

DEPARTMENT OF THE AIR FORCE

**PRESENTATION TO THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON READINESS**

UNITED STATES HOUSE OF REPRESENTATIVES

**SUBJECT: ENERGY MANAGEMENT AND INITIATIVES ON MILITARY
INSTALLATIONS**

**STATEMENT OF: MRS DEBRA TUNE
PERFORMING THE DUTIES OF THE ASSISTANT SECRETARY
FOR INSTALLATIONS, ENVIRONMENT AND LOGISTICS
UNITED STATES AIR FORCE**

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From aviation operations to installation infrastructure within the homeland and abroad, energy enables the dynamic and unique defense capabilities of global vigilance, global reach and global power the Air Force needs to fly, fight and win...in air, space and cyberspace. Effective and efficient energy management is not only necessary—it is critical to assuring available energy today and sustainable energy into the future. There is a recognized need to have assured access to reliable energy sources and ensure that sufficient energy is available to meet Air Force operational needs. The Air Force is proud to be a leader in America's ongoing quest to use energy more efficiently and effectively through improved processes, better operational procedures and new technologies, as well as helping the nation decrease its dependence on imported oil through the use of alternative fuels and renewable energy.

Sustaining the Air Force's mission execution capabilities and its global operations requires a tremendous amount of energy. In Fiscal Year (FY) 2009, the Air Force spent approximately \$6.7 billion on energy to conduct its operations. Of that \$6.7 billion, \$1.1 billion, or 17 percent, was spent to operate Air Force installations and facilities around the world. In FY2009, the Air Force spent over \$350 million for installation energy projects and requested more than \$280 million in the FY2011 President's budget for similar projects, with the majority of those funds slated for energy conservation initiatives that would make bases more energy efficient and improve the quality of life for Airmen. Additionally, the 2009 American Recovery and Reinvestment Act (ARRA) provided the Air Force with \$455 million for energy performance improvements and efficiencies. The Air Force also received \$75 million for energy research, development, test and evaluation projects under ARRA with \$33.0 million going towards

projects to improve installation energy security. Other ARRA funds will indirectly improve energy performance by modernizing a host of facilities and infrastructures across the Air Force.

The Air Force recognizes that there are many national energy policy objectives, to include the economic impacts of energy costs, the need to reduce greenhouse gas emissions and the national security implications of a high reliance on imported energy. While addressing these challenges, it is of vital importance the Air Force have the energy available necessary to accomplish its missions. Accordingly, the Air Force has developed a comprehensive energy strategy to improve its ability to manage supply and demand in a way that enhances mission capability and readiness, while helping address the nation's broader energy challenges.

In the FY 2011 President's Budget, the Department of Defense (DoD) identified a number of high priority performance goals to include "Increase Energy Efficiencies". Current Air Force energy policy will provide a foundation for the Air Force to achieve these goals.

AIR FORCE ENERGY POLICY: The Air Force's Energy Vision—*Make Energy a Consideration in All We Do*—highlights that energy is central to all of the interdependent functional aspects of the Air Force's mission execution. In July 2009, the Air Force formally institutionalized its energy program along with its strategy and goals with the issuance of formal Air Force policy. In December 2009, the Air Force released its Energy Plan, which established "End State Goals" for 2030 and provided a strategic framework to translate formal policy into actionable energy "Focus" areas.

The Air Force approach to energy is built upon three primary pillars: *Reduce Demand*, *Increase Supply*, and *Change the Culture*. Each pillar has been defined and further developed to include implementing goals, objectives and metrics. This three-pronged approach integrates *demand-side* energy efficiency and mission effectiveness with *supply-side* alternative energy utilization, both of which are enhanced by creating a culture that values energy as a mission-critical resource.

REDUCE DEMAND: The Air Force is committed to reducing aviation, installation and ground operations energy demand, and understands it is critical to reduce energy consumption as a way to enhance security. In support of this commitment, the Air Force has met every federal mandate related to facility energy use since 1975, and continues to develop programs and invest in technologies to meet new and emerging energy goals.

