identify and manage daily operations that generate waste and pollution, and use the pollution prevention hierarchy as a guide to select

implementation options. To facilitate and standardize environmental efforts across the organization, in 2010 the Air Force began implementing eDASH, a web-based solution for creating and storing documents pertaining to the environment and sustainability, providing transparency to all levels of management. The Air Force expects eDASH to be fully implemented across the organization by the end of FY 2012. Specific to TRI, the Air Force regularly reviews TRI releases to identify potential chemicals, processes, and installations where reduction opportunities exist. This process has allowed the Air Force to achieve significant reductions during FY 2011 in the use of hexavalent chromium, through the use of alternative conversion coatings (a 47.5% reduction since 2003), and in the use of HCFC-225g solvent for oxygen lines (32% less than 2008).

Implementation Strategies

Beryllium is a critical, strategic material for DoD, yet it is also toxic. In FY 2012, the Department is initiating a series of efforts aimed at improving beryllium risk management and realizing the potential costs savings from collecting and recycling beryllium. The work will improve DoD's understanding of current end-of-life practices for beryllium so that the Department can correct any weaknesses in the management of beryllium-containing materials throughout their life cycle. DoD will identify gaps in existing policies and procedures and investigate ways to ensure full utilization of existing beryllium recovery and recycling facilities. If needed, the Department will develop new or revised policies or procedures to ensure the capture of materials containing beryllium. In addition, four new projects funded by SERDP/ESTCP are underway to design and develop materials capable of replacing copper-beryllium and aluminum-beryllium alloys currently used in military weapons systems. The alternative materials must meet all of the performance requirements associated with the current alloys and have significantly reduced toxicity.

In November 2011, DoD proposed to amend the final rule it issued in May 2010, which amended the Defense Federal Acquisition Regulation Supplement (DFARS) on the use of materials containing hexavalent chromium. The proposed amendment seeks to clarify the applicability of the rule to commercial items containing hexavalent chromium, including for commercial subcontracts under a noncommercial prime contract. DoD posted the proposed amendment on the Federal Register for comments, due in January 2012.

The Air Force Center for Engineering and the Environment and Air Force Research Laboratory will continue to identify opportunities to demonstrate and validate innovative, sustainable, and cost-effective technologies and processes to reduce the use and release of toxic chemicals to the environment. Their focus in FY 2012 is expected to be on reducing the use and release of hazardous organic solvents and coatings associated with de-painting and surface coating operations, and the use and release of chromium, cadmium, and other inorganic materials associated with maintaining weapon systems. The Air Force is on track to eliminate installed lead tire weights in FY 2012.

While not under the purview of this SSPP, the Air Force will continue working in FY 2012 to reduce emissions of sulfur hexafluoride (SF_6) associated with the operation of the E-3 airborne warning and control system. The Air Force expects to continue evaluating methods for minimizing system leaks and initiate the steps necessary to institutionalize the recovery and reuse of SF_6 from the E-3. Once the Air Force is assured

Wheel washing system prevents release of hazardous waste and reuses water, Altus AFB, OK

Photo: U.S. Air Force

HIGHLIGHTS

Goal 5: DoD Success Stories Reducing Chemicals of Environmental Concern

U.S. Army: Anniston Army Depot

In FY 2010, Anniston Army Depot, AL, identified and tested three potential paint strippers that do not contain methylene chloride. Based on the testing, in FY 2011 Anniston began replacing the paint stripper containing methylene chloride with the best alternative, resulting in a 35% reduction in methylene chloride (nearly 43 tons). The switch also reduced annual operating costs by one-third. Anniston expects to eliminate nearly all use of the chemical by FY 2012. Since most of the Army's use of methylene chloride occurs at Anniston, this is a major achievement for the Army as a whole.

The Depot's work to reduce trichloroethylene, a cleaner for gun tubes and other system components, is also bearing fruit. Since CY 2007 (the baseline reporting year for TRI data), Anniston reduced its use by 83% (nearly 50 tons) in three years. Anniston achieved this by improving processes, identifying alternative substances, and cleaning technologies and 'right sizing' remaining processes still reliant on trichloroethylene. Work is continuing to identify and further improve alternatives.

U.S. Navy: Electronics Recycling Events

Naval Base San Diego hosted its seventh Electronic Waste Recycling Event in November 2011, enabling 35 Navy commands to take advantage of the recycling opportunity to get rid of old appliances and electronic waste. Commands turned in four and half tons of appliances and 14 tons of electronic waste—valued at more than $200,000—which was properly recycled or resold. "E-Waste" Recycling Events are a proven approach for the base. It has hosted seven so far in the past two years and so far the events have pulled in more than 87 tons of electronics and 30 tons of appliances for recycling and resale, saving the taxpayers approximately $500,000 in disposal costs.

U.S. Air Force: Reduced SF_6 Emissions from the E-3

In FY 2011, the Air Force evaluated various operating procedures on the E-3 airborne warning and control system and found that modification of the procedures could reduce SF6 emissions without compromising the mission. Crews now wait until the aircraft reaches an altitude of 20,000 feet before turning on the radar, an action that reduces the amount of gas typically vented during climb out by approximately 50%.

U.S. Air Force Academy Electronics Recycling

Each year from November through January, the Air Force Academy opens its electronic recycling centers every Wednesday and Thursday from 8 a.m. to 3 p.m. for anyone who has access to the Academy grounds to drop off electronics. Recyclable items include personal computers and components, televisions, DVD and CD players, stereos and speakers. Over the past five years, the Academy has recycled more than 20 tons of electronics.

U.S. Army: Protecting Soldier Health and the Environment

The military uses simulation devices to prepare Soldiers, Sailors, Marines, and Airmen for the rigors of combat by simulating the stress and confusion of hand grenade and artillery explosions. Perchlorate is a common component of some of these devices, generating the "the flash, bang, and whistle" effects of the simulators. However, scientists have linked perchlorate to thyroid problems and it can contaminate groundwater. The Army Research, Development and Engineering Command Perchlorate Replacement Team successfully developed an alternative mixture consisting of black powder, aluminum, and silica sand. Going forward, the M115A2 ground burst projectile simulator and the M116A1 hand grenade simulator will be produced without perchlorate. Transitioning to a new energetic composition for simulation munitions is an unprecedented advance and one that DoD can leverage in dozens of other weapons systems.

E-3 airborne warning and control system taking off

Photo: U.S. Air Force

that recycled SF_6 is suitable for use in the E-3, it will identify appropriate SF_6 gas- reclaiming cart specifications for this purpose, incorporate the recovery and reuse procedures into the technical specifications for the E-3, and acquire and field the carts.

During FY 2012, the Navy will emphasize integration of pollution prevention plans (including efforts to reduce TRI releases) into EMS programs at the installation level. Both efforts will be accomplished via policy changes in the revised Environmental Readiness Program Manual, the update to OPNAV Instruction 5090.1C, scheduled for release in FY 2013. As it does every year, the Navy will review past releases to identify potential chemicals, processes, and installations where reduction opportunities exist. The review results inform the research efforts of the Navy's Environmental Sustainability Development to Integration program, in cooperation with ESTCP and the Joint Services Solvents Substitution team. Also, the Navy is moving toward a more regionalized approach to hazardous materials management, including increased reliance on third-party logistics solutions where a contractor owns the Navy's hazardous material inventory until it is requisitioned for use by a unit or shop. This greatly reduces the amount of hazardous materials owned by the Navy and consequently the amount of hazardous waste generated due to shelf-life expiration. To reduce the amount of nitrate compounds released from Navy wastewater treatment plants, the Navy is upgrading several plants.

The Marines Corps will reduce the use and release of chemicals of environmental concern by continuing to purchase sustainable materials and implement its Authorized Use List policy which prohibits installations from purchasing or using hazardous materials that are not found on an approved list. It will also increase the tracking and visibility of hazardous materials.

Sub-Goal 5.2 – ELECTRONICS DISPOSITION

Performance

The Department has long had a rigorous system in place to dispose of excess or surplus electronic products in an environmentally sound manner, either donating to a charitable cause; using a manufacturer's take-back or trade-in service; or trading-in, recycling, or disposing through a facility that is fully licensed for treatment and disposal. The vast majority of DoD surplus or excess electronics pass through DLA Disposition Services, ensuring application of environmentally sound and best practices to the handling of electronics equipment at the end of its useful life in the Department. Some DoD Components, however, such as DON, USAF, NGO and NGA, use DLA Disposition Services most of the time but do not in certain cases, where: electronics components potentially contain classified material; DLA Disposition Services is unable to accept items because they are damaged or cannot be verified as government-owned; or the cost of shipping items to a DLA Disposition Services site exceeds the value of the items. In such cases the waste is processed through a company certified to properly handle the waste, including recycling and harvesting precious metals. In the case of NSA, all computer components that can store or potentially store classified data are disposed internally through mechanical destruction (shredding) and the materials separated and recycled. All other NSA electronic equipment is disposed of through DLA.

DLA Disposition Services continued the disposition of surplus electronics through various reutilization, transfer, donation, sales, and ultimate disposal programs. In FY 2011, it identified goals designed to improve quality assurance of the electronics disposition process. These include:

- Mapping out the excess electronic asset and electronic waste disposition process and defining the downstream movement of these items.
- Establishing an audit protocol specific to electronic waste for use by contract auditors and DLA personnel.
- Identifying a practical method to improve tracking and data reporting on electronics disposition.
- Identifying a disposal or recycling solution for Electron Tubes.

- Enhancing electronic scrap subject matter expertise.
- Improving the downstream due diligence process for electronic scrap and incorporating this into internal operating procedures.

DLA Disposition Services strengthened its oversight of the electronics demanufacturing process in FY 2011 by tightening electronics demanufacturing contract evaluation factors, auditing multiple demanufacturing locations, and adding an environmental protection specialist with extensive private sector electronics recycling experience. In the procurement of its follow-on demanufacturing contract for military electronics, for the first time DLA considered a bidder's status as an e-Steward or Responsible Recycling certified entity in the evaluation criteria. DLA also awarded a contract in FY 2011 for a third party auditor to evaluate the electronics demanufacturing process at two locations. The audits completed in the first quarter of FY 2012 used the Federal Electronics Challenge program "On-Site Review of Electronics Recycling Facility" work sheet and the Responsible Recycling program "Checklist for Use with the R2 Practices" worksheet.

DLA Troop Support manages DoD's Precious Metals Recovery Program. DoD defines precious metals as gold, silver, and the platinum family metals such as palladium, rhodium, iridium, osmium and ruthenium. All items and material bearing precious metals, including regulated hazardous items or materials, are turned in to one of DLA Disposition Services field office locations. So far in FY 2012, the program is depositing precious metals at a current market value of $1.6 million per month. DoD recovered $14.9 million in precious metals in FY 2011. After subtracting the $1.1 million in costs to operate the precious metals recovery program, taxpayers saved almost $14 million as a result. Over the last 30 years, the program has saved taxpayers nearly $300 million.

The Department continues to participate fully in the ongoing Interagency Task Force on Electronics Stewardship and Federal Electronics Stewardship Workgroup to ensure the implementation and documentation of the latest electronics goals and best practices.

Implementation Strategies

The Navy is updating its integrated solid waste management policies in OPNAV Instruction 5090.1C, to be released in FY 2013, to include specific guidance regarding disposal of electronic products. In addition, WHS has a process and contract in place to dispose of electronics through DLA Disposition Services, but a compliance audit found that the process was not always followed by WHS. Efforts are currently underway as part of a larger Green IT initiative to ensure proper collection and disposal of all electronic products through DLA. As part of the Green IT program, WHS aims to record and report metrics on electronics disposal and achieve a 100% disposal rate through DLA.

Sub-Goals 5.3 & 5.4 – PESTICIDES

Performance

To help ensure that individuals apply pesticides only when absolutely necessary and do so safely and effectively, DoD requires the individuals applying pesticides on its installations to be appropriately certified. The overall rate for EPA certification of DoD applicators and its contract personnel in FY 2011 was 99.2% (3006 out of 3029). Due to constant turnover in personnel, the Department is unlikely to achieve a 100% certification rate. However, under EPA guidelines, DoD's uncertified personnel may apply pesticides as long as they are under the direct supervision of someone who is appropriately certified. In addition, those uncertified personnel have a two-year window to achieve the required certification; thus far, none of the reported uncertified applicators have exceeded that two-year window.

The Department updated the Measures of Merit in DoD instruction 4150.07 for 2011 and the goal of DoD installations having Pest Management Plans (PMPs) prepared, reviewed and updated annually by Senior

Pest Management Professionals remains in place. Approval rates for plans are reported up the chains of command of the respective Services and DLA. An annual DoD data call forwards this information to the AFPMB, where AFPMB consolidates it into a single report. The Department initiated this metric in 1993, when just over 50% of DoD installations had such PMPs in place. For 2011, the percentage of installations having approved plans was 90.2% (416 out of 461). Installation PMPs are valid for five years and all installations have such plans in place. However, installations must update and review these plans annually. It is this annual requirement that continues to be the most difficult to achieve because the operational tempo in support of overseas contingency operations continues to limit the capability of installations and headquarters to review those annual updates. Because of these circumstances, the likelihood of DoD achieving its goal of 100% over the course of the next several years is low.

In its efforts to control pests (such as insects, ticks, rodents, weeds, and fungi) that impact its personnel, facilities, and materiel, the Department closely adheres to the principal of Integrated Pest Management: effectively combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks. Applying pesticides is only one tool that the Department uses and DoD applies them only after careful analyses ensure that they are the best method. The DoD Components actively monitor and report their pesticide usage on an annual basis. Application rates today continue to be approximately half the reported amount in 1993, and 2011 usage dropped by 15,000 pounds from the amount reported in 2010. While DoD continues to work at minimizing the amount of pesticides it uses, invasive species control remains a significant issue because these situations often require quick, safe, and effective measures and pesticides often end up being the weapon of choice.

DLA formally wrote EPA's "25b" minimum risk pesticides into each DLA installation Integrated Pest Management Plan in FY 2011. Products meeting paragraph 25b requirements are generally regarded as safe by EPA.

Implementation Strategies

A DoD data call forwards the numbers of applicators certified by the Components annually to the AFPMB. AFPMB then collects and provides the data to the EPA and other DoD offices as required. Because it is critical that the personnel who apply pesticides on DoD installations are certified, the DoD certification program remains robust. The AFPMB and DoD Components will continue to closely interact with EPA to ensure that DoD remains on the forward edge in the area of pesticide applicator certification.

All DoD installations develop PMPs following an Integrated Pest Management approach. One of the primary reasons why the Department has been able to cut its annual pesticide rate nearly in half since it first started reporting such data in 1993 (when the usage rate was 892,000 pounds of active ingredient) is because of DoD's strict adherence to the principals of Integrated Pest Management in the PMPs.

In early 2012, EPA implemented the National Pollutant Discharge Elimination System for applying pesticides in and near waters of the U.S. Through the AFPMB, Senior Service Pest Management Professionals and the DoD Clean Water Act Service Steering Committee, DoD has been in close communication with EPA to ensure that all impacted installation PMPs comply with current requirements. However, the National Pollutant Discharge Elimination System process is also affecting individual states. The Components' impacted installations are still in the process of confirming if they are currently in compliance. These installation-level issues are expected to be resolved by May 2012. The Components' Senior Pest Management Professionals will also continue to help installations develop and review their PMPs. AFPMB will continue to collect annual data, via a DoD data call, and generate a forward a single report to other DoD offices and EPA.

The Marine Corps is strengthening established compliance audit mechanisms, through the Marine Corps Environmental Compliance Evaluation Program, to ensure that installations have implemented an

effective integrated pest management plan, that personnel who apply pesticides on Marine Corps installations are properly certified, and that all installations have their plans prepared, reviewed, and updated annually by pest management professionals.

In FY 2012, DLA plans to certify and install the Integrated Pest Management Information System, a centralized pest management portal. DLA expects the installation of the software on DLA's network by the end of the third quarter FY 2012, after which it will train DLA pest control operators on its use, with full implementation beginning in FY 2013. The program streamlines the annual process of reviewing, updating, and approving the integrated pest management plans and allows all stakeholders to access the same document in real time.

Objective 4: Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community

GOAL 6 Sustainability Practices Become the Norm

Goal 6 Sub-Goals

SUB-GOAL 6.1 95% of Procurement Conducted Sustainably

Metric

The percent of contract actions (new contracts and modifications) that adhere to the principles of sustainability by containing requirements for (as relevant and where such products and services meet DoD performance requirements): energy-efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water-efficient, bio-based, environmentally preferable, non-ozone depleting, containing recycled content, and/or are non-toxic or less-toxic alternatives. The sub-goal applies to products and services, including task and delivery orders, but excluding the acquisition of weapon systems and their components and spare parts. The Federal Procurement Data System will be used as the source of data on contracts meeting these requirements.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
RESULTS	n/a	n/a									

SUB-GOAL 6.2 15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings By FY 2015, and Thereafter Through FY 2020

Metric

The percent of existing buildings over 5,000 ft^2 (combined owned and leased) that meet the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles), as per the December 2008 implementation guidance developed by the Interagency Sustainability Work Group.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	7%	9%	11%	13%	15%	15%	15%	15%	15%	15%
RESULTS	0.06%	**0.3%**									

SUB-GOAL 6.3 All Environmental Management Systems Effectively Implemented and Maintained

Metric
Overall DoD status using the Federal Environmental Management System Scorecard Metrics as reported in the Defense Environmental Programs Annual Report to Congress. The overall DoD status is a color rating (green, yellow, or red) for all DoD facilities and organizations for which an environmental management system (EMS) is appropriate. Status is based on the color ratings for individual facilities determined using the federal EMS Metrics. An overall green rating requires at least 80% of all EMS-appropriate facilities and organizations to have green EMSs, with no more than 5% total red EMSs. An overall yellow requires no more than 10% red EMSs. An overall red is assigned when the status is neither green nor yellow.

Annual Planning Targets and Results

Fiscal year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Targets	-	green	green	green	green	green	green	green	green	green	green
RESULTS	red	**red**									

Goal 6 Responsible OSD Offices

Sub-Goal 6.1: AT&L/Defense Procurement and Acquisition Policy
Sub-Goal 6.2 and 6.3: AT&L/I&E

Table II.9 provides results for other performance metrics pertaining to Goal 6.

