

*RECORD VERSION*

**STATEMENT BY**

**THE HONORABLE KATHERINE HAMMACK  
ASSISTANT SECRETARY OF THE ARMY FOR INSTALLATIONS,  
ENERGY, AND ENVIRONMENT**

**BEFORE THE**

**HOUSE ARMED SERVICES COMMITTEE  
SUBCOMMITTEE ON READINESS  
UNITED STATES HOUSE OF REPRESENTATIVES**

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**THE VALUE OF ENERGY SECURITY  
FROM  
BATTLEFIELD TO THE BASE**

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**INTRODUCTION**

Mr. Chairman and members of the Subcommittee, it is a pleasure to appear before you to discuss the Army's Energy Security program. We are grateful for this Subcommittee's continued support for the Army's Energy program. The Subcommittee's ongoing support, coupled with the President's vision for Energy Security and Sustainability, is marked by increased energy efficiencies and investments in renewable energy. This will result in improved access to reliable supplies of energy, the ability to protect and deliver sufficient energy to meet operational needs and reduced energy costs for the Army.

The Army requires secure and uninterrupted access to energy. Over reliance on fossil fuels and connection to a vulnerable electric power grid jeopardize the security of Army installations and mission capabilities. Investment in energy capabilities, including renewable energy and energy efficient technologies will help ensure the Army can meet mission requirements today and into the future.

Army operations span a diverse range of environments and tasks, from base infrastructure under lesser threat, to expeditionary operations and sustained campaigns in hostile areas. Supplying energy to these diverse missions is increasingly challenging. Constraints and threats to the supply of energy, water and other resources are growing in scope and complexity both abroad and at home.

The Army recognizes there are limited resources and that investments must be based on clear returns, measured both in terms of future savings and added mission capability.

We are moving forward to address the challenge of Energy Security and Sustainability to ensure the Army of tomorrow has the same or greater access to energy, water, land, and natural resources as the Army of today. To maintain an effective readiness posture as energy costs escalate, the Army has implemented a comprehensive Energy and Sustainability program based on culture change, increased energy efficiency, and development of renewable and alternate sources of energy. We are focusing our energy efforts on Soldier Power, Basing Power and Vehicle Power. Reducing energy use across the Army is mission critical, operationally necessary and financially prudent.

## **OVERVIEW**

The Army is addressing Energy Security through the development of a force-wide energy doctrine and operating principles. Technological investments, operational training, education and facilities management are all critical aspects of instilling a mindset of conservation, efficiency and sustainability.

To enable these transformational changes, the Army has integrated our energy strategies with an investment strategy that leverages both appropriated funding and private sector investments to accelerate the deployment of proven, viable technologies. The Army is using the authorities given us by the President and the Congress, namely power purchase agreements, enhanced use leases and energy performance contracting to attract outside investments geared toward long-term installation energy resource management that benefits both industry and

the Army.

The FY 2012 National Defense Authorization Act (NDAA) defines Energy Security as “having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet mission essential requirements.” The NDAA definition directs the Army to build energy security into its programs and requirements.

The Army has incorporated Energy Security into the Army Campaign Plan (ACP), the overall strategic management plan for the Army, along with the sustainable use of natural resources. Integrating Energy into the ACP provides the framework to imbed Energy Security into enterprise structures across the Army so energy is a factor in everything the Army does, from training, to managing our bases, to what we buy. Energy is also front and center in a range of Army policies, plans and governance structures – receiving constant attention from the senior most persons in the organization.

In FY11 the Army spent \$5 billion to provide energy to our Soldiers, which includes \$3.7 billion for liquid fuel and \$1.3 billion for electricity and other commodities on our installations. In the FY13 budget request the Army plans to spend \$4.5 billion on its energy program. This sum includes \$2.5 billion for liquid fuel and \$1.05 billion for utility services such as electricity and natural gas. The Army will also invest \$960 million to reduce future energy consumption (\$560 million in our operational forces and \$400 million for installations). We also anticipate attracting well over \$500 million in private sector investment through performance contracting and power purchase agreements. The Army evaluates all energy investment opportunities, regardless of funding source, to determine their long-term benefits for the Army. We examine projects based on return on investment and demonstrated cost savings over their lifetime. We also

expect projects to make positive contributions to mission success through reduced fuel demand on the battlefield, increased capability, reduced energy weight carried by a Soldier on patrol, and more energy-informed operations.

