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SENATE ENVIRONMENT AND PUBLIC WORKS
COMMITTEE

STATEMENT OF

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Chairman Sanders, Chairman Whitehouse, Senator Boozman, Senator Johanns and members of the Subcommittees, I am pleased to appear before you today to provide an overview of the Department of Navy's investment in its energy programs.

It is critically important that we reform how the Navy and Marine Corps use, produce, and procure energy, especially in this fiscally constrained environment. We must use energy more efficiently and we must lead in the development of alternative energy; otherwise, we allow our military readiness to remain at risk.

In theater, fuel is a tactical and operational vulnerability. Guarding fuel convoys puts our Sailors' and Marines' lives at risk and takes them away from what we sent them there to do: to fight and prevail, to engage and rebuild. For every 50 fuel convoys in theater, there is one Marine casualty. This is simply too high a price to pay.

President Obama's "All of the above" strategy toward sources of energy recognizes a fundamental math problem: while the United States consumes 22 percent of the world's oil, we possess just two percent of known oil reserves.

Oil prices are set on a global market often driven by speculation and rumor, leaving the Department exposed to price shocks in the global market.

Every time the cost of a barrel of oil goes up a dollar, it costs the Department an additional $30 million in fuel costs. In FY12, in large part due to political unrest in oil producing regions, the price per barrel of oil has risen $38 over what was budgeted, raising Navy's fuel bill by over $1 billion. These price spikes must be paid for out of operations, meaning our Sailors and Marines are forced to steam less, fly less, and train less.

Strategically, we are at risk because much of the fuel we use comes from volatile regions of the world. We would never buy aircraft or ships from many of the places that supply us oil because some are unstable and some do not necessarily have our best interests at heart.

The Department of the Navy is committed to implementing an energy program that enhances our national security and our military readiness by increasing our energy efficiency and reducing our dependence on imported fossil fuels. Energy security is national security. Our energy program is comprehensive – it involves both Services and contains initiatives to reduce energy demand and provide alternative forms of energy supplies on shore, afloat, in the air, and on the ground.

Navy's leadership on energy innovation is nothing new. It was the Navy that shifted from sail to steam in the middle of the 19th Century, steam to oil in the early 20th Century, and pioneered nuclear power in the middle of the 20th Century. At each of those transitions, there were those who questioned the need, challenged the cost or simply opposed change of any kind.

Department of Navy Goals and Initiatives

Congress and previous administrations have recognized the imperative of energy security as demonstrated in the Energy Independence and Security Act of 2007, Energy Policy Act of 2005, and the National Defense Authorization Act of 2007 and 2010, and several executive orders. This administration has built on those actions, but the program proposed for FY13 and beyond will exceed the goals set in those previous laws because we must.

The Secretary of the Navy set five aggressive department-wide goals to reduce the Department's overall consumption of energy, decrease its reliance on petroleum, and increase its use of alternative energy.

The goals are:

- By 2020, at least 50% of total DON energy will come from alternative energy resources,
- By 2020, DON will produce at least 50% of shore based energy requirements from alternative resources and 50% of Department installations will be net-zero,
- DON will demonstrate a Green Strike Group in local operations by 2012 and sail the Great Green Fleet by 2016,
- By 2015, DON will reduce petroleum use in non-tactical vehicles by 50%,

- Evaluation of energy factors will be used when awarding contracts for systems and buildings.

Meeting these goals requires that the Navy and Marine Corps value energy as a critical resource across maritime, aviation, expeditionary, and shore missions and myriad investments and activities. They will all foster behaviors that will reduce the Navy and Marine Corps' overall energy requirements and technologies that can provide adequate substitutes for fossil-based energy.

To meet the goal of 50% of total DON energy from alternative sources, the DON has partnered with the DOE and USDA to collectively pool $510M to jump start commercial development of the advanced alternative fuels industry. The DON intends to use the Defense Production Act (DPA) Title III for its contribution. This effort will help to obtain the 8 million barrels of biofuel needed by 2020 to sail the "Great Green Fleet." The alternative fuel that the DON will purchase must be available at prices competitive with the conventional petroleum fuels being replaced; it must not have negative consequences for the food supplies; and it must be a "drop-in", that is, not requiring infrastructure or operational changes.

