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ENERGY MANAGEMENT AND INITIATIVES ON MILITARY INSTALLATIONS

HEARING

BEFORE THE

READINESS SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

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ENERGY MANAGEMENT AND INITIATIVES ON MILITARY INSTALLATIONS

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
READINESS SUBCOMMITTEE,
Washington, DC, Wednesday, February 24, 2010.

The Subcommittee met, pursuant to call, at 2:05 p.m., in room 2118, Rayburn House Office Building, Hon. Solomon P. Ortiz (Chairman of the Subcommittee) presiding.

OPENING STATEMENT OF HON. SOLOMON P. ORTIZ, A REPRESENTATIVE FROM TEXAS, CHAIRMAN, READINESS SUBCOMMITTEE

Mr. ORTIZ. Good afternoon. This hearing will come to order. I thank our distinguished witnesses for appearing before this subcommittee today to discuss energy management and initiatives on military installations.

Today's hearing is one of several held by this Subcommittee relating to the Department of Defense (DOD) energy posture. We have heard from the Defense Science Board's Energy Security Task Force, the Government Accountability Office (GAO), and the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics on a broad range of energy issues.

Today's hearing will focus on the many energy initiatives underway on military installations and the overarching strategies that guide these initiatives.

In many ways, through these strategies and initiatives, the Department has assumed a leadership role in addressing our Nation's energy challenges. Each of the military services and the Office of the Secretary of Defense (OSD) have worked to develop energy strategies and goals. Capping these efforts off, the 2010 Quadrennial Defense Review (QDR) identifies energy and its sister issue, climate change, as two key agents that will play a significant role in shaping the future of national security and the environment.

The military services have demonstrated a willingness to be early adopters of new technologies and enablers of renewable and alternative energy projects. They have started to lease electrical vehicles and they work towards net zero installations, adopt advanced metering technologies, investigate microgrid technologies, and partner with the private sector to develop wind, solar, geothermal and waste-to-energy systems, just to name a few.

Initiatives are accelerating not only in variety but in size. When it was completed in 2010, the 14.2 megawatt solar array at Nellis Air Force Base was the largest such array in the Americas. Today, another military installation is contemplating partnering on a solar

project 35 times larger. This project would encompass as much as 14,000 acres and provide 500 megawatts of solar energy to the installation and to the grid.

Now, this is an exciting prospect. However, in a recent report conducted at this Subcommittee's request, the Government Accountability Office recognized that development of renewable energy projects is not always compatible with the primary mission of a DOD installation. I would like to hear what steps the Department has taken to ensure that large-scale energy projects on military installations don't eventually impede a base's primary mission or result in another form of encroachment.

While the Department's initiatives have been accelerating at military installations, outside defense private-sector initiatives have been, too. The number of domestic renewable energy projects such as wind farms, solar power and arrays has been increasing significantly in recent years. These projects have great potential to enhance our energy security.

At the same time, I am concerned to learn that some of these energy projects, particularly large wind farms and solar towers, may have the potential to impair military readiness. Recent tests conducted by the Department of Defense and recent experiences at some military installations show that windmills can significantly affect radar performance, can obstruct military training routes, and can interfere with military systems designed to operate in the electromagnetic spectrum. These are significant challenges that we must address. It is important that we understand how to balance energy security and military readiness because our Nation needs both.

I look forward to hearing the perspective of our distinguished witnesses today on these and other issues of interest to the Subcommittee.

But before I recognize my good friend, Mr. Forbes, the distinguished Ranking Member, I would like to speak for one brief moment on a topic that we will not focus on today, but that is important and related, and that is operational energy.

Now, this Subcommittee created a new office for a Director for Operational Energy to advise the Secretary of Defense and oversee energy the Department uses for military operations. Now, I believe that a nominee has been selected and I am hopeful that her Senate confirmation will happen quickly. It is imperative that we round out the Department's energy team with this key official dedicated to operational energy oversight.

With that said, I look forward to the thoughtful testimony on installation energy management and initiatives from the distinguished witnesses we have here today.

The Chair now recognizes the distinguished gentleman from Virginia, my good friend, Mr. Forbes, for any remarks he may like to make.

[The prepared statement of Mr. Ortiz can be found in the Appendix on page 31.]

STATEMENT OF HON. J. RANDY FORBES, A REPRESENTATIVE FROM VIRGINIA, RANKING MEMBER, READINESS SUBCOMMITTEE

Mr. FORBES. Mr. Chairman, thank you, as always, for your service for holding this hearing. I want to thank all of our witnesses for their time and sharing their expertise with us today. The timing of this hearing is certainly excellent.

Whatever your views are on global warming and the benefits of clean energy, there are certainly a few things that are clear:

One, that the cost and risk of an exclusive reliance on petroleum energy sources grows with each passing year.

Two, we should use renewable sources when it is cost-competitive and when it enhances or, at a minimum, does not detract from our military readiness.

Lastly, renewable resources can greatly increase the energy security of our national military installations.

My primary interest today, however, is not only to learn about goals to expand green energy in the military, but also to understand how realistic and achievable each of the goals are.

For instance, net zero energy consuming installations is a laudable goal from a cost savings and energy security viewpoint. But the question is: Is it achievable? What will we have to give up in the short run or the long run to reach this goal?

I believe it is critical to address two serious flaws in the rush to push green energy on military installations:

First, there seems to be no shortage of good ideas and mandates that are placed on the Department of Defense by both the White House and Congress without either an integrated plan or an evaluation system to ensure we are meeting the stated objectives. The list of mandates includes specific substantial goals for hybrid vehicles, greenhouse gas emissions, solar energy use and reduction goals for petroleum use and overall reductions in energy use. Meeting just a few of the goals would be daunting. Before we add more mandates, we should agree on our key objectives. Is it total energy security for each installation so that our energy sources are not ever in question? Is the goal to ensure at least 50 percent of our energy comes from renewable energy sources? To my knowledge, there is no comprehensive Departmental plan beyond saving what we can, where we can.

My second concern is the impact renewable energy products have on military training. Solar projects can spread across vast areas of valuable military training land and limit military training, particularly military aviation. Even more troubling are wind turbines. These giant devices not only present hazards near military airfields, but they also alter military aviation training routes across the country and can adversely affect military training and air defense radars.

Despite these acknowledged drawbacks, wind farms are being funded at breakneck speed by stimulus funding within a porous regulatory oversight structure. Any large undertaking that substantially alters land, sea or airspace, must undergo thorough scrutiny for military training impacts as well as other environmental concerns. Military training land and airspace is extraordinarily difficult to acquire, so we must preserve and protect what we have.

Mr. Chairman, I also believe we must expand our use of renewable energy, and I have introduced legislation and supported legislation that moves us in this direction. But like any laudable goal, the marginal cost of any approach must be considered. We must be careful that our national enthusiasm for clean energy does not negatively affect military readiness. We must do a better job of fully considering the long-term consequences of our actions. In my view, the Pentagon's energy goals must be realistic, compatible with military training, advance the goal of energy security, and be a part of a comprehensive Department-wide plan.

I would like to hear how our witnesses intend to achieve those objectives. And, once again, thank you all for taking your time and being here.

Mr. Chairman, thank you for scheduling this hearing.

With that, I yield back the balance of my time.

Mr. ORTIZ. Thank you.

[The prepared statement of Mr. Forbes can be found in the Appendix on page 38.]

Mr. ORTIZ. Today we are fortunate to have a panel of witnesses representing the Department of Defense, the Departments of the Army, the Navy and Air Force. We have with us Dr. Dorothy Robyn. Doctor, good to see you again and welcome. She is the Deputy Under Secretary of Defense for Installations and Environment.

Mr. L. Jerry Hansen, Army Senior Energy Executive and senior official performing duties as the Assistant Secretary of the Army for Installations and Environment.

Mr. Roger Natsuhara, good to see you again, sir. Good to see you yesterday and see you back again. He is the Acting Assistant Secretary of the Navy for Installations and Environment and Logistics.

Mrs. Debra K. Tune, performing the duties of the Assistant Secretary of the Air Force for Installations, Environment and Logistics.

Without objection, the witnesses' prepared testimony will be accepted for the record.

Mr. ORTIZ. Dr. Robyn, welcome. You may proceed with your opening remarks.

STATEMENT OF DR. DOROTHY ROBYN, DEPUTY UNDER SECRETARY OF DEFENSE FOR INSTALLATIONS AND ENVIRONMENT, U.S. DEPARTMENT OF DEFENSE

Dr. ROBYN. Thank you very much, Chairman Ortiz, Congressman Forbes, and other distinguished members. It is a real pleasure to testify today on the Department of Defense's strategy for improving energy management at military installations.

As you know, the Department operates more than 500 permanent installations overseas and in the United States. They contain more than 300,000 buildings and 2 billion square feet of space. That means our footprint is 4 times that of Wal-Mart and 10 times that of the General Services Administration (GSA).

I want to make three key points today. The first is that management of installation energy is an extremely important issue, and we are all grateful to you for having this hearing and giving us an opportunity to talk about it and talk to you. Facilities energy rep-

resents a significant cost. That is the first reason it is such an important issue.

In 2009, we spent close to $4 billion as a Department to power our facilities. That is about 30 percent of our total energy bill, and that percentage is higher during peacetime when our operational energy bill is lower. Moreover, our installation energy needs will increase over the next several years as we grow the Army and the Marine Corps and reduce our presence overseas and bring troops and equipment back.

In addition to the cost of installation energy, it matters because of its importance to mission assurance, as your opening statements have discussed. Many experts believe that the commercial power grid is vulnerable to disruption from cyber attacks, natural disasters and sheer overload, and since our installations rely on this grid, critical missions may be at risk.

The second key point I want to make is that there are impediments to improving the way we manage energy on our installations. The key impediment is flawed economic incentives.

Let me mention two examples. Mr. Chairman, you referred to the Defense Science Board Report. I am taking those examples right out of that. What I got was an outstanding report.

One incentive problem is referred to as split incentives. This arises because energy efficiency typically requires an increase in capital investment, but it yields savings over time in operation and maintenance. That leads to under-investment in energy efficiency when one organization or individual within the Department of Defense is in charge of investment and capital and another is in charge of operation and maintenance. So there is a divergence between the incentives that they face.

A second example of flawed incentives is the commander who succeeds in reducing energy consumption but cannot keep the savings, which is typical. In fact, his or her budget is typically reduced as a result of the good behavior. The military departments have developed mechanisms to offset this disincentive to energy conservation, but they are limited in scope.

Now, despite these impediments, the Department has noticeably improved its energy performance over the last five years, largely in response to statutory and regulatory goals. However, in the last year, the Department has stepped up the level of effort even beyond what it has been, and that is my third key point. And I want to talk about just the key elements of what we are doing.

The first key element is commitment from the top. Secretary Gates himself has made energy security a priority, and that is reflected in the Quadrennial Defense Review. Consistent with the legislation from this committee, the Secretary has created the Office of Director for Operational Energy Plans and Programs in the Office of the Secretary, and the President has nominated Sharon Burke to head this new directorate. Thank you, Chairman Ortiz, for the plug for her confirmation. We hope that comes soon.

Second, the Department is investing more to improve the energy profile of our fixed installations. Our basic strategy is twofold: One, reduce the demand for traditional energy through conservation and energy efficiency; and, two, increase the supply of renewable and other alternative energy resources.

Investments that curb demand are the most cost-effective way to improve an installation's energy profile. We know that from work done by McKenzie and others. As Energy Secretary Chu has observed, energy efficiency is not just the low-hanging fruit, it is the fruit lying on the ground.

Investment designed to expand the supply of renewable energy sources on base is also an important complement to the demand-side investment. Although the payback period is significantly longer than that for energy efficiency projects, renewable energy is key to energy security on our installations.

A third element, in addition to commitment from the top and increased investment, we are taking advantage of the Department's strength in research and development (R&D). The military, as you know, has a long history of stimulating through new technology, through R&D. When it comes to military installations, our most valuable role will be as a test bed for next-generation technologies coming out of laboratories in industry, universities, and the Department of Energy (DOE).

Our built infrastructure, these 300,000 buildings, are unique both for their size and variety, and they capture the diversity of building types and climates in the country at large. For a wide range of energy technologies for which deployment decisions must be made at a local level, DOD can play a crucial role by filling the gap between research and deployment, the so-called "valley of death."

Specifically, as both a real and a virtual test bed, our facilities can serve two key roles in which the military has historically excelled. One is as a sophisticated first user, and the other is for technologies that are effective to serve as the first customer, an early customer, thereby helping to create a market, as the Department did with everything from aircraft to electronics to the Internet. This will allow the military in turn to leverage the cost savings and technology advances that private-sector involvement will yield. We are pursuing the energy test bed approach on a small scale, and we hope to expand this effort working with the Department of Energy and others.

Finally, let me say that we are pursuing a couple of initiatives to address specific challenges or impediments, the incentives problem that I talked about. Let me just briefly mention three of them.

First, we are addressing DOD's lack of an enterprise-wide energy information management system for its global assets. Large commercial enterprises manage their energy portfolio using such systems. The Department needs one as well, one that can provide the appropriate information on energy consumption at various levels of aggregation, everything from an individual building all the way up to an entire military department.

Second, we have begun what will likely be a major effort to address the risks to our installations from potential disruptions to the commercial electricity grid, and we will be getting you a report that you requested in the authorization bill that lays out our strategy for that.

Then, finally, we are devoting considerable time and effort to a growing challenge to which you both alluded in your opening statements, ensuring that proposals for domestic energy projects, includ-

ing renewable energy, are compatible with military requirements for land and airspace.

We are working that problem at two levels. First—and this is in the Office of the Secretary, and you will hear from the services as well about this—there is a DOD product team, which I co-chair, devoted to sustaining our test and training ranges. We are working through that group to come up with a better process for evaluating proposals from energy developers who want to site a renewable project on or near an installation.

The current process for reviewing proposals and handling disputes is opaque, very time-consuming and ad hoc. I don't believe we are going to come up with a one-stop shop for this, but I think we can go a long way toward improving that process from the standpoint of developers and the Department.

Second, we are looking at the role of research and development. Better technology can help us in two key ways. One is to better measure the potential impact of a proposed wind turbine project or solar tower on military operations in that area. Second, new technology can help to mitigate the impact. The technology is getting better. There are press reports recently about stealth technology going a long way towards solving the problem between wind turbines and ground radar, though not air-based radar.

In sum, we have steadily improved our profile at installations in terms of energy in recent years in response to regulatory and statutory goals. While continuing on that very positive trend, I think it is time for us to adapt our approach to installation energy management from one that is primarily focused on compliance to one focused on long-term cost avoidance and mission assurance.

We have made energy security a priority. We are investing more to achieve it. In addition to investing military construction and sustainment dollars, we will need to leverage the Department's strength in research and development, particularly by using our installations as a test bed for next-generation technologies.

Finally, we will need to address the impediments to improved energy management, including the flawed incentives.

I very much look forward to working with you all to address the challenges and opportunities we face in this very, very exciting and important area.

Thank you.

Mr. ORTIZ. Thank you, Doctor.

[The prepared statement of Dr. Robyn can be found in the Appendix on page 42.]

Mr. ORTIZ. Mr. Hansen, you may proceed with your statement.

STATEMENT OF L. JERRY HANSEN, ARMY SENIOR ENERGY EXECUTIVE, SENIOR OFFICIAL PERFORMING DUTIES AS THE ASSISTANT SECRETARY OF THE ARMY FOR INSTALLATIONS AND ENVIRONMENT, U.S. DEPARTMENT OF THE ARMY

Mr. HANSEN. Thank you, Mr. Chairman.

Mr. Chairman and members of the Subcommittee, it is my pleasure to appear before you today to discuss the Army's energy security program. This Subcommittee's ongoing support, coupled with the President's vision for energy security and sustainability, will result in assured access to reliable supplies of energy, to reduce

risks, meet our operational needs, and build the clean energy future that will benefit the Nation.

We recognize that disruption of critical power and fuel supplies can harm our readiness, our ability to accomplish vital missions, and exposes us to a vulnerability that must be addressed by a more secure energy posture.

Among the most immediate, significant and systemic risks we face is dependence on the commercial power grid. In developing the Army program, we considered operational mission priorities foremost in planning energy security projects. We are committed to enhancing energy security and mission assurance without degrading those tests, training, and operational areas essential for mission readiness, areas secured at some expense with your assistance and support.

Sustaining Army mission capabilities and global operations requires a tremendous amount of energy, as we all appreciate. In fiscal year (FY) 2009, the Army spent approximately $1.2 billion for more than 80 trillion British thermal units of energy to operate installations and facilities, and more than $1.7 billion for the operational energy requirements worldwide.

To ensure a comprehensive and coordinated approach to energy security, the Secretary of the Army created a Senior Energy Council in 2008 to facilitate a cohesive Army-wide approach to energy security. The comprehensive Army Energy Security Implementation Strategy (AESIS) was developed with the active participation of all Army major commands and was approved in January of 2009.

This strategy requires energy to be a key consideration in all Army activities, with emphasis on reducing demand, increasing efficiency, seeking alternative sources, and creating a culture of energy accountability while sustaining or enhancing our operational capabilities. The strategy requires energy activities across the Army and tracks progress of more than 20 objectives and more than 50 metrics for meeting established energy efficiency goals.

The Army is actively supporting advanced technologies and is taking immediate action to implement innovative energy initiatives to include solar, wind and geothermal power, electric and hybrid vehicles, and improve facility energy performance, to name but a few.

