Secretary of Defense Environmental Award Category
Environmental Quality - Team

Introduction

The Missile Defense Agency (MDA) is a research, development, and acquisition agency within the Department of Defense. The agency does not own facilities or real property, and occupies administrative and test support spaces as a tenant at federal facilities, military installations, and commercially owned buildings. Our workforce is approximately 7,500 personnel (government, military, and contractors) in multiple locations at host Service installations and test ranges around the world.

Our mission is to develop, test, and field an integrated, layered, ballistic missile defense system to defend the United States, its deployed forces, allies, and friends against all ranges of enemy ballistic missiles in all phases of flight.

The agency is committed to maximizing the mission assurance and cost effectiveness of our activities through continuous process improvement. This philosophy is thoroughly embraced within our Environmental Management System that serves as the framework for our Environmental Management Program.

Background

Mr. Eric Sorrells leads MDA's Environmental Management Division and provides environmental compliance and stewardship support to the agency using processes that are integrated into the agency's planning and decision-making activities.

Mr. Sorrells wears many hats as the "Management Representative" responsible for executing the day-to-day environmental management program activities and managing our environmental integrated project team that includes representatives from organizations across the agency. MDA relies heavily on the team to identify environmental aspects, determine significance, set objectives and targets, implement action plans, and help minimize MDA's environmental footprint.

Following the processes documented in our environmental management system, we identified six significant environmental aspects, one of which is the agency's use of energy. As part of our action plan to control and reduce the potential impacts from MDA activities, our team instituted the MDA Sustainable Operations sub-working group. They developed a sustainable operations-specific action plan to focus on measures we could implement – as a tenant organization – to control and reduce potential environmental impacts of energy use in our facilities. This action plan lays out the activities, responsible parties, and timelines for developing our program, including policy, guidance, education, controls, auditing, and feedback to facilitate continuous improvement.

To implement the building controls and equipment upgrade projects, our directorate works closely with MDA's Director of Facilities and Services led by Mr. Paul Schaefer and his facility managers, to ensure projects are feasible and can be conducted with minimal impact to the building occupants. We note that through this teamwork and educational process, the facility managers identify and implement additional energy

conservation projects that are in the unique position to identify (e.g., HVAC system optimization).

Together, we provide the environmental and facilities sustainment expertise required to identify and successfully implement energy conservation projects across the agency, and report metrics to MDA's environmental executive, the Department of Defense (DoD), and other agencies.

The MDA staff responsible for the development and implementation of MDA's energy conservation program and their roles are in Table 1.

Table 1 – MDA's Energy Conservation Team Members

Team Member Name	Office	Primary Role
Eric Sorrells	FDOE	Team Lead/EMS Management Representative
Bettie McCaulley	FDOE	Chair, EIPT Sustainability Operations WG, EMS
David Fuller	FDOE	EIPT Sustainability Operations WG
Buff Crosby	FDOE	EIPT Sustainability Operations WG
Barbara Young	FDOE	EIPT Sustainability Operations WG
Lana Partridge	FDOE	EMS, EIPT Sustainability Operations WG
Catherine Spencer	FDOE	EIPT Sustainability Operations WG
Howard Finkel	FDOE	EMS, Vending Machine Disconnect, Set Backs
George Wheeler	FDOE	EIPT Sustainability Operations WG
Bill Swofford	FDOE	EIPT Sustainability Operations WG
Tina Lemmond	FDOE	EIPT Sustainability Operations WG
Joe Venable	FDOE	EIPT Sustainability Operations WG
Paul Schaefer	FDF	Facilities and Services Director
David Nieman	FDF	Facilities and Services Project Management
Howard Lockwood	FDF	Team Lead/FDF HSV Regional Manager/EPOC
Tom Perkins	FDF	Lighting, Thermostats, and EV Charging System
Donna Hirabayashi	FDF	Team Lead/FDF NCR Regional Manager/EPOC
Paul Bowie	FDF	HQ Temperature Set Back Study
Lorhland Gandy	FDF	LED Lighting at HQ Parking Lot and Building
Ron Moser	FDF	HQ Temperature Set Back Study
Chris Timberlake	FDF	HQ Temperature Set Back Study
Jim Behan	FDF	HQ Parking Lot Replacement
Jeffrey Alford	FDE	LRDR Cooling/Heating Project
Ricky Combs	FDE	LRDR Cooling/Heating Project
Michael Wasner	FDE	LRDR Cooling/Heating Project
Jeffrey Goolesby	FDF	Aegis Ashore Deckhouse Temperature Set Backs
Spencer Altom	FDF	Aegis Ashore Deckhouse Temperature Set Backs
Stuart Duff	FDE	HQ Temperature Set Back Study
Ryan Wellman	FDF	Vending Light Disconnect Project
Prudence Uhrich	FDF	Vending Light Disconnect Project
Jerry Slusher	FDE	LRDR Cooling/Heating Project
Joe Darr	FDF	Dahlgren Solar Water Heating Optimization
Chase Dorsett	FDF	HQ Lights / EV Charging / Temp. Set Back