To meet the goal of 50% of shore based energy requirements from alternative resources and 50% of Department installations will be net-zero, the DON is working closely with private industry, academic institutions and federal agencies. By the end of this year, a strategy to facilitate the production and/or consumption of large-scale renewable power projects on or near Naval installations will be completed and forwarded to the Secretary for approval. These projects will be developed without added cost to taxpayers by using existing third-party financing mechanisms such as power purchase agreements, joint ventures and enhanced use leases. The energy from the projects will cost less or at least no more than that from conventional energy sources over their life.

Funding

The Department has budgeted $1.0 billion in FY13 and approximately $4.0 billion across the FDYP for operational and shore energy initiatives. The funding

sources are almost entirely Navy and Marine Corps O&M funds and Research, Development, Test, and Evaluation (RDT&E) dollars.

Achievements

The Department is on track to meet its goals.

Since flying the F/A18, dubbed 'The Green Hornet', at MACH 1.7 in 2010 as part of the test and certification process using a 50-50 blend of Camelina based JP-5, the Department has successfully conducted test and certification on the MH-60 Seahawk helicopter, AV-8B Harrier, E-A6B Prowler, MQ-8B Fire Scout, T-45C Goshawk, MV-22 Osprey. We also ran a Riverine Command Boat, Landing Craft Air Cushion (LCAC), Landing Craft Utility (LCU), 7m Rigid Hull Inflatable Boat (RHIB), the ex-USS Paul F Foster, and an Allison 501K turbine generator. The DON partnered with Maersk to run a large merchant ship on renewable biofuel. These tests represent real milestones that are necessary to support the use of alternative fuels to meet the goal of sailing the Great Green Fleet in 2016.

Throughout 2011 we demonstrated progress through an assortment of programs, partnerships, and initiatives. Last summer, the Blue Angels flew all six planes on biofuels during their 2-day air-show at NAS Patuxent River. The USS *MAKIN ISLAND*, which is currently deployed to the Pacific region, can use its electric drive 75% of the time it is operating, needing its gas turbines only when it requires top speeds. On its maiden voyage she saved $2M over predecessor steam ships and is estimated to provide a cost avoidance of nearly $250M over her service life. The Navy is continuing to move forward with installation of a similar system on new construction DDGs and to look at the feasibility of retrofitting the entire non-nuclear fleet with these systems in the course of routine shipyard availabilities.

Additional energy initiatives, such as propeller and hull coatings, were undertaken to make the existing inventory of ships more energy efficient. Stern flaps will reduce energy consumption, as will some combustor modifications and systems to monitor ship-wide energy use. Energy conservation programs were put in place for both ships and aircraft to educate and incentivize the Fleets to reduce energy consumption and identify inefficient activities. The future Navy will use advanced materials on propellers, energy storage and power

management systems, and advanced propulsion technology to make warships more efficient while allowing them to meet their combat capability.

Last year, the Marines tested equipment that could be deployed on battlefields at their Experimental Forward Operating Bases (ExFOB) at Twenty-Nine Palms. The Third Battalion, Fifth Marines (the 3/5), deployed in Afghanistan, managed to cut fuel use and logistical support requirements by 25 percent at main operating bases and up to 90 percent at combat outposts by relying on alternative energy sources such as solar power generators and hybrid power. One three-week patrol reduced weight by 700 lbs and saved $40,000 due to not requiring a battery resupply.

The PV-powered battery recharging technology has allowed Marine Patrols, which would normally require a battery re-supply every 2-3 days, to go three weeks without a battery re-supply, enhancing the expeditionary nature of their missions and reducing the number of dangerous re-supply missions needed.

Recently, the next phase of ExFOB deployed with the Marines from 2nd Battalion, 4th Marines. They brought renewable and energy efficient equipment that was identified during the ExFOB conducted during August 2010. The equipment targets a major battlefield power user: battalion-level command and control systems. Its capabilities include hybrid power systems and efficient air conditioning, which demonstrated an 83% savings in fuel compared to the conventional capabilities.