The Army recognizes the value of external collaboration and to this end we work closely with a variety of public and private organizations to include the Offices of the Secretary of Defense, other military Services, Department of Energy, Environmental Protection Agency, OMB, industry, and others to meet our energy security requirements.

## **OPERATIONAL ENERGY**

The Army is designating the G-4 as the Army Staff proponent for Operational Energy. This designation ensures synchronization and integration of Operational Energy functions across the Army. The Army's FY 13 Operational Energy Investment Budget totals \$560 million and includes \$154 million for Science and Technology and \$406 million for Acquisition. This funding will develop and procure energy efficient generators, improve battery and Soldier power systems, increase energy efficient systems for Army aircraft and tactical vehicles, and procure aviation simulators. Together, these investments will reduce the volume of petroleum used by the Army. For example, the new generators use 21% less fuel than the ones they are replacing and the new aircraft engine provides dramatic performance improvements while using 25% less fuel.

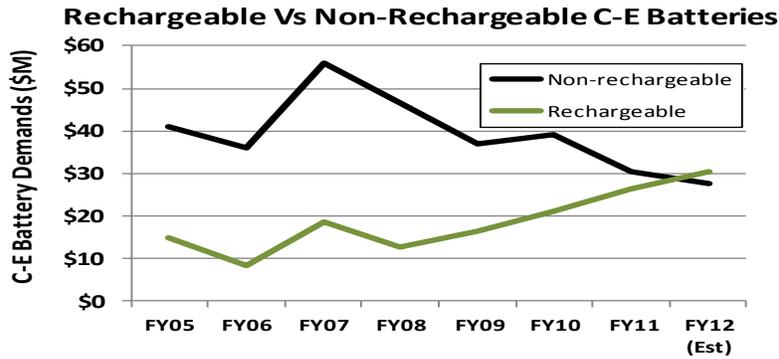
On the battlefield, energy is fundamental to Army capability and performance. The Army's energy requirements are driven by the military mission. The primary goal of the Army's Operational Energy efforts is to maximize effectiveness of Soldiers and leaders on the ground.

Power and water logistical requirements in combat theaters represent significant risks, from convoy supply operations to Soldier equipment weight. Fuel and water comprise seventy to eighty percent of ground resupply convoys (by weight). The fully burdened cost of fuel – the total cost per gallon of all activities needed to acquire, transport, distribute and secure fuel - ranges from \$3.95 to as high as \$56 per gallon in Afghanistan. We estimate the Army suffered one casualty for every forty-six convoys in Operation Enduring Freedom (OEF) in 2010. The Army is committed to easing the aggregate burden of powering the tactical edge while still providing the amount of power and resources needed by Soldiers. New technologies are being tested in combat theaters that will increase mission agility through better power management and flexible power sourcing. Further, forward operating base improvements are being developed to allow Soldiers to be more efficient and less energy intensive. Technologies including smart micro-power grids, advanced structure insulation and onsite water generation are just some of the concepts being explored to reduce the energy footprint of operations.

The Army is focusing on Soldier Power to lighten Soldier energy loads and help them become more agile and self-reliant. Current efforts include advanced portable power systems, lighter batteries, universal charging devices and water purifiers. A Soldier on a three-day patrol may carry seventy batteries weighing about sixteen pounds. This means that for a dismounted platoon to operate for 72 hours they must carry more than 400 pounds of batteries. Developing solutions to reduce this load will build flexibility and resilience. One way the Army is achieving this is by transitioning to the use of more rechargeable batteries. In FY12 the Army will spend about \$60 million on Communication-Electronics batteries, 56% of which will be rechargeable batteries vs. 26% in FY05 (Figure 1). When such batteries are paired with portable solar power blanket recharging systems,

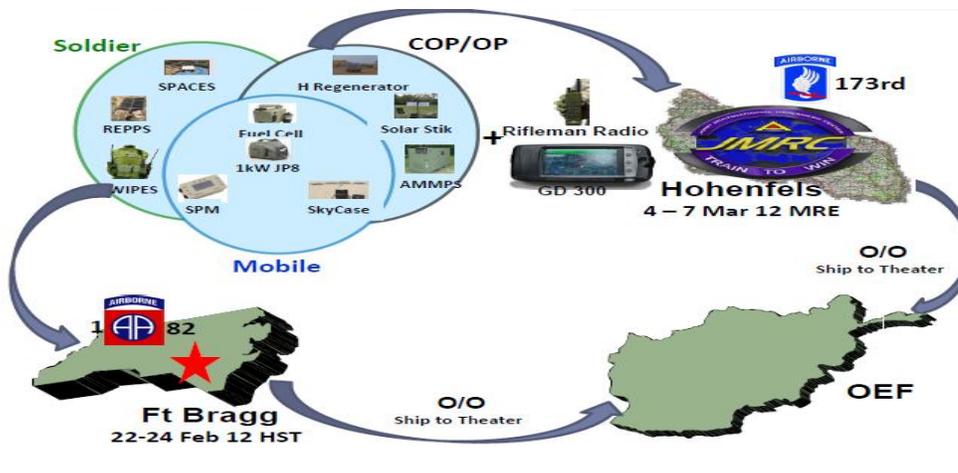
significant weight savings can be achieved and patrols can stay out longer without resupply.