The 2007 Energy Independence and Security Act established a goal for the Air Force to reduce energy intensity at installations by 30 percent by 2015. More recently, the DoD, as part of its High Priority Performance Goals identified the reduction of installation energy consumption by 18 percent by 2011. The Air Force is on track to meet these goals as supported by our performance from FY2003 to FY2009, where by the Air Force reduced installation energy consumption by more than 14 percent. A majority of the Air Force's future energy intensity reductions will come from energy efficiency improvements to existing infrastructure such as lighting retrofits, installation of ground source heat pumps, decentralizing heat plants, and paint hangar heating, ventilation and air conditioning recirculation systems.

There are numerous examples where the Air Force has already completed energy efficiency improvements at bases across the nation. For example, energy leaders at **Vandenberg Air Force Base, California**, installed energy efficient lights and occupancy sensors in more than 100 buildings. Lights in high bay buildings that used to take 30 minutes to warm-up can now be turned off and on instantly. This project saves almost \$500,000 a year in electricity costs, while improving the function of the facility.

At **Elmendorf Air Force Base, Alaska**, the Air Force replaced a 50-year old central heat and power plant with a new, base-wide decentralized heating system. This project reduced the installation's energy consumption by over 1 million MBTUs per year—a cost savings of almost \$4 million a year and almost a 2 percent reduction in the total annual energy consumption for the entire Air Force.

In FY2009, the Air Force funded 11 energy conservation projects totaling \$23.0 million through the Energy Conservation Investment Program (ECIP). These projects will save enough electricity to power 4,000 homes. As part of ECIP, the Air Force received \$37.5 million for 22 energy projects in FY2010 and requested \$35.0 million for 19 additional projects in FY2011.

INCREASE SUPPLY: The Air Force is committed to increasing the amount of energy supplies available to assure the mission is accomplished and improve the nation's energy security. The Air Force is the largest purchaser of renewable energy in the Federal government, and continues to seek out interagency and industry partnerships to expand its renewable portfolio. As a leader in the purchase and generation of renewable energy from biomass, wind, solar, and geothermal

sources, the Air Force continues to meet the goals established by the President and Congress. In FY2009, almost six percent of the Air Force's total electric power consumption was from on-base and purchased renewable energy sources. With current projects in development, the Air Force expects to generate 335,000 megawatt hours from renewable energy on-base by 2015, exceeding current goals.

Additionally, as identified in the FY2011 President's Budget, DoD has developed an internal High Priority Performance Goal to produce or procure over 14 percent of its annual electric energy usage as renewable energy. The Air Force is working with the Office of the Secretary of Defense to help achieve that goal.

At **Buckley Air Force Base, Colorado**, construction has begun on a 1 megawatt solar project that will use more than 5,000 photovoltaic modules to help power the base. In FY2009, **F.E. Warren Air Force Base, Wyoming**, installed a two megawatt wind turbine as part of a wind test demonstration project under the FY2006 National Defense Appropriations Act. The base now has three wind turbines in place that can generate more than three megawatts of power.

The **180th Fighter Wing Air National Guard Base, Ohio**, recently began the fourth phase expansion of their solar field. When complete, the field is anticipated to provide about 37 percent of the base's electrical needs. It is the largest solar field in Ohio and largest on any National Guard base in the country. Since its inception, the solar field has produced 21 percent of the base's total electrical requirements and saved about \$140,000 in energy costs within the

last 2 years. To reduce its overall energy usage, the installation also upgraded several boiler systems to high efficiency modulating units and installed high efficiency lighting.

The **United States Air Force Academy, Colorado**, is identifying and implementing both energy conservation projects and investments in renewable energy sources. The Academy has embarked on a net zero energy initiative where all power consumed there is generated on Academy grounds and is transforming into a showcase base using solar power, hydro-power, wind energy, waste-to-energy and dry fermentation biomass.

Through Enhanced Use Leases (EULs), the Air Force is pursuing the development of large-scale energy projects that use renewable sources of energy, such as solar, wind, and geothermal.

EULs offer the Air Force the opportunity to lease land that is either not anticipated to be needed for mission purposes for the duration of the lease or where the leasehold use is consistent with mission requirements for the property to commercial entities and enables the Air Force to enter into projects that benefit installations, local communities and the private sector. In November 2009, the Air Force announced it will begin negotiations to develop more than 3,000 acres at **Edwards Air Force Base, California**, with a target to construct a crystalline photovoltaic solar development that would deliver enough energy to power nearly 89,000 homes.