The Marine Corps continues to aggressively pursue technologies that will increase combat effectiveness and reduce the need for fuel, water, and battery logistics. The Marine Corps is committed to conducting two ExFOBs per year (one in 29 Palms and one in Camp Lejeune) for the foreseeable future. The upcoming ExFOB will concentrate on wearable electric power systems and lightweight man-portable water purification systems.

Through investments in expeditionary energy the Marine Corps will stay longer, go further, at reduced risk. In 2017 the Marines will be able to operate one month longer on the same amount of fuel they use today, and they will need

208 fewer fuel trucks, thereby saving seven million pounds of fuel per year. This translates into a lighter, more agile and capable Marine Corps

In addition to these tactical applications, the DON is pursuing energy efficiency and renewable energy projects at our facilities ashore. As noted above, we are on track to secure half of our shore energy from alternative sources. Effective programs to reduce overall consumption will be necessary to manage the denominator. But, in addition, we'll need about a gigawatt of renewable power at the bases.

Currently our bases support about 300 MW of renewable energy, 270 MW of which is from a geothermal power plant at China Lake. We are actively exploring for additional geothermal resources.

We have awarded three solar projects under our Solar Multiple Award Contracts (MAC) in the Southwest (SW) and are finalizing a similar solar MAC for Hawaii. The three solar power purchase agreements (PPAs) at China Lake, 29 Palms, and Barstow will save the Department $20 million in total over the 20 year life of those contracts. And, in all three of these cases, we'll be paying less per kW-hour than conventional power. These projects have the added benefit of providing a measure of security from electric grid outages. The Hawaii solar MAC will install 28 MW of solar PV on DON installations, including covering the runway on Ford Island with PV, recreating the look of the runway as seen from the air.

At Marine Corps bases in Albany, GA and Miramar, CA we have partnered with the local communities to harness landfill gas to power generators. This important technology is providing 25% of the electric load in Albany and will provide up to 50% of the electric load at Miramar when done. This is one of the most effective forms of waste-to-energy and we are exploring other applicable technologies.

Where the development of wind resources would be compatible with an installation's missions, we would favor that technology. We are watching with great interest the potential exploitation of the enormous wind resource off the Atlantic coastline. As long as the wind turbines can be placed at mission-compatible sites and the electricity can be delivered to our facilities at a price competitive with the local utility source, we could be a customer.

In order to support a wide range of facility energy efficiency measures, we are aggressively conducting facility energy audits and completing installation of "smart" electric metering. By the end of this year, the over 27,000 meters installed or under contract to be installed in our existing facilities will begin providing the capability to monitor and control the amount of energy we are consuming. This will allow our energy managers to provide real-time feedback to the users and the installations' commands.

The Department continues to promote behavior and culture change through education and training, to ensure that energy management is understood to be a priority in tactical, expeditionary, and shore missions. Awareness campaigns are used to encourage personal actions that show commitment to energy program goals. The Naval Postgraduate School has added an energy program to its curriculum targeting both the Navy's and Marine Corps' most promising young Sailors and Marines as well as an executive series targeting senior civilians and flag officers. We have collaborated with the National Defense University to pilot two culture change demonstrations -- at MCB Camp Lejeune and NAVSTA Mayport -- to focus on raising energy awareness in civilian and military personnel.

The Department will continue to cultivate strategic partnerships to leverage our energy opportunities. By partnering with federal agencies, such as the Department of Energy, the Department of Interior, the Department of Agriculture, and the Small Business Administration, we are broadening the scope of our programs. In addition, we are working with academic institutions and private industry to bring innovative ideas and approaches to the forefront.

Conclusion

Our Nation's Sea Services continue to operate in an increasingly dispersed environment to support the maritime strategy and ensure the freedom of the seas. We must continue to transform the way we procure and consume energy.

Thank you for the opportunity to testify before you today. I look forward to working with you to sustain the war fighting readiness and quality of life for the most formidable expeditionary fighting force in the world.