In fiscal year 2009, the Army had 67 active renewable energy projects, 42 of which generated electricity that qualified for credit toward the Energy Policy Act's 2005 renewable energy goal.

The Army is making significant investments in implementing energy projects. The 2009 Army Recovery and Reinvestment Act for research included over $600 million for more than 300 energy-related projects, such as energy efficiency, facility improvements, and projects under the Energy Conservation Investment Program (ECIP).

Some specific examples include at Fort Irwin, California, where the Army, as you mentioned, Mr. Chairman, is working with a developer to design a plan for the largest solar project within DOD, featuring phased construction of about 500 megawatts of solar power. This plant, which will be constructed with approximately $2 billion of private capital, will reduce the Army's utility costs by an

estimated $20.8 million over 25 years and will provide secure electricity to Fort Irwin, even if the commercial grid were to go down.

At Fort Bliss, we are experiencing the largest DOD facility growth and the installation's position to become an Army center for renewable energy. Fort Bliss has begun to utilize renewable energy to provide secure electric power for the installation. Also in partnership with the local community, an inland desalination was developed to create a new supply of fresh water, which enables many of the other projects.

At Fort Detrick, Maryland, the installation has entered into an enhanced use lease for a central utilities plant in support of the National Interagency Biodefense Campus to provide an efficient, cost-effective, reliable and secure utility asset. It is an excellent example of a public-private partnership.

In the area of vehicle consumption, the Army is leasing 4,000 low-speed electrical vehicles to replace petroleum-fueled non-tactical vehicles, and in 2009 the Army acquired more than 700 hybrid vehicles. These initiatives significantly reduce our dependence on and consumption of fossil fuels while lowering the greenhouse gas emissions.

In fiscal year 2009, the Army completed installation of 2,690 advanced electric meters and 575 advanced natural gas meters that will be networked to a central metered data management system to assist the energy management review and analysis throughout the Army.

In light of the strategic threats to the commercial energy infrastructure, the Army acknowledges and accepts that in some cases there will be a cost premium associated with achieving energy security. Future energy cost-benefit analysis must go beyond short-term economic considerations and include a determination of how much risk national leadership is willing to accept to ensure continued operation of our critical military installations, missions and functions.

Without power and energy, the Army lies silent. The Army's energy security program addresses some of the great challenges of our time: confronting our dependence on foreign oil; addressing the moral, economic, security and environmental challenge of global climate change; and building a clean energy future to benefit all Americans.

Mr. Chairman, this concludes my statement. Thank you again for the opportunity to appear before you today. I look forward to your questions.

Mr. ORTIZ. Thank you.

[The prepared statement of Mr. Hansen can be found in the Appendix on page 51.]

Mr ORTIZ. Mr. Natsuhara.

STATEMENT OF ROGER M. NATSUHARA, ACTING ASSISTANT SECRETARY OF THE NAVY FOR INSTALLATIONS, ENVIRONMENT AND LOGISTICS, U.S. DEPARTMENT OF THE NAVY

Mr. NATSUHARA. Chairman Ortiz, Representative Forbes, members of the Subcommittee, thank you for the opportunity to present you with an overview of the Department of Navy installation energy program.

The Department is a recognized leader in energy management, research and development, and environmental stewardship, receiving 28 percent of all of the Presidential awards and 30 percent of all of the Federal energy awards in the last nine years. But we cannot rest on our accolades.

The United States relies far too much on fossil fuel, a finite resource imported, to a large extent, from volatile areas of the world. To set us on the path toward greater energy security, Secretary Mabus has committed us to a very ambitious set of goals that goes beyond meeting legislative mandates.

For the shore establishment, he directed that 50 percent of our energy will come from alternative sources, and by 2015 the Department will reduce fleet vehicle petroleum uses by greater than 50 percent. Based on these ambitious goals, we are developing a strategic roadmap and set of energy directives that will provide guidance to the Navy and Marine Corps. We are making investments, allocating resources, developing possible legislation, institutionalizing policy changes, creating public-private partnerships, and pursuing technology development required to meet these goals.

Renewable energy is a key component of our comprehensive energy program. Currently, almost 19 percent of the energy produced or consumed on our installations comes from alternative sources such as wind, solar and geothermal power, and we are leading the way in the development of new technologies. With Army Research Office (ARO) funds, we are advancing technology to convert the ocean's thermal gradients to electricity and potable water. We partnered with industry to further develop the design and concept of an Ocean Thermal Energy Conversion (OTEC) power plant that we plan to test near Naval Station Pearl Harbor, Hawaii, in the coming years.

With investments hybrids, flex fuel and electric vehicles, we can retire many of our petroleum-intensive vehicles currently in use. In fact, we have already replaced 30 percent of our non-tactical fleet with alternative fuel counterparts.

Vital to the readiness of our fleet is unencumbered access to critical water and space adjacent to our facilities and ranges. An example is the Outer Continental Shelf (OCS), where the vast majority of our training evolutions occur. The Department realizes that energy exploration and offshore wind development play a crucial role in our Nation's security and are not necessarily mutually exclusive endeavors. However, we must ensure that obstructions to freedom of maneuver or restrictions to tactical action in critical range space do not measurably degrade the ability of the naval forces to achieve the highest value in training and testing.

The Department of Navy is committed to expanding interagency partnerships in order to develop the United States renewable energy economy. On January 21, 2010, Secretary Mabus and the Secretary of Agriculture signed a memorandum of understanding. Under this agreement, we will explore and develop advanced biofuels, which will be a major component in the solutions to meet our aggressive goals.

We have begun a major effort to address the risk to our installations from potential disruptions to the commercial electric grid. The Department is participating in interagency discussions on the mag-

nitude of the threat and how best to mitigate it. Developing more renewable and alternative energy sources on our stations will be one element of this effort. When combined with smart grid or microgrid technologies, investments that reduce demand and produce renewable energy will enable installations to sustain mission-critical activities during grid disruptions.

I take pride in the Department of Navy's energy program with its proven track record of saving energy and making the Nation more secure. We know we cannot meet the threats of tomorrow by simply maintaining today's readiness and capabilities. We will continue to lead the way through our efforts to develop renewable energy sources, and I am confident that the Navy and the Marine Corps will excel in meeting the energy challenge of the 21st century.

I am pleased to answer any questions you may have, sir. Thank you.

[The prepared statement of Mr. Natsuhara can be found in the Appendix on page 67.]

Mr. ORTIZ. Ms. Tune, you may proceed with your statement.

STATEMENT OF DEBRA K. TUNE, PERFORMING THE DUTIES OF ASSISTANT SECRETARY OF THE AIR FORCE FOR INSTALLATIONS, ENVIRONMENT AND LOGISTICS, U.S. DEPARTMENT OF THE AIR FORCE

Mrs. TUNE. Mr. Chairman, Congressman Forbes, and distinguished members of the Committee, it is a pleasure to be here to address the Air Force's efforts regarding installation energy efficiency and security. I would like to thank the Committee for its continued support of America's Air Force and the many brave and dedicated airmen who serve around the globe to protect our Nation and its interests.

From aviation operations to installation infrastructure within the homeland and abroad, energy enables the dynamic and unique defense capabilities of global vigilance, reach, and power, the Air Force needs to "fly, fight, and win" in airspace and cyberspace. We are 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, including the use of alternative fuels and renewable sources of energy.

Sustaining the Air Force's mission-execution capabilities in its global operations requires a tremendous amount of energy. In fiscal year 2009, the Air Force spent approximately $6.7 billion on energy to conduct our operations. Of that, $1.1 billion went to operate Air Force installations around the world.

We also spent over $350 million last year for installation energy projects, with the majority of the funds slated for energy conservation initiatives that will make our bases more energy efficient.

The case for action to reduce our energy consumption and diversify our energy sources is compelling. Military forces will always be dependent on energy, but we must reduce the risk to national security associated with our current energy posture. Our fragile energy infrastructure, such as the national electrical grid, may hinder our ability to reliably deliver energy during times of crisis.

Several years ago, we recognized the need to develop a purposeful campaign that builds upon our long history of energy conservation and leadership to create an enduring and viable energy strategy that meets conservation mandates, establishes energy independence, and provides the pathway to acquire the resources necessary to make our installations energy efficient. Accordingly, the Air Force developed a comprehensive energy strategy to improve our ability to manage supply and demand in a way that enhances mission capability and readiness.

A realistic assessment of the current energy situation and environment shows the necessity to develop flexible options and make choices and investments that will yield a balanced energy implementation plan. It is within this context that we developed the Air Force energy strategy.

Under this strategy, our approach to installation energy is built on four pillars: improve our current infrastructure; improve our future infrastructure; expand renewables; and manage costs.

At the core of this approach is the recognition that it is critical to reduce energy consumption and increase the available supply of energy. From installing energy-efficient lighting systems, to investing in the state-of-the-art energy meters, we are continually improving the energy conservation of our facilities and reengineering our processes. We are expanding the use of renewable energy on our bases to enhance energy supplies and advance energy security.

We are also collaborating with the Office of the Secretary of Defense, our sister services, other Federal agencies, research institutions, and private industry to help us meet or exceed our goals. By sharing our ideas and best practices, we can improve our energy security and reduce our greenhouse emissions through the use of renewable energy and robust energy management practices.

The Air Force has a solid record of successes and strengths in energy management, and we will continue to make gains through our strategy. The key to a successful execution is aligning our resources to the goals and creating accountability through effective governance. Our approach will sustain our leadership in energy conservation and alternative energy.

Mr. Chairman, Congressman Forbes, this concludes my remarks. I thank you and the Committee again for your continued support of our airmen and their families. I look forward to your questions.

Mr. ORTIZ. Thank you so much for your testimony.

[The prepared statement of Mrs. Tune can be found in the Appendix on page 82.]

Mr. ORTIZ. Now I would like to ask unanimous consent that nonsubcommittee members be allowed to participate in today's hearing after all subcommittee members have had an opportunity to ask questions.

Hearing no objection, so ordered.

Mr. ORTIZ. I am going to start off with one of the questions that I mentioned earlier in my testimony.

The number of domestic renewable energy projects has been increasing significantly in recent years. Since 2006, the Department of Energy and the American Wind Energy Association have been investigating means to enable wind energy to contribute at least 20 percent of our Nation's electricity, by 2030 at least, an initiative

that will require thousands of new wind turbine generators. Yet, wind fields can significantly affect radar performance and can cause obstructions and hazards along military training routes, and not only for military training, but I understand for Homeland Security as well.

The burden of coordinating with local communities on proposed wind farm projects currently falls on individual commanders, and I know, because we are going through some of those problems right now.

I just wonder what efforts are being made to engage proactively at the service at the Department level to mitigate impact of new wind turbines on military training routes and air defense radars. I am just wondering, has this been established, have studies been made that they do impact training and radar?

This is a very interesting subject, and I know that we are right in the middle of them, my district, right in the middle of two military training bases. So any of you that would like to tackle this, go right ahead.

Dr. ROBYN. Sure, I will take a stab at it.

It is a serious issue. I spent the better part of a week touring test and training ranges in Southern California in part to get a better feel for this issue.

I don't believe that any project has gone forward that creates any sort of a problem. I think there are a lot of checks in this system now to keep that from happening. But it is an opaque process and one that can take a long time. Often the base commanders don't find out about a project until the project is pretty far along, and that is because the energy developers have an incentive to keep that information to themselves. They don't want their competitors to know about it. And the developers say, well, they often don't know that there is a problem until late in the process. So we hear complaints from both sides about it.

Obviously, our concern is with making sure that these crown jewels that we have in the form of test and training ranges, and bases more generally, can continue to operate.

I think that the Air Force—and Deb can talk more about this, but to illustrate, probably the most difficult case is one with Solar Reserve Company. It was a solar tower at Nellis Air Force Base, so a different project than the one that you talked about in your opening statement.

Nellis had concerns about it. The Air Force brought in the Air Force Scientific Advisory Board. They brought in Massachusetts Institute of Technology (MIT) radar experts. They spent six months studying it and determined that it would be okay if it were moved a mile away.

So I think for the time being, when there are contentious projects, that is going to be—that is how it is going to have to be handled. There is going to have to be a lot of scrutiny and study to determine whether it is okay to go ahead.

What we would like to do and what we are trying to do is to come up with a process that can provide a more streamlined approach for projects that aren't as controversial as that, so that developers have some sense and can get an early read on whether a project is going to create a problem. And one way we have talked

with WIA, the wind power folks, about is if we create a process that allows developers to share confidential information with us, would that be helpful? The Federal Government has done that in other cases with cell tower siting, for example. So I think that would help to get information earlier.

It is, of course, an interagency process, so we have brought the Department of Energy, the White House Office of Science and Technology Policy as well.

Number one, we are trying to come up with a better process so that developers can get an answer sooner, more predictably. Second, to push the envelope in terms of R&D, because I think there will be mitigation techniques that can be developed. And as the opportunities become more valuable, it will become in the industry's interest to put more money in that, and it is in our interests as well.

Mr. ORTIZ. See, what happens is that most of the time this land is outside the city's jurisdiction, there is no ordinances that they have to follow, and people go out and they buy thousands of acres, and this is what they want to build. But there is nobody that they can go and file, like you say, what they are going to build, and then all of a sudden, we say my God, it is going to be in the path of some of these helicopter and aircraft training.

But you are right, I hope that somebody is looking into this, and maybe we can tighten up the rules a little bit. We really appreciate the young men and women who go through this training, and we want to keep them away from harm's way.

Anybody else that would like to answer?

Mrs. TUNE. Sir, I would like to add, I agree with everything that Dr. Robyn said. For the Air Force, we have dealt with this at Travis Air Force Base with multiple wind turbine sitings there, and we have come up with a protocol, a siting protocol that we can work in conjunction with. If it is Bureau of Land Management (BLM) land, you are exactly right; we have a little more opportunity to engage with BLM and to develop the siting protocols. That has worked very well.

We have a good working relationship with industry and the developers. And our experience is the developers want it to be a cooperative situation, so they do want to work with the Air Force installations, provided we share information very early in the project. They don't make a lot of investments too early. So I think we are working through that.

I would say another agency that does get involved in private lands is Federal Aviation Administration (FAA). So we have been partnering with FAA as well, if you are looking at a flight obstruction, some type of obstruction that may impact us.

We too believe that there needs to be some centralized process that allows the private developers to access the information they need and to have a collaborative environment, and we can have a standard process to ensure—because we do not and the Air Force's position is we will not trade off operational mission capabilities for renewables. So we need to partner, we need to work together, it needs to be collaborative.

Mr. ORTIZ. Thank you.

Mr. Hansen, would you like to add something?

Mr. HANSEN. Yes, Mr. Chairman. It probably hasn't been as big an issue in the Army as it might have been at some of our sister services, but we did have a recent example at Massachusetts Military Reservation where the Army coordinated with the State, the Air Force, Coast Guard, FAA, all through the National Guard, and wind does appear to be the reasonable solution for renewable energy at that particular site.

But overall, we are ensuring that there will be no adverse impact to missions as well, and we do have a work group reviewing the process to make sure we have the requisite visibility and oversight and we are working closely with the other services and OSD on that.

Mr. NATSUHARA. For the Navy, for the encroachments around the bases, we have good liaison. The Marine Corps uses their community plans and liaison offices and the Navy uses their regional offices. So we have a pretty good handle on what goes around the bases.

Our concern that we have been working with OSD and the other agencies are those in the flight paths, and we will continue to coordinate with DOD and the other services.

The Outer Continental Shelf is an issue that we are very concerned with. As I mentioned in my statement, the Department of Interior has established a process and we are working with OSD on that.

So on the land, the local, we think we have a workable process. It can be streamlined. On the Outer Continental Shelf/ocean, we are still working with Interior and OSD to streamline that one. Our concern is the ones that we don't know about outside.

Mr. ORTIZ. Thank you. We are going to have votes in the next few minutes, and I know what happens when this happens to be the last votes of the day. I am going to yield to my good friend Mr. Forbes for any questions that he might have.

Mr. FORBES. Thank you, Mr. Chairman. Once again, I thank all of you. I am going to be very brief and try to articulate this the best I can. I will take one shot at it.

But if you look at a college football coach or a high school football coach when they are drawing up pass plays and all, they spend quantities of time trying to intersect those and make sure they are working against the defenses and they are all planned out. Before that, when you are playing street ball, people get together and they just say, just go deep, we are going to throw it to you.

My worry when we are looking at some of the alternative energy stuff that we are dealing with is we are just kind of saying, just go deep. You know, just get as much out there as you can. Just get it as fast as you can.

But I kind of, in a follow-up to what the Chairman just raised, whether it is looking at impacts on our training, or whether it is looking on whether we have an overall plan, it seems like we got a lot of stuff out there. And when we hear at hearings like this, we have got all of these projects and all these kinds of things going, do we have and will we be better served with kind of a comprehensive coming together and saying here are our objectives? It might not be 700 different things. It might be 50 things. But we have

some quantifiable measuring standards to see if we are reaching those.

Mr. Hansen, you talked about 700 hybrid vehicles, and Mr. Natsuhara has talked about 30 percent of the fleet being alternative energy. But I know when I even talk to some of my automobile dealers, they are saying the jury is kind of out on some of the hybrid stuff as to whether or not it makes sense to have it.

So I would like to just have your thoughts about how we can kind of get our arms around a more—or should we even do it—a more comprehensive set of goals, set of objectives, how we measure those and how we look at that together, including the impacts on training and other things.

That will be my only question to you. I hope I have been clear enough on the question.