Table II.9. FY 2011 Results for Other Metrics Pertaining to Goal 6

% of covered electronics acquisitions that are FEMP-designated and ENERGY STAR qualified *(estimate)*	97%
% of covered electronic product acquisitions that are EPEAT- registered *(estimate)*	98%
FRPP-Reported leased buildings meeting the Guiding Principles	0.00%

Sub-Goal 6.1 – PROCURING SUSTAINABLE GOODS AND SERVICES

Performance

Sufficient automated systems are not yet in place to enable the Department to accurately report the extent of sustainable procurement. For example, the Federal Procurement Data System (FPDS) is incomplete with regard to the categories outlined in EO 13514, and it lacks entirely sustainability attributes for six sustainability categories: energy efficient, water efficient, environmentally preferable, bio-based, less toxic or non-toxic, and non-ozone depleting. Meanwhile, the Department manually reviewed 577 contract actions with values over $3,000 from the second half of FY 2011 for their compliance with sustainable procurement requirements and found 91.7% to be in compliance. Since the last review, DoD expanded the process to include MDA and the Defense Commissary Agency (DeCA) as well as the Military Services and DLA. The applicable sustainability categories examined were: EPA Designated Recycled Content, Energy Star- or FEMP- designated energy efficient products, USDA-designated biobased products, environmentally preferable, registered with the Electronic Product Environmental Assessment Tool, WaterSense or other water efficient products, reduced ozone depleting substances, and non- or low-toxic or hazardous constituents. The results by Component are compiled in Table II.10.

GSA and DoD collaborated in FY 2011 and early in FY 2012 on a project to create lasting improvement in the ability of both agencies to conduct procurement sustainably. The core of the project was a one-day workshop held on November 17, 2011, the purpose of which was to facilitate ongoing collaborative discussions between GSA and DoD procurement staff on targeted green procurement topic areas. As a result of the workshop, four joint GSA-DoD work groups were established for staff to collaborate on those areas where the two agencies can most effectively improve the incorporation of sustainability into

the procurement of goods and services. The joint working groups will continue to work on an ongoing basis. To maintain the momentum generated by the founding work group members, GSA and DoD will hold another workshop in the summer of 2012.

Table II.10. Results of DoD Sustainable Procurement Compliance Review

Component	Number of Contracts[a]	
	Reviewed	Compliant
Army	101	70
Navy	137	133
Air Force	100	99
DLA	100	95
DeCA	93	92
MDA	46	46
Total	**577**	**535**
Compliance rate		**92.7%**

[a]*for contract actions in the second half of FY 2011*

DLA plays an important role in the Department's sustainable procurement practices. In FY 2011, to help acquisition personnel track and report compliance with sustainable procurement mandates, DLA assisted with the development of data fields for four categories in FPDS and issued an Acquisition Directorate Procurement Letter establishing these fields for reporting starting in FY 2012. DLA began the process of updating its Green Procurement Plan, which is used by all DLA acquisition offices to ensure compliance with applicable procurement regulations. DLA instituted the use of the Integrated Acquisition Review Board process to verify the incorporation of sustainability into DLA Troop Support (pilot location) acquisitions. DLA Headquarters reviews and analyzes every acquisition forwarded for approval to ensure the acquisition incorporates some form of sustainability into the process. Also in FY 2011, DLA Disposition Services issued a DLA Distribution Acquisition Directorate Policy and Procedure Memo that helps the acquisition workforce identify opportunities to incorporate sustainable procurement during acquisition planning, and it developed a template with language for use in procuring material handling and equipment and janitorial services.

Although the systems are not yet in place to allow federal agencies to properly track compliance with sustainable procurement requirements, DoD Components have nonetheless been active in promoting awareness and implementation of sustainable procurement. For example, in June 2011 the Air Force issued a memorandum titled *Air Force Green Procurement Program.* The memo directs program managers and requirement owners in every mission area to consider and document green alternatives as they develop their requirement and product specifications for purchase. It also calls on them to incorporate sustainable procurement language in performance work statements, statements of work, and other product specifications for all new contracts. The memo also requires key personnel involved in the acquisition process to receive training on sustainable procurement requirements and mandates updating Air Force Instructions to promote sustainable green procurement practices. Also in FY 2011, the Air Force provided its contracting officials guidance on the use of fields pertaining to EPA-designated products and the use of recovered material and procedures regarding corrective action reports. Air Force acquisition leadership updated the 2005 Contracting Officer's Primer on Green Procurement and forwarded it to all contracting officials, reinforcing the use of EPA-Designated products and use of recovered material in accordance with the DoD Federal Acquisition Regulation (FAR). In addition, the Air Force added two EPA-related data elements for verification and validation in accordance with the Air Force FPDS Verification and Validation plan.

The Navy developed a new prototype training and awareness catalog titled *Buy It Green 2012: How to Buy Green for a Sustainable Navy*. The catalog includes background information and requirements for sustainable procurement, a listing of green products for high demand items, guidance for card holders, and sample FAR clauses and statements of work for contracting professionals. NAVSUP issued the Energy Management Program Instruction in June 2011, which included guidance and instruction on incorporating sustainable procurement into command-specific Affirmative Procurement Plans. WHS is providing recommendations to the Pentagon Storefront on making sustainable purchases, to ensure that all operations and maintenance materials are procured sustainably, and it will continue working with the Storefront in FY 2012 and 2013. The Army's Net Zero pilot initiative has reinvigorated green procurement activities across the organization.

HIGHLIGHT

DLA Sustainable Procurement Success: Bio-Based Penetrating Lubricants

DLA developed new bio-based penetrating lubricants and sorbents as acceptable alternatives to the currently used petroleum-based products. In FY 2011, eight Tri-Service DoD installations successfully demonstrated the new products, and found that they meet all requirements as well provide enhanced health and safety benefits to the Warfighter. The participating demonstration sites asked DLA to establish a bio-based class of penetrating lubricants under the Commercial Item Description A-A-50493 (Class A Bio-based Penetrating Lubricants). Now the Military Services can purchase them through DLA and receive credit on their environmental score card for buying sustainable/bio-based penetrating lubricants. DLA established five new National Stock Numbers (NSNs) for bio-based penetrating lubricants and established two for the bio-based sorbents, with more on the way.

Implementation Strategies

The Army plans to issue an updated sustainable procurement policy in FY 2012. It will also develop sustainable procurement 'quick guides' to educate the garrison and contracting staff on sustainable procurement requirements and how they support the Army's mission. These one-page 'quick guides' will summarize the requirements and guidance provided in the comprehensive December 2010 Army Green Procurement Guidance and cover a variety of procurement categories, such as housekeeping, grounds keeping, furnishings, office supplies, construction, and renovation.

NAVSUP Weapon Systems Support is partnering with DLA and GSA on a sustainable procurement initiative to identify "green" alternatives for high-demand consumable items the Navy uses daily, and make them available to acquisition professionals via electronic tools and catalogs. Weapon Systems Support is also leading a joint working group to develop more sustainable requirements for military and commercial packaging practices, such as increasing the use of recyclable and bio-based content in boxes, wrapping, and paper materials used for packaging. Once finalized, DoD and the American Society of Testing Materials will incorporate these requirements into their packaging specifications.

The Marine Corps will increase sustainable procurement by educating contract writers, vendors, and product purchasers about sustainability requirements and mandates, and it will continue to work with GSA and DLA to increase the procurement of sustainable products and purge all unnecessary products like Styrofoam from the supply chain. The Air Force will implement the suite of new and updated policies, procedures, and guidance it issued during FY 2011, which will serve as a guide for FY 2012 Air Force sustainable procurement activities.

DLA will proactively promote sustainable procurement during FY 2012 and FY 2013 through the following measures:

- Issue exhortatory Procurement Letters detailing current requirements in the Federal Acquisition Regulation and DFARS pertaining to sustainable procurement.
- Incorporate environmentally sustainable regulatory compliance as a special interest area into the

Procurement Management Review process for applicable contracts.

- Investigate the appointment of a sustainable procurement compliance advocate in the contract policy office at each DLA field activity and DLA contracting activity.
- Expand the use of the Integrated Acquisition Review Board process to verify that sustainability is being addressed in every new, applicable acquisition.
- Develop and gather sample contract language to aid contracting officers.
- Perform periodic audits of contracts.
- Revise reporting requirements for the DLA field activities to heighten the awareness and ensure compliance.
- Continue to analyze FPDS for potential system change requests to enable the identification of sustainable acquisitions.
- Investigate potential improvements to the DLA EProcurement contract writing system, used throughout the agency, to give it the ability to track compliance with environmental regulations.

In FY 2012, WHS will complete a guidance document on conducting minor renovations sustainably, including sustainable procurement. At that point, it will work with applicable stakeholders to provide training and to assist with implementation. DIA will have a revised contract management system in place by February 2013, which will enable contracting officials to indicate green product and service procurements on Award Contract Line Item Numbers. MDA will issue and implement in FY 2012 a Green Procurement Instruction that will identify all federal green purchasing requirements and establishes MDA guidelines for complying with them. All MDA credit card holders and staff involved in procurement will complete green procurement training to ensure they understand green procurement requirements. For FY 2012 and 2013, MDA plans to make its compliance audits more effective by improving its ability for conducting electronic searches of contract information.

Sub-Goal 6.2 – HIGH PERFORMANCE, SUSTAINABLE BUILDINGS

Performance

During 2011, 117 additional DoD buildings complied with the Guiding Principles, bringing the DoD total to 148 buildings out of 51,724 applicable buildings, owned and leased (0.3%).

In December 2010, the NAVFAC Capital Improvement Business Line issued *Engineering & Construction Bulletin* (ECB) 2011-01, "Navy Shore Energy Building Standard", which includes policy on sustainability standards for existing buildings. If the revision to the Guiding Principles currently underway includes sustainable location and site development, as proposed, the Navy can implement land use plans that maximize the use of limited land resources through more dense, mixed-use development where appropriate and increase transportation alternatives that are accessible and easy to use, including walking and other non-motorized modes.

LEED Platinum fitness center, Tyndall Air Force Base, FL

Photo: U.S. Air Force

Air Force sustainable design and development policy issued in June 2011 requires all new construction and major renovations to incorporate the Guiding Principles. The Air Force MILCON Sustainability Requirements Score Sheet, included in Air Force MILCON project contract documents, fully incorporates the new building and major renovations requirements outlined in the December 2008 High Performance and Sustainable Buildings Guidance. In FY 2011, the Air Force began combining the following into a single Sustainable Infrastructure Assessments activity:

energy and water audits, assessments of high performance sustainable buildings, facility condition assessments, and space optimization assessments.

The Army issued an updated sustainable design and development policy on 27 October 2010, establishing a performance-based standard following ASHRAE Standard 189.1. The policy applies to all new construction and major renovations beginning with the FY 2013 program and, if achievable within the programmed project amount, to projects in the FY 2011 and FY 2012 program. The Army's previous policy required the design and construction of projects to be certifiable at the LEED-Silver level but did not provide a proscriptive path to that standard, resulting in variable building efficiency. While the benefits will vary depending on location, preliminary analysis by the U.S. Army Corps of Engineers indicates the energy savings over a standard building will be at least 45%. In November 2011, the Army issued policy guidance requiring all installations to incorporate sustainable design and development practices into their installation Real Property Master Plan by the end of FY 2014.

Transparent atrium joining two buildings at NGA LEED Gold campus, Springfield, VA

Photo: U.S. Army Corps of Engineers

In FY 2011, NGA consolidated five sites under BRAC into a new LEED Gold certified campus, NGA Campus East, in Springfield, VA.

Implementation Strategies

Over the next six months, the Department will publish a new Unified Facilities Criteria for High Performance Sustainable Buildings that will serve as the minimum building standard for all new construction, major renovation, existing buildings, and leased facilities. The standard will be based on ASHRAE 189.1, the Guiding Principles, and Title 10 Code of Federal Regulations 433 and 435. This standard will be incorporated into contract documents so that, working in concert with third-party rating systems, it will help guarantee DoD buildings achieve and maintain a high level of performance throughout their life-cycle. The Department will also publish an updated Unified Facilities Criteria for Real Property that, among other things, will articulate the process for documenting compliance with the Guiding Principles in DoD's real property records. This should help correct the data quality problem that has prevented the Military Departments from accurately capturing facilities built to sustainable standards. The Army is working with the U.S. Army Corps of Engineers to modify the BUILDER™ tool to capture Guiding Principles criteria. BUILDER is a web-based software application developed by the Corps to help civil engineers, technicians, and managers decide when, where, and how to best maintain building infrastructure. Incorporating the Guiding Principles into the tool will help users estimate the investments needed to meet the Guiding Principles criteria and facilitate accurate data collection on compliance with the Guiding Principles. The Army will train installation personnel on the modified system.

In FY 2012 and beyond, the Air Force will annually assess the sustainability status of 25% of its buildings (based on area) and for each of them provide an investment grade project report that includes a savings-to-investment ratio (SIR) so they can compete with energy and water infrastructure projects for resources.

The Navy and Marine Corps will continue to ensure all new construction and major renovation projects meet the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings, as per Engineering Construction Bulletin 2011-01 issued in December 2010. In addition to new construction, they will develop building repair projects with project thresholds exceeding $2.5 million to reduce the consumption of energy, water, and materials and to identify alternatives that reduce maintenance costs.

HIGHLIGHTS

Sub-Goal 6.2: DoD Success Stories with Sustainable Buildings

U.S. Air Force: Sustainable Materials

Moody AFB was an Air Force 2011 Merit Award winner for Sustainable Design for a new 46,791 square foot dormitory. The building construction used recycled materials, such as wood doors, carpet and wall tiles, recycled structural steel, and metal roofing. Local suppliers provided most of the materials, reducing the amount of energy to transport them and boosting the local economy. The building envelope is made of autoclave aerated concrete panels. These economical, sustainable, solid blocks provide much greater thermal insulation than conventional masonry, resulting in added energy savings. The largest energy efficiency feature comes from the geothermal ground water heating and air conditioning system.

(Photo: U.S. Army Corps of Engineers)

U.S. Navy: Proposed Platinum

The new NAVY Operational Support Center at Luke AFB in Phoenix, AZ is a 32,055 SF facility for an 800 member Navy Reserve facility with administrative, training, operational, supply, and medical spaces. It is proposed for Platinum LEED certification, designed to use 26% less energy than a building that meets ASHRAE Standard 90.1, and 45% less water than a typical building. The Navy completed the building in December 2011, with 75% of construction waste diverted from disposal. It includes a 68 kW PV system.

(Credit: U.S. Navy)

U.S. Marine Corps

In FY 2011, the Marine Corps Recruit Depot San Diego completed construction on a project consisting of two new Recruit Support Barracks and a Recruit Reconditioning Facility. The barracks have LEED Gold certifications and the Recruit Reconditioning Facility is awaiting LEED Platinum certification. Sustainable energy features include daylighting, a design for the barracks that does not require air conditioning, and rooftop PV. The facility has a Living Machine wastewater reclamation system to reuse grey water for irrigation. Construction used sustainable construction materials and diverted 80% of construction waste from disposal. *(Photo: GKK Works, Inc.)*

In FY 2012, WHS will assess the sustainability of six applicable buildings on the Pentagon Reservation. WHS expects building-level meters and software for tracking and analyzing data to be in place by the end of FY 2013. Once the meters are in place and WHS has collected data for one year, WHS may pursue LEED certification for Existing Buildings, Operations, and Maintenance for two Reservation buildings, if the data supports the feasibility of certification. For FY 2012, NGA is planning a massive modernization program for its second campus, NGA Campus West.

Photo: U.S. Army

DoD manages the largest portfolio of historic buildings in the federal government. As stewards of some of the nation's most significant historic resources, DoD continues to be a leader in adaptively reusing its historic buildings. By balancing mission needs with appropriate rehabilitation practices, reuse of DoD's historic buildings reduces landfill demolition and construction waste, and sets an example for achieving the goals of EO 13514.

Sub-Goal 6.3 – ENVIRONMENTAL MANAGEMENT SYSTEMS

Performance

The overall rating for the Department is red for FY 2011, although EMS performance continues to improve, with 52% of DoD EMSs earning a green rating. Green ratings are up from 48% in FY 2009, although the portion of red EMSs rose slightly over that period, from 14% to 15%.

The Navy's EMS performance improved remarkably from last year: 74% green in FY 2011 compared to 51% in FY 2010. This occurred in part because the Navy conducted integrated external EMS audits and compliance evaluations in order to improve compliance oversight and track implementation of corrective actions to address the root cause of deficiencies. The Navy also applied a systematic approach to managing, training, documentation, and auditing, coupled with automated follow-up on corrective and preventive actions. As a result, the Navy improved relationships with regulators, the effectiveness of environmental media programs, and decision-making at the practice level, reducing recurring deficiencies.

The Navy tested an enterprise online business tool, EMSWeb, in FY 2011 to support sustainable environmental management at installations and regions. Developed by Naval Facilities Engineering Service Center in Port Hueneme, CA, in partnership with the Chief of Naval Installations Command and Naval Facilities Engineering Command components, EMSWeb facilitates demonstration of conformance and accelerates the pre-audit preparation and document review for both the auditors and installation staff. This first iteration provided valuable feedback to improve functionality of EMSWeb and streamline Navy environmental business practices.

Headquarters Marine Corps revised the Marines Corps self-audit guides and web-based auditing tool in FY 2011 to help installations more accurately identify EMS requirements and track progress toward meeting them. The auditing tool now incorporates an automatic linkage between compliance findings and their EMS element root cause, allowing Headquarters Marine Corps to identify systemic EMS issues, both within installations and Marine Corps-wide. The improvements will help installations ask the right questions when looking critically at their EMSs. The Corps is also updating the *Environmental Compliance*

and Protection Manual (Marine Corps Order 5090.2A) to emphasize the role of the EMS in supporting DoD sustainability goals.

Of the Air Force's 90 EMSs, 51% were rated green in FY 2011. Continual improvement is the cornerstone of any working EMS, and the Air Force issued its *EMS Standardization Methodology and Approach* policy memo in October 2011. The newly standardized Air Force EMS provides a systemic approach to planning, implementing, reviewing, and improving processes and actions, and will allow the Air Force to achieve federal environmental and sustainability goals; sustain and modernize its asset portfolio; increase mission capability; and maintain compliance with federal, state, and local laws. The Air Force Environmental Management Instruction (AFI 32-7001) was also updated in November 2011 to formally establish environmental management systems across the enterprise as the core framework for continual program, process and performance improvement. In March 2012, the EMS audit and associated compliance inspections were integrated into the AF Inspection System (AFI 90-201), further institutionalizing EMS principles down to the unit level and ensuring compliance through self-assessment checklists.

In FY 2011, 40% of the Army's 142 EMSs were rated green. The Army issued updated EMS policy guidance in October 2010 that clarifies the process of conducting external audits on EMSs every three years. External auditors have conducted initial EMS audits at all 142 Army facilities deemed appropriate for EMSs and initiated the three year re-audit cycle. The Army's land-holding commands (e.g., Army Materiel Command, Installation Management Command, Army National Guard, and Army Reserves) continue to conduct installation assistance visits and provide EMS auditor training classes for their installation-level staff.