**Figure 1**



The Army is so convinced of the value of energy solutions on the battlefield that we are currently equipping two Airborne Brigade Combat Teams (ABCT) in preparation for deployment to Afghanistan with a suite of new technologies. These technologies build upon the earlier deployment of the 1-16 infantry battalion. The 1-82<sup>nd</sup> and the 173<sup>rd</sup> ABCTs will deploy with capabilities such as power management devices, fuel cells, energy efficient generators, and alternative energy sources (Figure 2).

**Figure 2: Suite of New Energy Technologies**



The US Army Corps of Engineers has aggressively installed “mini-grids” throughout Afghanistan, consolidating point generators into fewer, larger and more efficient units. The increased efficiency from this effort will result in an annual fuel savings of more than 50 million gallons per year, the equivalent of removing nearly 20,000 fuel trucks from the road.

To drive energy security across all aspects of the Army, an Operational Energy (OE) Initial Capabilities Document (ICD) will be published within the next several months. The Army OE ICD relates energy requirements to operational capabilities and outlines the analytical framework to assess operational improvements against costs. It highlights the inherent need for energy networking and management functions, materiel solutions to reduce the energy footprint, and an increased operational focus on energy.

### **BASE / INSTALLATION ENERGY**

The Installation Energy budget totals \$1.45 billion and includes \$50 million from the Department of Defense (DoD) “Defense-Wide” appropriation for the Energy Conservation Investment Program (ECIP), \$343 million for Energy Program / Utilities Modernization program, \$1.053 billion for Utilities Services, and \$7.1 million for installation related Science and Technology research and development.

The Army is the largest facilities energy user in the Federal Government, using roughly one fifth or just over 20% of the Government’s total. Investment in renewable energy and energy efficient technologies will help ensure the Army can meet mission requirements today and into the future.

Since FY 2003 the Army has reduced its installation energy consumption by 13.1 percent while its total number of active Soldiers and civilians has increased 20 percent.

Energy Security on our Installations aligns with the FY 12 NDAA definition of Energy Security: “having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet mission essential requirements.” It is clear that an energy secure installation must have: a) a very energy efficient set of buildings, b) on-site power generation and c) a secure micro-grid that can match power with key loads. The Army is making investments in each of these areas.

Over the past several years the Army has taken significant steps towards improving the energy efficiency of our installations. To meet our energy efficiency goals we have utilized appropriated funds, policy initiatives and third-party financing.

***a. Energy Conservation Investment Program (ECIP)***

The Army invests in efficiency, on-site energy production and grid security through the Department of Defense’s (DoD) appropriation for the Energy Conservation Investment Program (ECIP). The Army’s FY 2013 budget for the ECIP program, \$50 million, includes seven renewable energy projects, six energy conservation projects, one water project, and two Energy Security projects. The Army is taking a strategic look at requirements, including a thorough project validation and prioritization process, to develop an ECIP Future Years Defense Program to fund additional requirements should such an opportunity arise.

***b. Energy Program/Utilities Modernization (Energy Efficiency)***

When developing energy projects to be funded with appropriated dollars, the Army subjects these projects to a Cost Benefit Analysis (CBA) process to ensure that the Army will receive a reasonable return on investment. When we developed our budget request for FY13-17, approximately 1800 projects were submitted to this process. Projects that did not have reasonable returns on investment were eliminated, ensuring that taxpayer funds will be used in the most effective manner possible. As a result the Army was able to identify approximately \$343 million in its Energy Program / Utilities Modernization budget for FY13 for projects and initiatives that will have a cost effective return on investment for the Army while contributing significantly to the energy security of Army facilities.