Mr. HANSEN. Yes, sir, Mr. Congressman, you have been very clear on that, and I think I can see how that impression would be given that we might be just going deep. But as a couple of examples we have in the Army, at Fort Bliss we did a Tiger Team that looked at the overall energy security needs of that installation and had wide participation from other Federal agencies as well as from the Army, and developed really a hybrid solution to what is most appropriate based on the business case, based on a lot of factors, State and regulatory factors, and what is the potential there for geothermal, for wind, for solar and so forth, and really designed a hybrid solution for that installation that would allow it to become eventually a net zero type of installation.

We are doing a similar process for other installations, where we are doing an overall study now looking at all the installations and the climates in each of the States and the potentials that exist in all of them. I really do believe that the solution for each installation will be a hybrid that will include a lot of components and won't just be whoever is available the quickest and biggest.

Mr. NATSUHARA. In the Department of Navy, and particularly our Geothermal Office has been around for a couple of decades, so we feel pretty good that we have a lot of experience, we have been very methodical about looking at different areas for the geothermal. So because of our experience, they have been around for a couple of decades.

We think at least on our geothermal, we have done a very methodical job of looking at these things. And off of that, we have been very methodical looking at not only the bases, but the regions for the bases on energy, the types where it makes sense.

We have stood up a couple of task forces in the Department of Energy. We have a task force of energy in the Marine Corps; they have stood up an expeditionary group that looks at energy. So we are starting to look at it in a much more methodical method. Within the Secretary's Office we are standing up a new Deputy Assistant Secretary for Energy that will help with this coordination also. So we are very concerned about that also. And we are looking at that with establishing metrics also.

Mrs. TUNE. Congressman Forbes, I am aiming to answer your question a little bit differently. First, let me just say I think the Air Force has a very aggressive infrastructure plan, that we have looked at all of our bases and decided what makes sense from a re-

newable perspective, what is the best value, you have got to have some return, you have got to ensure you have mission assurance and security. And so we really have a robust plan that takes us out to 2025.

But I think your point really is with the mandates that we have out there: Are they just mandates or are they smart things to do? And obviously we are going to comply with the law. But I would agree with you, we are, for example, on vehicles, we are looking at some of the low-speed vehicles and what return we are getting on that. And I think that we will work in conjunction with OSD and with the administration if we need to make some changes that are really not providing the value that we think should be there.

So we are tracking that. We are seeing what makes sense. We are going where the money is and where the payback is going to be, from either, we think, a big payback from a greenhouse gas perspective, from a security perspective, or from a financial perspective.

And so obviously we are following mandates as well.

Mr. FORBES. Thank you. And Doctor, I would just like to have your idea, too. But one of the other things I would just throw out to you for your thoughts is, are we able to use modeling and simulation very well on this? Because we are no longer just in a situation to go do it and let's get our data in, but really we have become pretty sophisticated on how we can do that to give us the kind of jointness we need across the services, but also so we take at least some of the guesswork out of that: Is that helping and how can we utilize that more to perhaps make sure we are getting the goals that we want to reach?

Dr. ROBYN. I am not sure—well, we are certainly using modeling and simulation to determine if a potential wind farm project is going to have an impact on radar, other activity. So in that sense, that has been absolutely critical. I think that technology can get better, but that is critical.

And one point, I just wanted to reiterate what the others said, that with respect to that issue of renewable siting and potential incompatibility, there are a lot of checks in the system now and none of the services are making any trade-off between their operational needs and renewable energy. So are you talking about modeling more generally to——

Mr. FORBES. I am talking about our capability now of bringing modeling and simulation to advance all of our projections and help our decision making in a much more coordinated fashion than we have ever been able to do it before, with limited resources and where we need to go.

I just think that is something I put on the table for you and would love to chat more. I don't want to take up more time. But I just think it affords us some great opportunities now to do some things we couldn't do a decade ago to maximize our resources and make sure we are hitting the goals that we want to reach.

With that, Mr. Chairman, thank you and I yield back my time.

Mr. ORTIZ. I yield to my good friend, Mr. Taylor.

Mr. TAYLOR. Thank you, Mr. Chairman. And I realize this is probably a little bit out of any of your leagues, but I'm going to ask the question anyway. It is my understanding that the gallon for a

burdened cost of fuel in Afghanistan, the cost, which is the real cost of actually delivering it to one of those forward operating bases, is about $400 per gallon by the time——

Dr. ROBYN. No.

Mr. TAYLOR. Well, what is it ma'am?

Dr. ROBYN. I think General Conway put that number out there and that there has since been—there are scenarios where one could construct a scenario where the fully burdened cost of fuel would be $400. But the Marine Corps has done the most recent analysis and it is—I mean it is definitely bigger than the commodity price maybe by an order of magnitude. It is scenario-dependent.

Mr. TAYLOR. Let's average it off over the cost.

Dr. ROBYN. The Marines' numbers are in the vicinity of $9 to $16 a gallon as I recall. But I don't want to—I think the argument that there isn't a—the fully burdened cost is larger than the commodity price, that is a powerful, powerful argument, and I am fond of making it. So I don't want to. I just wanted to take issue with the $400.

Mr. TAYLOR. The reason I put that out there is my question is, I want to, let me start by saying I want our troops to be warm in the winter, cool in the summer, have what creature comforts they can, understanding that they are in a war zone. But my concern is I think the contractors who provide those things are paid on a cost-plus basis, which, whether it is $400 a gallon or $40 a gallon, provides them with no incentive to try to be energy conscious.

Now, from a taxpayer point of view that is wrong. But also considering that someone is risking their life to drive that fuel truck, whether it is a U.S. Government contractor or someone's child serving in the military. So if we can encourage those contractors to be more energy efficient, then we ought to be doing that.

Now, one technology that I don't see being used that is commonly used on commercial vessels is to take the warm water that is cooling the propulsion unit, run that through a heat exchanger, which in turn creates the warm water for the ship's crew. It is my understanding that about 10 percent of all the fuel we use is just trying to warm water. So let's say we saved half. Five percent of the hundreds of thousands of gallons that are shipped to Afghanistan at $40 a gallon or $400 a gallon is a significant savings.

I am curious if you have looked into that at all because, again, it is very common technology used by people for their recreational boats, used by commercial vessels, but I do not see it being used in either Iraq or Afghanistan. And the one thing if you visit those installations, the one thing that strikes you is the constant drone of the diesel generators at every one of those installations, providing every bit of electricity on almost every one of those installations. Have you looked into it?

Mr. NATSUHARA. The Marine Corps has established what they call an experimental forward operating base at Quantico, where they are bringing in industry to demonstrate those types of technologies that are mature enough. And if they work——

Mr. TAYLOR. They do work, sir, I can assure you. The question is, since we know it is proven technology, it is used by average Joes, it is used by commercial vessels, who is pushing the DOD to use it?

Mr. NATSUHARA. I know that the Marine Corps is very aggressively trying to validate these technologies. And if they work, if the companies can demonstrate that it meets their requirement, their plan is to buy those immediately and ship them off to Afghanistan. And I know we have—I believe we have some solar-powered desalination type units that have been recently shipped out there. So they are looked at; the Marine Corps is very much looking at those types technologies.

Mr. TAYLOR. Would you get back to me on this specific thing?

Mr. NATSUHARA. Yes, sir.

[The information referred to can be found in the Appendix on page 95.]

Mr. TAYLOR. Second thing, and if the Chairman will pardon me, having been through a pretty catastrophic event in my congressional district four years ago, seeing people living without electricity, and contrasting the difference between what happened in south Mississippi and what happened in south Louisiana, one of the huge differences for things going better in Mississippi was the availability of our military installations to ride to the rescue. One of the things that helped them was being able to prepare hot meals in the case of the Navy construction battalion the day after the storm, but almost every one of those installations, after putting in a hard day's work, at almost every one of those installations they could take a shower at the end of the day, which the average Mississippian was not doing; they had a hot meal; and the reason they could do that was almost every one of these installations had their own water well, had their own sewage treatment plant, had their own generators.

And again, I realize that multiple Presidents and multiple Secretaries of Defense have been pushing you to buy it on the private sector. But there will be other hurricanes, there will be other manmade and natural disasters, and other communities will be looking for their nearby military installations to ride to the rescue.

In your deliberations, to what extent do you weigh at least having an auxiliary plan of having that base be self-sufficient for that scenario if the local grid is out for whatever reason?

Mr. MARSHALL. Would the gentleman yield? I might as well go ahead and ask what I was going to ask you all, because it is essentially along these lines, but it takes it a little further. I will start out, I guess, by saying that Ms. Tune, Mrs. Tune as she calls herself, is a superstar in middle Georgia. I bet the other three of you did not know that, but she truly is adored and extremely effective when she was at Robins Air Force Base, and I'm glad you are kind of stuck up there so you don't come back here and run against me or something terrible like that, because you are very, very highly thought of.

Now, Ms. Tune in her comments mentioned that the Air Force had gone about the business of serving all of its facilities and deciding what it could do as far as independent energy sources is concerned. My guess is that survey did not adequately take into account the possibility of installing in all of these places small nukes that are hardened against electromagnetic pulse (EMP) attacks, that are large enough that they can serve the local population in the event that we do have a major problem.

In the last bill, following along the lines of the question from Mr. Taylor, we had language asking the Secretary to do a study. I imagine you all are involved in that study. But it seems to me in all likelihood we should be thinking about slowing down a little bit on the energy initiatives that we have begun thus far. If, in fact, what we ought to be doing is putting in small nukes so that we are completely self-sufficient, hardened against EMP attacks, ready to provide power—not just services but power—to the communities that are involved in such an attack, then we are just going to be—we are wasting money on other projects, wind turbine, solar, et cetera, if in fact we wind up heading in that direction. So that elaborates a little bit more on what Mr. Taylor's question is.

Mr. TAYLOR. Again I appreciate, if I may, I appreciate the gentleman's question. But in an ideal world I am in total agreement with Mr. Marshall. So let's start with the basics.

Are you at least keeping an eye towards having those bases have the ability to deliver their own water, to treat their own waste, since that does become a huge problem; sufficient generators for each installation to take care of itself should the local grid go down. Because those installations will be counted on by whatever nearby community to ride to the rescue.

Do you keep that as a part of your master plan is what I would like to know?

Mrs. TUNE. Sir, for the Air Force, that is part of our plan. I would not say that we are completely capable of doing that. We do have backup generators and capability for that. The first thing we do is look at the vulnerability of the grid and assess what our threats are and how we can address those so we can mitigate any risk that we may have.

But if you are looking at independent security for the base, we do have two installations in the Air Force currently that do have that scenario, that is at Tinker Air Force Base in Oklahoma and Robins Air Force Base, Georgia. And we were able to get that because the local utility needed it for peak loads. And so they built that plant generation on the bases at their expense. And we are able to, if we lost power to the grid, we would be able to field the generator to kick-start this plant. At Robins Air Force Base, for example, only one-third of that generation would power the entire base and the other two-thirds could go back out to the community. And we have the same type of scenario at Tinker Air Force Base.

Whether we are going to be able to do that across our installations, that is going to require a lot of joint work with the utilities, with the local communities. It could be expensive. We are going to have to decide where we best do that. But you are absolutely right.

And the contingency plans, we do have that from a perspective of backup generators and how we will provide that support to the community in a national emergency type situation. But we do not have that across the board. But we are looking at that because that is something we would like to be able to do.

Mr. TAYLOR. Please, sir.

Mr. HANSEN. Mr. Congressman, I would second Mrs. Tune's comments and just emphasize the fact that energy security for the Department really hits at the heart of what you describe, because it means having assured—this is just the QDR definition—having as-

sured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet our operational needs. And hand in hand with our energy management programs, our energy security programs, we also have the defense critical infrastructure protection program and we are coordinating very closely with them to make sure that we meet those key needs that you have described.

Mr. NATSUHARA. For the Department of the Navy, as the Air Force and the Army, for our critical loads we do have emergency backup generators today. Secretary Mabus has for our goal to have 50 percent of our bases at net zero by 2020, and so we are actively working very hard to have many of our bases, and we have some that are very close right now with different variety of technologies from wind, solar, we have geothermal, those types of alternate energies on our bases. So we are shooting for—our goal is to be 50 percent net zero by 2020.

Water and wastewater, we have not addressed that yet. Most of our bases' water and wastewater is—we do get that service from outside the fence, and we have not looked at those in depth yet.

Mr. ORTIZ. Like I stated in the beginning, we are going to have some votes. So let's see if we can stick to the five-minute rule so everybody has a chance to ask questions.

Ms. Giffords, go ahead.

Ms. GIFFORDS. Thank you, Mr. Chairman. And thank you to our panelists for being here today. It is exceptional, the work that you are doing, not just keeping our military safe and keeping them able to fight hard, but actually transforming energy in America and energy on the planet and reducing our dependency from foreign energy. It is very exciting.

As we all know, the DOD is the largest user of energy in the world. On our installations, we spend nearly $4 billion a year and about $16 billion on fuel. That is a lot. But the Department is also the largest purchaser of renewable energy now in the country, and I think also maybe even around the planet. So there are a lot of really good success stories.

In a recent meeting that we had with you, Mr. Chairman, and with Dr. Robyn and Assistant Secretary Dory, we spoke in great length about installation energy issues and legislation that we have been working with to reduce the Department's energy consumption, increase efficiencies, and continue the development of renewable energy on DOD installations. So we have spent, a lot of us in this room, a significant amount of time together.

But a couple of the points that I want to make sure we bring out for the public, each of the services have expressed an interest, and according to the branch, it is not a one-size-fits-all. But I look at the Navy's China Lake geothermal plant and, of course, Nellis' facility for the Air Force. These are the first major large-scale projects of their type that have brought forward. We had a recent ribbon cutting at Davis-Monthan Air Force Base in southern Arizona.

I am curious whether or not—or, specifically, do the services continue to plan constructing the similar large-scale solar arrays as a viable means of achieving the net zero installations?

Mrs. TUNE. Well, I definitely believe it has been a success for us and will continue to do so. As you probably know, many of those larger solar arrays are third-party providers, and so we probably will. We like that model. It is their money. And so, yes. I would say the short answer is yes.

Mr. HANSEN. Thank you for asking, Madam Congresswoman. We don't, as you say, consider that one size fits all, so we look at each installation individually as to what makes the most sense there. And as I said earlier, I think that we are finding that the hybrid solution is pretty much what we are going to find at most installations. It might include a mix of solar and wind, and photovoltaics (PV), geothermal, biomass. Fort Knox, for instance, geothermal is working well because they have good dirt. But in the Southwest there is a lot of good sun so we are looking more closely at it in those areas just based on the potentials there.

Mr. NATSUHARA. For the Department of the Navy, since we do have a lot of facilities in the Southwest, where it is very advantageous, we are pursuing those in our 2011 budget. The Marine Corps has about $30 million of photovoltaic plan for Military Construction (MILCON) with three projects. And at the Air Force and Army, we do like to leverage the private sector for the photovoltaics. And we are also pursuing, as I mentioned, geothermal in Miramar. We are also trying to get off the landfill there, the methane gas off the landfill, to do a cogeneration plant there through a private venture.

Ms. GIFFORDS. That is good to know. Talking about the grid and the dependency on the grid, that is another area of concern that we have in this country. And I think about the ability to sustain bases in the case that there is an attack on the grid. Blackouts and natural disasters, of course, are unfortunately inevitable.

I am curious whether the Department has revisited the idea of islanding its bases, allowing each facility to maintain an independence from the grid, and whether or not any sort of initiatives have really been explored in this means.

Mr. NATSUHARA. For the Department of the Navy, we are very concerned about islanding. We don't want to be perceived as just taking care of ourselves. And we are part of the community. We are very concerned. We are looking at making sure critical loads are, but we don't want to be perceived as an island within the community.

Dr. ROBYN. I think maybe the word "islanding" was used in the Defense Science Board report. I'm not sure if that was the source of it. And I think it is an unfortunate choice of word, because it does conjure up images of the way the Defense Department has in the past done things when they tended to create their own, do it solo, and that is not always good. In recent years they have moved much toward leveraging the broader commercial market, and that is a very positive thing.

I think the key is there is a lot of—we are focusing heavily on this. I think it is more on critical missions as opposed to entire bases. So identifying at any installation are there critical missions there that we would need to maintain in the event of grid disruption and, if so, how do we do that? Is the backup diesel capability, or whatever that we now have, sufficient? Do we need to do more

than that? And renewable can be helpful. Nuclear could be very helpful. I don't see renewable and nuclear as either/or. It could be both.

Mr. NATSUHARA. Just real quick, part of it is that the new smart-grid technologies, where you are able to isolate those critical loads so you don't have this islanding—and that is what we are working with, with the research agencies in the Department of Energy, on those smart-grid technologies.

Ms. GIFFORDS. Mr. Chairman, I know my time is up, but to piggyback on Mr. Taylor's point by figuring this out here in the United States, where it is a safer and more stable environment, we can transform a lot of that technology from some of our forward operating bases into theater.

Mr. ORTIZ. Thank you. I was under the impression that my good friend, Mr. Marshall, was finished; but he is not finished with his question. And we have two more members and I hope that we can—we hate to keep you here until we finish the voting. I know you have other things to do. But now let me yield to my good friend, Mr. Marshall, for his question.