The Air Force strongly supports the use and development of renewable energy and continues to collaborate with developers. Some energy sources, such as wind, solar and traditional fossil fuels, present complex challenges to mission and radar compatibility. The Secretary of the Air Force has directed the Air Force Scientific Advisory Board to study the potential impacts of

emerging alternative energy on operations. In addition, the Air Force Research Laboratory is collecting data on potential impact mitigations strategies. Through this report and collaboration with the Federal Aviation Administration, the Office of the Secretary of Defense and the other Services, the Air Force is working to resolve these challenges and enable developers to identify potential mission impacts from off-base energy projects early enough in their planning process to avoid lost investment of time or money.

Through collaborations with developers and local communities, the Air Force has achieved positive results regarding the siting of energy projects near installations. For example, at **Travis Air Force Base, California**, the Air Force, wind energy developers and local government officials collaborated on a joint research effort to assess the impact of three pending wind turbine projects on radar capabilities at the base. This group used an innovative simulation methodology to predict the project's impact on the radar's coverage and determined the base could maintain the necessary level of radar coverage to ensure safe flying operations. The efforts at Travis Air Force Base provide just one example of how collaborations can be used to solve problems with mutually beneficial results.

Providing power to installations is contingent upon continuous energy flows, yet in the event of a grid disruption, the ability of the Air Force to sustain mission-critical operations is limited to tactical back-up power systems. The Air Force is pursuing ways to assure power is available to Air Force critical assets by increasing reliability, security, and efficiency. While the development of a smart grid will enable energy efficiencies for the Air Force and the nation, a secure grid is essential to ensure energy is available to power critical Air Force assets.

The Air Force realizes a collaborative approach is necessary to address this national issue. For example, at **Wright-Patterson Air Force Base, Ohio**, the Air Force is partnering with other Federal agencies, academic research partners, local utilities, and private industry to develop recommendations that will maintain or improve mission capability, while improving resiliency and security of power delivery. Additionally, at **Robins Air Force Base, Georgia**, there are multiple existing generation, fuel sources and electric distribution options in place that ensure the base can operate independent of the electric grid during a loss of service. Similar collaborative efforts to increase combat and sustainment capabilities through assured energy are underway at **Peterson Air Force Base, Colorado**, and the **U.S. Air Force Academy, Colorado**. This is a national challenge and the Air Force is ready to do its part to help Congress, other Federal agencies, and affected stakeholders.

CULTURE CHANGE: Changing the Air Force culture is critical to achieving the Air Force's Energy Vision. As the culture changes and the Air Force increases its energy awareness, new ideas and methodologies for operating more efficiently will emerge as Airmen consider energy in their day-to-day duties. Training and education are critical to the Air Force Energy strategy and energy vision. The Air Force is emphasizing energy training for uniformed and civilian personnel. Through year-long campaigns at all Air Force major commands and installations, every member of the Air Force—from uniform to civilian—is made aware of the importance of energy to the mission. Additionally, all Airmen entering the Air Force are educated about the importance of energy conservation. The Air Force Institute of Technology provides formal training to Air Force energy managers that provides a foundation in the engineering principles

related to facility energy efficiency and conservation, as well as the policies, legislation, and guidance that directs energy activities in the Air Force.

SUMMARY: Energy availability and security impacts all Air Force missions, operations, and organizations. The Air Force must have assured energy access to meet the demands of contingency operations abroad and protect the homeland from emerging threats. Though there is no single “silver bullet” solution for reducing energy dependence in day-to-day operations, the Air Force is dedicated to integrating holistic energy management across all mission areas. To enhance energy security, the Air Force is developing a portfolio of renewable and alternative energy sources, as well as implementing energy conservation and efficiency management strategies. By reducing energy demand, increasing the amount and diversity of energy supply, and changing the culture to make energy a consideration in every activity, the Air Force will increase warfighting capabilities, effectiveness through efficiency, and help the nation reduce its dependence on imported oil.