Included in this total is \$96.6 million for energy efficiency projects, \$49.2 million for the development and construction of renewable energy projects, \$43.8 million for the Army's metering program, \$112.7 million to modernize the Army's utilities, \$13.2 million for energy security projects and \$27.4 million for planning and studies.

The Army is placing considerable emphasis on energy efficiency in its facilities. Energy efficiency improvements provide a significant opportunity for the Army to reduce total energy usage while generating significant cost savings. The FY13 investment of approximately \$343 million in Energy Program / Utilities Modernization initiatives is projected to avoid utility costs of \$23 million dollars annually.

In addition, the Army has initiated several Energy policies to promote energy security. The Army has adopted the highest building code in the Federal Government, ASHRAE Standard 189.1 which will reduce energy and water consumption on average 40 percent annually in

our new construction program and in existing facilities that undergo major renovations. This policy decision was made only after extensive cost-benefit analysis by the US Army Corps of Engineers, the Department of Energy and an independent outside organization. For most buildings and most climate zones the Army will get these savings simply through better, more integrated design. In some locations for some facility types we may have to pay up to 5% additional costs at time of construction, a figure that will be recovered many times over in savings throughout the life of the building.

While internally the Army is focusing and prioritizing investments towards energy security, we are very mindful of and trying to achieve the goals for reduction in installation energy that Congress and the President have mandated. The Army energy goals include a 30% reduction in facilities energy intensity by 2015 from the 2003 baseline; generation of 25% of energy from renewable resources by 2025; reduction in petroleum use in non-tactical equipment by 20% by 2015; and elimination of the use of fossil fuel generated energy in newly constructed buildings by 2030.

**Figure 3: Net Zero Initiative**



Underpinning all efforts is culture change and a need to take a holistic integrated design approach to solutions that can be found in the

Net Zero Initiative. In FY11, the Army announced the Net Zero Initiative (Figure 3), which aims to provide significant security benefits to installations while helping to meet Congressional and Presidential goals. With an FY13 budget of \$2.2 million, the Net Zero Installation initiative is advancing an integrated approach and will improve the management of energy, water, and waste. Net zero installations will move closer to the objective of consuming only as much energy or water as they produce and eliminate solid waste to landfills. When fully implemented, this will establish Army communities as models for energy security, sustainability, value, and quality of life. Seventeen installations have been identified for this effort, with plans to reach Net Zero by 2020.

The installations piloting this initiative have already had successes. In support of its Net Zero Water Installation goals, Tobyhanna Army Depot (TYAD) used Army Working Capital Fund (AWCF) resources for an in-house project that replaced potable water with process wastewater for foam reduction in two locations at its wastewater treatment plant. The project cost of \$1,200 will result in savings of 300,000 gallons of potable water per month. The project paid for itself in just over one month.

Also using AWCF, TYAD installed a water chiller to replace a single-pass cooling system in an Industrial Operations Facility. This project saves over two million gallons of potable water per month. A payback period of 8 months is expected to cover project costs of \$125,000.

### ***Renewable Energy***

The development of power production on Army installations to meet critical loads is a critical component of energy security. The FY 13 budget

allocates \$49.2 million to support development of cost effective renewable energy projects and leverage private sector funding.

To streamline the process of developing large scale renewable energy projects on Army lands we have established the Energy Initiatives Task Force (EITF). The EITF is integral to the Army addressing rising energy security challenges and escalating fuel prices. Through the EITF the Army will secure renewable electricity on our installations at rates that are on par or below existing rates. The FY 13 budget includes \$29 million for the EITF to serve as a one-stop shop and augment installation staff for the development of renewable energy projects greater than 10 MW on Army installations to obtain secure, sustainable, and affordable energy from a diversity of sources. The EITF is dedicated to working with the private sector to streamline the process to help speed overall project development timelines to ensure the best value to the Army and private sector. The EITF is currently evaluating 12 projects at eight installations to determine feasibility for further development and has identified further opportunities at 21 installations. The goal is 1 gigawatt of alternative energy by 2020.

### ***Metering***

The Army's FY13 budget includes \$43.8 million for installing advanced meters on its facilities. The Army Meter Implementation Plan was developed in response to the Energy Policy Act of 2005 (EPAAct 2005) which required metering of all federal facilities with advanced electric meters by 2012 where practicable, and the Energy Independence and Security Act of 2007 (EISA 2007) which established a 2016 deadline for natural gas and steam metering. A baseline was established for facilities to receive advanced metering as facilities with an estimated annual electric utility cost of \$35,000 or more (generally buildings of 29,000

square feet or greater) or reimbursable tenant facilities. The Army will connect these meters to an enterprise level Meter Data Management System that will allow commanders to track energy consumption and integrate that information into command decisions resulting in improved performance.