Mr. MARSHALL. Because of the fact that there are two others here, and we are under 15 minutes right now, I am going to be very, very brief and just make the observation that there may be no inconsistency between other forms of renewable power and nuclear, we don't know. It depends largely upon whether or not you are hardening the other stuff. I suspect we are not. I suspect we didn't even look into what it would cost, for example, with Warner Robins working with the private utility to add whatever should be added in order to have a hardened facility that would survive an EMP attack. It is, frankly, the attack that we are most vulnerable to here in the United States and it is something that would be absolutely dreadful if we are not able to get up and get running fairly quickly.

So I would just simply ask that you brief me on the Department's current process for making decisions concerning renewables, or others where power is concerned.

Do you take into account hardening?

I know we have gamed the consequences of EMP attacks. I know we want to be able to produce electricity fairly quickly after an EMP attack. We wouldn't want to do it simply for ourselves. We would want to do it for the populations we are serving, just like we did where Katrina was concerned. I will just let it go at that so that the others can ask their questions. You need not comment at this point.

Mr. ORTIZ. Ms. Shea-Porter, she is a member of the Subcommittee. And then we will give to Mr. Murphy. And we don't want to keep you here longer than you have to be here. Thank you. Go ahead, Ms. Shea-Porter.

Ms. SHEA-PORTER. Thank you. I have been concerned about the burn pits. I had an amendment to the fiscal year 2010 Defense authorization that prohibited disposing of medical and hazardous wastes and plastics in burn pits. Unfortunately in conference, they took out the part about the plastics.

I received a safety newsletter from Iraq recently and it focused on burn pits. Their two incinerators can handle 70 of the 110 tons

of trash a day generated by the base, and the remainder, about 40 tons a day, is burned in the open pit. Their safety department knows of the health dangers, exposure to dioxins and other toxic chemicals released by the burning of these plastics, a practice prohibited in the U.S. for health reasons. Most of the plastics are from the dining hall and the newsletter notes the importance of recycling the plastics.

I would also add there are alternatives to using plastic utensils. We use them right here in the House. What are you doing, please, to reduce the quantity of plastics that are burned in these pits, and are you open to purchasing the renewables that would be much safer for the troops? Mr. Hansen.

Mr. HANSEN. Madam Congresswoman, I am not sure the status of alternatives to the plastic utility ware, I mean to plastic ware, but I know that we have put out some directives on burn pits; and we are certainly moving to eliminate those because we recognize the hazard and potential hazard is serious, and a serious threat to our soldiers as well as the locals. And we can get you an answer on the specifics on that.

[The information referred to can be found in the Appendix on page 95.]

Ms. SHEA-PORTER. I would appreciate that. Again, I would repeat that most of the plastics are from the dining hall. So it seems a pretty simple solution. And I do believe that it is essential to protecting these soldiers' lungs and their bodies from some unnecessary exposure. Thank you, and I yield back.

Mr. HANSEN. Yes, ma'am.

Mr. ORTIZ. Mr. Murphy.

Mr. MURPHY. Thank you, Mr. Chairman. I appreciate the opportunity to ask questions today. Thank you. And to the panel, thank you so much for your continued service to our country and to our military.

My question today is mostly focused on facility energy, and the Department of Defense, as we all know and as you testified today, is the single largest energy consumer in the United States. In 2008 alone, the Department of Defense spent $4 billion on facility energy. And I think that we can all acknowledge that the Department needs to do much more work on utilizing renewable energy sources. But outside the sheer dollar value, I also know that the Department itself has highlighted how intertwined energy security is with installation security.

Two months ago, I read that the December 2009 GAO study on renewable energy in our defense infrastructure clearly raised concerns about the current challenges in ensuring installation energy security, specifically noting—and I quote—"technical and safety challenges required to integrate the onsite renewable energy generation with the installation's existing electrical infrastructure and operating the renewable technology safety during a power supply disruption."

Additionally, the QDR noted "to address energy security while simultaneously enhancing mission assurance at domestic facilities, the Department is focused on making them more resilient" as well as focusing on the need to ensure that critical installations are ade-

quately prepared for prolonged outages caused by natural disasters, accidents, and attacks.

So I am sure each of the services are executing their own plans in this area, but would each of you comment on the GAO findings in the QDR and discuss what more we need to do in terms of research, development, integration and implementing a strategy to ensure installation security through energy security?

And I will start off with you, Mr. Hansen. You are a West Point graduate; I had an opportunity to teach at your alma mater. You can lead off. How does that sound, sir?

Mr. HANSEN. Thank you, Mr. Congressman. We, as part of our Army energy security implementation strategy, are trying to pull together all aspects of that, the R&D part, the integration part. We haven't fully implemented all that. I am not saying we are where we need to be yet, but we are well on the way with the metrics to achieve that integrated approach that you are describing.

I know that the Air Force at Robins has done some exercise on this. There are good news stories, and we are certainly learning from each other. So I think that we appreciate the assistance that the Congress has given us in a number of these areas with programs like the energy conservation improvement program. And we try to use those smartly to improve those security elements at both the installation level and through energy security. That is a fairly general answer, but we are working hard in just the areas that you identified.

Mr. MURPHY. Before I go to the others, because I know my time—if I could, just one other thing real quick. How about as far as coordinating—I know, obviously all of you in your individual departments and Dr. Robyn with the Department of Defense itself, but how about the coordination with outside agencies, outside the Department of Defense, on installation energy issues?

For example, we all know about the historic investments this Congress has made in smart-grid technology that has been utilized by the Department of Energy. So is there any coordination with the Department of Energy, with DOD, et cetera, in regards to that?

I will turn to Dr. Robyn and anyone else that wants to touch base.

Mr. NATSUHARA. For the Department of the Navy, we just started four working groups with the Department of Energy and through the Department of Defense. And one of those working groups is on the smart grid, and energy security is one of the big topics that we have just kicked off. Through our research, our own naval research labs, and the Department of Energy, we really wanted to leverage that technology. We do see that as a big area, and so we are going across the other agencies with that.

Dr. ROBYN. We meet early and often with the Department of Energy. There is the Office of Renewable Energy and Energy Efficiency, and there is a division of that devoted to buildings and overseen by a former colleague of mine, and we are working with them.

As you note, Department of Energy has a new program called Advanced Research Projects Agency–Energy (ARPA–E) modeled after our Defense Advanced Research Projects Agency (DARPA) program, and we are hoping to partner with them on the test bed

idea. The National Renewable Energy Lab—I mean there are many, many parts of the Department of Energy that we work with on the issue of compatibility of renewables with our air and land requirements. They are a critical player on that as well.

Mrs. TUNE. As I stated earlier, the Air Force is completing both physical and cyber vulnerability threats, and there are things that are short, mid, and long-term, and we are engaged, along with the other services, in OSD, with the Department of Homeland Security, and DOE, because we are all aggressively working this to mitigate the risk.

Mr. MURPHY. Thank you, everybody. Thank you, Mr. Chairman, I appreciate it.

Mr. ORTIZ. Thank you so much. I think that all of us have a huge responsibility not only to those that serve in the military, but our taxpayers, to come up with the new ideas, new concepts, new research that will save the taxpayers money as well.

I think that this has been a very interesting hearing. And we hate to keep you here because we have a series of votes. But any member who is here, who may not be here, who might like to ask questions, we will give them the opportunity to submit written questions to you so you can respond.

And thank you so much. This has been very interesting testimony, and we will work with you and stay in contact with you. The hearing stands adjourned. Thank you.

[Whereupon, at 3:30 p.m., the Subcommittee was adjourned.]

A P P E N D I X

FEBRUARY 24, 2010

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

FEBRUARY 24, 2010

ORTIZ OPENING STATEMENT,
ENERGY HEARING,
READINESS SUBCOMMITTEE,
FEBRUARY 24, 2010

This hearing will come to order.

I thank our distinguished witnesses for appearing before this subcommittee today to discuss energy management and initiatives on military installations.

Today's hearing is one of several held by this subcommittee related to the Department of Defense's energy posture. We have heard from the Defense Science Board's Energy Security Task Force, the Government Accountability Office, and the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics on a broad range of energy issues.

Today's hearing will focus on the many energy initiatives under way on military installations and the overarching strategies that guide these initiatives.

In many ways, through these strategies and initiatives, the Department has assumed a leadership role in addressing our nation's energy challenges.

Each of the military services and the Office of the Secretary of Defense have worked to develop energy strategies and goals. Capping these efforts off, the 2010 Quadrennial Defense Review identifies energy and its sister issue, climate change, as two key issues that will play a significant role in shaping the future national security environment.

The military services have demonstrated willingness to be early adopters of new energy technologies and

enablers of renewable and alternative energy projects.

They have started to lease electric vehicles, work towards net-zero installations, adopt advanced metering technologies, investigate micro-grid technologies, and partner with the private sector to develop wind, solar, geothermal, and waste-to-energy systems, to name just a few.

Initiatives are accelerating not only in variety, but in size.

When it was completed in 2007, the 14.2 megawatt solar array at Nellis Air Force Base was the largest such array in the Americas. Today, another military installation is contemplating partnering on a solar project 35 times larger! This project would encompass as much as 14,000 acres and provide 500

megawatts of solar energy to the installation and to the grid.

This is an exciting prospect.

However, in a recent report conducted at this subcommittee's request, the Government Accountability Office recognized that development of renewable energy projects is not always compatible with the primary mission of a DOD installation.

I would like to hear what steps the Department is taking to ensure that large-scale energy projects on military installations don't unintentionally impede a base's primary mission or result in another form of encroachment.

While the Department's initiatives have been accelerating inside of military installations, "outside-the-fenceline" private-sector initiatives have been, too.

The number of domestic renewable energy projects such as wind farms, solar towers and arrays has been increasing significantly in recent years. These projects have great potential to enhance our energy security.

At the same time, I am concerned to learn that some of these energy projects, particularly large wind farms and solar towers, may have the potential to impair military readiness.

Recent tests conducted by the Department of Defense, and recent experiences at some military installations, show that windmills can significantly

affect radar performance, can obstruct military training routes, and can interfere with military systems designed to operate in the electromagnetic spectrum. These are significant challenges we must address.

It is important that we understand how to balance energy security and military readiness, because our nation needs both.

I look forward to hearing the perspectives of our distinguished witnesses today on these and other issues of interest to the Subcommittee.

Before I recognize Mr. Forbes, our distinguished Ranking Member, I would like to speak for one brief moment on a topic we will not focus on today but that is important and related, and that is operational energy.

This subcommittee created a new office for a Director for Operational Energy, to advise the Secretary of Defense and oversee the energy the Department uses for military operations. I am pleased that a nominee has been selected, and I am hopeful that her Senate confirmation will happen quickly.

It is imperative that we round out the Department's energy team with this key official dedicated to operational energy oversight.

With that said, I look forward to thoughtful testimony on installation energy management and initiatives from the distinguished witnesses we have invited here today.

Statement of Ranking Member Randy Forbes
Subcommittee on Readiness

Energy Management and Initiatives on Military Installations

February 24th, 2010

I thank the chairman. I also thank the witnesses and appreciate their being here. The timing of this hearing is excellent. Whatever one's views are about global warming and the benefits of clean energy, a few things are clear:

- One, the cost and risks of an exclusive reliance on petroleum energy sources grows with each passing year.
- Two, we should use renewable resources when it is cost competitive and when it enhances, or, at a minimum, does not detract from, our military readiness.
- Lastly, renewable resources can greatly increase the energy security of our nation and our military installations.

My primary interest today, however, is not only to learn about goals to expand green energy in the military, but also to understand how realistic and achievable each of the goals are. For instance, "net zero" energy consuming installations is a laudable goal from a cost savings and energy security viewpoint. But is this achievable? What will we have to give up in the short run or the long run to reach this goal?

I believe it is critical to address two serious flaws in the rush to push green energy on military installations. First, there seem to be no shortage of "good" ideas and mandates that are placed on the Department of Defense by both the White House and Congress without either an integrated plan or an evaluation system to ensure we are meeting the stated objectives. The list of mandates includes specific, substantial goals for hybrid vehicles, greenhouse gas emissions, solar energy use, and reduction goals for petroleum use and overall reductions in energy use. Meeting just a few of the goals would be daunting.

Before we add more mandates, we should agree on our key objectives. Is it total energy security for each installation so that our energy sources are not ever in question? Is the goal to ensure at least 50 percent of our energy comes from renewable sources?

To my knowledge, there is no comprehensive departmental plan beyond saving what we can, where we can.

My second concern is the impact renewable energy projects have on military training. Solar projects can spread across vast areas of valuable military training land and limit military training, particularly military aviation. Even more troubling are wind turbines. These giant devices not only present hazards near military air fields, but they also alter military aviation training routes across the country, and can adversely affect military training and air defense radars. Despite these acknowledged drawbacks, wind farms are being funded at breakneck speed by stimulus funding, within a porous regulatory oversight structure. Any large undertaking that substantially alters land, sea, or airspace must undergo thorough scrutiny for military training impacts, as well as other environmental concerns. Military training land and air space is extraordinarily difficult to acquire; we must preserve and protect what we have.

I believe we must expand our use of renewable energy, and I have introduced legislation and supported legislation that moves us in this direction; but like any laudable goal, marginal costs of any approach must be considered. We must be careful that our national

enthusiasm for clean energy does not negatively affect military readiness. We must do a better job of fully considering the long term consequences of our actions. In my view, the Pentagon's energy goals must be realistic; compatible with military training; advance the goal of energy security; and be a part of a comprehensive Department-wide plan. I would like to hear how our witnesses intend to achieve those objectives.

Again, thank you Mr. Chairman for scheduling this hearing.

Statement of Deputy Under Secretary of Defense for Installations and Environment

Dr. Dorothy Robyn

before the

House Armed Services Committee

Subcommittee on Readiness

February 24, 2010

Thank you for the opportunity to testify on the Department of Defense's strategy for improving energy management at our military installations. As the Deputy Under Secretary of Defense for Installations and Environment, I oversee policy and programs related to energy use on the 500-plus permanent installations we maintain at home and overseas. In that capacity, I work closely with my counterparts in the Military Departments, who are here today. I also work closely with the (acting) Director for Operational Energy Plans and Programs in the Office of the Secretary of Defense.

The recently released Quadrennial Defense Review (QDR) makes clear that crafting a strategic approach to energy and climate change is a high priority for the Department of Defense (DoD). This reflects mission considerations above all. The Department's own analysis confirms what outside experts have long warned: our military's heavy reliance on fossil fuels creates significant risks and costs at a tactical as well as a strategic level. They can be measured in lost dollars, in reduced mission effectiveness and in U.S. soldiers' lives. Unleashing warfighters from the tether of fuel and reducing our installations' dependence on a costly and potentially fragile power grid will not simply enhance the environment, it will significantly improve our mission effectiveness.

The Department's permanent installations comprise hundreds of thousands of buildings and facilities, and the Department spends several billion dollars a year on the energy required to operate them. Over the last five years, the Department has steadily reduced energy consumption per square foot at these installations, largely in response to statutory and regulatory goals. While continuing that very positive trend, it is time for us to adapt our approach to installation energy management from one that is primarily focused on compliance to one that is focused on long-term cost avoidance and mission assurance.

In my testimony today, I will talk about why installation energy management matters and what we are doing to improve it. I will discuss the importance of the two goals noted above (long-term cost avoidance and mission assurance) and identify some of the impediments we face in trying to achieve them. I will also review the Department's performance on key statutory and regulatory goals related to energy efficiency. Finally, I will describe the major elements of the Department's strategy for building on that record to further reduce energy costs and improve energy security.

Why Installation Energy Management Matters

The Department of Defense consumes energy for two broad purposes. The first is to support our combat, or operational, forces. "Operational energy" consists largely of the fuel used by aircraft, ships, tanks, trucks and other tactical vehicles, as well as by the generators that provide heating, air conditioning and other forms of power at our forward operating bases in Afghanistan and Iraq.

The second broad use of energy is to support the 507 fixed installations we operate in the United States and overseas. These installations comprise more than 300,000 buildings, which contain 2.2 billion square feet of space—a footprint four times that of Walmart and ten times that of the U.S. General Services Administration. Moreover (and in contrast to Walmart, with its uniform, big-box structures), the Department's inventory of buildings is diverse, encompassing barracks, commissaries, data centers, office buildings, laboratories, and aircraft maintenance depots. "Facilities energy" consists largely of traditional energy sources used to heat, cool, and provide electrical power to these buildings. It also includes the fuel used by the 160,000 non-tactical vehicles housed at our installations.

The management of energy on our installations is important for two key reasons. One, facilities energy represents a significant cost. In 2009, DoD spent $3.8 billion to power its facilities—down from $3.96 billion in 2008. That represents about 28 percent of the Department's total energy costs (that fraction is higher in peacetime, when we are not consuming large amounts of operational energy). Moreover, energy needs for fixed installations in the United States will likely increase over the next several years as we "grow" the Army and the Marine Corps, reduce our presence in Iraq and Afghanistan, and continue to improve the quality of life for soldiers and their families—for example, by installing flat-panel TVs in individual rooms in a barracks that now has just one TV per common room.

Facilities energy is costly in other ways as well. Although fixed installations and non-tactical vehicles account for less than a third of DoD's energy costs, they contribute nearly 40 percent of our greenhouse gas emissions. This reflects the fact that our installations rely on commercial electricity, which comes from fossil fuels—principally coal. Given that facilities energy as a share of total DoD energy will increase when we reduce our presence in Iraq and Afghanistan, fixed installations will likely become DoD's major source of greenhouse gas emissions.