Best Practices

The Environmental Management System as a Driver of Sustainability

Joint Base Lewis-McChord is a model of sustainability, and one indication of this is the successful implementation and maintenance of its ISO 14001-conformant Environmental Management System despite a number of challenges: increased training needs, additional maneuver units, and rapid development inside and outside the installation. However, the base does not just implement its EMS for compliance reasons, it uses the EMS as the means for achieving its ambitious sustainability goals. The base uses a set of six cross-functional EMS (or sustainability) teams to maintain and implement its EMS, which a cross-section of senior leadership, chaired by the Installation Commander, oversees. The six sustainability teams responsible for the Installation Sustainability Program goals are: Air Quality, Water Resources, Energy, Products & Materials Management, Sustainable Community, and Sustainable Training Lands.

Joint Base Lewis-McChord has 17 Garrison Directorates and organizations with an EMS managing the daily operations impacting the entire installation. These organizations span all functions from health and contracting to resource management and logistics. Each Directorate is assigned annual objectives in support of achieving the installation's sustainability goals. The significant environmental aspects for the base include: vehicle and equipment use and maintenance; hazardous material use; fuel transfer, leaking, and burning; excavation, grading, clearing, and constructing; water use; energy use; and disposal of material and waste. All other operational organizations on JBLM—military, civilian and contractor—are incorporated into the EMS by issuing them an Environmental Operating Permit (EOP). The EOP is configured after the requirements of the EMS and tailored as an environmental management document specific for an individual unit on the installation. It is essentially a guidance document, detailing processes, legal requirements, authorizations, requirements regarding training and documentation, and any other information that helps the unit meet the EMS, environmental, and sustainability requirements and goals of the installation.

Of DLA's nine EMSs, 44% were green in FY 2011. DLA is expecting its performance to improve because

in FY 2011 DLA began integrating its external EMS conformance audits with what had been independently conducted environmental compliance audits, providing a comprehensive view of the management system and its impact on and relation to the environmental compliance posture.

Implementation Strategies

Each of the Military Services and DLA will continue to have external conformance audits performed on each of their EMSs every three years. DLA is in the process of developing an Environmental Management DLA Instruction that will provide detailed EMS requirements for all levels of the agency.

For FY 2012, the Air Force is working with OSD to base the EMS conformance metric on the essence of ISO 14001, with a green rating defined as those appropriate facilities whose external audit declared conformance. The Naval Facilities Engineering Service Center, in partnership with Chief of Naval Installations Command and Naval Facilities Engineering Command components, will implement EMSWeb in FY 2012, to support sustainable environmental management at installations and regions. EMSWeb allows the Navy to leverage information technology to manage practices and processes and their environmental aspects, rank the risk of potential impacts, perform high level data queries and reporting, control documents, plan and schedule audits and inspections, document the findings and any corrective actions, and share a variety of templates and customizable reports to summarize compliance status and overall program health. The Navy will also issue an updated policy instruction in FY 2012 and FY 2013 and conduct over 60 integrated external EMS audit and compliance evaluations, in order to improve compliance oversight and track implementation of corrective actions to address the root cause of deficiencies. Periodic external audits are a primary mechanism for providing oversight and have shown that EMS provides greater transparency at all levels of command, drives performance, raises environmental program awareness, and provides metrics and audit results to articulate program issues to higher echelons, thereby enabling the Navy to manage its resources more effectively.

REGIONAL & LOCAL PLANNING

DoD has a robust program—the Defense Economic Adjustment Program—to advance regional and local integrated planning by working with communities and state and local governments on transportation and other types of planning. This Program assists state and local governments to plan and carry out community adjustments in response to military mission growth and to support compatible use. Through the Office of Economic Adjustment, the Department provides this assistance to support a cooperative effort to identify and assess community impacts and to take action to respond to these impacts and achieve compatibility between the military mission and neighboring civilian communities. In response to the growth of military missions, the Office of Economic Adjustment guides a participatory stakeholder process involving the installation and officials from state and local government to develop a growth management plan that responds to community impacts.

The need to ensure that community development does not interfere with military installation missions can pose important challenges and opportunities for communities in ways that cross jurisdictional boundaries. However, many regions lack sufficient staff and other resources to undertake cooperative, long-term, strategic regional planning. The Defense Economic Adjustment Program provides technical and financial assistance to enhance the planning capacity of local communities. This support enables the region, with DoD input, to develop land use and transportation plans that promote mixed-use development, centralize public infrastructure, and support housing diversity and multi-modal transportation, especially regional rapid transit. The Department has provided technical and financial assistance to state and local government to support regional transportation planning in response to major DoD activities. DoD has not yet formally integrated the Principles for Sustainable Federal Location Decision into DoD site selection and lease procurement procedures, or procedures for defining facility requirements.

Agency Innovation & Government-Wide Support

Agency Innovation

DoD implemented a number of innovative approaches in FY 2011 that serve as valuable models for adoption both within the Department and by other federal agencies. Highlighted in the Best Practices sections of the SSPP, their summaries are here, with references provided to the page numbers that provide more detail.

Energy Efficiency

A guaranteed savings contract with an energy service provider combined with the cogeneration approach (also known as combined heat and power) that uses of the heat in exhaust gases from the electricity generation portion of the system to produce hot water and/or steam for the facility. (See page II-14.)

Data Centers

The application of a suite of energy efficiency measures in data centers that avoids the increased energy consumption normally required with the much higher computing density that results from data center consolidation. (See page II-14.)

Renewable Energy

A three-way power purchase agreement where the federal government provides the land for large-scale renewable energy production and purchases the electricity from the project at a good rate, while a private sector energy company designs, builds, operates and maintains the installation, and a private sector financier pays for the project. (See page II-22.)

Industrial, Landscaping and Agricultural Water

The Army is collaborating with DOE's Pacific Northwest National Lab to develop an estimating tool for industrial and irrigation water use and to expand water data tracking methodologies. The tools and methods developed should be useful to other DoD Components and federal agencies in estimating unmetered water use. (See page II-29.)

Solid Waste Reduction

The use of paper can be greatly reduced through on-site or nearby Print on Demand printing and distribution facilities that eliminate the need for advance printing and storage of documents, saving on costs for warehouse space, printing, and disposal. (See page II-45.) Another strategy for reducing the use of printing paper is reducing the number of desktop printers. Confidential Print Release allows network-attached printers to print confidential documents that can only be released with the sender's Common Access Card and Personal Identification Number, eliminating the security need for desktop printers. (See page II-45.)

Prevent construction and demolition debris from being disposed by finding high value uses for it and writing requirements for C&D debris diversion into the contracts for construction projects. (See page II-48.)

Environmental Management Systems

Use a facility's Environmental Management System as a tool for advancing sustainability. A cross-functional set of EMS, or sustainability, teams are responsible for the facility's sustainability goals. Another set of EMS teams correspond to each of the facility's organizations or units, which span all functions performed. Every unit has its own Environmental Operating Permit that details the processes, legal requirements, authorizations, and requirements that unit needs to follow meet the EMS and sustainability requirements and goals of the facility. These two sets of teams work together to ensure that all EMS and sustainability goals are met. (See page II-65.)

Cross-Cutting: Internal Communication
Engage personnel participation in sustainability agency-wide through a multi-pronged approach to communication and outreach: a Component-wide team or task force to promote and communicate sustainability, orientation for new employees, sustainability content on the general internal website, an internal website dedicated to sustainability, social media, and mandatory training. (See pages II-5 and II-6.)

Cross-Cutting: Sustainable Facilities
The Army's Net Zero Initiative, being conducted in partnership with GSA, EPA, and DOE, will generate successes and lessons learned applicable to facilities throughout the federal government. (See page II-5 and various other points in the document.)

Government-Wide Support

Improving the Federal Automotive Statistical Tool
The Marine Corps GME has made consistent efforts to improve the accuracy of the data captured by the U.S. Government's Federal Automotive Statistical Tool. GME is piloting and has plans to incorporate an automated fuel tracking and dispensing technology that allows the fuel infrastructure to communicate with each vehicle and with the USMC's Fleet Management Information System, improving the accuracy of the data and reducing the time needed to track fueling records.

Air Travel
Through the Defense Travel Management Office (DTMO), DoD is collaborating with other agencies to find the best ways to reduce energy consumption and GHG emissions from employee business travel. DTMO is an active participant in the Green Travel Working Group, consisting of DoD, DOE, EPA, GSA, and the White House Council on Environmental Quality. The group has begun piloting an effort to make hybrid cars available through the DTMO Rental Car program. Several rental car vendors have begun offering hybrid and electric vehicles, though limited quantities are available. Hybrid rental rate ceilings are now included as part of the program, and efforts are focused on making these a more cost effective option for the government traveler, in addition to improving fuel efficiency. The results of the DoD pilot will benefit all agencies.

Sustainable Procurement
GSA and DoD are the two largest buyers in the federal government. Recognizing that they are in the best position among the agencies to help government procurement become more sustainable, GSA and DoD collaborated in FY 2011 and early in FY 2012 on a project to create lasting improvement in the procurement process. The core of the project was a one-day workshop held on November 17, 2011, the purpose of which was to facilitate ongoing collaborative discussions between GSA and DoD procurement staff on targeted green procurement topic areas. As a result of the workshop, four joint GSA-DoD work groups were established for staff to collaborate on those areas where the two agencies can most effectively improve the incorporation of sustainability into the procurement of goods and services. The joint working groups will continue to work on an ongoing basis.

GSA-DoD Partnership on Sustainability
DLA Disposition Services Battle Creek is a tenant in the GSA Federal Center facility in Battle Creek, MI. When DLA's Environmental Management Office there discovered that GSA's environmental initiatives, goals, and targets did not always match those of DoD, it created an endorsement memorandum, signed by all DLA Activities and GSA, to support and strive to meet the goals of the DoD SSPP, in addition to GSA's. In addition, DLA and GSA created an Environmental/Sustainability Working Committee to address environmental requirements and develop plans specific to the Federal Center.

Appendix A – Acronyms

AFB	Air Force Base
AFERS	Air Force Energy Reporting System
AFPMB	Armed Forces Pest Management Board
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
AT&L	Acquisition, Technology and Logistics
Btu	British thermal unit
C&D	construction and demolition
CO_2	carbon dioxide
CY	calendar year
DCMA	Defense Contract Management Agency
DeCA	Defense Commissary Agency
DENIX	Defense Environmental Network and Information eXchange
DFARS	Defense Federal Acquisition Regulation Supplement
DLA	Defense Logistics Agency
DoD	Department of Defense
DOE	Department of Energy
DoDI	Department of Defense Instruction
DON	Department of the Navy
DTMO	Defense Travel Management Office
DUSD	Deputy Under Secretary of Defense
ECIP	Energy Conservation Investment Program
EISA	Energy Independence and Security Act of 2007
EMS	environmental management system
EO	Executive Order
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESTCP	Environmental Security Technology Certification Program
FAR	Federal Acquisition Regulation
FEMP	Federal Energy Management Program
FPDS	Federal Procurement Data System
FY	fiscal year
GGE	gallons of gasoline equivalent
GHG	greenhouse gas
GME	Garrison Mobile Equipment
GOCO	government-owned contractor-operated
GWP	global warming potential
HFC	hydroflurocarbon
HVAC	heating, ventilation and cooling
I&E	Installations and Environment
ISWM	Integrated Solid Waste Management

IT	information technology
LEED	Leadership in Energy and Environmental Design
LID	low impact development
M&O	management and operating
MCAGCC	Marine Corps Air Ground Combat Center
MDA	Missile Defense Agency
MILCON	Military Construction
MM Btu	million British thermal units (Btu)
MMT CO_2(e)	million metric tonnes of carbon dioxide equivalents
MW	megawatt
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVSUP	Naval Supply Systems Command
NGA	National Geospatial-Intelligence Agency
NSA	National Security Agency
NSN	National Stock Number
OEPP	Operational Energy Plans and Programs
OPNAV	Chief of Naval Operations
OSD	Office of the Secretary of Defense
PMP	Pest Management Plan
PPA	power purchase agreement
REC	renewable energy certificate
SERDP	Strategic Environmental Research and Development Program
SSC	Senior Sustainability Council
SSO	Senior Sustainability Officer
SSPP	Strategic Sustainability Performance Plan
SF_6	sulfur hexafluoride
TMA	Tricare Management Activity
TRI	Toxics Release Inventory
USAF	United States Air Force
USMC	United States Marine Corps
USN	U.S. Navy

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Appendix 1: Energy & Sustainability Resources/Investments (Circular A-11, Section 25)

Treasury Agency Code (2 digits)	Treasury Account Code (4 digits)	Treasury Account Name	Goal	Type of Investment	Type of Alt. Finance	Intended Purpose/ Use	Budget FY11 - ($K)	Budget FY12 - ($K)	Budget FY13 - ($K)	Comments
			Scope 1 and 2 GHG Reduction	Incremental Investment	N / A	Energy Management	471674	1253447	1205564	There are multiple intended purposes for these resources
			Scope 3 GHG Reduction/Develop and Maintain Agency Comprehensive GHG Inventory	Embedded/ Leveraged Investment	N / A	Administrative	2257	2627	2309	There are multiple intended purposes for these resources
			High Performance Sustainability Design/Green Buildings/Regional and Local Planning	Embedded/ Leveraged Investment	N / A	Administrative	13388	14754	14504	MILCON data not available yet.There are multiple intended purposes for these resources
			Water Use Efficiency and Management	Embedded/ Leveraged Investment	N / A	Design and/or Construction/ MILCON	15406	18227	16950	There are multiple intended purposes for these resources
			Pollution Prevention and Waste Elimination	Embedded/ Leveraged Investment	N / A	Environmentally Preferable Materials and Processes	170566	181359	193257	There are multiple intended purposes for these resources
			Sustainable Acquisition	Embedded/ Leveraged Investment	N / A	Green Procurement	4653	6062	5891	There are multiple intended purposes for these resources
			Electronic Stewardship and Data Centers	Embedded/ Leveraged Investment	N / A	Administrative	4579	5942	5759	At this point these resources are not identifiable as separate line items
			Agency Specific Innovation and Government-wide Support	Embedded/ Leveraged Investment	N / A	Administrative	3491	4404	4166	At this point these resources are not identifiable as separate line items

Appendix 2: DoD FY 2012 Climate Change Adaptation Roadmap

The Department of Defense (DoD) Climate Change Adaptation Roadmap (CCAR) fulfills a requirement of Executive Order 13514, *Federal Leadership in Environmental, Energy and Economic Performance*. All Federal Departments and Agencies should evaluate climate change risks and vulnerabilities to manage both the short- and long-term effect of climate change on the agency's mission and operations, and include an adaptation planning document as an appendix to its annual Strategic Sustainability Performance Plan.

1. Policy Framework for Climate Change Adaptation Planning

The foundation for DoD's strategic policy on climate change adaptation began with the publication of the Quadrennial Defense Review (QDR) in 2010 by the Secretary of Defense. The QDR is a principal means by which the tenets of the National Defense Strategy are translated into new policies and initiatives. The QDR sets a long-term course for DoD as the Department assesses the threats and challenges that the nation faces and re-balances DoD's strategies, capabilities, and forces to address today's conflicts and tomorrow's threats. The QDR acknowledged that climate change has national security implications and must be addressed by DoD and its partners.

The QDR recognized that climate change will affect DoD in two broad ways.

- First, climate change will shape the operating environment, roles, and missions that the Department undertakes. It may have significant geopolitical impacts around the world, contributing to greater competition for more limited and critical life-sustaining resources like food and water. While the effects of climate change alone do not cause conflict, they may act as accelerants of instability or conflict in parts of the world. Climate change may also lead to increased demands for defense support to civil authorities for humanitarian assistance or disaster response, both within the United States and overseas.
- Second, DoD will need to adjust to the impacts of climate change on its facilities, infrastructure, training and testing activities, and military capabilities. DoD's operational readiness hinges on continued access to land, air, and sea training and test space, all of which are subject to the effects of climate change.

Through its planning and adaptation actions, DoD will be better prepared to effectively respond to climate change and to ensure continued mission success, both in the near term and in the future.

As climate science advances, the Department will need to regularly reevaluate climate-related risks and opportunities in order to develop policies and plans that manage climate change's impacts on the Department's operating environment, missions, and facilities. Managing the national security implications of climate change will require DoD to work collaboratively, with both traditional allies and new partners.

> "Our mission at the Department is to secure this nation against threats to our homeland and to our people. In the 21st Century, the reality is that there are environmental threats which constitute threats to our national security. For example, the area of climate change has a dramatic impact on national security: rising sea levels, to severe droughts, to the melting of the polar caps, to more frequent and devastating natural disasters all raise demand for humanitarian assistance and disaster relief. "
>
> *Secretary Leon E. Panetta, May 2, 2012*

1.A Vision and Goals

As articulated in the Department's Strategic Sustainability Performance Plan, DoD's sustainability vision is to maintain our ability to operate into the future without decline, either in the mission or the natural and man-made systems that support it. Including climate change and climate variability considerations in our planning processes will enhance operational and infrastructure resilience.

Four broad goals support the Department's vision, as detailed below; implementation is discussed in Section 3.

1. Define a coordinating body to address climate change.
2. Utilize a robust decision making approach based on the best available science.
3. Integrate climate change considerations into existing processes.
4. Partner with Federal agencies and allies on the challenges of climate change.

> "Our ability to advance constructive cooperation is essential to the security and prosperity of specific regions, and to facilitating global cooperation on issues ranging from violent extremism and nuclear proliferation, to climate change, and global economic instability-issues that challenge all nations, but that no one nation alone can meet." (p. 11)
>
> — 2010 National Security Strategy

1.B Responsible Senior Agency Official

The Department's Senior Sustainability Officer (SSO) is the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(ATL)) and is responsible for overseeing the implementation of the requirements of Executive Order 13514, including climate change adaptation efforts. The Deputy Under Secretary of Defense for Installations and Environment (DUSD(I&E)) is the Department's Senior Climate Official and reports progress to the SSO. Given the broad range of potential impacts to the Department's operational, training, and test and infrastructure capabilities, the Department will analyze how climate change adaptation measures can be incorporated into the full scope of its missions and operations.

2. Agency Vulnerability: Analysis of Climate Change Risks and Opportunities

Climate change is expected to play a significant role in DoD's ability to fulfill its mission in the future. Climate-related effects already are being observed at DoD installations throughout the U.S. and overseas. The physical changes are projected to include rising temperature and sea level and increases in both heavy downpours and the extent of drought. These will cause effects such as more rapid coastal erosion, shifts in growing seasons, and changing water tables.

The direction, degree, and rates of the physical changes will differ by region, as will the impacts to the military's mission and operations. By taking a proactive, flexible approach to vulnerability assessment and adaptation planning that recognizes uncertainty and incorporates the best available science, the Department can keep pace with changing climate patterns and minimize their impact on operations.

The military is potentially vulnerable to climate change in many of the same ways as the rest of society, and in ways that are unique due to its operations and mission. The following table summarizes the potential high-level climate change impacts to the Department's mission and operations. More comprehensive and region/installation-specific vulnerability assessments are needed to determine what adaptive responses are the most appropriate.