Team Member Name	Office	Primary Role
Jim Gott	FDF	HQ LED Lights / EV Charging Station Research
Ricky Stanford	FDF	HQ LED Light Research
Gary Zahorchak	FDF	HQ Temperature Set Back and LED Light Study
Craig Robinson	DPLS	EV Charging System (HSV)
Alisha Bell	DPLS	EV Charging System (HSV)
Johnnie Mosely	FDF	EV Charging System (HSV)

Summary of Accomplishments

Through implementation of the environmental management system, the agency energy conservation team has identified and implemented numerous projects and educational campaigns to control and reduce potential environmental impacts of energy use in our facilities. Examples of notable accomplishments, beyond participating in our host installations' energy conservation programs, include:

- Evaluating and optimizing HVAC system controls and air handlers at Fort Belvoir, Virginia, Building 245, which significantly reduced energy intensity by 20% and energy costs by 9.5% between FY16 and FY17. (FY16-17) See Figure 1.

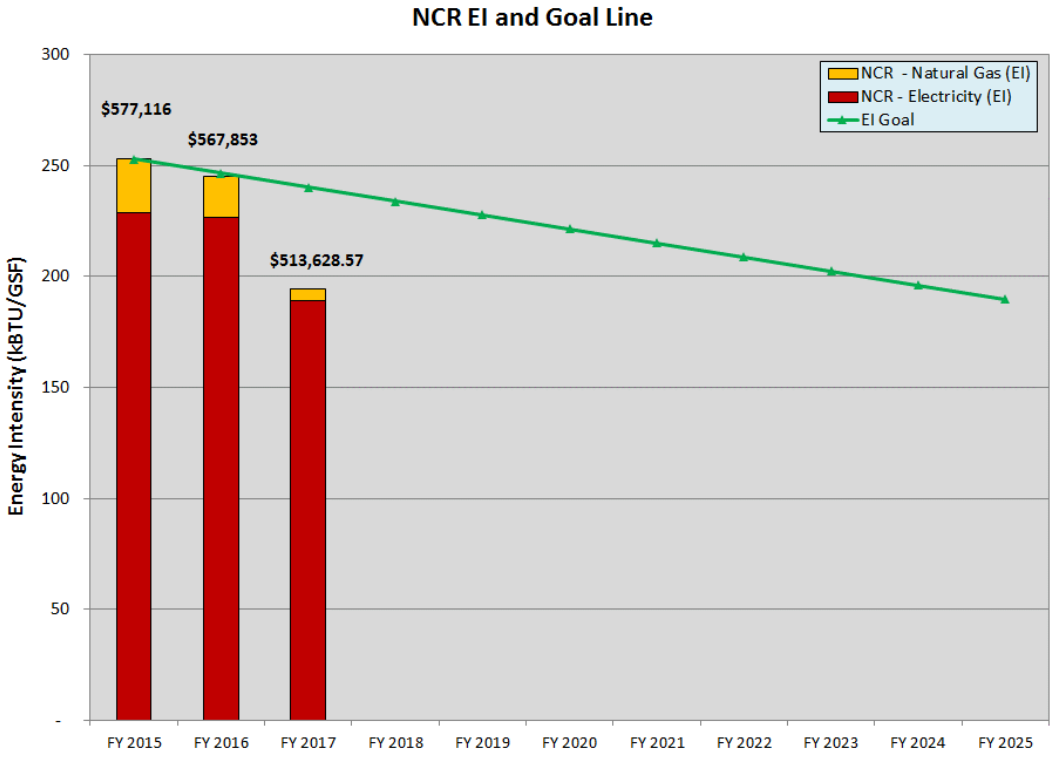

Figure 1 - Building 245 Energy Intensity between FY15-FY17

- Designing and constructing the Long Range Discrimination Radar at Clear Air Force Station, AK to take advantage of the abundant supply of 40 degree groundwater to cool the radar and all supporting facilities. In addition, when needed, waste heat generated from the radar arrays will be used to heat the supporting facilities. The

supply wells are equipped with variable frequency pumps to optimize the amount of water withdrawn for cooling, which in turn conserves energy and ground water. The system is expected to reduce energy costs by $5 million over the life of the radar. (FY16-17)