Two, installation energy management is key to mission assurance. According to the Defense Science Board, DoD's reliance on a fragile commercial grid to deliver electricity to its installations places the continuity of critical missions at serious and growing risk.[1] Most installations lack the ability to manage their demand for and supply of electrical power and are thus vulnerable to intermittent and/or prolonged power disruption due to natural disasters, cyberattacks and sheer overload of the grid.

[1] "More Fight-Less Fuel," Report of the Defense Science Board Task Force on DoD Energy Strategy, February 2008.

The changing role of the military's installations accentuates this concern. Although in the past fixed installations functioned largely to train and deploy our combat forces, they have an increasingly direct link to combat operations, by providing "reachback" support for those operations. For example, we operate Predator drones in Afghanistan from a facility in Nevada and analyze battlefield intelligence at data centers in the United States. Our installations are also becoming more important as a staging platform for homeland defense missions. This means that power failure at a military base here at home could threaten our operations abroad or harm our homeland defense capability.

Impediments to Doing More, Better

There are a number of impediments to improving the way we manage energy on our installations along the dimensions discussed above. Without attempting to offer an exhaustive list, let me mention two related impediments: flawed incentives and lack of information.

In its recent report on DoD energy strategy, the Defense Science Board identified several ways in which flawed incentives impede investment in energy efficiency.[2] One is the oft-cited problem of "split incentives," which arises because energy efficiency requires increased capital investment but yields savings over time in reduced operations and maintenance. That leads to under-investment in energy efficiency within DoD, because often the individual or entity responsible for capital spending is different from the one responsible for operations and maintenance. A related problem noted by the Board is that a commander who succeeds in reducing energy consumption is not able to keep the savings—in fact, his or her budget typically gets reduced. Although the Military Departments have developed mechanisms to offset this disincentive, they are limited in scope. A different type of incentive problem is reflected in the vulnerability of our installations to disruption of the power grid. According to the Defense Science Board, although certain improvements in the energy efficiency of installations would have national security value far greater than the economic value of reduced electricity consumption, the business case for these improvements ignores the benefit to national security.

Lack of information is another impediment to improved installation energy management. The Department currently lacks an enterprise-wide energy information management system that can provide the appropriate information on energy consumption at various levels of aggregation, including the individual building, the installation, the geographic region and the Military Department. This hampers DoD's ability to monitor, measure, manage and maintain energy systems at their optimal performance levels; collect renewable energy generation and performance data; and compare performance across facilities and across Military Departments.

These two problems are linked. Without an energy information management system in place, it is difficult to implement an efficient approach to utility charges. Under such an approach, individual users confront the cost of their usage, ideally in real time, and thus have an incentive to reduce their overall use or shift activity to off-peak periods. This type of charging system, which has been shown to elicit a significant "demand response" from users, will be key to improved installation energy management.

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[2] "More Fight-Less Fuel," Report of the Defense Science Board Task Force on DoD Energy Strategy, February 2008.

Installation Energy Goals and Performance

Despite these impediments, the Department of Defense has noticeably improved the energy performance of its fixed installations over the last five years, largely in response to statutory and regulatory goals. Although we are not meeting all of the targets, that is primarily a reflection of operational demands.

The key statutory and regulatory goals relevant to installation energy consumption require the following:

- Reduce energy intensity (BTUs per square foot) by 3 percent per year, or 30 percent overall, by 2015 from the 2003 baseline [Energy Independence and Security of 2007]. Under DoD's High Priority Performance Goals, the interim target is an 18 percent reduction by the end of 2011.
- Increase use of renewable energy to 7.5 percent in 2013 and beyond [Energy Policy Act of 2005, or EPACT]; and produce or procure 25 percent of all electric energy from renewable sources by the end of 2025 [National Defense Authorization Act of 2007, or NDAA]. Under DoD's High Priority Performance Goals, the interim NDAA target is 14.3 percent by 2011.
- Reduce consumption of petroleum (gasoline and diesel) by non-tactical vehicles by 30 percent by 2020 [Executive Order 13514, October 2009].

With respect to energy intensity, we have made solid progress but fallen short of the goal: DoD reduced its energy intensity by 10 percent from 2005 to 2009, compared to the goal of 12 percent. From 2005 to 2008, we reduced the energy intensity of our facilities by 11 percent relative to the baseline (2003). However, in 2009, our energy intensity actually went up slightly, by 1.1 percent. This largely reflects the demands on the Army related both to the movement of troops and equipment to and from Afghanistan and Iraq and to the completion of the Base Realignment and Closure process (as it closes some facilities and moves to others, the Army is carrying out certain functions temporarily at multiple locations).

By contrast, we exceeded the EPACT goal for increased consumption of renewable energy: DoD achieved 3.6 percent, compared to the 2009 EPACT target of 3.0 percent. That said, the 2025 goal (produce or procure 25 percent from renewable sources)—a goal that applies only to DoD—remains a major challenge, and we are not even close to meeting the interim target.

With respect to consumption of petroleum by non-tactical vehicles, the Department also exceeded the target: DoD achieved a 9 percent reduction in its petroleum use from the 2005 baseline, compared to the target of 8 percent.

The Department's Strategy for Improving Installation Energy Management

In the last year, the Department has made energy policy a significantly higher priority, partly in response to the growing recognition that operational energy has a long logistics "tail," which

imposes large risks and hidden costs. Let me describe the key elements of this stepped-up strategy on energy, with an emphasis on facilities energy.

Senior Leadership and Organization

The first element is senior leadership—commitment from the top—and corresponding organizational changes. Secretary Gates has expressed his strong support for the goal of reducing energy consumption, and the QDR reflects his desire for a more strategic approach to energy security. Among other things, he has created the office of Director for Operational Energy Plans and Programs. The President has nominated Sharon Burke to head this new Directorate, and we hope the Senate will confirm her very soon.

The Military Departments are staffing up their energy offices as well and they are developing detailed strategic plans and metrics. Without exception, the Service Secretaries have made energy a high priority. For example, in October, Navy Secretary Ray Mabus announced a set of ambitious new goals to boost the energy efficiency of the Navy and the Marine Corps. With respect to installations, he directed that the Department of the Navy get 50 percent of its shore energy from alternative sources by 2020 and reduce by half the amount of petroleum consumed by fleet vehicles by 2015.

The Department as a whole recently announced that, under Executive Order (EO) 13514, it will reduce greenhouse gas emissions from non-combat activities—largely installations and non-tactical vehicles—by 34 percent by 2020. Since greenhouse gas pollution is due overwhelmingly to direct energy use, this aggressive target will require major gains in energy efficiency at our installations. Operational energy is necessarily exempt from this target, since providing immediate support for the warfighter must remain our highest priority. Nevertheless, reducing the energy demands of our operational forces is a major focus of the Department's efforts to cut energy consumption. Moreover, our combat operations will benefit as we improve the energy profile at our supporting installations and solve the cross-cutting structural problems that drive DoD's energy inefficiency.

Increased Investment

Second, the Department is investing more to improve the energy profile of our fixed installations. Financing for these investments has come from annually appropriated funds, including military construction, operations and maintenance, and the Energy Conservation Investment Program (ECIP). (Below I discuss the investments we made with one-time appropriations from the American Recovery and Reinvestment Act.) We have utilized third-party financing through Energy Savings Performance Contracts (ESPCs) and Utilities Energy Service Contracts (UESCs). We are also pursuing other innovative financing mechanisms, such as Enhanced Use Leases (EULs) and Power Purchase Agreements (PPAs).

Our basic investment strategy is twofold: 1) reduce the demand for traditional energy through conservation and energy efficiency; and 2) increase the supply of renewable and other alternative energy sources. Investments that curb demand are the most cost-effective way to improve an installation's energy profile. As Department of Energy (DOE) Secretary Steven Chu has observed, "Energy efficiency is not just the low hanging fruit; it's the fruit lying on the ground."

A large fraction of our demand-side (energy efficiency) investments go to retrofit existing buildings. The Department spends almost $10 billion a year to sustain, restore and modernize our facilities. About one-sixth ($1.7 billion) of this is spent on projects designed directly to improve energy efficiency. Typical projects install improved lighting, high efficiency HVAC systems, double-pane windows, energy management control systems and new roofs. As we replace major components and subsystems in our buildings, the newer, more energy efficient systems contribute to DoD's overall energy reduction goals.

In addition to retrofitting existing buildings, we are taking advantage of new construction to incorporate more energy efficient designs, material and equipment into our inventory of facilities. The Department spent about $25 billion on military construction in FY2009 and we will devote another $23 billion to construction in FY2010. New construction must meet LEED Silver standards and/or the five principles of High Performance Sustainable Buildings (these principles are included in EO 13423 and referenced in EO 13514). It must also be 30 percent above the energy efficiency standard set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

Investment designed to expand the supply of renewable energy sources on base is also important. Although the payback period is significantly longer than that for energy efficiency projects, renewable energy is key to energy security. When combined with microgrid technology and energy efficiency investments that significantly reduce demand, distributed renewable energy sources will allow installations to carry out mission-critical activities and potentially serve as mini-islands that can support restoration of the grid in the event of disruption.

Military installations—which are large and disproportionately located in the Southwest and on our coasts—are well-situated to support solar, wind, geothermal and other forms of renewable energy. For example, Nellis Air Force Base in southern Nevada built a 14-megawatt (MW) photovoltaic solar array: more than 72,000 solar panels track the sun to generate 30 million kilowatt-hours of electricity per year—equivalent to a quarter of the total power used at the 12,000-person base. As with most renewable energy projects on military installations, Nellis took advantage of third-party financing. Nellis saves $1 million a year in electricity costs and avoids 24,000 tons of carbon dioxide emissions.

The military's interest in renewable energy is nothing new. Naval Air Weapons Center China Lake in California has been operating a 270-MW geothermal plant since 1987. The heat from 166 wells, some of them 12,000 feet deep, is sufficient to light up 180,000 homes. The Navy is helping the Army tap into geothermal resources at its Weapons Depot in Hawthorne, Nevada, and that project will be capable of producing 30 MW of clean power.

Finally, let me note that the Department took advantage of the $7.4 billion it received through the Recovery Act to invest in both energy efficiency and renewable energy projects. We devoted $2 billion of that amount to projects designed to improve existing buildings, largely through upgraded systems and equipment. Of that, $90 million went to ECIP, which supports energy efficiency and renewable projects based on payback and which has achieved an estimated $2.16 in savings for every dollar spent. Another $1.6 billion of Recovery Act funds is going to construct new facilities, all of which will meet LEED Silver standards and/or the five guiding principles of High Performance Sustainable Buildings.

RDT&E: Installations as a Testbed for Next-Generation Energy Technology

The military has a long history of stimulating new technology, beginning with the War Department's support for the development of interchangeable machine-made parts for musket production in the 1800s. Although DoD has provided this support solely for national security reasons, the technologies spawned have served as key drivers for U.S. economic growth and competitiveness. The commercial success of these technologies, ranging from aerospace to the internet, has in turn benefited DoD by allowing the military to take advantage of the cost savings and further technology advances from the private sector.

With respect to facilities energy, the military's most valuable role will be as a testbed for next-generation technologies coming out of laboratories in industry, universities and the Department of Energy. As I noted earlier, DoD's built infrastructure is unique for its size and variety, which captures the diversity of building types and climates in the United States. For a wide range of energy technologies for which deployment decisions must be made at the local level, DoD can play a crucial role by filling the gap (the "valley of death") between research and deployment.

As both a real and a virtual testbed, our facilities can serve two key roles in which the military has historically excelled. One is as a sophisticated first user, evaluating the technical validity, cost and environmental impact of advanced, pre-commercial technologies. For technologies that prove effective, DoD can go on to serve as an early customer, thereby helping create a market, as it did with aircraft, electronics and the internet. This will allow the military to leverage both the cost savings and technology advances that private sector involvement will yield.

We are pursuing the energy testbed approach on a small scale through the Environmental Security Technology Certification Program (ESTCP). Using $20 million in Recovery Act funding, ESTCP awarded contracts through a competitive solicitation to 9 projects to demonstrate technologies that will provide for increased energy efficiency or that will generate cost effective renewable power on site.

To illustrate, consider that buildings degrade over time in terms of their energy performance, rarely meeting their design intent much less performing optimally. Advances in monitoring and modeling tools allow us to continuously commission and optimize building performance. Two ESTCP projects are demonstrating a whole-building monitoring system and will assess its ability to: 1) identify, classify and quantify deviations from design intent or optimal performance in terms of the consumption of building energy and water; 2) classify and identify the root causes of such deviation; 3) identify corrective actions; and 4) quantify the value of these actions in terms of energy and water savings and other economic benefits. Project participants include United Technologies Research Center, Lawrence Berkeley National Laboratory, the University of California at Berkeley and Oak Ridge National Laboratory. There are three demonstration sites for the projects: Naval Base Ventura, California; the Army's Construction Engineering Research Laboratory in Champaign, Illinois; and Great Lakes Naval Station in Illinois.

Another ESTCP project builds on the recognition that facilities are more sustainable if renewable energy systems can be cost effectively integrated into their initial design. ESTCP is conducting a multi-site demonstration of building-integrated photovoltaic (BIPV) roof concepts. By verifying that an energy efficient roof can perform its expected function, DoD can increase its capacity to

generate renewable energy. The Naval Facilities Command leads this project in collaboration with Lawrence Berkeley National Laboratory. Demonstrations are taking place at Luke Air Force Base and Marine Corps Air Station Yuma, both in Arizona, and Naval Air Station Patuxent River in Maryland.

The testbed approach is key to meeting the Department's needs, but it is also an essential element of a national strategy to develop and deploy the next generation of energy technologies needed to support our built infrastructure. We hope to expand it, working closely with the Department of Energy and other agencies and organizations.

Other Key Initiatives

The Department is pursuing several other initiatives to address specific challenges or impediments to improved installation energy management. Let me briefly describe two of them.

First, we are addressing DoD's lack of an enterprise-wide energy information management system for its global assets. Large commercial enterprises manage their energy portfolio using such data systems; they are essential to a firm's ability to set goals and incentives for optimal energy efficiency and to monitor subsequent performance. My office has begun to evaluate various commercial systems and assess DoD's needs with the goal of having the Department develop and implement a state-of-the-art, mission-driven, *enterprise-wide energy information management system* that can provide the appropriate information on energy consumption at various levels of aggregation, including the individual building, the installation, the geographic region and the Military Department. 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; collect renewable energy generation and performance data; and compare performance across facilities and across Military Departments.

Second, we have begun what will likely be a major effort to *address the risk to our installations from potential disruptions to the commercial electric grid.* The Department is participating in interagency discussions on the magnitude of the threat to the grid and how best to mitigate it. We are also looking at how to ensure that we have the energy needed to maintain critical operations in the face of a disruption to the grid. As required by the National Defense Authorization Act, the Secretary of Defense this year will give Congress a plan for identifying and addressing areas in which electricity needed for carrying out critical military missions on DoD installations is vulnerable to disruption. The development of renewable and alternative energy sources on base will be one element of this effort, because—in combination with other investments—these energy sources can help installations to carry out mission-critical activities and support restoration of the grid in the event of disruption.

As discussed earlier, the Defense Science Board concluded that, because of the vulnerability of the grid, rapid improvements in the electrical efficiency of military installations would have national security value far greater than the economic value of reduced electricity consumption. The Board argued that the risks and consequences of grid outage should be the basis for a business case to pursue higher levels of energy efficiency at permanent installations. Our planned assessment of the risk facing individual critical missions and installations will allow us to evaluate that business case.

Third, we are devoting considerable time and effort to a complex and growing challenge—*ensuring that proposals for domestic energy projects, including renewable energy projects, are compatible with military requirements for land and airspace.* As noted above, military installations lend themselves to renewable energy development, and a renewable project can benefit the host installation by providing a secure source of energy and reduced energy costs. In some cases, however, a proposed project can interfere with the military mission. For example, wind turbines can degrade air- and ground-based radar, and solar towers can cause interference by creating thermal images detrimental to sensitive testing of weapons systems. The current process for reviewing proposals and handling disputes is opaque, time consuming and ad hoc.

The Department is working to balance the nation's need for renewable sources of energy with military mission needs. The DoD "product team" devoted to sustaining our test and training ranges, which I co-chair, is working to come up with a better process for evaluating proposals from energy developers who want to site a renewable project on or near an installation. We have begun to reach out to potential partners, including other federal agencies, energy developers, state and local governments, and environmental organizations. In addition to working to improve the current approval process, the Department is looking at the role of research and development. New technology can allow us to better measure the potential impact of a proposed project. It can also help to mitigate the impact. For example, recent press accounts suggest that developments in stealth technology as applied to turbine blades can reduce the harm to ground-based (but not air-based) radar.

Conclusion

The management of installation energy is an important issue. Facilities energy represents a significant cost to the Department. Moreover, it is increasingly important to ensure that mission-critical activities have reliable access to energy. The Department has steadily improved the energy profile at its installations in recent years, largely in response to statutory and regulatory goals. While continuing that very positive trend, it is time for us to adapt our approach to installation energy management from one that is primarily focused on compliance to one focused on long-term cost avoidance and mission assurance.

The Department has made energy policy a priority, and we are investing more both to reduce demand and to expand the supply of renewable energy. We will also need to leverage the Department's strength in research and development, particularly by using our installations as a real and virtual testbed for next-generation building energy technologies. Finally, we will need to address the impediments to improved installation energy management, including flawed economic incentives. We look forward to working with the Congress to address the challenges and opportunities we face in this exciting and important area.