Table 1. Climate Phenomena and Potential DoD Mission Vulnerabilities

Climate Change Phenomena	Potential Impacts	Potential Mission Vulnerabilities
Rising temperatures	Rising mean temperatures; seasonal temperature increases; increased number of cumulative days with temperatures exceeding 95°F; opening of Arctic waters; melting permafrost and ice sheets; lengthening ice-free seasons; human health effects ; vegetation transition (species and biome shifts); changes in incidence/distribution of vector-borne diseases; wildfire risk; soil warming; electrical grid stress; equipment performance	Increased occurrence of test/training limitations due to high heat days; reduced military vehicle access (e.g., melting permafrost); degrading infrastructure and increased maintenance costs for roads, utilities, and runways; reduced airlift capacity; reduced live-fire training; potential degradation or loss of cold weather training venues; increased energy costs for building and industrial base operations; increased operational health surveillance and risks; change in operational parameters for weapons and equipment development and testing; increase in seasonal Arctic commerce and transit
Changes in precipitation patterns	Seasonal increases and decreases in precipitation; increases in extent and duration of drought; increases in extreme precipitation events; changes in number of consecutive days of high or low precipitation; change in form of precipitation (i.e., snow-ice-rain); increased wildfire risk; altered burn regimes; impacts to air quality; stream bank erosion and gullying of vegetative cover; impacted soil function and resilience (desertification); soil loss; infrastructure damage; water supply constraints; impacted groundwater quality; increased dust; protected species stress and potential for more species placed at risk; spread of invasive species; changes in incidence/distribution of vector-borne diseases; land management impacts; competing non-military land use	Reduced land carrying capacity for vehicle maneuvers; increased maintenance costs for roads, utilities, and runways; limits on low-level rotary wing flight operations; icing on aircraft; increased regulatory constraints on training land access; reduced live-fire training; reduced water availability and greater competition for limited water resources; reduced training land access; reduced training carrying capacity; operational health surveillance and risks; increased flood control/erosion prevention measures
Increasing storm frequency & intensity (coastal and inland)	Flooding; water quality issues; soil and vegetation loss; impact to soil function and carbon/nutrient cycling; wind damage	Military personnel safety; temporary or prolonged disruption of military operations or test and training activities due to intense storms and resulting storm damage; inundation of and damage to coastal infrastructure; reduced access to military water crossings and river operations; reduced off-road maneuver capacity; increased maintenance costs; increased flood control/erosion prevention measures; transportation infrastructure damage

Climate Change Phenomena	Potential Impacts	Potential Mission Vulnerabilities
Rising sea levels & associated storm surge	Loss of coastal land; damage to physical infrastructure (roads, targets, ranges) and protected ecosystem resources; saltwater intrusion; reduced capacity of protective barrier islands and coastal wetlands	Degradation or loss of coastal areas and infrastructure; increased cost of infrastructure reinforcement to withstand increased storm intensities; increased cost of infrastructure modification (e.g., raising pier heights); impacts to littoral and shore training and ranges; increased regulatory constraints on training land access; impacts on supply chain from potential shipping interruptions; increased demand for freshwater resources and associated increased cost of saltwater intrusion countermeasures; impact to future land availability and siting of new construction
Changes in ocean temperature, circulation, salinity, and acidity	Potential greater change to global climate system; negative impacts to general populations that rely upon fish as their main source of protein; coral reef losses that may impact ocean productivity and storm surge/wave dampening benefits	Exacerbation of conditions and mission impacts discussed above; coastal installation vulnerability; regional instability; increased potential for conflict or humanitarian assistance

3. Process for DoD Adaptation Planning and Evaluation

The QDR provides broad direction for future DoD strategies that will define plans and policies. Prompted by the QDR, the Department is prudently considering how to factor climate impacts into its mission areas. Given the diversity and complexity of DoD's mission and operations, there is an equally wide array and magnitude of planning processes across DoD. The Department recognizes that both operational and infrastructure plans and processes present opportunities to integrate climate change risks and opportunities to enhance the resilience of our mission, at home and abroad.

DoD is well-versed in employing systematic methodologies and modeling frameworks in order to assess potential threats and risks to national security. The use of these risk assessment tools is an essential element of accomplishing the DoD mission. The Department anticipates employing a similar risk-based approach to evaluate multiple scenarios of potential climate change effects on the DoD mission. Many of the Department's current efforts are focused on assessing potential climate change impacts to, and adaptation strategies for, facilities, built infrastructure, key ecosystems and protected species, and capabilities where military training is conducted or supported, and evaluating potential actions DoD can take to respond to these impacts. Sections 4 and 5 discuss specific efforts.

DoD intends to move forward with the previously stated goals for adaptation planning and evaluation. Goal implementation is described below.

> "Preventing wars is as important as winning them, and far less costly." (p. 7)
> — 2011 National Military Strategy

Goal 1: Define a coordinating body to address climate change.

The Department intends to define an appropriate structure utilizing existing bodies and organizations within DoD to guide the development, implementation, and evaluation of climate-related policy, guidance, and practice. The Senior Sustainability Council (SSC) is currently responsible for coordinating climate change adaptation efforts. The SSC will establish a technical advisory committee or working group to take direction from and provide advice to the council regarding the state of climate science, vulnerability and impact assessment, and adaptation science and practice. The advisory committee will analyze technical constraints and considerations related to climate change-related policy, guidance, and practice. The advisory committee will focus on ensuring that the Department has access to the climate-related information necessary to make informed decisions that support the Department's mission. This structure would identify those offices and existing forums, with authority in this area, those that would assist in coordination and guidance, and those that would be involved in support and implementation.

> The DSB recommended the Secretaries and Chiefs of the Services should: better integrate climate change and disaster risk reduction consideration into exercise, training, and educational materials; establish metrics focused on risk reduction to minimize the impact of climate change on military and support operations, forces, programs, and facilities; ensure climate change resilience by incorporating climate change risk in design standards for facilities and installations, with an emphasis related to energy- and water-intensive uses.
> — Defense Science Board "Trends and Implications of Climate Change for National and International Security," Oct 2011

The advisory committee, once established, will:

- Optimize use of existing plans and processes and identify gaps where new policies could be developed;
- Stress the importance of the science-policy interface;
- Foster sound vulnerability and impact assessment;
- Emphasize iterative and adaptive policy and planning approaches; and
- Monitor assessment and adaptation implementation effectiveness, learn from these experiences, and adjust action when needed.

Goal 2: Utilize a robust decision making approach based on the best available science.

Assessing climate change vulnerabilities, impacts, and adaptive responses requires a deliberative and iterative approach. The Department intends to develop appropriate assessment tools for use across all affected DoD Components. In developing its approach to assessment, adaptation planning, and implementation, the Department will strive to:

- Establish a process to obtain updated scientific data on potential future climate conditions and potential impacts;
- Use commonly accepted future climate scenarios that are based on the best available science, recognize uncertainties, and updated as the science changes;
- Provide guidance so that assessments consistently apply science that is appropriate in terms of location, resolution, and timeframe; and
- Use pilot approaches to develop decision frameworks for assessment and adaptation planning that attempt to match decisions to available and appropriately down-scaled climate information and other data.

Goal 3: Integrate climate change considerations into existing processes.

Climate change and climate variability will affect many of the Department's activities and decisions related to future operating environments, military readiness, stationing, environmental compliance and stewardship, and infrastructure planning and maintenance. Climate change also will interact with other stressors that the Department now considers and manages. As a result, adaptation to climate change and variability should not be a separate decision-making process, but rather an aspect of overall management. DoD intends to fully integrate climate change considerations into its extant policies, planning, practices, and programs. Some stand-alone policy and guidance may be needed to help direct specific assessment activities and adaptation implementation; however, by and large the Department will use existing mechanisms to implement policy and guidance and to ensure mission and environmental sustainability.

Goal 4: Partner with Federal agencies and allies on the challenges of climate change.

Partnerships will be needed to fully ensure DoD's mission is sustainable under climate change. The Department cannot assess its vulnerabilities and implement adaptive responses at its installations if its neighbors and stakeholders are not part of the process. Decisions made by outside communities will affect DoD and DoD's decisions will also affect outside communities. Moreover, aspects of our mission such as force deployment may be affected by assets outside DoD control, such as transportation infrastructure.

The requisite scientific and practical understanding needs to be obtained in concert with the rest of the Federal community. This can occur through partnerships with individual agencies such as the National Oceanic and Atmospheric Administration or through the Department's continued participation in forums such as the National Climate Assessment and informal forums such as the Interagency Forum on Climate Change Impacts and Adaptations.

> "In combination with U.S. diplomatic and development efforts, we will leverage our convening power to foster regional and international cooperation in addressing transnational security challenges." (p. 15)
>
> — 2011 National Military Strategy

Internationally, the Department will continue its collaboration with the State Department and foreign militaries on vulnerability assessment and adaptation efforts. The Department has already started to assess potential climate change impacts and begin initial adaptation planning. Efforts to partner with foreign defense force counterparts are coordinated through existing planning processes. Climate change presents a unique opportunity to work collaboratively in multilateral forums, promoting a balanced approach that will improve human and environmental security in the region. The Department's disaster response programs will continue to provide domestic and international response, but should adapt its response planning based on plausible climate change scenarios.

4. Actions to Better Understand Climate Change Risks and Opportunities

DoD is already working to foster efforts to assess, adapt to, and mitigate the impacts of climate change. The Military Services are considering potential climate change vulnerabilities and impacts to their activities and infrastructure in light of their Service-specific missions and plans.

The Department looks to the Strategic Environmental Research and Development Program (SERDP), a joint effort among DoD, the Department of Energy, and the Environmental Protection Agency, to develop climate change assessment tools for DoD's installations. The DoD Legacy program can be used in transitioning these tools for natural and cultural resources management applications. The

Navy's Arctic and Climate Change Roadmaps also outline specific action items which contribute to DoD's understanding of how a changing climate can pose risks and opportunities to its mission and operations. The Air Force 2010-2030 Strategic Environmental Assessment includes discussion of climate change as a strategic consideration for Air Force strategic planners. The Army is investigating climate risks to installation lands and facilities in its Environmental Quality Technology research program, and the Army Climate Change Workgroup is developing a framework for integrating climate change considerations into existing planning processes. The Sustainable Ranges Integrated Product Team, led by an Office of the Secretary of Defense and tasked to address test and training encroachment and sustainability issues, also includes consideration of climate change as an emerging encroachment issue. As discussed earlier in this roadmap, such nascent DoD initiatives will benefit significantly when an overarching DoD policy framework can be put in place to help guide and focus such efforts.

The sections that follow summarize activities currently underway to understand the risks and opportunities to DoD operations. Some of these assessments are general and high-level, while others are specific to certain subject matter areas and/or locations.

> "Our diplomacy and development capabilities must help prevent conflict, strengthen weak and failing states, lift people out of poverty, combat climate change and epidemic disease ..." (p. 11)
>
> — 2010 National Security Strategy

4.A General Assessments

DoD is working to overlay regional climate models with installation locations, in order to appropriately downscale climate variables for individual locations and develop an analytical tool that can be used to generate climate projections at the regional level. DoD is involved in high-level climate and weather data gathering efforts, as the Air Force 14th Weather Squadron collects, stores, and characterizes earth-space environmental data, receiving nearly 500,000 weather observations and satellite-derived wind profiles each day and sharing these data with the National Climatic Data Center and the Navy's Fleet Numerical Meteorological and Oceanographic Detachment. DoD collaborates with the National Oceanic and Atmospheric Administration on the development and operational implementation of a national Earth System Prediction Capability.

4.B Coastal Risks and Opportunities

Many of DoD's military installations are concentrated in coastal regions of the continental United States. As a result, DoD is undertaking multiple projects to assess climate change impacts to these installations and areas. Several of these projects focus specifically on sea level rise and storm surge, developing the necessary methodologies and/or tools that might inform decision making processes, including where to build and how to update coastal installations. Other projects deal with climate impacts on coastal ecosystems, as the military's long-term use of coastal installations is, in part, dependent on the ability to maintain the continued functioning of coastal ecosystems. Projects that specifically address coastal ecosystems can help educate natural resource managers and enhance their decision making processes related to managing these ecosystems for their training/testing value, storm protective functions, and species diversity. The Department, drawing on the lessons learned from the preceding studies, has identified the key technical considerations to consider when conducting assessments of climate change impacts on coastal military installations. This effort will assist the Department in developing its approach to coastal assessment.

4.C Arctic Risks and Opportunities

The Department has also begun to assess and plan for changes to our operating environment. For example, preliminary assessments have been conducted for the Arctic where measurable climate change impacts are already occurring. These efforts have focused on assessing the Department's Arctic observing, mapping, and environmental prediction capabilities, as well as identifying science and technology needs. The Department has completed two Capabilities Based Assessments for Arctic surface and environmental prediction capabilities and a Fleet Readiness Assessment. The Department is developing cooperative partnerships with interagency and international Arctic stakeholders to collaboratively address future opportunities and potential challenges inherent in the projected opening of the Arctic.

4.D Permafrost in Alaska

The change in permafrost in Alaska is impacting both the built and natural infrastructure. The Department held, as early as 2009, workshops to better understand affected defense assets and military missions in Alaska. The melting permafrost will impact foundations, utilities, runways and roads. This is a challenge for operation and maintenance especially when considering 80% of the infrastructure that will exist in 2050 is already in place today. The melting permafrost influences on training lands and natural ecosystems can significantly affect the types and timing of training activities. The potential ecosystem responses in interior Alaska to climate change could have severe ramifications on how, where, and when the DoD can train in Alaska. To address concerns related to climate change's impact on permafrost freeze and thaw processes and other ecological factors in interior Alaska, DoD initiated a suite of projects in FY 2011 focused on understanding and predicting these changes and the implications for Alaskan training land sustainability. These efforts will fill knowledge gaps relative to how climate change is affecting permafrost and the overall system dynamics, informing decisions on the development of future training and installation management plans.

4.E Arid Ecosystems

Long-term use of military installations and ranges in the southwestern United States depends, in part, on the condition of local ecosystems. Changes to local ecosystems can adversely impact natural resources and affect the use of certain locations for training, and/or increase the possibility of wildfires. DoD has initiated several projects to assess changes to ecosystems in the southwestern United States, including the intermittent and ephemeral stream systems that harbor much of the region's biological diversity, and the interaction of land-use activity, altered water sources, the introduction of invasive species, and altered fire regimes.

4.F Pacific Islands

In FY 2013, DoD anticipates initiating climate change studies to assess the impacts on DoD facilities in the Pacific. Changes in sea level, precipitation, and storm patterns can have significant impact on the island infrastructure that supports DoD missions in the region.

5. Actions to Address Climate Change Risks and Opportunities

In addition to the activities outlined in Section 3, DoD's current efforts to integrate, partner, and undertake pilot activities to address climate change risks and opportunities include the following.

DoD is already beginning to incorporate climate considerations into installation-level planning, as well as training plans. The Department is starting to incorporate climate change science and strategic considerations into formal training and education. The Military Services are beginning to explore incorporating climate risk/vulnerability factors into installation development planning processes. At the DoD level, United Facilities Criteria (UFC) 2-100-01, paragraph 3-5.6.2.3 requires master planners to consider climatic changes (including but not limited to: changes in land use and population density in the vicinity of installations; changes in climatic conditions such as temperature, rainfall patterns, storm frequency and intensity and water levels) when crafting long-range installation infrastructure master plans. UFC 2-100-01, paragraph 3-5.6.2.3 specifically calls out the National Climate Assessment as a source for reliable and authorized climate change scenarios. The Department's Natural Resources Conservation Program Instruction (DoDI 4715.03) requires installation natural resources management plans (INRMP) to assess the potential impacts of climate change on natural resources and to adaptively manage such resources to minimize adverse mission impacts.

> "We must, therefore...design structures and systems that can withstand disruptions and mitigate associated consequences, ensure redundant systems where necessary to maintain the ability to operate, decentralize critical operations to reduce our vulnerability to single points of disruption, develop and test continuity plans to ensure the ability to restore critical capabilities, and invest in improvements and maintenance of existing infrastructure." (p. 27)
>
> — 2010 National Security Strategy

As part of its Sustainable Ranges Initiative, DoD has conducted research and completed an initial study of potential climate change vulnerabilities affecting DoD training and potential adaptive measures. Additional research and coordination is ongoing, and several workshops have been held to engage with DoD offices and Federal agencies on possible avenues to foster a more adaptive individual and organizational culture that is better prepared to respond to mission stressors such as climate change. DoD is also actively engaged with regional partnerships in the Southeastern and the Southwestern U.S. Both regions are very significant to DoD, and host a number of major military installations and ranges. The aim of both the Southeast Regional Partnership for Planning and Sustainability and the Western Regional Partnership is to strengthen regional coordination and advance the missions and land use objectives of DoD and the other state and Federal agencies involved. Both partnerships are actively assessing the climate change challenge, along with a number of other often interrelated issues (habitat and species protection, land use planning, energy development, coastal zone management, fire management and disaster preparedness, and sustainable land use) as they work on cooperative policy and planning initiatives. DoD expects cooperation on climate change issues to continue and likely grow in importance within both partnerships in coming years.

Through SERDP, DoD has initiated pilot projects intended to develop and test assessment approaches and decision-making frameworks for climate adaptation appropriate for military installations. These pilot efforts will help DoD identify appropriate processes for matching climate information with DoD decision processes, understanding data needs for vulnerability assessments, and developing adaptation tools with installations across the country.

Appendix 3: Fleet Management Plan

There is no DoD-wide Fleet Management Plan because each DoD Component prepares their own. The plans for the Military Departments and Defense Logistics Agency are provided here. All plans have incorporated the recommendations GSA made based on its review of the Component's Vehicle Allocation Methodology submissions.

The Air Force, Navy and Army plans are attached below, while the plan for DLA can be found at the following link:
http://www.dla.mil/InstallationSupport/InstallationManagement/Documents/DLAFleetManagementPlan16FEB2012.pdf.

Apart from the Military Departments, the DLA Fleet Management Plan is used as an example for the remainder of DoD, since the plans of the other Components will follow the DLA pattern. Plan highlights for the Military Departments include the following:

Army

- Army expects to reduce its fleet size by ~ 5,000 vehicles over the FY 2012 and FY 2013 time frame.
- Army has issue guidance regarding the annual GSA leased vehicle replacement policy to transition the fleet from a fossil fuel fleet to an alternative fuel fleet.

Navy

- Navy is working towards reducing its fleet size by ~1,100 vehicles by FY 2015.
- Navy is developing policy mandating the purchase of 100% AFVs to meet the President's memo suspense of Dec 15, 2015.

Air Force

- Air Force has procedures in place to achieve the minimum most fuel efficient, economical to maintain fleet inventory to accomplish the mission.
- Since FY 2010, Air Force has increased its number of AFVs by 1,356.
- Air Force has a plan in place for acquiring all AFVs starting Dec 31, 2015.