- Ensuring all MDA-funded buildings meet UFC 1-200-02, "High Performance and Sustainable Building Requirements" criteria and are designed to achieve the Leadership in Energy and Environmental Design (LEED) Silver level or other equivalent sustainability building certification system with at least 40 percent of the points coming from energy and water conservation measures (including advanced metering devices). (FY16-17)
- Performing a cost analysis for replacing existing lighting in the MDA Headquarters building with longer-lasting, lower energy consumption light emitting diode (LED) bulbs. The analysis showed the cost of replacing existing lighting would be recovered in 2.55 years due to lower maintenance and energy consumption costs. The replacement is projected to reduce parking lot lighting energy consumption by 48%. (FY16)
- Operating a solar-heated water system at Building 1705 at Dahlgren, Virginia initially designed as a pre-heat system, but which is working beyond expectations and eliminated the need to operate the electric hot water heater. (FY16-17). See Figure 2.

Figure 2 - Solar Water Preheat Panels at Dahlgren

- Replacing 265 parking lot light fixtures at Huntsville's Von Braun-III facility from high-pressure sodium bulbs to LED bulbs, resulting in a 50% parking lot lighting energy consumption reduction and projected annual savings of $73,000. (FY16)
- Installing a vehicle charging station at Huntsville's Building 3302 and receiving our first hybrid minivan October 2017. Assuming hybrid vehicle testing is successful, MDA has a multi-year schedule for leasing 40 additional minivans from GSA. MDA's Executive Motor Pool is targeted for electric vehicles, especially in the National Capitol Region. MDA's Hybrid Vehicle Replacement Plan will reduce MDA's petroleum consumption and Greenhouse Gas (GHG) emissions. See Figure 3.