RECORD VERSION

STATEMENT BY

MR. L. JERRY HANSEN
ARMY SENIOR ENERGY EXECUTIVE (SEE)
DEPUTY ASSISTANT SECRETARY OF THE ARMY (STRATEGIC INFRASTRUCTURE) AND SENIOR OFFICIAL PERFORMING DUTIES AS ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS & ENVIRONMENT)

BEFORE THE

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

SECOND SESSION, 111TH CONGRESS

ENERGY SECURITY / INSTALLATION ENERGY MANAGEMENT

FEBRUARY 24, 2010

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THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT BY
MR. L. JERRY HANSEN
ARMY SENIOR ENERGY EXECUTIVE (SEE)
DEPUTY ASSISTANT SECRETARY OF THE ARMY (STRATEGIC INFRASTRUCTURE) AND SENIOR OFFICIAL PERFORMING DUTIES AS ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS & ENVIRONMENT)

INTRODUCTION

Mr. Chairman and members of the Subcommittee, it is a pleasure to appear before you to discuss the Army's Energy Security program, specifically our installation energy initiatives. We are especially grateful for this Subcommittee's continued support for the Army's Energy Security program. The Subcommittee's ongoing efforts, coupled with the President's vision for Energy Security and Sustainability, marked by increased energy efficiencies, investments in renewable energy, and leveraged Federal purchasing power to promote environmentally-responsible products and technologies, will result in assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs.

The recently published Quadrennial Defense Review (QDR) Report presents energy security in a manner consistent with current and planned Army energy initiatives. The Army program supports the QDR determinations that energy efficiency can be a force multiplier and that the expanded use of renewable energy and the reduction in energy demand, if properly implemented, will improve operational effectiveness. We are committed to enhancing energy security and mission assurance without degrading our test, training, and operating areas essential for mission readiness.

Among the most immediate, significant, and systemic risks to Army installations are those which house our Task Critical Assets, Defense Critical Assets, critical infrastructures and key Continuity of Operations and Continuity of Government capabilities. These risks are linked to our

dependence on the commercial power grid. Senior homeland security and defense leaders have acknowledged that sophisticated state-sponsored actors have demonstrated both capability and intent to disrupt Department of Defense (DoD) missions, logistics, and communications by exploiting this strategic vulnerability. Beyond those threats to the grid, we are also susceptible to non-state actors, accidents, and natural disasters.

The Army is answering the call for the nation to face many of the inextricably linked challenges of our time: confronting our dependence on foreign oil, addressing the moral, economic, security, and environmental challenge of global climate change, and providing clean energy that benefits all Americans in the near term and in the future. Increased Energy Efficiency is a DoD High Priority Performance Goal and as such the Army's Energy Security program goals support the DoD two-part investment strategy for installations to (1) reduce the demand for traditional energy (18% by 2011) and (2) increase the supply of renewable energy sources (14.3% of annual electric usage in 2011). The Army is consistent with DOE, GAO and DOD General Counsel regarding counting renewable contributions and is committed to meeting federal energy management requirements. The Army will continue to lead by example and partner with public and private organizations to meet our nation's energy security needs. Energy is a key consideration in all Army activities, with emphasis upon reducing demand, increasing efficiency, seeking alternative sources, and creating a culture of energy accountability, while sustaining or enhancing operational capabilities.

Sustaining the Army's mission capabilities and its global operations requires a tremendous amount of energy. In fiscal year 2009, the Army spent approximately $1.2 billion for more than 80 trillion British thermal units of energy to operate installations and facilities worldwide and invested more than $600 million for installation energy efficiency projects.

The Army is engaging in studies and developing plans to maximize renewable energy opportunities across Army installations in an effort to meet established goals. In fiscal year 2010, the Army expects to invest over $45 million for 19 Energy Conservation Investment Program projects, including renewable projects such as solar walls, solar day lighting, and solar photovoltaic power generation. The Army is also utilizing Sustainment, Restoration and Modernization and military construction funds to implement energy efficient projects.

We now view Energy Security as an Operational Imperative which will provide the Army with a significant tactical advantage. Army installations, tactical operations, and Soldier training require secure and uninterrupted access to energy. Dependence on fossil fuels and a vulnerable electric power grid jeopardizes the security of Army installations and mission capabilities. The long liquid fuel logistical tail poses risks to contingency operations and is a vulnerability for deployed Army forces. Today's Army is transitioning into an elite 21st Century expeditionary force designed to confront elusive enemies that threaten our interests both around the globe and on our home soil; therefore, Energy Security will support Army goals to transform into an agile and technologically superior fighting force capable of successfully accomplishing any and all mission requirements.

BACKGROUND

The Army recognizes that continued reliable access to affordable, secure energy supplies is a significant concern for the Army and the nation. Given our reliance on energy, disruption of critical power and fuel supplies will harm our ability to accomplish critical missions. Such a risk exposes a vulnerability that must be addressed by a more secure energy position and outlook. In addition, increasing efficiencies and lowering demand for energy will save money and free up both fiscal and personnel resources. Industry partnerships that supply power

to the commercial grid from Army installations provide residual benefits to the region while meeting Army requirements.

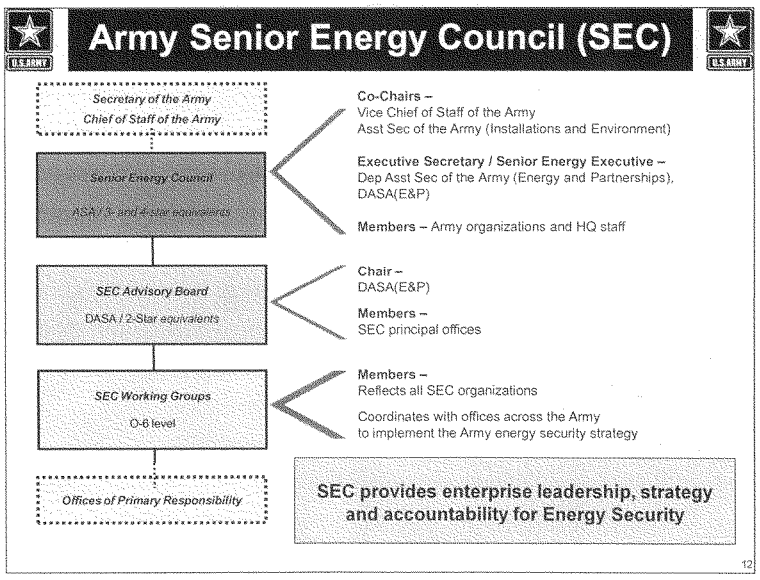
To facilitate development of a cohesive Army-wide approach to energy security, the Secretary of the Army commissioned an Army Energy Security Task Force (AESTF) in April 2008 to assess our energy security posture. The AESTF developed recommendations for reducing Army energy consumption, increasing energy efficiency across platforms and facilities, promoting the use of new sources of alternative energy, establishing benchmarks for reducing the Army's energy footprint, and creating a culture of energy awareness across the Army based on the principles of Leadership, Partnership, and Ownership.

Based on initial recommendations from the task force, the Army created the Senior Energy Council (SEC), comprised of the senior leadership of the Army's key energy stakeholder organizations, to oversee the Army's Energy Enterprise. An enterprise perspective is essential since energy investments and activities in one organization have potential impacts on the ability of other organizations to perform their respective missions. The enterprise represents vertical and horizontal alignment of people, processes and technologies across organizational and functional boundaries. The Deputy Assistant Secretary of the Army for Energy and Partnerships, serving as the Army's Senior Energy Executive (SEE), integrates energy activities across the Army, monitors objectives and metrics, and tracks progress for meeting established energy goals. The Assistant Secretary of the Army (Installations and Environment) Co-Chairs the SEC because installations make up a very large proportion of the Army's energy consumption.

The Army Energy Security Implementation Strategy (AESIS) was approved in January 2009. This strategy addresses the Army's energy security challenges and establishes initiatives to help achieve the energy security necessary for the full range of Army missions. Energy security to the Army

means the following: preventing loss of access to power and fuel sources (surety); ensuring resilience in energy systems (survivability); accessing alternative and renewable energy sources available on installations (supply); providing adequate power for critical missions (sufficiency); and promoting support for the Army's mission, its community, and the environment (sustainability).

The AESIS, which encompasses new and existing plans under an enterprise framework, is an evolutionary document addressing future Army energy security requirements and initiatives, and will link all energy plans to the Army enterprise level energy security goals. For the first time, the development of the Army budget will be influenced by an enterprise energy security strategy. The Program Objective Memorandum (POM) 12-17 submission will reflect the priorities developed to support the goals and objectives of the AESIS.



ENERGY SECURITY PROGRAM OBJECTIVES AND METRICS

Through the Army's Senior Energy Council (SEC) governance structure, specific goals, objectives, and metrics have been developed in the past year to support the AESIS, providing integrated, goal-driven energy security activities for the Army while drastically reducing vulnerabilities and risks. The Army's strategic Energy Security Goals (ESGs) are designed to be achieved over the long term through steady annual progress that will be monitored with review of established metrics. Success will represent a significant improvement of the Army's energy security enterprise and will place Army assets in a strong position for future energy-effective operations. The ESGs incorporate the fundamental principle that the improvements achieved shall not lead to reductions in either operational capability or in the ability of the Army to carry out its primary missions. The Army's solutions to achieving its energy goals will effectively maintain and enhance operational capabilities, achieve long-term cost savings, and strengthen the ability of the Army to fulfill its missions.

The Army's five overarching **Energy Security Goals** are:

ESG 1. Reduced Energy Consumption. Reducing the amounts of power and fuel consumed by the Army at home and in theatre. This goal will assist in minimizing the logistical fuel tail in tactical situations by improving fuel inventory management and focusing installation consumption on critical functions.

ESG 2. Increased Energy Efficiency Across Platforms and Facilities. Raising the energy efficiency for generation, distribution, storage and end-use of electricity and fuel for system platforms, facilities, units and individual Soldiers and Civilians. This goal also relates to the productivity of a system based on energy requirements and supports the ability to

make informed trade-offs in development, engineering and deployment of weapon systems.

ESG 3. Increased Use of Renewable / Alternative Energy. Raising the share of renewable / alternative resources for power and fuel use, which can provide a decreased dependence upon conventional fuel sources. This goal also supports national, regional and local goals related to renewable / alternative energy.

ESG 4. Assured Access to Sufficient Energy Supply. Improving and maintaining the Army's access to sufficient power and fuel supplies when and where needed, including incorporation of smart secure grid capabilities. Energy is a critical resource in conducting Army missions. Vulnerabilities to external disruption of power and fuel sources should be minimized and the potential for industry partnerships to enhance energy security and generate net revenues for the Army should be considered.

ESG 5. Reduced Adverse Impacts on the Environment. Reducing harmful emissions and discharges from energy and fuel use. Conducting energy security activities in a manner consistent with Army environmental and sustainability policies.

The Army will measure progress toward its ESGs through engaging in specific implementation activities that support more than 20 energy security objectives and over 50 supporting metrics. Metrics are based on both quantitative and qualitative requirements for energy performance that have been established by legislation, Presidential Executive Orders (EO), Office of the Secretary of Defense (OSD) mandates, and Army policies.

The Army is committed to measuring the impact of energy security implementation activities undertaken to meet its ESGs. Measuring and tracking progress will occur systematically across all major energy activities to ensure that the ESGs are being addressed and that

compliance with energy directives is occurring. Progress toward directive targets and ESGs will be gauged using quantitative and qualitative metrics to permit periodic data collection, analysis and reporting and to build a historical record of performance. Progress from across the Army will be measured using the Army Strategy Management System (SMS) and reported to the SEC. SMS serves as the foundation for ensuring Army-wide strategy execution, strategy management, organizational alignment (vertical and horizontal), and data synchronization. It consolidates input from various Army information technology systems or Standard Army Management Information Systems (STAMISs) into a single dashboard to compare actual performance to stated targets or standards.

ENERGY SECURITY INITIATIVES

The Army is actively supporting advanced technologies and is taking immediate action to implement innovative energy initiatives to include large-scale solar, wind and geothermal power sources, electric and hybrid vehicles, and improved insulation of facilities, to name but a few. In fiscal year 2009 the Army had 67 active renewable energy projects operating, 42 of which generated electricity that qualifies for credit toward the Energy Policy Act of 2005 renewable energy goal. In addition, per the Fiscal Year 2010 National Defense Authorization Act (NDAA), the Army is coordinating with OSD to consider nuclear power options to help achieve our energy security goals. The Army is making significant investments in implementing energy projects in Army installation facilities, including more than $600 million for energy-related projects identified in the 2009 American Recovery and Reinvestment Act. Examples of ongoing initiatives are listed below.

Army Construction Standards. The Army, in coordination with the US Army Corps of Engineers, is implementing energy efficiencies in facility construction and renovation projects. The Army requires military

construction projects to reflect Leadership in Energy and Environmental Design (LEED) Silver level standards and compliance with energy efficient designs. In addition, water conservation is being pursued through a comprehensive program which includes water management plans, adoption of best management practices, establishment of a waterless urinals as standard in new Army construction, increased metering, and improved asset management of water distribution systems.

Sustainment, Restoration and Modernization (SRM). SRM funding through the American Recovery and Reinvestment Act and Military Construction funds for the Energy Conservation Investment Program (ECIP) produced over 300 energy efficiency facility improvement projects. The majority of funds received for ECIP are dedicated toward renewable energy technology projects.

Energy and Utilities Services Contracting Authority. Alternative financing from private industry and utility companies is being used through the energy savings performance contracting and utility energy services contracting authorities. Energy services companies and utilities have invested over $1 billion in energy efficiency improvements to Army facilities over the last 20 years since Congress provided this authority. Expanding the current contracting authority would allow more opportunities for energy security initiatives.

Acquisition Policy. In January 2009, the Army published policy requiring energy productivity (the level of output we can achieve from the energy we consume) to be a consideration in all Army Acquisition Programs. Therefore, all new Army acquisition programs, including information systems, with energy-consuming end items, must include the fully burdened cost of energy needed for system operation in their total ownership cost analysis. The acquisition policy will have a second-order and positive impact at our

installations, as new vehicles and equipment consume less energy (both electrical and fuel) from our fixed installations and forward operating bases.

Fort Irwin, CA. In July 2009 the Army selected a developer to design a plan for phased construction of a 500 megawatt solar energy plant at Fort Irwin. This will be the DoD's largest solar project and will include a partnership with Clark / Acciona utilizing an Enhanced Use Lease (EUL) and Power Purchase Agreement. The plant is intended to provide secure electricity to Fort Irwin even if the commercial grid goes down. The plant will be constructed with approximately $2 billion of private capital and will reduce the Army's utility cost by an estimated $20.8 million over 25 years. Most importantly, the project will provide energy security to a one-of-a kind Army training installation, and 'island' the National Training Center from outside the gate grid-failure.

Hawthorne Army Depot, NV. The Army is planning to partner with industry to build a 30 megawatt geothermal power plant at Hawthorne Army Depot. To utilize their experience and expertise, the Army has established a partnership with the Navy to assist us with the procurement process. The 30 megawatt geothermal power plant will meet all of Hawthorne's electrical power requirements on a 24/7 basis, independent of the commercial power grid, with essentially no greenhouse gas emissions.

Fort Bliss, TX. With the largest DoD facility growth underway, Fort Bliss is positioned to become an Army Center for Renewable Energy. Fort Bliss has begun to implement unique renewable energy opportunities from wind, solar, geothermal and biomass resources to provide secure electric power for the installation. A unique inland desalination plant has been developed in partnership with the local community.

Fort Knox, KY. Since 1996, Fort Knox has implemented innovative energy saving projects through a utility partnership and signed a 10-year contract to develop low-grade natural gas reserves contained in the Devonian Shale geologic formations beneath the installation, with first option to purchase gas at reduced cost. The Army negotiated a monthly natural gas price at 86 percent of market price. Fort Knox has also leveraged its utility partnership and awarded six Utility Energy Support Contract task orders for almost $50 million for energy projects in fiscal year 2008. Fort Knox used Energy Conservation and Investment Program (ECIP) funding to install ground source heat pumps to reduce heating and cooling costs. Building meter systems have been installed and integrated into the Army's largest wireless utility management system. Two fiscal year 2007 ECIP projects were awarded for $5.5 million to convert seven barracks to geothermal heating and cooling, and four barracks were converted in fiscal year 2009 using $3.35 million ECIP funding. The projects have estimated savings to investment ratios of 1.5 and payback of 10 years. Another fiscal year 2009 ECIP project for $1.15 million converted domestic water heating from natural gas to geothermal with a three year payback.

Fort Detrick, MD. To support the National Interagency Bio-defense Campus (NIBC) an EUL project for a Central Utilities Plant (CUP) has been initiated. The CUP provides an efficient, cost-effective, reliable, and secure utility asset and is an excellent example of a public / private partnership. The new, energy-efficient plant, which is fueled by natural gas or fuel oil, delivers highly secure and reliable steam, chilled water, and high-quality / conditioned stand-by emergency power to the 24/7/365 operations of the NIBC. The CUP was designed to enable expansion of service and capacity as additional needs arise on the installation. The CUP provides a highly energy-efficient and environmentally-friendly solution to utility needs in a secure campus setting providing both

conditioned power and backup emergency power. The electrical system can be isolated from the commercial utility system in time of national emergency, weather emergency, or power shortages. The chiller plant is designed to exceed LEED efficiency standards by up to 30 percent. The highly efficient chilled water plant delivery system reduces electrical usage through a 27,000-ton-hour thermal energy storage tank. Peak loads occur at different times in different buildings; therefore, less installed capacity is required to meet the diversity of the steam loads. Bulk purchasing of fuel for the boilers reduces overall cost.