United States Air Force

Vehicle Fleet Management Plan

Developed by
Vehicle and Equipment
Management Support Office (VEMSO)
300 Exploration Way
Hampton, VA 23666

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Executive Summary

Statutory Authority

Presidential Memorandum – Federal Fleet Performance states that the Federal Government owes "a responsibility to American citizens to lead by example and contribute to meeting our national goals of reducing oil imports by one-third by 2025 and putting one million advanced vehicles on the road by 2015." This memorandum requires the United States Air Force to develop a management plan with recommendations for improving the administration and operation of the USAF fleet.

Plan Scope

The Vehicle Fleet Management Plan applies to all USAF-owned, General Services Administration (GSA) leased vehicles, and commercial lease vehicles. The plan addresses:

- Procedures to achieve the minimum smallest most fuel efficient, economical to maintain inventory to accomplish the mission.
- The number and types of vehicles owned/leased and the purpose each vehicle serves.
- Plans for acquiring all Alternative Fueled Vehicles (AFVs) by December 31, 2015.
- Vehicle sourcing decisions for vehicle acquisitions, compared to leasing vehicles through GSA Fleet or commercially.

The USAF will only acquire fleet vehicles authorized through the budget process, in the most cost effective manner available, that meet mission requirements. Focus on achieving an optimized inventory through conflict drawdowns, targeting underutilized vehicles and authorized vacancies.

The 6,137 vehicles listed in the "Exempt Vehicle Summary" of our optimum attainment plan includes are War Reserve Materiel assets and are not reported in the covered fleet inventory.

VEMSO

The Vehicle and Equipment Management Support Office (VEMSO) on behalf of Headquarters United States Air Force/Logistics Materiel Support Division, Fuels (HQ AF/A4LE); will:

- Maintain and revise Air Force Instruction – 23-302, Vehicle Management
- Collect, draft, create, monitor and report on vehicle issues to HQ AF/A4LE

- Provide enterprise fleet management support via direct interface with Air Force units
- Analyze vehicle authorization policy for compliance with vehicle fleet policies
- Craft annual Office of Management and Budget (OMB) forecasts for vehicle procurement and sustainment
- Maintain centralized baseline fleet inventory profile
- Ensures Warner Robins – Air Logistics Center (ALC) maximizes the procurement of alternative fuel vehicle (AFV), a hybrid or electric vehicle, compressed natural gas, or biofuel vehicle technologies and will consider mission requirements with base-specific demands and vehicle availability with emphasis on alternative fuel use, fuel efficient hybrid technology, and reducing greenhouse gas emissions.
- Ensure vehicle sourcing decision(s) for purchasing/owning are compared with leasing through GSA Fleet or commercially are in the best interest of the USAF
- Ensure compliance with EPAct of 1992 (Public Law 102-486), Title VII of EPAct of 2005 (Public Law 109-58) and Executive Order (EO) 13423 "Strengthening Federal Environment, Energy and Transportation Management"

Air Force Fleet Management Tools

LIMS-EV

Provides a single-source business intelligence environment that delivers information and capabilities to agencies' fleet managers. Data available in LIMS-EV includes but not limited to:

- Unique vehicle identifier
- Manufacture
- Model
- Type
- Size
- Year
- Acquisition cost/sustainment costs
- Vehicle ownership
- Mileage
- Fuel type
- Passenger capacity
- Cargo capacity
- Installed equipment beyond original equipment
- Garaged location
- Service date

- Mission
- Historical/expected miles or hours of use per vehicle
- Vehicle condition
- Age
- Retention cycle
- Vehicle down time

FMDSS

FMDSS utilizes LIMS-EV data through use of web based business intelligence technology to determine an optimum fleet size. FMDSS processes four major parts: determines what the base needs, matches computed requirement to existing authorizations, adjudicates differences, and updates authorizations as required. Questions built into FMDSS include but not limited to:

- What tasks does organization accomplish with the vehicle?
- Does the vehicle need special equipment to accomplish tasks?
- How important is the vehicle to accomplishing the mission?
- How many people will be transported per trip on a regular basis?
- How much and what type of cargo will the vehicle haul on a regular basis?
- Is the vehicle shared with other employees or other base organizations?
- Is there access to alternative fuel within 5 miles or 15 minutes of the vehicles garaged location and if so, where is it located and what type of alternative fuel is available?
- Age
- Ratio of employees to vehicles?
- Frequency of trips per vehicle?
- Vehicle function?
- Operating terrain?
- Climate?

New Vehicle Requirement

Inputs

- Request from base fleet manager

VEMSO Activities

Analyze base fleet/mission composition using LIMS-EV and FMDSS data, for most fuel efficient, size vehicle to validate vehicle requirement

Outputs

- Report recommendations for realignment or authorization of new vehicle requirement is established in LIMS-EV for prioritization

Right sizing Fleet/Utilization Survey

Input

- LIMS-EV and FMDSS data

VEMSO Activities

Apply utilization criteria to each vehicle, and collect additional information about each vehicle. Use all information to help achieve performance goals, and to ensure that The United States Air Force is in compliance with Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance". Identify target reductions and right-size opportunities, standardizes approach decisions, and exploit technology. Consolidate or pool vehicles that are required for infrequent mission support into U drive it fleet. This allows units to sign out or share vehicles to accomplish mission requirements that otherwise authorized and assigned to unit would have low utilization. Pooling vehicles decreases requirements and increases utilization.

Output

- Generate report with multiple columns displaying validated authorizations, suspect authorizations, and recommend deletions.
- Publish findings derived from the vehicle needs evaluation to articulate metrics via LIMS-EV, which will display target reductions.

Acquisitions

VEMSO Activities

LIMs-EV prioritized requirements are sent to Warner Robins ALC for procurement

Alternative Fuel Vehicle Acquisition Strategy

The Air Force's AFV acquisition strategy allows the flexibility for the USAF to make the decision to procure smallest either an alternative fuel vehicle (AFV) or a hybrid electric vehicle to meet mission requirements. The USAF now has 10,051 E-85 and 1058 hybrid electric vehicles, a total increase of 1356 AFV's from FY10. Note: The number of hybrids that the Air Force receives is limited by the availability and types of hybrids available through the GSA that

meet mission requirements. To aid in continuously improving these numbers, the AF became a key member of the Tank-Automotive Research, Development & Engineering Center, (TARDEC) Hybrid truck Users Forum (HTUF) with goals of increasing hybrids on GSA schedule for heavy duty applications. Furthermore, the Air Force is attempting to comply with the new requirement to procure low greenhouse gas (GHG)-emitting vehicles as defined by Section 141 of the Energy Independence and Security Act of 2007. Specifically, the Air Force is drafting an internal policy memorandum that will help identify those vehicles that will be exempt based on mission requirements. As part of a cultural change to right-size the vehicle fleet, the USAF instituted an internal policy on strict restrictions for acquiring Class III/IV sized vehicles.
Alternative fuel infrastructure is established by DLA. The following AF website https://afkm.wpafb.af.mil/Database/oo-lg-af-66/altfuelloc_js/Locator.htm and DOE site http://www.afdc.energy.gov/afdc/locator/stations/ displays alternative fueling stations available throughout the US.

The Air Force uses an automated tool to align AFV's with alternative fuel infrastructure to maximum use of alternative fuel.

EPAct Goal: Ensure **75** percent of acquisitions and leases of light duty covered vehicles are alternative fuel capable. Use alternative fuels in non-waivered AFVs.

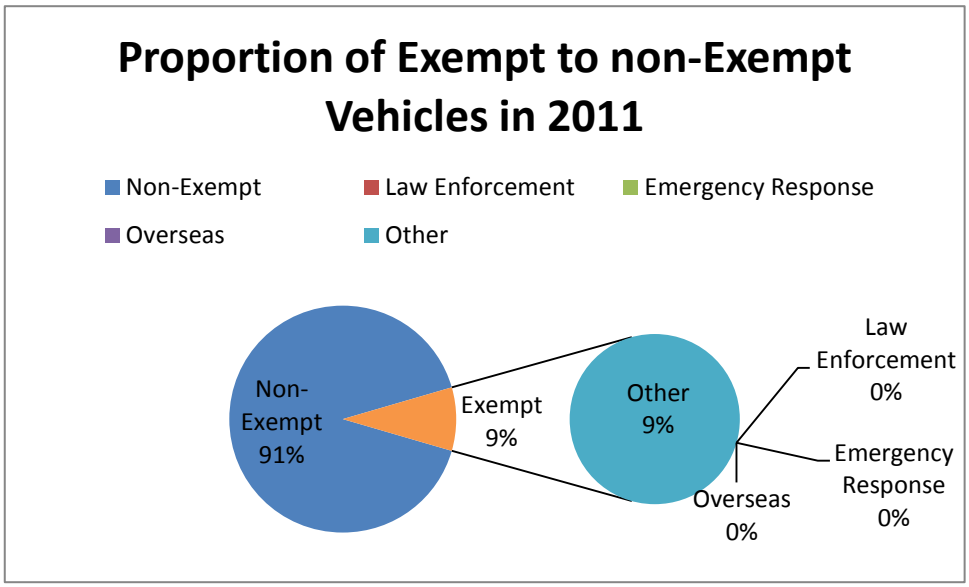
USAF Goal: Ensure **100** percent of acquisitions and leases of light duty covered vehicles are alternative fuel capable. Use alternative fuels in non-waivered AFVs.

GSA Recommendations

A. VAM Exemptions:

The USAF has included all law enforcement, emergency response, and overseas vehicles in its VAM studies.

The Presidential Memorandum on Federal Fleet Performance states that the head of the agency may exempt vehicles used for law enforcement, protective, emergency response, or military tactical operations of that agency from the provisions of the VAM study.

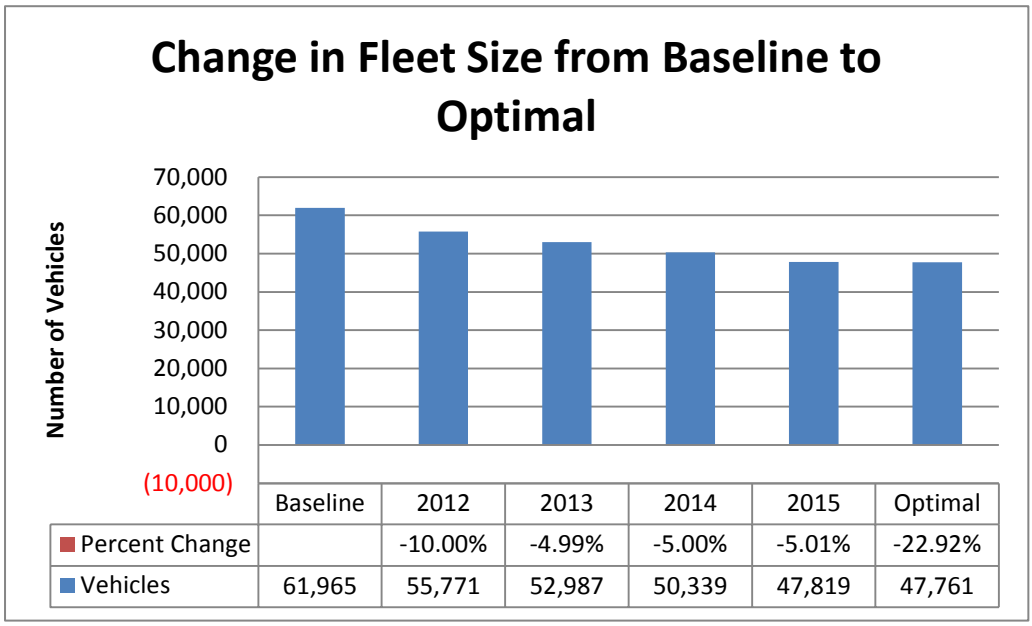


The USAF has exempted no law enforcement or emergency vehicles from the VAM study and has voluntarily included vehicle assets located overseas. The only vehicles not included in the VAM study are War Reserve Materiel assets.

B. Fleet Size:

GSA commends the USAF on its planned fleet reduction of 23%.

USAF will have reduced its baseline fleet inventory by an impressive 23% upon reaching its projected optimal inventory.



This is one of the largest vehicle reductions planed for any Federal fleet and sets the example for other Federal agencies to follow.

Planned reductions in fleet size and petroleum consumption should be coordinated with, and sufficient for, achieving the agency's scope 1 & 2 GHG reduction target by 2020.

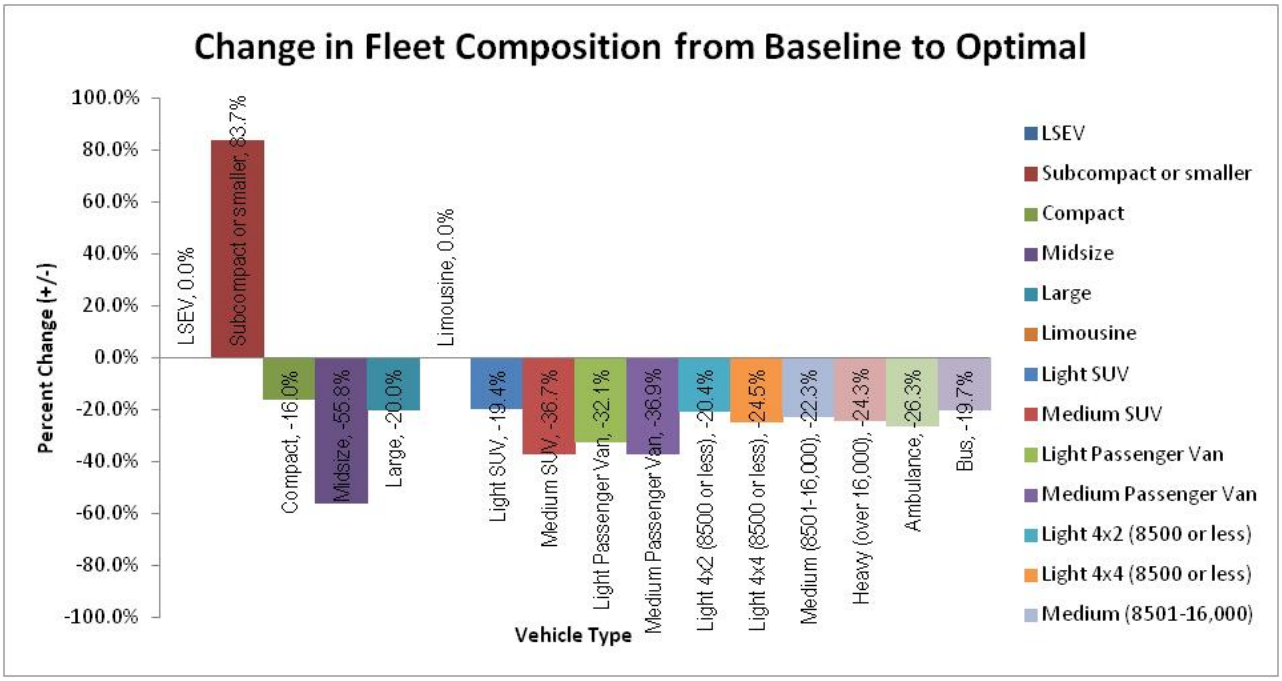
C. Vehicle Type Composition:

GSA recommends that where possible, the USAF should eliminate larger vehicles in favor of smaller, fuel-efficient vehicles.

USAF projects an 85% increase in sub-compact sedan inventory from the baseline fleet to the optimal fleet while all other vehicle categories decrease. This movement to more fuel efficient, smaller sedans will reduce petroleum use and reduce GHG emissions. Even with these improvements, USAF will still have a large inventory of medium trucks upon reaching its optimum inventory. GSA recommends that the USAF re-examine its larger vehicles, such as medium trucks, and ensure that they can't be replaced with smaller, more fuel efficient vehicles.

Agency Response:

USAF Fleet Management Plan addresses procedures to achieve the minimum, smallest, most fuel efficient and economical to maintain inventory to accomplish the its mission.



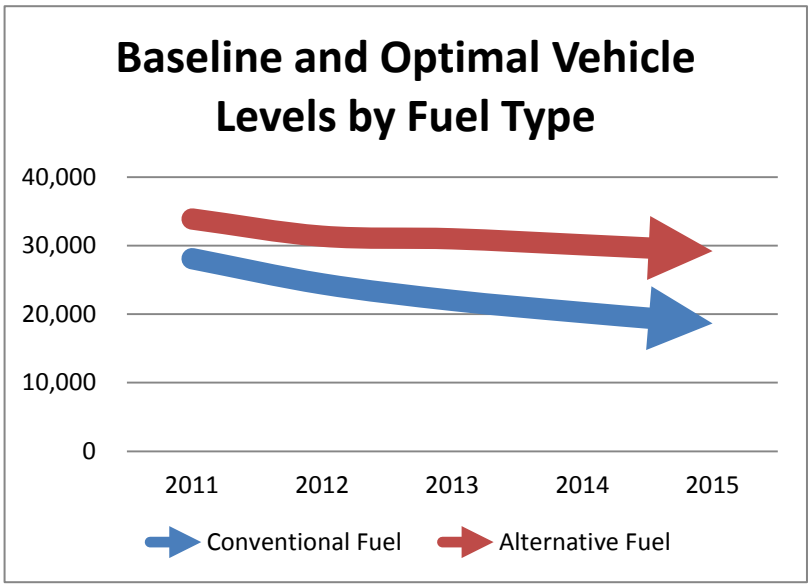
As cited in the Presidential Memorandum on Federal Fleet Performance, pursuant to motor vehicle management regulations, set forth at 41 C.F.R. 102-34.50, executive fleets are required to achieve maximum fuel efficiency; be limited in motor vehicle body size, engine size, and optional equipment to what is essential to meet agency mission; and be midsize or smaller sedans, except where larger sedans are essential to the agency mission.

D. AFV Vehicles Composition:

GSA notes the USAF's projection to have far more AFV vehicles than conventionally fueled vehicles by 2015 and requests re-examination of the remaining conventionally fueled vehicles to ensure that all possible vehicle requirements are replaced with AFVs.

The USAF has indicated plans to decrease a large amount of its conventionally fueled vehicle inventory (34% reduction) and retain a large majority of the alternative fuel vehicle inventory (14% reduction) through 2015.

By December 31, 2015, all new light duty vehicles leased or purchased by agencies must be alternative fueled vehicles, such as hybrid or electric, compressed natural gas, or biofuel. The USAF's AFV acquisition plans will position the agency to easily meet this mandate.



In locations where biofuel (e.g., E85 or biodiesel) is available, acquiring biofuel-capable AFVs and fueling them with the biofuel is the most effective way to reduce fleet petroleum consumption. In locations where biofuel is not available, the fleet should consider acquiring AFVs that operate on other alternative fuels (e.g., electricity, natural gas, or propane), including hybrids and other low GHG-emitting vehicles that operate on petroleum. Within the preceding general parameters, the fleet should aim to acquire the most fuel-efficient vehicles available to fulfill a given vehicle mission. Dual-fueled vehicles capable of operating on either petroleum or alternative fuel should be placed in locations where the alternative fuel is available (to avoid the need for EPAct 2005, section 701 waivers) and be operated on the alternative fuel (to be compliant with EPAct 2005, section 701 requirements).