### ***Utilities Modernization***

The projects in the Utilities Modernization Program (UMP) compete for funding resources from Sustainment, Restoration, and Modernization (SRM) programs and O&M funding. In FY13, the Army has allocated \$112.7 million for UMP, whose primary focus is to invest in improvements of water and non-water utility systems infrastructures, HVAC efficiency performance, and electrical system improvements. Utilities Modernization projects in the FY13 budget will improve energy security by increasing the reliability and operational efficiency of Army utilities infrastructure.

### ***Energy Security Projects***

Energy security projects in the FY13 budget are specifically focused on assurance of electrical service. Among projects programmed for energy security are ones to upgrade electrical power distribution systems, harden transformers, and provide back-up power capability.

The Army is also working to develop “Smart” grid capabilities on its installations. The technology and processes in this area are still emerging. The Army is making investments in “Smart” grids to develop and acquire these technologies for use at our fixed installations and in contingency operations. The inter-agency Smart Power Infrastructure Demonstration for Energy Reliability and Security (SPIDERS) program will build the largest and cyber secure micro-grid in the Army at Fort Carson,

CO and an award is planned for late May 2012. The SPIDERS Joint Capability Technology Demonstration (JCTD) integrates infrastructure upgrades, renewable energy generation, bi-directional vehicle to grid and energy storage to provide a template other military installations may take in building energy security. Additionally, the Army is investing in micro-grid projects at Fort Bliss, Fort Sill and Fort Hunter-Liggett, as well as the in theater at the tactical edge with investments in the Afghan Micro-grid project at Bagram. While the Army can utilize alternative financing authorities to improve efficiency and install onsite energy generation, the financial return on investment from including “Smart” grids in these projects is an attribute asked for by Congress and valued by the Army, but is hard to monetize in private markets. Going forward we will build in “smart-grid ready” features in our buildings and, renewable energy projects. Smart grid features include security, economic metrics, and conservation and promote environmental and sustainable accounting. Bundling these capabilities into Army applications for Smart Grid technologies will accelerate the transition to commercial and community adoption.

### ***c. Installation Related Science and Technology***

The FY13 budget includes \$7.1 million for Installation related Science and Technology Research. Installation Science and Technology programs investigate and evaluate technologies and techniques to ensure sustainable, cost efficient and effective facilities to achieve resilient and sustainable installation and base operations. Facility enhancement technologies contribute to cost reductions in the Army facility life cycle process and the supporting installation operations. Furthermore, technologies necessary for secure, energy efficient, sustainable military installations, emphasizing energy and utility systems protections are also investigated.

#### ***d. Utility Services***

The FY 13 budget includes \$1.053 billion for Utilities Services. The Utilities Services account pays all Army utility bills and is used to finance the repayment of Utilities Privatization, Energy Savings Performance Contracts (ESPCs) and Utilities Energy Service Contracts (UESCs). The Army is the largest user of ESPCs and second largest user of UESCs in the Federal Government. ESPCs and UESCs are contracts where private companies / servicing utilities provide initial private capital investment to execute projects, and are repaid from realized energy savings. These contracts guarantee energy savings so that the Army is assured that it receives the energy savings. To date the Army has implemented ESPCs at 72 installations, representing more than \$1 billion in private sector investment, more than 5,860,000 million BTU Energy savings per year, and \$8.5 million savings to Army over and above the \$106 million of savings used to repay these long term contracts annually. The Army has also implemented UESCs at 43 installations representing more than \$500 million in private sector investment, more than 3,590,000 million BTU energy savings per year, and \$12 million savings to Army over and above the \$49 million of savings used to repay these long term contracts annually. The Army plans to expand the use of these contracts with more than \$500 million worth of projects in development.

#### ***Conclusion***

In conclusion, the Army is working diligently to improve our energy security posture, both on our fixed installations and in our operations. The ability for the Army to produce, store, dispense and manage its own energy, with reduced reliance upon outside sources, will greatly enhance our performance goals. Reduced reliance means increased mobility by

not being tethered to supply lines, foreign suppliers and volatile energy markets. Investment in energy capabilities, including renewable energy and energy efficient technologies will help ensure the Army can meet mission requirements today and into the future. Not only is it the smart thing to do; it is the right thing to do from both an operational and financial stand point.