Sea Girt, NJ (NJ Army National Guard). The Sea Girt Photovoltaic Electric Power System represents the New Jersey Department of Military and Veterans Affairs' ongoing efforts to optimize efficiency, conserve natural resources and lessen our dependence on foreign energy sources. With 230 kilowatts of power generating capacity, this system will produce about 250,000 kilowatt hours per year and reduce carbon dioxide by seven million pounds over the next 30 years. The New Jersey Department of Military and Veterans Affairs is also conducting wind analysis through Rowan University for the construction of a 1.5 megawatt wind turbine. Data from this test has determined Sea Girt to be an excellent facility for a turbine. This turbine has the potential to produce 4 million kilowatt hours per year, which is enough energy to allow Sea Girt to operate independent of the power grid. In the event of a crisis, Sea Girt will be able to function providing necessary services, energy security, and National Security.

Alternative and Hybrid Vehicle Fleet. The Army is building one of the largest federal fleets in the country of Low Speed Electric Vehicles (LSEVs) and hybrid vehicles. We are replacing 4,000 petroleum-fueled vehicles with LSEVs at installations nationwide. The LSEVs operate up to 40 miles between charges and can travel at about 35 miles per hour. This

initiative will result in over 100,000 fewer metric tons of carbon dioxide emissions and an estimated savings of more than 7.5 million gallons of fossil fuel over six years. In addition to the LSEVs, the Army is replacing traditional gas / diesel fuel vehicles with the latest hybrid technology vehicles. In 2009, the Army acquired more than 700 hybrid vehicles and now has the second largest hybrid fleet in the federal government. These two initiatives significantly reduce dependence on and consumption of fossil fuels, while lowering greenhouse gas emissions.

Utility Metering Program. The Army is installing advanced utility meters for electricity, natural gas, steam and water on individual buildings where cost-effective and on all new military construction projects to enhance energy management efforts per federal metering mandates. Through fiscal year 2009, the Army has completed installation of 40 percent of needed advanced electric meters and 20 percent of needed advanced natural gas meters. These meters will be networked to a central meter data management system to assist energy management review and analysis throughout the Army.

Spray Foam Insulation. The Army has pioneered use of spray foam insulation for temporary structures in forward operating bases to cut the amount of power needed from liquid-fueled generators, and potentially cutting the number of fuel convoys required for fuel supplies. Insulation provides energy savings of more than 50 percent in many of the newly foamed structures. This is just one point solution with specific application parameters and other technological solutions will be investigated to support the basic requirement for enhanced insulation of temporary structures Army wide.

Utilities Privatization (UP). The Utilities Privatization Program focuses on privatizing electrical, natural gas, water, and waste water

systems. Systems are exempt if privatization is uneconomical or if privatization raises security concerns. The privatization of utilities utilizes private sector financing and expertise to modernize and sustain utility systems to industry standards. The Army is evaluating 355 utility systems in the United States. Currently, 304 systems have been evaluated, 146 systems privatized.

ADDRESSING THE CHALLENGES

The fragility and vulnerability, from both a physical and cyber perspective, of the national electric grid has been well documented by numerous credible institutions including the intelligence community, the Defense Science Board and Congressional study groups. Not only are we susceptible to prolonged, widespread outages due to natural hazards and aging infrastructure (e.g., Northeast Blackout of 2003), but there is strong evidence that the U.S. grid is a prime target for cyber exploitation by our enemies during periods of crisis.

To date, efforts to provide assured power to Army owned critical infrastructure has been assessed primarily from the perspective of traditional back-up diesel power generators. Given the physical and cyber vulnerability of the commercial grid, this will not be adequate for a number of key facilities in the future. The concept of applying alternative energy sources, including solar, geothermal, wind and small scale nuclear generation, is being examined for all Army installations.

In light of the strategic threats to the commercial energy infrastructure, energy security is a key consideration when developing comprehensive Army energy policy. Future energy cost benefit analysis must go beyond purely economic considerations and include a determination of how much risk national leadership is willing to accept to ensure continued operation of critical military missions and functions. The

Army acknowledges and accepts that in some cases there will be a cost premium associated with achieving energy security.

The Army's installations and associated lands are valuable and critical assets and as training or operational demand requirements increase, the Army will continue to address critical energy security requirements in addition to our traditional focus on energy conservation.

CONCLUSION

Without power and energy the Army lies silent. Energy security provides our Soldiers with superior capabilities, weapons, and facilities to live, work, and train. The energy required to power these assets is integral to the success of the mission and the quality of life for our personnel and their Families.

Based on 2010 QDR, the Army is working with DoD to develop a strategic approach to Climate and Energy. We have made impressive progress and plan to continue with our aggressive, synchronized, and methodical approach to obtain energy security. If funded and implemented, our strategy and initiatives will move us from where we are now – vulnerable at our installations and at our overseas forward operating bases – to where we want to go: 'islanding' key assets and installations, producing a much smaller energy and carbon boot print, and supporting a smaller fuel logistical tail in theater that will reduce the risk to our Soldiers.

Mr. Chairman, this concludes my statement. Thank you again for the opportunity to appear before you today. I look forward to your questions.

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SUBCOMMITTEE ON
READINESS

STATEMENT OF

MR. ROGER M. NATSUHARA

ACTING ASSISTANT SECRETARY OF NAVY
(INSTALLATIONS AND ENVIRONMENT)

BEFORE THE

HOUSE ARMED SERVICES SUBCOMMITTEE

ON READINESS

ON

ENERGY MANAGEMENT AND INITIATIVES ON MILITARY INSTALLATIONS

24 FEBRUARY 2010

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HOUSE ARMED SERVICES SUBCOMMITTEE ON
READINESS

Chairman Ortiz, Representative Forbes, members of the subcommittee, thank you for the opportunity to present an overview of the Department of the Navy's Energy Program, specifically as it relates to Installation Energy initiatives.

INTRODUCTION

The Department of the Navy (DoN) is committed to implementing a balanced energy program that exceeds the goals established by the Energy Independence and Security Act of 2007, Energy Policy Act of 2005, National Defense Authorization Act of 2007 and 2010, Executive Orders 13423 and 13514. We place a strong emphasis on environmental stewardship, reducing overall energy consumption, increasing energy reliability, and reducing our dependence on fossil fuels. The Department is a recognized leader and innovator in the energy industry by the federal government and private sector as well. Over the past nine years, DoN has received 28% of all of the Presidential awards and 30% of all of the Federal energy awards. Additionally, DoN has received the Alliance to Save Energy "Star of Energy Efficiency" Award and two Platts "Global Energy Awards" for Leadership and Green Initiatives.

Organization and Commitment

Increased Energy Efficiency is a Department of Defense (DoD) High Priority Performance Goal. Moreover, the Secretary of the Navy (SECNAV) is whole-heartedly committed to the energy effort and it is one of his top three initiatives for the Department. The Secretary established a Deputy Assistant Secretary of the Navy for Energy (DASN-Energy) to consolidate the Department's operational and installation energy missions. The consolidation of both operational and installation energy portfolios under one director is unique to the Department of the Navy.

The DASN-Energy will be a career member of the Senior Executive Service who will report directly to the ASN (I&E) and will be able to coordinate across the Department to develop overarching policy, provide guidance, oversee the continued development of new ideas and align existing programs. In turn, each of the Services has established an energy management office to implement the Secretary's guidance. Within the Chief of Naval Operations (CNO) organization, a Navy Energy Coordination Office (NECO) was established to develop and institutionalize the Navy's Energy Strategy. Within the Commandant of the Marine Corps (CMC) organization, an Expeditionary Energy Office was established to drive energy efforts and initiatives within the expeditionary forces on the ground in theater.

From the Secretary down to the deck plate Sailor and the Marine in the field, the Department is committed to meeting our aggressive energy goals. We all view energy as an invaluable resource that provides us with a strategic and operational advantage.

Energy Goals

The key statutory and regulatory goals relevant to installation energy consumption require the following:

- Reduce energy intensity (BTUs per square foot) by 3 percent per year, or 30 percent overall, by 2015 from the 2003 baseline [Energy Independence and Security of 2007, or EISA] [this includes an 18 percent reduction by the end of FY2011 in accordance with DOD's High Priority Performance Goals in the President's Budget];

- Increase use of renewable energy to 7.5 percent in 2013 and beyond (Energy Policy Act of 2005, or EPACT); and produce or procure 25 percent of all electric energy from renewable sources by the end of 2025 [National Defense Authorization Act of 2007] [this includes the DOD's High Priority Performance Goal of 14.3 percent by 2011]; and
- Reduce consumption of petroleum (gasoline and diesel) by non-tactical vehicles by 30 percent by 2020 [Executive Order 13514, October 2009].

However, in October of 2009, Secretary Mabus established far more aggressive goals for the Department. For installations, he directed that 50% of our shore energy will come from alternative sources and that by 2015 the Department will reduce fleet vehicle petroleum usage by greater than 50%.

Based on these ambitious energy goals, we are developing our strategic roadmap and a set of energy directives that will provide guidance and direction to the Navy and Marine Corps. We are also developing baseline metrics, milestones, tools and methodologies to measure and evaluate progress towards meeting the Secretary's goals. Additionally, we are documenting our past and current energy use for tactical platforms and shore installations. We are making investments, allocating resources, developing possible legislation, institutionalizing policy changes, creating public-private partnerships, and pursuing technology development required to meet these goals.

ENERGY STRATEGY

With respect to installations, the Department has pursued a two-part strategy that is designed to (1) reduce the demand for traditional energy while (2) increasing the supply of renewable energy sources. Financing for these investments has come from appropriated funds, such as our Energy

Conservation Investment Program (ECIP), Operations and Maintenance, Military Construction, and most recently, the American Recovery and Reinvestment Act. We have been successful in utilizing third-party financing through Energy Savings Performance Contracts (ESPC) and Utilities Energy Service Contracts (UESC). We are also pursuing other mechanisms, such as Enhanced Use Leases (EUL) and Power Purchase Agreements (PPA).

Energy Efficiency

Efforts to curb demand—through conservation measures and improved energy efficiency—are by far the most cost-effective way to improve an installation's energy profile. A large portion of our energy efficiency investments go to retrofit existing buildings. Typical projects install high efficiency HVAC systems, energy management control systems, high performance roofs and improved lighting. For new construction, the Department is incorporating more energy efficient designs, material and equipment, using LEED Silver standards, and building to 30% better than American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) standard 90.1-2004 for energy efficiency requirements. From FY2005 to FY2009, we reduced the energy intensity of our facilities by 13 percent through conservation and energy efficiency investments.

Renewable Energy

Renewable energy is a key component of our comprehensive energy program. The Department of Navy is a leader in developing innovative approaches for the construction of renewable generation within the fence line of our installations. We are making significant progress towards the renewable and alternative energy goals mandated by the Secretary. Currently, nearly 19% of

our energy produced or consumed on our installations today comes from alternative sources such as wind, solar, and geothermal power.

The Department is committed to using renewable energy where cost effective and fostering the development of renewable energy technology when it supports and is compatible with our mission. We partner with industry to facilitate power purchase agreements, public private ventures and Energy Savings Performance Contracts that build renewable energy systems on our installations; we make use of proven technology developed by industry, universities, and the Department of Energy; and we encourage renewable technology development in ocean environments.

The Department analyzed options for constructing renewable generation capability on installations, purchasing renewable power from commercial sources, and purchasing renewable energy credits from private entities. We made the decision a number of years ago to concentrate our efforts on generating renewable energy on base. We took this position for several important reasons. First, in a time of man-made or natural disaster, electric power received from national power grids may not be as reliable as we require. By locating large-scale renewable energy generation systems on installations we increase energy security and decrease demand on our nation's electric grid. Of course, some renewable technologies, such as wind and solar will be subject to periods of limited or non-availability, but we have implemented redundant capabilities for mission critical functions and assets while awaiting for large scale energy storage to become more viable. We continue to pursue geothermal and bio-mass opportunities where applicable, while funding RDT&E efforts on the large scale applicability of wave and ocean thermal energy.

A second important reason for choosing to locate renewable energy systems on installations is because every kilowatt-hour (kwh) of electricity produced simultaneously reduces the amount of fossil fuel burned and the associated emissions released. Third, renewable energy is of great interest to our Sailors, Marines, and their families and our civilian workforce. They often take pride in the renewable energy systems installed on installations and feel part of the solution. We have seen that energy awareness increases and overall energy consumption has decreased at work and in military housing.

Geothermal Energy

The earliest and, by far, the most successful of our renewable energy plants is the 270 MW geothermal power plant at the Naval Air Weapons Station China Lake, California. Awarded in 1979, 180 MW is produced from Navy lands and 90 MW is produced from Bureau of Land Management lands. The electricity generated is the equivalent amount of energy to power 180,000 homes annually. To facilitate construction of this world-class plant, the government provided land and the geothermal steam resource and the contractor provided investment funds. The contractor owns, operates and maintains the plant. The project is unique, being the only geothermal power plant of its type on Department of Defense (DoD) lands. Its distinctiveness is more startling when you consider that 166 wells, 200,000 linear feet of piping and four power plants are operating on one of the Navy's busiest weapons and test ranges that is also surrounded by Native American cultural sites.

The Navy does not take ownership of the electric power generated from this "facilitated" project. The electricity produced, to date over 45 million mega-watt-hours, is owned by the contractor and sold to the grid. As authorized by 10 USC 2867, the Navy receives a share of the contractor's revenue as compensation for the land and geothermal resource. The amount of compensation is typically based upon an increasing percentage over time, a smaller percentage in the early years when the contractor's risk and investment are higher, and a larger percentage to the Navy when the contractor's investment is recovered and the plant, resource and operations are more stable. The majority of the revenue received is used to fund the Department of Navy's shore energy program and to meet mandated goals. Annual revenue is leveraged to validate and transfer technology into broad DoN use, to install advanced meters, energy efficient lighting, heating, air conditioning, motors and other energy systems, provide program quality control and standardization, educate and involve all personnel in our efforts to reduce consumption, recognize and share success, and develop and utilize new renewable resources.

We are pursuing other geothermal resources in our role as the DoD Lead Service for Geothermal Energy. We are exploring geothermal resources at Naval Air Station Fallon, NV, Naval Air Field El Centro, CA, Marine Corps Air Ground Combat Center Twenty-nine Palms, CA, Marine Corps Air Station Yuma, AZ, and we are assisting the Department of Army to delineate their geothermal resource at the Hawthorne Army Depot in Hawthorne, Nevada.

One of the challenges affecting our ability to attract industry participation in geothermal partnerships is the inherent risk involved in committing to a long term contract with the government when the scope and extent of the resource is unknown. To reduce this risk the Navy

has adopted the "farm out business model" used extensively by the oil industry. The Navy performs the preliminary investigations up to and including drilling test wells to quantify the resource. With proven test results and a hot well which can be instrumented, industry is more willing to partner in what is still a financially risky enterprise.

Ocean Thermal Energy Conversion (OTEC)

The Department of the Navy has been a world leader in setting the standard for innovative energy reduction initiatives. We have partnered with industry to support deployment of innovative technologies such as wave and ocean thermal energy conversion (OTEC). We are monitoring the operation of the 3rd generation of wave power buoys at Kaneohe Bay Marine Corps Base. This program will evaluate the economic and technical feasibility of converting wave energy into reliable electrical power for Naval applications. In the spring of 2004, the first buoy was deployed and produced 20 Kilowatts of carbon-free electricity. The second and third generation buoys have increased efficiency and have become smaller. The Wave Energy Project objectives are: 1) maximize the efficiency of the wave energy conversion process; 2) demonstrate system reliability; and 3) minimize deployment, operation and maintenance requirements. In meeting these key objectives, the Navy will gain the capability to deploy a unique renewable energy system, taking advantage of the Navy's linkage to the sea, and applying renewable energy where traditional systems are not cost effective or technically feasible.

With ARRA funds, we are advancing technology to convert the ocean's thermal gradients to electricity and potable water. We partnered with industry to further develop the design and concept of a 5-10 MW OTEC power plant that we plan to test near Naval Station Pearl Harbor,

HI in the coming years. Using ONR funding, various ocean bathymetry studies are ongoing off the coast of Hawaii to support the OTEC project

We are evaluating the technical and economic feasibility of integrating hydrogen and synthetic liquid hydrocarbon fuel production with ocean thermal energy conversion (OTEC) technology on floating platforms. A hydrogen/synthetic-fuel production facility on a floating OTEC platform could serve as a floating fuel depot in tropical oceans for the US Navy or as a production facility for commercially viable liquid hydrogen and/or synthetic-fuels.

Fuel Cell Development

While fuel cells are not yet cost effective, DoN is gaining experience with the technology and facilitates industry's fuel cell development by providing sites to validate fuel cell performance. In FY2005 the Navy demonstrated 12 proton exchange membrane fuel cells in cogeneration applications at selected DoN sites. The fuel cells offset a total of 30 kW of electric demand and are projected to generate 200,000 kWh and 670 MBTU in thermal recovery. We are currently demonstrating molten carbonate fuel cells at 4 locations. The current test involves two to four 250kw units at each location and is projected to be completed by FY 2011. An added advantage of fuel cell technology is that it only emits water vapor.