E. AFV Infrastructure:

GSA recommends the use of DOE tools to increase utilization of alternative fuels

The USAF has indicated plans to acquire increasing percentages of alternative fuel vehicles, including E-85 fueled vehicles and has E-85 infrastructure installed on many bases, but has not discussed the infrastructure needs in its fleet plan. The USAF is reminded that, alternative fueled vehicles must, as soon as practicable, be located in proximity to fueling stations with available alternative fuels, and be operated on the alternative fuel for which the vehicle is designed. GSA recommends that the USAF continue its effort to install or encourage commercial development of alternative fuel infrastructure in areas where needed and to document these accomplishments in its annual sustainability plan.

The Department of Energy has a number of tools available on its website, including an interactive map showing Federal vehicles for which waivers for the use of non-alternative fuel have been granted, which may be useful in finding partners: http://federalfleets.energy.gov/performance_data/2012_waivers. GSA also encourages the USAF to ensure that drivers are aware of and use the Alternative Fueling Station Locator at: http://www.afdc.energy.gov/afdc/locator/stations/. If alternative fuel is not already available in proximity to fleet locations, DOE offers strategies for developing or attracting new alternative fuel infrastructure in chapter 6 of its Comprehensive Federal Fleet Management Handbook at https://federalfleets.energy.gov/sites/default/files/static_page_docs/eo13514_fleethandbook.pdf. USAF can also examine the potential to use low-GHG vehicles in areas without alternative fuel infrastructure, which it does not address in its Management Plan.

GSA also recommends that USAF consult with the GSA Office of Motor Vehicle Management for assistance in identifying and facilitating the placement of GSA Fleet AFVs, as soon as practicable, in proximity to fueling stations with available alternative fuels, so that the vehicles can be operated on the alternative fuel for which the vehicle is designed.

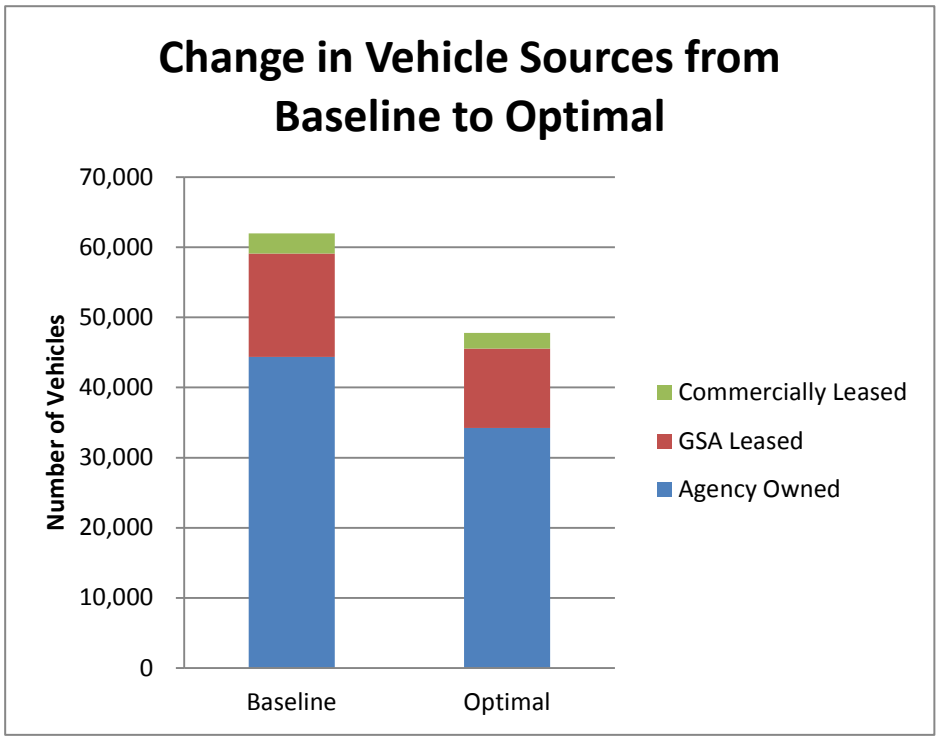
Agency Response:

USAF Fleet Management Plan includes a hyper-link and the DOE site that displays alternative fueling stations available throughout the continental U.S. We also utilize an automated tool to align AFV's with alternative fuel infrastructure to maximum the use of alternative fuel. Additionally, we will continue to partner w/GSA during the acquisition process to ensure our leased AFVs are aligned properly.

F. Vehicle Sourcing/Cost:

GSA recommends the elimination of large, expensive, commercially-leased vehicles

Some of the USAF's fleet consists of specialized agency-owned vehicles that are not easily replaced with less costly GSA Fleet leased vehicles. However, it is recommended that the USAF continue to examine all agency-owned vehicles throughout the fleet to ensure that less costly vehicle sourcing is not feasible. The USAF's commercially-leased vehicles cost 3 times as much as a GSA fleet vehicle. Every effort should be made to eliminate them.



Agency Response:

USAF Fleet Management Plan includes right-sizing activities and has instituted internal policy on strict restrictions for acquiring Class III/IV sized vehicles. To date, we have 14 vehicles that meet criteria for Executive Fleet vehicles to be posted to the AF public website. We recommend that OSD/AT&L update policy contained in DoD 4500.36-R, Management, Acquisition, and Use of Motor Vehicles to reflect the guidance outlined in the 24 May 2011 Presidential Memorandum.

G. Fleet Data:

GSA commends the USAF for its acquisition and use of a centralized management system

Federal executive agencies are required by Sections 15301 and 15302 of the Consolidated Omnibus Budget Reconciliation Act of 1986 (Pub. L. No. 99-272) (40 U.S.C. Sec. 17502 and 17503) to have a centralized system to identify, collect, and analyze motor vehicle data with respect to all costs incurred for the operation, maintenance, acquisition, and disposition of motor vehicles. The USAF has a robust agency-wide vehicle management information system (LIMS-EV) that compiles the following data: Unique vehicle identifier, Manufacture, Model, Type, Size, Year, Acquisition cost/sustainment costs, Vehicle ownership, Mileage, Fuel type, Passenger capacity, Cargo capacity, Installed equipment beyond original equipment, Garaged

location, Service date, Mission, Historical/expected miles or hours of use per vehicle, Vehicle condition, Age, Retention cycle, and Vehicle down time.

H. Shared Fleet-on-Demand Services:

GSA recommends that the USAF look for opportunities to use Shared Fleet-on-Demand Services.

Short-term vehicle needs, such as vehicles for seasonal workers, could be met with rental vehicles under a recent policy change that permits rental up to 120 days. In its Management Plan, the USAF does not mention consideration of vehicle sharing, on-demand service, or public transportation. GSA recommends that the agency specifically address these options in the agency's annual Strategic Sustainability Performance Plan beginning with the June 2012 submission; otherwise, OMB has indicated to GSA that it may consider withholding funding for future fleet purchases.

Agency Response:

USAF Fleet Management Plan now includes our standard policy to consolidate or pool vehicles that are required for infrequent mission support into the Air Force's U- Drive it fleets. This allows units to sign out or share vehicles to accomplish mission requirements that otherwise authorized and assigned to individual units would have low utilization. We agree pooling vehicles decreases requirements and increases utilization. This update was included in our June 2012 submission.

Annual Strategic Sustainability Performance Plan

The Air Force will incorporate its fleet management plan into its Annual Strategic Sustainability Performance Plan (as required by Executive Order 13514).

Army Fleet Management Plan

SUMMARY:

In order to comply with the POTUS Memo – Federal Fleet Performance and Executive Order 13514, the Army has conducted a structured Vehicle Allocation Methodology process. By adhering to a standard methodology, with input from all stakeholders, an acquisition plan to attain optimum fleet composition was developed.

The resultant acquisition plan is based on several assumptions:

1. The Army budget will support the programmed replacement of fossil fueled Army owned and General Services Administration (GSA) leased vehicles with alternative fuel vehicles (AFVs).
2. Manufacturers will manufacture AFVs in passenger and light duty truck body styles that will meet Army needs and be made available through GSA .
3. GSA will reevaluate its business case model to determine if AFVs, which incur an incremental cost to maintain the monthly lease cost equal to a comparable conventional vehicle, can be amortized over a 5 to 7 year timeframe eliminating the incremental cost requirement.
4. Low Green House Gas vehicles, used in locations where E-85 fuel is not available, will be considered an AFV and amortized over a comparable period of time equal to that of other AFVs.

Plan and Schedule for attaining the Optimal Fleet:

Army has been working steadily for the last three years to downsize and right size its nontactical vehicle fleet. Major improvements to the fleet composition have been made in the last two years with the elimination of over 1,000 large Sport Utility Vehicles used for passenger transport. Funding reductions and mission changes also are driving down the fleet size by approximately 5,000 vehicles over the FY12 and FY13 timeframe. Once these vehicles are removed from the fleet, the intent is not to grow the fleet, unless a mission change justifies the increase.

Attached, as an enclosure, is the Army Guidance that was provided to all stakeholders regarding the annual GSA leased vehicle replacement cycle. This guidance is meant to systematically transition the fleet from a fossil fuel fleet to an alternative fuel fleet.

The fleet will be downsized and right sized based on the acquisition and disposal plan submitted as part of the VAM. This will be done in coordination with GSA to ensure that

the residual cost of early turn-in is minimal since the Army budget will not be able to absorb non-mission supporting costs.

As per published guidance to all stakeholders, E-85 vehicles will not be ordered unless E-85 is available within 5 minutes or 15 miles of the vehicles garage location. All E-85 vehicles that are located in areas where E-85 is not available will be either attrited out of the fleet or relocated to fleets that have E-85 available to them by December 2014.

During each of the annual GSA replacement cycles only vehicles considered as alternative fuel vehicles (AFVs) will be requested as replacements, unless GSA cannot provide the that type of vehicle in an AFV configuration.

Army is working with DLA and other Federal entities to determine locations where E-85 dispensing stations can be established based on the density of the vehicle population, annual fuel consumption and availability and affordability of the fuel from an E-85 vendor. Where E-85 is not available the fleet will be transitioned to other alternative fuels to include low green house gas vehicles that will afford a large mile per gallon ratio.

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NAVY FLEET MANAGEMENT PLAN

INTRODUCTION

On May 24, 2011, the President issued Presidential Memorandum-Federal Fleet Performance. It requires that all federal agencies conducting an annual Vehicle Allocation Methodology (VAM) to determine the optimum fleet inventory to meet mission requirements and identify necessary resources. The expected outcome of implementing this bulletin is a Federal fleet that is comprised of smaller, more efficient, less greenhouse gas emitting vehicles that operate primarily on alternative fuels.

For the Navy, we based our VAM on our Transportation Review of Inventory Objectives (TRIO) process. The Product Line Management Office (PLMO) reviews activity transportation equipment IOs for shore activities on a continuing basis and also reviews and validates IOs during Transportation Review of Inventory Objectives (TRIOs) performed every three years and during Transportation Management Assistance Visits (TMAVs), which should be conducted every 18 months. As changes in mission, new functions, and/or functional transfers occur, the activity IO shall be revised. The IOs shall be based on the minimum number of units required to accomplish the activity's mission. Based on the VAM requirement we plan to validate the TRIO data once a year.

Transportation equipment shall be assigned only to those shore activities that have approved inventory objectives (IOs). Civil Engineering Support Equipment (CESE) shall be supplied by the regional Facilities Engineering Command (FEC) through new procurement, rental or lease, or by redistribution of excess equipment. Only that transportation equipment needed to accomplish the stated mission of an activity shall be assigned. Yearly assessments shall be made by the PLMOs to determine if adjustments are needed due to mission changes or new taskings.

CESE is received at an activity to replace current inventory or to fill an unfilled IO and is not to be retained when excess to IO. When new or used CESE is received at an activity to replace current inventory, a reasonable period of time is allocated for the changeover to report excess and process paperwork before transferring equipment to disposal.

Note: In certain situations, items excess to IO are considered mission essential and may be retained for a limited period of time. These situations shall be fully documented, approved by the PLMO, and kept on file at the activity. Examples of such situations include: Blood mobiles; on-hand assets are of less capacity than IO items, so additional units must be retained until IO items can be procured (i.e., two 5-ton dump trucks substituting for one 10-ton dump truck); a short-term need that must be met, but where an IO change would not be required (less than one year duration). In each such case, authorization for retention of excess vehicles shall be obtained from the PLMO in writing. The PLMOs are to review these temporary approvals during TRIOs and Transportation Management Assistance Visits (TMAVs).

The TRIO considers the following objective criteria:

1) Mission;
2) Historical/expected miles of use per vehicle;
3) Historical/expected hours of use per vehicle;
4) Ratio of employees to vehicles;
5) Frequency of trips per vehicle;
6) Vehicle function;
7) Operating terrain;
8) Climate;
9) Vehicle condition, age, and retention cycle;
10) Vehicle down time;
11) Needed cargo and/or passenger capacity;
12) Required employee response times; and
13) Greenhouse gas emission level of the vehicle

We plan to collect additional information about each vehicle through user surveys. Such subjective information could provide valuable insight into the objective criteria. For example, a fire truck may have low utilization as it is on standby, but it is necessary that it be available and prepared to respond to emergencies. The survey questions are listed below:

1) What tasks do you accomplish with the vehicle? Describe how those tasks support the agency's mission.
2) Does the vehicle need special equipment (aftermarket equipment not standard to commercial vehicles and trucks) to accomplish the tasks?
3) How important is the vehicle to accomplishing the mission? Describe critical need to the mission.
4) How many people will be transported per trip on a regular basis?
5) How much and what type of cargo will the vehicle haul on a regular basis?
6) Is the vehicle shared with other employees or other agency organizations?
7) Is there access to alternative fuel within 5 miles or 15 minutes of the vehicle's garaged location and if so where is it located and what type of alternative fuel is available?
8) If the vehicle is an AFV, does it have an approved waiver from the use of alternative fuel?
9) What type of driving conditions will the vehicle be in (exclusively on a base or campus setting, city, highway, off road, weather, etc.)?
10) Can the work be done via alternatives to owning or leasing a vehicle such as shuttle bus services, motor pool vehicles, sharing vehicles with other offices/agencies, public transportation, or short term rentals when needed, etc.?

SCHEDULE

This section describes the schedule the Navy will follow to achieve its optimal fleet inventory, including plans for beginning to acquire all AFVs by December 31, 2015.

TASK	DUE DATE
Enter VAM data into FAST	17 Feb 2013
Enter Fleet Management Plant into FAST	17 Feb 2013
Incorporate Fleet Management plan with Annual Strategic Sustainability Performance Plans prepared	31 June 2013
Optimize Inventory based on VAM	31 Dec 2015
All new acquisitions will be AFVs	31 Dec 2015

Each year until 2015 starting in 2012, the Navy will analyze non-AFV acquisitions and determine if an AFV can meet this need.

NAVFAC HQ will work with CNO to come up with a policy mandating the purchase of 100% AFVs unless granted a waiver form NAVFAC HQ. EXWC (Navy purchasing agent) will notify NAVFAC HQ of all non-AFV purchases before they go through and ask for a justification and HQ can approve or deny the request.

The Navy replaces approximately 2,000 vehicles per year. We fund these replacements through the POM process. For the past 8 years we have exceed the 75% AFV acquisition requirement. Purchasing 100% AFVs will not be a problem as long as GSA offers low incremental cost AFVs in sufficient quantities.

Based on the results of the VAM, each year the Navy will work towards optimizing its inventory by retiring vehicles when necessary, combining requirements and buying the smallest and most efficient vehicle that meets the mission requirement. We will work to ensure that our fleet is reduced to our inventory objectives shown in the “optimal fleet” section of the VAM worksheet. We have 1092 vehicles to reduce by 2015 assuming no change in mission. We will work to reduce 273 per year in order to achieve our optimal fleet by 2015.

Besides the TRIO process, the Navy is also using technologies such as Carshare to reach its optimal fleet. The Navy conducted follow-on pilot studies in 2011 of fleet-type car-sharing systems. The technologies have the potential to optimize fleet size and streamline vehicle dispatching. Prospective systems included automated (web-based) reservations, geographic tracking equipment, and keyless entry systems. Initial demonstrations at NAVSTA Norfolk VA and NAVSTA San Diego CA concluded in 2010. NAVFAC conducted follow-on demonstration of the fleet-type car-sharing technology used at NAVSTA Norfolk at two additional sites. NAVSTA Great Lakes launched an onboard computer and key management system in October 2010. In February 2011, NBK Bangor implemented a key management system to automate their

reservations and vehicle check out system. All three sites on the fleet-type system identified efficiency benefits and continued using the technology through FY2011. Savings from large scale implementation can enable reinvestment toward more advanced technology vehicles.

AFVS IN PROXIMITY TO AFV INFRASTRUCTURE

Table 1 is the most current list of AFV infrastructure on Navy Bases. The Navy has recently awarded the contract for the construction of 20 additional alternative fueling stations. These sites are shown in Table 2.

Table 1: AF INFRASTRUCTURE NAVY-OWNED & NEX

ACTIVITY	E85	Electric	CNG	B20
HAWAII	1	P	0	P
MIDLANT	3	P	1	5
MIDWEST	2/P	P	1	2/P
NORTHWEST	4	P	0	2
SOUTHEAST	1	P	0	1
SOUTHWEST	1/P	P	2	9
WASHINGTON	P	P	0	P
EURAFSWA	0	0	0	0
MARIANAS	0	0	0	0
FAR EAST	0	0	0	0
	12	0	4**	19
*P = Planned				
** The Navy has approximately 9 additional CNG stations are not operational				

During the TRIO VAM process we will try to ensure that all AFVs are in proximity to an AF station. However, since we are required to buy all AFVs starting in 2015 and have already been required to acquire 75% AFVs, some AFVs are located where no infrastructure exists. These are primarily E85 vehicles because they have the little to no incremental cost but require significant infrastructure investment. Now with low GHG vehicles counting as an AFV we will be able to minimize this effect. We are also trying to purchase hybrids and electrics for the areas without E85 but these are very expensive compared to low GHGs and flex-fuel (E85 compatible vehicles). During the TRIO/VAM process we will attempt to move current E85 vehicles in an area without any E85 infrastructure (also without any planned E85 infrastructure) to areas where infrastructure exists. This may present problems and will be a very labor intensive process. We will focus more on eliminating this problem in the future and correct it wherever possible.