Figure 3 – Electric Vehicle Charging Station

- Replacing existing, old technology thermostats with "smart" thermostats in Huntsville's Von Braun-II facility, allowing trending and setbacks, potentially reducing energy consumption by 30%. (FY16)
- Replacing 20 high pressure sodium (HPS) bulb lights with LED lights at the Fort Belvoir Headquarters Building 245 parking lot at a total cost of $7,143, which is projected to save $15,698 over a 20-year period. (FY16) See Figure 4.
- Conducting a business case analysis for converting existing bulbs with LED bulbs in the staircases at Von Braun-II and Von Braun-III, showing the project would result in a 63% staircase lighting energy use reduction, saving $1,040,583 over ten years with a payback of 1.1 years. (FY16/17)
- Disconnecting product display lights in vending machines throughout the Von Braun Complex and MDA's Headquarters Building at Fort Belvoir to obtain a 35% cost savings projected to be >$50,000 over the next five years. (FY16)
- Commissioning an energy study to determine the feasibility and potential benefits of implementing temperature setbacks at MDA's Building 245 at Fort Belvoir, projected energy savings of $7,500/year. Programming changes are estimated to cost $20,880, with a payback of <3 years. (FY17)
- Issuing MDA "Facility Management" Instruction 6015.01-INS (April 18, 2017) requiring the implementation of temperature setbacks between 68°Fahrenheit (heating) and 78°Fahrenheit (cooling), winter and summer, and prohibiting the use of personal heaters, fans, and high wattage appliances in MDA facilities. (FY17)
- Purchasing 3,635 Electronic Product Environmental Assessment Tool (EPEAT) registering electronic devices in 2016, projected to save 1 million kWh of electricity (or $110,190) and reduce greenhouse gas emissions by 185 metric tons over their useful life. (FY16). Received EPEAT Award. See Figure 5.
- Purchasing 14,879 EPEAT registered electronic devices in 2017, projected to save 4.8 million kWh of electricity (or $528,912) and reduce greenhouse gas emissions by 888 metric tons over their useful life. (FY17). Received EPEAT Award.

Figure 4 - LED Parking Lot Light at MDA HQ

Figure 5 - 2017 EPEAT Award

MDA's energy conservation projects have resulted in an overall reduction in the agency's energy use as measured by energy intensity. By the end of FY17, MDA lowered its energy intensity by 12,834 kBTU/GSF when compared to FY15,

a reduction of 5.3%. MDA is on track for meeting DoD's goal to reduce energy intensity by 25% by FY2025 (See Figure 6).

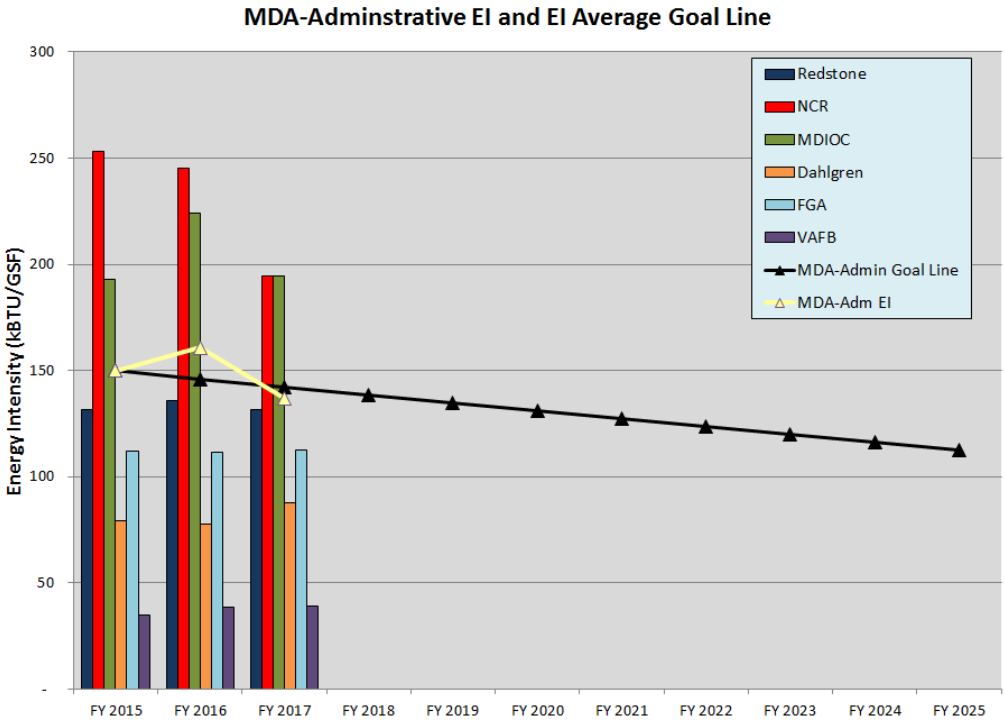

Figure 6 - MDA Energy Intensity by Major Administrative Facility (FY15-FY17)

Our energy conservation projects and educational techniques are directly applicable and transferrable to other DoD Components that do not own facilities or real property, and occupy administrative and mission support spaces as a tenant at federal facilities, military installations, and commercially owned buildings.