Non-Tactical Vehicle Fleet

The current mandated goal for fleet commercial vehicles is a 30% reduction in non-tactical vehicle petroleum use by 2020. SECNAV set the goal that by 2015, DoN will reduce our vehicle fleet petroleum use by greater than 50%. With investments in hybrid, flex fuel, and electric vehicles, we can retire many of our petroleum-intensive vehicles currently in use – a clear

example of how we can protect our Nation while we protect our environment. We have already replaced 30% of our non-tactical fleet vehicles with their alternative fueled counterparts.

At Marine Corp Base Camp Pendleton, California, we are involved in long range pilot demonstration of hydrogen fuel cell infrastructure and vehicles. The project includes installation of a hydrogen fueling system that will be used to test and evaluate fuel cell vehicles. The fuel cell vehicles get the equivalent of 26 miles per gallon and the only exhaust is pure water.

At the Naval Facilities Engineering Service Center (NFESC) in Port Hueneme, California, the Navy is conducting a biodiesel production facility demonstration/validation effort executed under a Cooperative Research and Development Agreement (CRADA). The effort is a collaboration between industry and the Navy. Biodiesel is an alternative fuel, produced from domestic, renewable resources such as spent restaurant vegetable oil. Biodiesel contains no petroleum and can be blended at any level with petroleum diesel to create a biodiesel blend. DoD currently approves the use of B20, which is a blend of 20% biodiesel and 80% petroleum diesel for non-tactical vehicles. NFESC has completed the testing on the 400 gallon batch processing pilot and is in the process of preparing to test a 1-3 million gallon per year full production unit. The economic model of biodiesel production facilities dictates small-distributed production facilities that the Navy would implement via public private ventures. The Navy installation would not pay for any of the capital investment or operational costs and would agree to buy a negotiated amount of biodiesel at a negotiated price for a set number of years. Other applications also under investigation include biodiesel as a tactical vehicle fuel and small containerized production facilities for remote applications.

Compatible Energy Development

Vital to the readiness of our Fleet is unencumbered access to critical water and air space adjacent to our facilities and ranges. An example is the outer continental shelf (OCS) where the vast majority of our training evolutions occur. The Department realizes that energy exploration and off-shore wind development play a crucial role in our nation's security and are not necessarily mutually exclusive endeavors. Therefore, we are engaging with the other services, the Secretary of Defense's office, and the Department of Interior to advance the administration's energy strategy. We are poised to coordinate with commercial entities, where feasible, in their exploration and development adjacent to installations and our operating areas along the OCS that are compatible with military operations. However, we must ensure that obstructions to freedom of maneuver or restrictions to tactical action in critical range space do not measurably degrade the ability of naval forces to achieve the highest value from training and testing.

RESOURCES

DoN makes very effective use of funding authorized by Congress. Each year, the Department is committed to allocating all 100% of ECIP funding to renewable energy projects. Additionally, DoN has obligated over $500 million of American Recovery and Reinvestment Act (ARRA) funds on more than 100 energy projects and $75M on research and development energy initiatives. The ARRA projects will increase solar photovoltaic capacity within DoN to over 24 MW.

Third Party Financing

Energy Savings Performance Contracts (ESPC) are a critical tool for building, operating and maintaining renewable energy systems on DoN installations and have been the primary method for financing capital investments. These contracts take advantage of private sector expertise and financing to meet energy goals with minimal up front government investment. Contractors often maintain the installed technology so that equipment efficiency is maintained and long term savings are realized. The savings generated are dramatic and more than pay for the project's life-cycle cost. Without ESPC, these same funds would instead be spent paying utility bills generated by consumption of inefficient systems that do nothing to reduce dependence on fossil fuels .

Using ESPCs, DoN constructed two of the largest federal photovoltaic projects in the U.S. The two systems are a 1.1 MW photovoltaic power generating plant at the Marine Corps Air Ground Combat Center Twenty-Nine Palms, CA, and a 1 MW photovoltaic parking structure at Naval Base Coronado, North Island, CA. Together, these systems generate energy equivalent to electrical demand of more than 1,200 homes, avoid the equivalent of burning 6,000 barrels of crude oil and reduce an estimated 567 metric tons of greenhouse gases annually.

DoN has constructed almost 6MW of wind farms by taking advantage of the unique capabilities of the ESPC program. At Naval Station Guantanamo Bay, Cuba, a 3.8 MW wind farm, the world's largest wind/diesel hybrid system, generates 7500 megawatt hours of electricity annually (25% of the Station's power requirements). On San Clemente Island, CA, nearly 15% of the island's electrical demand is generated by wind turbine technology. The quiet and smog-free

675-kilowatt wind farm takes advantage of the island's 13 mile-per-hour average winds. Finally, at Marine Corps Logistics Base Barstow, CA, the Marines have installed their first 1.5 MW wind turbine, which provides 15% of the installation's power and avoids the equivalent of burning 2,700 barrels of fuel oil annually.

INTER-AGENCY COOPERATION

The Department of the Navy is committed to expanding inter-agency partnerships in order to develop the United States' renewable energy economy. On January 21, 2010, Secretary Mabus and the Secretary of the U.S. Department of Agriculture (USDA) signed a Memorandum of Understanding (MOU) between the two Agencies. This agreement provides a platform through which DoN and USDA can work together to achieve a significant increase in the use of renewable energy sources. Specifically, we will explore and develop advanced biofuels, which will be a major component in the solution to accomplish our aggressive goals. We will also reach out to other Federal, State, and local organizations and encourage technical assistance and sharing of resources.

Another example of inter-agency partnerships is our recent agreement with the Department of Energy (DOE) to work together on a number of energy initiatives. Both agencies will establish a number of working groups to explore opportunities for joint development and implementation. The Department of Energy is already testing biofuels that have potential for supporting our efforts towards meeting Secretary Mabus' goals.

CRITICAL INFRASTRUCTURE PROTECTION

Energy security, energy efficiency, and environmental stewardship are critical to our mission and combat capabilities. We have historically looked at each of these concepts separately and have often competed one against each other for resources. We now look at them as complementary.

We have begun a major effort to address the risk to our installations from potential disruptions to the commercial electric grid. The Department is participating in interagency discussions on the magnitude of the threat to the grid and how best to mitigate it. We are also looking at how to ensure that we have the energy needed to maintain critical operations in the face of a disruption to the grid. The development of renewable and alternative energy sources on installations will be one element of this effort. When combined with smart grid or micro-grid technologies, investments that reduce demand and produce renewable energy will enable installations to sustain mission-critical activities during grid disruptions

CONCLUSION

I take pride in the Department of Navy's energy program and our achievements. Our energy management program, with large scale solar, wind, and geothermal projects, has a proven track record of saving energy and making the Nation more secure. We know we cannot meet the threats of tomorrow by simply maintaining today's readiness and capabilities. Through the partnerships we are forging with industry and other agencies to rapidly develop renewable energy sources to reduce our petroleum usage, the Department of the Navy's energy program will continue to lead the way and I am confident that the Navy and the Marine Corps will excel at meeting the energy challenges of the 21st century.

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

24 FEBRUARY 2010

NOT FOR PUBLICATION UNTIL RELEASED
BY THE COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

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.

WITNESS RESPONSES TO QUESTIONS ASKED DURING THE HEARING

FEBRUARY 24, 2010

RESPONSE TO QUESTION SUBMITTED BY MR. TAYLOR

Mr. NATSUHARA. On Jan 19, 2010, the Under Secretary of the Navy Mr. Robert O. Work accepted eight solar-powered water purifiers, on behalf of the Navy, from Quercus Trust. All eight purifers were sent to Afghanistan and employed by the Marines operating in the Helmand Province. Feedback from the Marines and Afghanis is very positive. We look forward to employing other similar renewable solutions that simplify the logistics chain and improve our combat effectiveness. [See page 19.]

RESPONSE TO QUESTION SUBMITTED BY MS. SHEA-PORTER

Mr. HANSEN. Theater guidelines contained in U.S. Central Command (CENTCOM) Regulation 200–2 applicable to both Iraq and Afghanistan prohibit the burning of plastics in burn pits. The recent assessment conducted in response to a Department of the Army execution order (EXORD), found that plastic is being separated and recycled in theater when possible but that there is room for improvement, particularly in segregating trash from the dining facilities. The guidelines also require that we continue to improve solid waste disposal methods and move away from open burn pits, to include installing incinerators.

Currently, there are 28 Solid Waste incinerators installed in Iraq and 2 more being installed. In Afghanistan there are 4 incinerators already operational, 17 containerized incinerators (3 Ton) being installed, and 45 smaller (1 Ton) containerized incinerators on the way. In addition, 15 larger (5 Ton) mobile incinerators are awarded and plans for $80M in military construction (MILCON) for 23 incinerators for future installation in Afghanistan.

CENTCOM and the Department of the Army are very open to employing eco-friendly and renewable technologies when doing so is not cost prohibitive and otherwise makes sense in the contingency environment. Utensils made from renewable materials are cost prohibitive as the least expensive available costs 400% more than the plastic utensils currently being used. In addition, the alternative of reusing table utensils is limited by cost associated with the limited potable water supply and other sanitary conditions at sites in theater. [See page 24.]

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

FEBRUARY 24, 2010

QUESTIONS SUBMITTED BY MR. ORTIZ

Mr. ORTIZ. The American Recovery and Reinvestment Act provided significant funding within operation and maintenance, military construction, and research and development accounts for energy projects. Just considering the operation and maintenance funding, the Department of Defense identified 1,473 energy-related projects with an estimated cost of $1.4 billion to be executed with Recovery Act dollars.

- Can you quantify the energy savings or energy security benefits to the Department of Defense from these investments?
- Are these or other similar energy investments correlated with a Department-wide energy security plan?

Dr. ROBYN. DOD currently has 63% of its buildings metered and is working aggressively to fully meter all buildings by 2012. Until this effort is complete, we are very limited in our ability to quantify savings on these individual projects. We use engineering estimates to project energy savings for individual projects. Also the Services collect energy performance data by installation.

The recently released Quadrennial Defense Review makes clear that crafting a strategic approach to energy and climate change is a high priority for the Department. Since 2003, the Department has reduced energy consumption per square foot by 10% at our permanent installations. DOD's strategy for energy security starts with establishing an enterprise-wide energy data management system to assist us with monitoring, measuring, managing and maintaining our installations at optimal performance levels. You can't manage what you can't measure. The DOD strategy for our energy investment is twofold. First we invest in making our infrastructure more energy efficient to reduce demand. We require new construction to meet LEED Silver design and all construction to be 30% better than ASHRAE standards. Secondly we are investing in renewable energy sources to reduce our dependence on fossil fuels and make us more secure from possible interruption of the U.S electric grid.

QUESTIONS SUBMITTED BY MR. MARSHALL

Mr. MARSHALL. Please detail the extent to which the Department, in developing a strategic approach to energy efficiency and independence on military installations both here and abroad, took into account the threat of electromagnetic pulse (EMP) attacks, major weather calamities, and other major threats.

Additionally, the FY10 National Defense Authorization Act directed the Department of Defense to develop specifications for "installation-wide, unified energy monitoring and utility control systems." Although the bill envisioned an installation-by-installation approach, in your written testimony you stated that one of the Department's key initiatives is to implement an "enterprise-wide" system.

1. Please provide an update on the Department's efforts to comply with Sec. 2481 of the FY10 NDAA.
2. Are you envisioning a different approach than installation-by-installation?
3. Please explain how an "enterprise-wide" approach will integrate with "installation-wide" systems.
4. Please detail any delays or additional costs that will be incurred by focusing on an "enterprise-wide" approach.

SEC. 2841. ADOPTION OF UNIFIED ENERGY MONITORING AND UTILITY CONTROL SYSTEM SPECIFICATION FOR MILITARY CONSTRUCTION AND MILITARY FAMILY HOUSING ACTIVITIES.

(a) Adoption Required.—

(1) In general.—Subchapter III of chapter 169 of title 10, United States Code, is amended by inserting after section 2866 the following new section:

"Sec. 2867. Energy monitoring and utility control system specification for military construction and military family housing activities

"(a) Adoption of Department-wide, Open Protocol, Energy Monitoring and Utility Control System Specification.—(1) The Secretary of Defense shall adopt an open protocol energy monitoring and utility control system specification for use through-

out the Department of Defense in connection with a military construction project, military family housing activity, or other activity under this chapter for the purpose of monitoring and controlling, with respect to the project or activity, the items specified in paragraph (2) with the goal of establishing installation-wide energy monitoring and utility control systems.

"(2) The energy monitoring and utility control system specification required by paragraph (1) shall cover the following:

"(A) Utilities and energy usage, including electricity, gas, steam, and water usage.

"(B) Indoor environments, including temperature and humidity levels.

"(C) Heating, ventilation, and cooling components.

"(D) Central plant equipment.

"(E) Renewable energy generation systems.

"(F) Lighting systems.

"(G) Power distribution networks.

Dr. ROBYN. Every installation has an installation disaster response and recovery plan that identifies critical missions and the energy and resources to recover missions interrupted by natural disaster, physical attack and a variety of other threats. Threats and responses due to electromagnetic pulses for some critical assets are known. Annual exercises are required at each installation to determine the proficiency of the installation's people and infrastructure to respond to an attack.

DOD recognizes that installation energy data is not collected, analyzed and reported in the same manner across the Department. We are working to develop an energy monitoring and utility control system specification as required by the 2010 National Defense Authorization Act. Currently we are reviewing concerns from the individual Military Departments that the specification be consistent with existing systems currently in use. Following this review we will produce an open-protocol specification to be approved by a Tri-Service Unified Facility Criteria (UFC) Board. Our efforts to develop an enterprise-wide energy data management system will not slow implementation of this specification.

QUESTIONS SUBMITTED BY MS. BORDALLO

Ms. BORDALLO. The recently released Quadrennial Defense Review stated that climate change and energy will play significant roles in the future security environment, that climate change, energy security, and economic stability are inextricably linked, and that the National Intelligence Council has judged that more than 30 military installations, including those on Guam, are already facing elevated levels of risk from rising sea levels. It also notes that one of the reasons the Department is increasing its use of renewable energy supplies is to reduce greenhouse gas emissions in support of U.S. climate change initiatives.

How important is the shift by DOD to renewable energy, including energy produced on DOD lands, to your overall strategy to address climate change?

I am concerned about whether DOD is really taking the serious steps, and programming the resources, necessary to successfully adapt to the impacts of climate change in terms of both U.S. military installations like those on Guam and in terms of working with U.S. and international partners to help fragile states, especially coastal states, adapt to those changes.

In addition to your efforts regarding renewable energy, what are the other steps DOD is taking both domestically and internationally with regard to climate change adaptation, and what is your sense of the level of resource commitment that will take over the FYDP?

Dr. ROBYN. Although other U.S. government agencies have the lead on responding to climate change, DOD has an opportunity to exhibit leadership on the issue. To this end, under Executive Order 13514, DOD recently established an aggressive 34% reduction target from facilities greenhouse gas emissions from 2008 to 2020. Meeting this target will require a concerted effort to both decrease energy demand and increase the supply of renewable energy. DOD has been investing in renewable energy on its facilities for decades and to both meet the EO target as well as comply with statute, DOD is increasing its development of renewable energy resources.

As to climate change adaptation, DOD is making significant investments in research and development to quantify the potential impacts to DOD installations and their missions and to identify adaptation options and strategies. These activities, as indicated in the Quadrenial Defense Review, are led by the Department's Strategic Environmental Research and Development Program. In addition, the Department's Defense Environmental International Cooperation Program will allow Combatant Commanders to cooperate on adaptation strategies with foreign militaries.

Ms. BORDALLO. For FY2010, the Department received more funding for the Energy Conservation Investment Program (ECIP) than was originally requested in the Administration's budget. Could you please explain how DOD plans to use the additional funding?

Dr. ROBYN. [The information referred to was not available at the time of printing.]

QUESTIONS SUBMITTED BY MS. GIFFORDS

Ms. GIFFORDS. When we discuss the prospects of net-zero facilities, does the department intend to continue investing in credits or will it expand its efforts to organically produce renewable energy solutions?

Dr. ROBYN. Currently, Renewable Energy Credits or Certificates (RECs) help DOD achieve federal renewable energy mandates under EPAct 2005, EO 13423, EISA 2007 and 10 USC 2911 (e) for the percentage of renewable energy DOD produces or procures. DOD uses DOE guidance for how the Department accounts for the RECs in the Annual Energy Management Report to Congress. However, RECs do not create real, measurable energy security at DOD installations since a REC is an environmental attribute that can be purchased in a REC tradable market as an "unbundled" attribute of the actual renewable energy produced at one location and sold to another purchaser at another location.

The DOD plan is to reduce energy demand through conservation and efficiency and increase the use and consumption of alternative energy and renewable energy from on-site or near-site generation sources in order to retain our ability to operate during prolonged grid outages. Under this plan, we will be reducing our purchases of RECs.

Ms. GIFFORDS. On-site energy generation has proven effective in offsetting energy use. Previous systems, for example fuel cells like those installed at Fort Huachuca in my District have a track record for creating serious cost savings that in previous years has averaged more than $65,000 annually.

What kind of savings could we assume if we expanded on-site generation programs to all new facilities on installations?

How could additional on-site generation be leveraged alongside LEED standards to achieve greater overall savings?

Dr. ROBYN. Given current technology, demand reduction provides a much quicker pay-back than on-site generation. We have therefore focused our efforts on designing and constructing to a goal of 100% LEED Silver. Nonetheless, we are making a significant investment in on-site renewable projects. We have also created a test bed initiative, leveraging our unique building portfolio to more quickly develop renewable technologies. As an initial customer we can then put these technologies to use on our bases.

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