Table 2: AWARDED 2012 AF INFRASTRUCTURE

FEC	Site	Infrastructure Type	Planned Construction Completion
WASHINGTON	NSF Dahlgren	E85/B20	12/1/2013
WASHINGTON	NSF Indian Head	E85/B20	12/1/2013
WASHINGTON	Anacostia	EV Charging Stations	12/1/2013
SOUTHEAST	NSB Kings Bay (upper base)	Solar Carport EV Charging	12/1/2013
SOUTHEAST	NSA Panama City	Solar Carport EV Charging	12/1/2013
SOUTHEAST	NAS Whiting Field	Solar Carport EV Charging	12/1/2013
SOUTHWEST	NAS Fallon	Solar Carport EV Charging	12/1/2013
SOUTHWEST	NBVC Port Hueneme	Solar Carport EV Charging	12/1/2013
SOUTHWEST	NB Coronado	Solar Carport EV Charging	12/1/2013
SOUTHWEST	NB San Diego	Solar Carport EV Charging	12/1/2013
NORTHWEST	NBK Bremerton	EV Charging Station	12/1/2013
NORTHWEST	NAS Everett	EV Charging Station	12/1/2013
NORTHWEST	NBK Bangor (lower base)	E85/ B20	12/1/2013
			12/1/2013
MIDLANT	PWD Philadelphia	E85/ B20	12/1/2013
MIDLANT	PWD Maine Portsmouth	E85/ B20	12/1/2013
MIDLANT	New London	E85/ B20	12/1/2013
MIDWEST	MW -- MidSouth	Solar Carport EV Charging	12/1/2013
MIDWEST	MW -- Crane	EV Charging Station / E85	12/1/2013
			12/1/2013
HAWAII	Pearl Harbor	Solar Carport EV Charging	12/1/2013
HAWAII	JBHickam	E85/B20	12/1/2013

VEHICLE SOURCING DECISIONS

Before purchasing a vehicle, the Navy activity completes a buy vs. lease analysis determining which method is the most cost effective.

It compares the cost of ownership to leasing vehicles, compares all direct and indirect costs projected for the lifecycle of owned vehicles to the total lease costs over an identical lifecycle. A justification for acquiring vehicles from other than the most cost effective source is required and must be approved by NAVFAC HQ.

NAVY RESPONSE TO GSA RECOMMENDATIONS

1. GSA recommends that the Navy exempt fewer vehicles from future VAM studies, and provide a copy of the exemption for the current VAM signed by the agency head.

Navy Response: The Navy has opted not to include its overseas fleet, and has also exempted 1,927 law enforcement and emergency vehicles from the VAM study. If there is an opportunity to revise the 2011 data the Navy will consider adding the foreign, law enforcement, and emergency vehicle fleet. The Navy already uses the 3-tier system of classifying law enforcement vehicles contained in FMR Bulletin B-33

2. GSA requests a copy of the Secretary's signed exemption from the VAM study of all law enforcement and emergency vehicles.

Navy Response: SECNAV has designation Commander of Naval Facilities Engineering Command (NAVFAC) the head of Agency for the Non-Tactical Vehicle Fleet. Navy will provide this to GSA.

3. GSA commends the Navy for controlling its fleet size prior to this VAM exercise, but notes that the VAM plan was not carried out to 2015 as instructed.

Navy Response: The Navy plans to include 2015 data in our 2012 submission. Because of our POM cycle, at the time of the original VAM, the Navy did not have data out to 2015 and did not want to provide inaccurate data.

4. GSA notes that while the overall composition of the fleet transitions toward smaller vehicles, there are significant exceptions that Navy should reconsider.

Navy Response: The Navy projects significant reductions in midsize and large sedans, with corresponding increases in compact sedans and LSEVs. Light SUVs and light passenger vans show significant reductions while heavier vehicles of these types are shown increasing. This is likely due to Navy's recent inclusion of new commands that relied heavily on large SUVs and trucks. Once Navy's VAM process is applied to these new requirements, it is expected that right-sizing will occur. Overall there is a movement to more fuel efficient, smaller vehicles which will reduce petroleum use and greenhouse gas emissions.

5. GSA commends Navy for its bold alternative fuel vehicle (AFV) transition plan, but notes that this will require a much faster rate of turnover than has been the case historically.

Navy Response: The Navy's non-exempt fleet is 30,296. Currently the Navy has 14,705 AFVs; 13,495 are in the covered fleet. 30,296-13,495 = 16,801. 16,801/3500 = 4.8. We believe GSA was not taking into account the fact that the Navy's covered fleet is already 45% AFVs. The Navy is aware that bio-fuel capable AFVs are the most cost effective way to reduce petroleum and continues to purchase these vehicles and build infrastructure where it is not commercially available. We are also continuing to purchase LSEVs, Hybrids and low-GHG vehicles in areas where there are no plans for E85. We are also a part of the GSA full size EV pilot.

6. In addition to its ambitious plans to increase AFV use, **GSA recommends** the use of Department of Energy (DOE) tools and consultation with GSA Fleet on the placement of AFVs.

Navy Response: The Navy already has significant alternative fuel infrastructure located on bases throughout the U.S., and is currently installing 20 additional stations. The Navy is also working with Naval Exchange and organizations such as clean cities to share infrastructure wherever possible. The Navy has started using the Fleet Sustainability dashboard in order to locate missed opportunities for alternative fuel use. We plan to use this information to increase our E85 use. The Navy also currently uses the Alternative Fueling Station Locator and encourages its use on the local level.

7. GSA notes Navy's failure to include vehicle sources in its VAM submission, which complicates analysis and planning.

Navy Response: The Navy does not segregate vehicles by source in future inventory planning. However, all vehicle acquisitions undergo a lease/buy analysis. GSA currently provides approximately 59 percent of the baseline fleet. The Navy plans to have a combination of Navy owned and GSA vehicles in the future.

8. GSA notes that Navy has a fleet management information system in place.

Navy Response: The Navy has a qualifying vehicle management information system covering all of the fleet.

9. GSA recommends that in addition to the efforts outlined in its Management Plan, Navy look for additional opportunities to use vehicle sharing and fleet-on-demand services.

Navy Response: The Navy plans to continue using vehicle sharing, on-demand service, and public transportation to the maximum extent possible when it is fiscally responsible.

ANNUAL STRATEGIC SUSTAINABILITY PERFORMANCE PLAN

The Navy will incorporate its fleet management plan into the Annual Strategic Sustainability Performance Plan (as required by Executive Order 13514).

Appendix 4: Optional Feedback Questions

[Goal 1] How frequently are agency operations formally evaluated to identify and quantify GHG emissions reduction opportunities?

How frequently are agency operations formally evaluated to identify and quantify GHG emissions reduction opportunities?	Frequency	Comments
Scope 1&2	a. Annually or more frequently	
Scope 3	a. Annually or more frequently	

[Goal 1] Has the agency considered reviewing the environmental attributes of existing agency vendors to determine the feasibility of considering those attributes, including GHG emissions, in purchasing and acquisition decisions?

Has the agency considered reviewing the environmental attributes of existing agency vendors to determine the feasibility of considering those attributes, including GHG emissions, in purchasing and acquisition decisions?	Comments
No	Consideration of GHG in procurement decisions will be a major federal procurement policy change with many serious complex ramifications. DoD will continue to work with the other Federal Agencies and the vendor community to encourage them to develop and share GHG emission inventories, DoD will monitor opportunities to appropriately use vendor and contractor GHG emissions as a part of purchasing or acquisition considerations.

[Goal 1] Emissions Reduction Opportunities Table: Scope 1&2

Strategy Category	Estimated contribution to reduction near term (FY12-13)	Estimated contribution to reduction long term (FY20)	Comments
Facility Energy Intensity	Primary	Primary	
Renewable Energy	Primary	Primary	
Space Management	[menu]	[menu]	Included in Facility Energy Management
Fleet Petroleum Use	Secondary	Secondary	Minor portion of DoD Scope 1&2
Fleet Alternative Fuel Use	Minor	Minor	Minor portion of DoD Scope 1&2
Optimizing Fleet Size	Minor	Minor	Minor portion of DoD Scope 1&2

Strategy Category	Estimated contribution to reduction near term (FY12-13)	Estimated contribution to reduction long term (FY20)	Comments
Fugitive Emissions	Insignificant	Insignificant	Minute portion of DoD Scope 1&2
Landfills, Wastewater Treatment	Insignificant	Insignificant	Minute portion of DoD Scope 1&2

[Goal 1] Emissions Reduction Opportunities Table: Scope 3

Strategy Category	Estimated contribution to reduction near term (FY12-13)	Estimated contribution to reduction long term (FY20)	Comments
Federal employee commuting	Minor	Minor	
Federal employee business air travel	Minor	Minor	
Federal employee business ground travel	Minor	Minor	
Contracted wastewater disposal	Insignificant	Insignificant	Minute portion of DoD Scope 3
Contracted solid waste disposal	Insignificant	Insignificant	Minor portion of DoD Scope 3
Other (describe in comments)	Primary	Primary	Hosting Third Party Renewable Energy Projects

[Goal 2] Rank the Guiding Principle elements in terms of difficulty to achieve for the agency's buildings. (Easiest to achieve (1) to most challenging to achieve (5); rank separately for both new and existing buildings.)

Guiding Principle Element	Ranking (new)	Ranking (existing)	Comments
1a: Integrated Design (new) / Integrated Assessment, Operation, and Management (existing)	1	2	
1b. Commissioning	3	4	
2a. Energy Efficiency	2	4	
2b. Onsite Renewable Energy	5	5	
2c. Measurement and Verification	4	4	
2d. Benchmarking	4	4	
3a. Indoor Water	2	3	
3b. Outdoor Water	4	4	

Guiding Principle Element	Ranking (new)	Ranking (existing)	Comments
3c. Process Water	4	4	
3d. Water Efficient Products	1	3	
3e. Water Use Measurement (existing only)	N/A	4	
4a. Ventilation and Thermal Comfort	3	4	
4b. Moisture Control	2	2	
4c. Daylighting (new) /Daylighting and Lighting Controls (existing)	4	3	
4d. Low-emitting Materials	1	1	
4e. Environmental Tobacco Smoke Control	0	0	
4f. Protect Indoor Air Quality During Construction (new)/ Integrated Pest Management (existing)	0	0	
5a. Recycled Content	0	0	
5b. Biobased Content	1	1	
5c. Environmentally Preferable Products	1	1	
5d. Waste and Materials Management	0	0	
5e. Ozone Depleting Compounds	0	1	

[Goal 2] Estimate the % of the agency's buildings that are likely to have met at least 3 of the Guiding Principles. (Must meet all elements to qualify)

Estimate the % of the agency's buildings that are likely to have met at least 3 of the Guiding Principles. (Must meet all elements to qualify)	Comments
a. 0-7%	

[Goal 2] To what extent is benchmarking or monitoring of building utility data utilized to identify energy conservation opportunities?

To what extent is benchmarking or monitoring of building utility use data utilized to identify energy conservation opportunities?	Comments
b. Used infrequently	

[Goal 2] How frequently is information from building benchmarking or monitoring referenced in the previous question analyzed? (This output may be analyzed to assess if meters are working properly, identify trends, evaluate implemented ECMs, etc.)

How frequently is information from building benchmarking or monitoring referenced in the previous question analyzed? (This output may be analyzed to assess if meters are working properly, identify trends, evaluate implemented ECMs, etc.)	Comments
d. Annually	

[Goal 3] Does the agency have a formal Fleet Management System (FMS) that tracks the following?

Component	Tracked in FMS	Comments
Total maintenance (labor hours and parts)	some DoD Components do	
Fuel usage by fuel type	Yes	
Procurement of vehicles	Yes	
Utilization of vehicles in miles and hours as applicable	Yes	

[Goal 3] To what extent has the agency streamlined or revised existing shuttle bus routes to ensure most efficient use?

To what extent has the agency streamlined or revised existing shuttle bus routes to ensure most efficient use?	Comments
Some shuttle bus routes have been streamlined including sharing with other agencies	

[Goal 3] Estimated % of agency buildings that have facilities that support bicycle commuting and use including bike racks, showers, and lockers.

Estimated % of agency buildings that have facilities that support bicycle commuting and use including bike racks, showers, and lockers.	Comments
(a) 0-10%	

[Goal 4] Estimated % of opportunities (i.e. locations or situations) where Industrial, Landscaping or Agricultural (ILA) water use is metered or otherwise measured.

Estimated % of opportunities (i.e. locations or situations) where Industrial, Landscaping or Agricultural (ILA) water use is metered or otherwise measured.	Comments
(a) 0-10%	Uncertain because this is the first year DoD requested water consumption data from the Services for ILA water consumption separate from indoor water.

[Goal 4] Estimated % of agency GSF with potable water use measured and tracked in EISA CTS, Portfolio Manager or a similar system.

Estimated % of agency GSF with potable water use measured and tracked in EISA CTS, Portfolio Manager or a similar system.	Comments
d. 90-100%	DoD uses its Annual Energy Management Reporting process to track and measure all water consumption. Since DoD collects GSF for water, it can determine that it matches closely with the total GSF of the DoD inventory.

[Goal 4] Identify any strategies currently in place for water reuse including the scale of use across the agency.

Strategies Used	Scale	Comments
Water Recycling	Local, national	Locally, some DoD installations have implemented wastewater reclamation for irrigation and industrial purposes to replace the use of potable water. Examples can be found in the success stories both in this Plan and in the FY 2011 version of the Plan. Nationally, the Army's updated sustainable design and development policy, issued in October 2010, requires facility construction projects to use water efficient landscape and irrigation strategies, including xeriscaping, rainwater retention, and water reuse and recycling to reduce outdoor potable water consumption by a minimum of 50% over that consumed by conventional means. The Army also published Water Reuse and Wastewater Recycling at U.S. Army Installations: Policy Implications in June 2011, and is implementing its Net Zero Water Initiative which includes alternatives to potable water.
Industrial Water Reuse	Local, national	See comment for Water Recycling

[Goal 5] How is agency waste tracked?

Type of Waste	Tracking Method	Comments
Non-hazardous non-construction	Weight	
Construction and demolition debris	Weight	

[Goal 5] Is there a current agency paper use reduction plan or policy?

Question	Answer	Link to Policy if publicly available	Success	Comments
Is there a current agency paper use reduction plan or policy? If yes, select which of the strategies listed below are used.	No		a. Plan has been in place less than 5 years	No DoD-level policy because given the organizational structure of DoD, the Office of the Secretary of Defense is taking a Component-level approach to this, requiring all DoD Components (currently numbering 29) to issue policy that establishes a program for reducing the use of printing paper, and to implement that policy. So far four DoD Components have established a formal paper reduction policy (all in place less than five years), and several others are in the process of doing so for FY 2012. The goal is for all Components to have done so by FY 2020.
If the answer is "yes" in row 1, does the agency	Yes		N/A	

Question	Answer	Link to Policy if publicly available	Success	Comments
use default duplex printing?				
If the answer is "yes" in row 1, does the agency use paperless (electronic) records?	Yes		N/A	
If the answer is "yes" in row 1, does the agency use electronic documents (e.g. agendas, document sharing)	Yes		N/A	
If the answer is "yes" in row 1, does the agency use wider margins by default?	No		N/A	
If the answer is "yes" in row 1, does the agency use another strategy? (define in comments)	Yes		N/A	see FY 2012 SSPP

[Goal 5] Have specific chemicals been identified for reduced acquisition, use and/or disposal?

Have specific chemicals been identified for reduced acquisition, use and/or disposal?	Success	Comments
d. Achieved measured chemical use reduction	Achieved measured chemical use reduction	

[Goal 6] Sustainable Acquisition Training: Answer the following question for both Acquisition Personnel and Purchase Card Holders

Did agency training in FY11 include the following components:	Acquisition Personnel	Purchase Card Holders	Comments
CPG/recycled content	Yes	N/A	
EPEAT-registered products	Yes	N/A]	
ENERGY STAR products/energy efficient products	Yes	N/A	
FEMP-designated efficiency requirements	Yes	N/A	
Low standby power requirements	Yes	N/A]	
USDA Biobased / Bioprefered products	Yes	N/A	

Did agency training in FY11 include the following components:	Acquisition Personnel	Purchase Card Holders	Comments
WaterSense or other water efficient products	Yes	N/A	
Environmentally preferable products	Yes	N/A	
SNAP/non-ozone depleting substances	Yes	N/A	
Nontoxic or less toxic alternatives (e.g. non-VOC paint)	Yes	N/A	
Alternative fuel vehicles/alternative fuels	Yes	N/A	
Renewable energy	Yes	N/A	
Sustainable landscaping	No	N/A	

[Goal 6] Identify any specific area targeted for improvement in carrying out acquisition greening efforts in FY11 and FY12.

[Goal 6] Identify any specific area targeted for improvement in carrying out acquisition greening efforts in FY11 and FY12.	Targeted in FY11	Targeted in FY12	Comments
Construction, Renovation, or Repair	Yes	Yes	
Laundry Services	No	No	
Building Operations and Maintenance	Yes	Yes	
Cafeteria Operations	No	No	
Landscaping Services	No	No	
Meetings and Conference Services	No	No	
Pest Management	No	No	
Building Interiors/Furniture	No	No	
Electronic Equipment	Yes	Yes	
Janitorial Services	Yes	Yes	
USDA Biobased / Biopreferred Acquisition	Yes	Yes	
Other (describe in comments)	N/A	N/A	

[Goal 6] If the agency has prototypes or sample language for any of the following elements for use in preparing contract requirements for sustainable acquisitions, select those elements in the following table.

Element	Prototype or sample language?	Comments
USDA Biobased / Biopreferred products	No	
CPG / recycled content	No	

Element	Prototype or sample language?	Comments
ENERGY STAR products / energy efficient products	No	
Environmental preferable products	No	
WaterSense or other water efficient products	No	
SNAP/non-ozone depleting substances	No	
EPEAT-registered products	No	
Nontoxic or less toxic alternatives	No	
FEMP-designated efficiency requirements	No	
Low standby power requirements	No	
Other (describe in comments)	No	

[Goal 6] How useful are the existing sustainable product categories in FPDS to track performance towards meeting sustainable acquisition goals?

How useful are the existing sustainable product categories in FPDS to track performance towards meeting sustainable acquisition goals?	Comments
b. Somewhat useful	

[Goal 6] To what extent are purchase card purchases tracked to ensure user conformity with sustainable acquisition requirements?

To what extent are purchase card purchases tracked to ensure user conformity with sustainable acquisition requirements?	Comments
d. Rarely	

[Goal 6] What procedures are in place to monitor and ensure sustainable products and/or services are delivered through contracts where they are required?