We successfully integrated energy conservation into the development of MDA weapon systems, as demonstrated by the LRDR project.

We have worked diligently to educate our workforce on our environmental management systems, significant environmental aspects, and how all can participate in reducing energy use throughout our daily activities. We publish numerous articles and banners on our internal employee Web site and on situational awareness monitors located in common areas throughout our facilities. See Figure 7.

Figure 7 - SEA Awareness Presentation for Situational Awareness Monitors

- All MDA employees (government, military, and contractors) are required to complete MDA's General Environmental Awareness Training annually. The training course has a module describing MDA's environmental management systems and opportunities for reducing energy consumption.
- MDA implemented an Energy Conservation Campaign that identifies energy-saving activities for each MDA location. MDA's Energy Conservation Campaign achieves resource reductions by promoting the environmental and socioeconomic value and benefits of energy conservation. The Campaign engages employees on a "personal responsibility" level to encourage behavioral changes to achieve energy, water, fuel, and greenhouse gas reductions. (FY 16-17). See Figure 8.

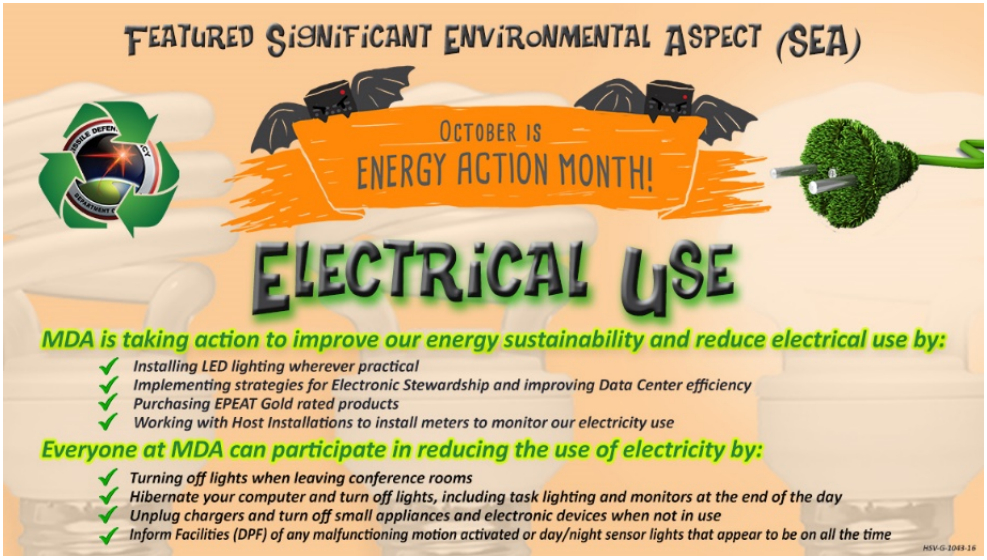

Figure 8 - SEA Presentation on Energy Use

In summary, the broad scope of these accomplishments required the sustained and focused effort of MDA's energy conservation team to successfully implement our energy conservation program. The majority of the accomplishments either occurred at no real cost or paid for themselves, set precedents for the agency that will help conserve resources, save money, comply with environmental laws and regulations, and reduce the environmental footprint of our mission activities without compromising the quality of mission support activities. These accomplishments are transferrable to other DoD Components that also do not own real property. MDA will provide electronic copies of our documents and training materials for use by others upon request. The agency accomplished these efforts through a careful strategy of communication, collaboration, and dedication that exemplifies the best behaviors critical to a successful environmental management program. The team richly deserves recognition for their unparalleled dedication to duty, perseverance, attention to detail, and the wealth of knowledge they bring to MDA's environmental management program.