Procedure	Utilized?	Comments
Agency COTR letters include responsibilities to verify green deliverables under applicable contracts as part of reporting to contracting officer	Yes	Although the letters do not specifically address green deliverables, these requirements are part of the terms and conditions of the contract which the letter requires the COR to monitor in order to assist the contracting officer in ensuring compliance. Additionally, the assigned COR is sometimes part of the Technical Evaluation Team which evaluates compliance with green initiatives as part of the pre-award evaluation process.
Agency policies/procedures for accepting contract deliverables include verifying conformity with green requirements	Yes	Similar to the answer to 5a above, these policies/procedures are included in the terms and conditions of the contract; therefore, conformance with green requirements is monitored by the COR. We have no way of identifying if DLA customers are checking deliverables for conformance with sustainability requirements.
Past performance reviews include evaluation of	Yes	In some cases sustainability is included in the evaluation of these items . Whenever the items are evaluated before award for sustainability, they are also evaluated as part of the past

Procedure	Utilized?	Comments
sustainable acquisition		performance evaluation for sustainability as well
Specification reviews are conducted annually	Yes	Specifications are reviewed on a periodic basis, some are done annually and others are done on a recurring basis depending on the item being procured.
Other (describe in comments)	Yes	As acquisition are reviewed at headquarters, we check to ensure that sustainability requirements are addressed. Throughout the year as we conduct our periodic reviews at the various contracting offices, we review all contract actions to ensure that sustainability is included and if not, the file is properly documented.

[Goal 7] Estimated % of imaging equipment that has power management settings enabled.

Estimated % of imaging equipment that has power management settings enabled.	Comments
c. 51-90%	

Use the space below to describe other recommendations for consideration by OFEE/CEQ.

Data availability is an issue in cases where a requirement (EO or legislation) asks for data retroactively. Data generally is only available once a requirement begins.

Appendix 5: Scorecard Agency Questions

1. **Do IT contracts include the FAR clause 23.704 to require EPEAT-registered products?**
   Yes

2. **Is there an agency-wide policy in place requiring that eligible faxes, copiers, printers and other equipment be set to duplex by default?**
   No. The policy has been developed but not yet formally issued. However implementation is already occurring in some DoD Components.

3. **Do applicable contracts include clauses that require default duplex settings on purchased/leased equipment?**
   Yes

4. **Is there a reporting and audit system in place to ensure compliance with PM requirements?**
   Yes. A DoD-level system named SETS (Sustainability Evaluation Tracking System) has been developed to track Department-level compliance with the Power Management requirements, although it does not involve auditing.

5. **Does the agency have a tracking system in place to report % of surplus or EOL electronics that are reused or recycled?**
   Yes

6. **Is the agency using only R2 and/or E-steward Certified Recycler when recycling?**
   Yes

7. **Green Purchasing contract action review table.**
   The following table would consist of 577 rows, since DoD reviewed 577 actions, so it is not attached here. The data is available upon request. Of the contract actions reviewed, 92% were compliant.

# of Eligible Contract	Center/ Contract Number	QTR (3rd or 4th 2011)	Compliant? YES/ NO	CPG/ Recycled Content	EPEAT-registered products *(Note: Only new contracts)*	Energy Star products/ appliances	FEMP-designated energy efficient products/ appliances	USDA Biobased/ Bioprefered products	Water Sense or other water efficient products	Env. Preferable products	Products containing non - or lower ozone depleting substances (SNAP)	Products containing no or low toxic or hazardous constituents (e.g., non-VOC paint)	Other (Indicate)	Brief Description of Contract Action:
1														

8. **Green Purchasing: If 95% compliance was not achieved on quarterly review of contract actions, identify and indicate corrective actions to be taken.**
   With 92% compliance achieved out of 577 contract actions reviewed, DoD nearly achieved the 95% requirement. Efforts continue across the Department to improve performance, including updating policies and guidance, and improving systems, tools and resources to aid procurement officials.

Appendix 6: Agency Input on Actions Taken/Actions Planned for the July 2012 OMB Scorecard on SUSTAINABILITY/ENERGY

FY 2011 STATUS (As of December 31, 2011)		ACTIONS		PROGRESS
Yellow	• For Scope 1&2 GHG Reduction Target of 34% by 2020: ___ On track, X% reduction to date (G) _X_ **4.4% reduction (Y)**	Red	Actions taken since January 1, 2012: • Submitted SSPP into OMBMAX system. • Completed evaluations of over 40% EISA covered facilities; reported in CTS on implemented projects, benchmarked buildings. • FPDS is still not capable of reporting all categories/attributes of sustainable procurement. Conducted a manual review of 917 contracts, 897 were compliant for a compliance rate to 95.9% • Awarded 7 ESPC/UESC ($48M) • Completed site visits and data analysis for Plug-In Electric Vehicle (PEV) study of vehicle to grid and ancillary services. • $1.1 billion included in the FY13 budget for energy efficiency improvements to existing inventory of buildings • Military Services established a goal to each develop ~ 1 GW of renewable energy • Navy established a Task Force to assess and select renewable energy projects that will achieve the 1 GW goal. • Army released a draft RFP for a renewable energy multiple award task order contract • Component Fleet Management Plans completed using VAM process. • Completed projects at various locations that will generate ~ 7 MW of renewable energy. • Submitted the FY11 GHG inventory along with the Inventory Qualitative Statement and a revised FY08 GHG baseline inventory • Developed methodology for Sustainability Evaluation Tracking System to collect Electronic Stewardship data from all DoD Components and compute the Department-level metrics. System validate EPEAT, Energy Star/FEMP, Power Management, and duplexing data collected from Components. • Developed DoD-wide data center	• DoD met or exceeded planned actions cited in July 2011 Scorecard • DoD's performance-based contracting planned investment target is $1.18B over the next 24 months, per the President's December 2, 2012 memorandum. • Per the January 19th OMB/CEQ workshop with Federal Agencies, DoD anticipates awarding approximately $450M performance-based contracts in FY12 and approximately $750M in FY13 • Over the last 2-3 years, the Department has invested heavily in smart utility meters at the building level; it will take a few years for those investments to show an appreciable effect. • UFC for Real Property will articulate the process for documenting compliance with the Guiding Principles in the Department's real property records. This will help correct the data quality problem that has prevented the Services from accurately capturing the facilities built to sustainable standards • Since it is not practical to review 5% of DoD's 11.8 million contract actions for sustainable procurement requirements, DoD reviewed 917 for Q1/Q2 and 95.9% are compliant, exceeding the 95% goal • In order to reach a "Green" score (7% of buildings over 5,000 sq ft meet Guiding Principles) for the 2011 OMB Scorecard, the Department would have had to verify 3,628 buildings were compliant with the Guiding Principles. As of October 2010, all new DoD buildings and major renovation projects must be designed to comply with the Guiding Principals • DoD GPP Work Group to address OMB's guidance of biobased procurement focus
Yellow	• For Scope 3 GHG Reduction Target of 13.5% by 2020: ___ On track, X% reduction to date (G) _X_ **0.1%** *increase* (Y)			
Red	• Reduction in energy intensity in goal-subject facilities compared with 2003: ___ at least 18 percent and on track for 30 percent by 2015 (G) _X_ **13.3** percent (Y)			
Red	• Use of renewable energy as a percent of facility electricity use: ___ Total of 5% from renewable electricity sources including 2.5% from new sources (thermal, mechanical, or electric) (G) _X_ **3.1** percent from any renewable electricity source (Y)	Red		
Green	• Reduction in potable water intensity compared with 2007 is at least: _X_ **10.7** percent and on track for 26% in 2020 (G) ___ 6 percent (Y)			
Green	• Reduction in fleet petroleum use compared to 2005 is at least: _X_ ≥13.4 percent and on track for 20% by 2015 (G) __ ≥10 percent (Y)			
Red	• Sustainable green buildings: 0.29% at least 7% of buildings sustainable & on track for 15% by 2015 (G) 0.52% GSF of inventory sustainable (Y)			

FY 2011 STATUS (As of December 31, 2011)		ACTIONS		PROGRESS
			performance plan detailing reduction in energy and other resources used by data centers DoD-wide. • Developed list of best practices, using DoE guidelines for Data Center efficiency and expertise from the Defense Information Systems Agency Defense Enterprise Computing Centers, to reduce energy consumption in existing DoD data centers. • Demonstrated biobased products at several DoD Installations to validate performance. Obtained National Stock Numbers for the products and are now available in the DLA supply system. <u>Planned actions for next six months:</u> • Award $7B multiple award task order contract for the purchasing of renewable energy • Award 24 contracts valued at $370M (8 UESCs and 16 ESPCs) • Award $200M in contracts to put energy conservation measures in place for existing infrastructure at DoD installations. • Continue installation of more than 50 distributed renewable energy projects at various locations. • Continue implementation of more than 20 water conservation projects at various locations • Publish PEV study of vehicle to grid and ancillary services • Issue RFP for the lease of PEVs • Begin collecting data for the FY 2012 GHG Inventory. • Continue work with SETS system developers to perform test runs to validate computed Electronics Stewardship data (EPEAT, Energy Star/FEMP, Power Management, duplexing) as recorded in the SETS tracking system. • Follow up with end-of-life procedures as performed by R2-certified recyclers of DoD surplus electronics such as UNICOR. • Continue with the Federal Data Center	on contracts for FY12 Q3/Q4 review. **CHALLENGES:** • The FY12 NDAA expressly prohibits the use of FY12 funds to obtain "Leadership in Energy and Environmental Design" (LEED) Gold or Platinum level facilities certifications without a SECDEF waiver and a 30-day Congressional notification based on cost-benefit analysis hence DoD did not complete the LEED Gold Policy action. • Progress in achieving GHG reduction goals will be directly dependent on progress made towards energy intensity and renewable energy goals. Progress towards GHG targets may lag if DoD is behind on these energy goals. • Progress in Scope 3 reductions will be dependent on the continued recognition of third party renewable energy projects on DoD managed lands. • Federal Tracking systems are required to track the procurement goals accurately. FPDS currently does not contain the data characteristics/attributes needed to identify contract actions with Energy Star, FEMP designated and other sustainable attribute products. Recommend OMB update FPDS. • Numerous reporting requirements for the same metrics at different times may cause inconsistency in the data. Request OMB align or eliminate redundant reporting requirements. • The Department is facing significant budget cuts, approximately $400B over 10 year, that may impact our ability to meet aggressive sustainability targets

FY 2011 STATUS (As of December 31, 2011)		ACTIONS		PROGRESS
			Consolidation Initiative (FDCCI) efforts to reduce/consolidate DoD data centers. • Expand the Biobasased Product Demonstration Program to other Green Products at DoD Installations to validate their performance. • Execute approximately $30M of energy reduction and renewable energy demonstration projects at DoD installations	

Appendix 7: DoD Strategy to Promote Biobased Markets

Addendum to the 2012 Strategic Sustainability Performance Plan:
Responding to the President's Memorandum on Promotion of Biobased Markets

On February 21, 2012, President Obama signed a Memorandum, *Driving Innovation and Creating Jobs in Rural America through Biobased and Sustainable Product Procurement*. The memorandum requires all federal agencies to undertake a number of activities to increase their purchase of biobased products. The Department of Defense (DoD) is moving aggressively to implement the Presidential Memorandum requirements.

Accomplishments in FY 2011 include:

- The General Services Administration (GSA) and DoD conducted a workshop to facilitate ongoing collaborative discussions between GSA and DoD procurement staff on green acquisition. The workshop provided training which included U.S. Department of Agriculture Biobased products for acquisition personnel. Concluding the workshop, the participants identified the BioPreferred program as a specific area targeted for improving acquisition greening efforts.

- The Defense Logistics Agency (DLA) made a concerted effort to identify, test and incorporate biobased products into its supply chain. During the Fiscal Year (FY) 2011-12 timeframe, DLA established National Stock Numbers (NSNs) for 10 biobased products and modified one product specification. The DLA developed new biobased penetrating lubricants and sorbents as alternatives current petroleum-based products. Eight Tri-Service DoD installations successfully demonstrated the new products and found that they meet all requirements, as well provide enhanced health and safety benefits. The participating demonstration sites requested DLA to establish a biobased class of penetrating lubricants under the Commercial Item Description A-A-50493 (Class A Biobased Penetrating Lubricants). Now the Military Services can purchase the lubricants through DLA and receive credit on their environmental scorecard for buying sustainable/biobased penetrating lubricants. Finally, DLA established five new National Stock Numbers (NSNs) for biobased penetrating lubricants and two NSNs for the biobased sorbents, with more on the way.

- To help acquisition personnel track and report compliance with sustainable procurement mandates, DLA assisted with the development of data fields for four categories in Federal Procurement Data System (FPDS), including a category for BioPreferred. DLA also issued an Acquisition Directorate Procurement Letter establishing these fields for reporting. DLA began updating its Green Procurement Plan, which is used by all DLA acquisition offices, to ensure compliance with applicable procurement regulations. Furthermore, DLA instituted the use of the Integrated Acquisition Review Board process to verify the incorporation of BioPreferred and other sustainable procurement requirements into DLA Troop Support (pilot location) acquisitions.

- DLA Disposition Services issued a DLA Distribution Acquisition Directorate Policy and Procedure Memo that helps the acquisition workforce identify opportunities to

incorporate sustainable procurement during acquisition planning. DLA Disposition Services also developed a template, providing language, for use in procuring material handling and equipment and janitorial services.

- The Air Force issued a memorandum titled *Air Force Green Procurement Program,* which directs program managers and requirement owners in every mission area to consider and document green alternatives as they develop their requirement and product specifications for purchase. The memorandum also calls on managers to incorporate sustainable procurement language, including biobased products, in performance work statements, statements of work, and other product specifications for all new contracts. Key personnel involved in the acquisition process are now required to receive training on sustainable procurement requirements. The memorandum mandates updating Air Force instructions to promote sustainable green procurement practices.

- The Navy developed a new prototype training and awareness catalog titled *Buy It Green 2012: How to Buy Green for a Sustainable Navy*. The catalog includes background information and requirements for sustainable procurement, a listing of green products for high demand items, guidance for cardholders, and sample Federal Acquisition Regulation clauses and statements of work for contracting professionals.

- Washington Headquarters Services continues to provide recommendations to the Pentagon Storefront on making biobased and other sustainable purchases to ensure that all operations and maintenance materials are procured sustainably.

- The Army Net Zero pilot initiative has reinvigorated biobased and other green procurement activities across the organization.

Baseline for Biobased Contracting

Prior to the issuance of the President's February 2012 Memo on Biobased Procurement, DoD's National Defense Center for Energy and Environment provided training to facilitate the fielding of newly validated technologies including biobased products. DoD intends to develop a standard contract language to reflect the need for products and services to be, among other green requirements, biobased. DoD is investigating the feasibility of revising the NSN system to distinguish those products that are biobased from non-biobased products. The Defense Intelligence Agency acquisition system provided provisions and contract clauses to help their personnel comply with sustainable procurement requirements, including biobased products.

DoD achieved a 92.7 percent rate of sustainable acquisition in the second two quarters of FY 2011, based on the review of 577 contract actions with values over $3,000.

FY 2013 Target/Compliance Goal

DoD annual planning targets for sustainable procurement are 95 percent by FY 2012 and annually thereafter.

Strategies for Improving Compliance

DoD's objective for biobased procurement is the full incorporation of requirements and clauses for biobased products in relevant and appropriate contracts and follow-on activities to ensure compliance is achieved. The Department's strategy for achieving this objective includes the following elements:

- DoD will collaborate with GSA to leverage efforts to improve the identification, purchase, and use of biobased products. The partnership includes identifying appropriate Military Specifications (MIL-SPECs) to review for inclusion of biobased requirements, leveraging resources to demonstrate biobased product performance, and continuing to ensure sustainable products are included in DOD/GSA contracts.

- The Army plans to issue an updated sustainable procurement policy and develop a sustainable procurement 'quick guides'. The guides will educate the garrison and contracting staff on sustainable procurement requirements and how these requirements support the Army's mission.

- Naval Supply Systems Command Weapon Systems Support is partnering with DLA and GSA on a sustainable procurement initiative to identify green alternatives for high-demand consumable items the Navy uses daily, and make them available to acquisition professionals via electronic tools and catalogs. Weapon Systems Support is also leading a joint working group to develop more sustainable requirements for military and commercial packaging practices, such as increasing the use of biobased content in boxes, wrapping, and paper materials.

- The Marine Corps will increase sustainable procurement by educating contract writers, vendors, and product purchasers about sustainability requirements and mandates. The Marine Corps will continue to work with GSA and DLA to increase the procurement of sustainable products and remove all unnecessary products, such as Styrofoam, from the supply chain.

- The Air Force will implement new and updated green procurement policies, procedures, and guidance issued during FY 2011 and 2012.

- DLA plans to promote sustainable procurement through FY 2013. The methods include:
    - Issue exhortatory Procurement Letters detailing current requirements in FAR and DFARS pertaining to sustainable procurement.
    - Incorporate environmentally sustainable regulatory compliance as a special interest area into the Procurement Management Review process for applicable contracts.
    - Investigate the appointment of a sustainable procurement compliance advocate in the contract policy office at each DLA field activity and DLA contracting activity.
    - Expand the use of the Integrated Acquisition Review Board process to verify that sustainability is being addressed in every new, applicable acquisition.
    - Develop and gather sample contract language to aid contracting officers.
    - Perform periodic audits of contracts.

- Revise reporting requirements for the DLA field activities to heighten the awareness and ensure compliance.
- Continue to analyze FPDS for potential system change requests to enable the identification of sustainable acquisitions.
- Investigate potential improvements to the DLA EProcurement contract writing system, used throughout the agency, to give it the ability to track compliance with environmental regulations.

- Washington Headquarters Services will complete a guidance document on conducting minor renovations sustainably, including sustainable procurement. In addition, Washington Headquarters Services will also work with applicable stakeholders to provide training and assist with sustainable procurement implementation.

- The Defense Intelligence Agency will have a revised contract management system in place by the end of FY 2013, which will enable contracting officials to indicate green product and service procurements on Award Contract Line Item Numbers.

- The Missile Defense Agency (MDA) intends to issue and implement a Green Procurement Instruction that will identify all federal green purchasing requirements and establishes MDA compliance guidelines. All MDA credit card holders and staff involved in procurement will complete green procurement training to ensure they understand green procurement requirements. For FY 2013, MDA plans on improving the electronic search system for contract information to make compliance audits more effective.

Required Specification Reviews:

The President's Memorandum requires that wherever possible and appropriate, agency specifications require the use of sustainable products, including USDA-designated biobased products, and that any language prohibiting the use of biobased products be removed. To meet MIL-SPECs review requirement for biobased content, DoD will follow the process identified in DoD Instruction 4120.24M, "The Defense Standardization Program Policies and Procedures," to conduct specification reviews.

More than 29,000 active DoD specifications must be reviewed on a five year cycle and either revised, validated as correct and up to date, or (if no longer needed) cancelled. Although it is not possible to review a significant number of these MIL-SPECs for biobased content by the end of calendar year 2012, DoD will use the established review process and its partnership with GSA to identify specifications affected by the BioPreferred designations, and assesses options for promoting the purchase of biobased products in those specifications.

In addition, DoD is investigating a modification to Military Standard 961, "Defense and Program-Unique Specifications Format and Content," to include a clause requiring all applicable specifications to include biobased requirements. The current proposed clause titled "Recycled, recovered, environmentally preferable or biobased materials" would state: "Recycled, recovered, environmentally preferable or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs." The modification will require Defense Standardization Council's approval.