Reducing Dependence on Energy

Adopting individual energy efficient behaviors will make the Corps more lethal and agile

by the MCICOM Staff

Providing energy supplies to the battlefield comes with considerable risk and a high price. From 2003 to 2007 in Iraq and Afghanistan, more than 3,000 American servicemembers and contractors were killed during the operation of supply convoys, and some 80 percent of supply trucks were carrying fuel. The wars in Iraq and Afghanistan introduced considerable challenges to the Marine Corps' tenets of maneuver warfare: travel light, travel fast, and bring only what you need to the fight. The nature of the fight in both theaters made it extraordinarily difficult to sustain our disparate forces over long distances, and energy played a key role in this difficulty. The production, distribution, and use of energy on the battlefield are crucial to every aspect of the mission, and efficient use of energy resources is necessary to achieving our strategic advantage.

A Marine adjusts the temperature on his office thermostat. Behaviors like this, where applicable, can have sizeable impacts on an installation's energy use intensity. *(Photo courtesy of the Energy Ethos Communications Team.)*

Reducing Marine Corps dependence on energy starts with effective management of energy for our operations at home. This is especially true in times of emergencies when the energy supply may be compromised. Marine Corps Installations Command (MCICOM) Facility Operations and Energy (GF-1) manages energy use across Marine Corps bases, air stations, logistics bases, and recruit depots, and is responsible for ensuring resiliency and energy security. One of our main goals to achieve these ends is to drive significant reductions in installation energy and water consumption through behavior and technology to ensure that Marines have what they need when they need it to accomplish the mission.

Powering our force requires energy from fossil fuels, a finite commodity that is becoming scarcer as global population and energy demand increase. Scarcity feeds geopolitical instability while driving up the fuel and utility costs we see in our homes, at the gas pump, and in our base utility budgets; thus, scarcity creates two significant risks—to our supply and to our finances. Supply risk puts Marine Corps bases in direct competition with their off-base neighbors who rely on the same common civilian energy grid. The latter—financial risk—is heightened during an era of decreasing defense budgets. Installation energy cost the Marine Corps $262 million in fiscal year 2013 (FY13), and with the price of energy rising and defense budgets shrinking, energy consumption habits became a perfect target for saving dollars that, in turn, can be redirected toward mission essential efforts such as training. As we begin to better understand these risks, it is imperative that Marines take an

active role through individual and unit involvement to mitigate these risks and shape the Corps' future.

Reducing Use, Reducing Risk

From that first haircut at the recruit depot or Officer Candidates School to training in garrison and deployment, energy is a constant requirement in our lives. But few of us understand its inherent vulnerability, which in turn reveals a potential vulnerability in executing a mission. For most of us, the energy supply is available when we need it ... and taken for granted.

The vulnerability of our electric grid is an increasing reality for most of our Nation, and our bases and stations are no exception. Power outages due to extreme weather, manmade accidents, and cyberattacks that disrupt production or distribution require an active risk mitigation plan.

Marine Corps leaders are focused on three elements to secure energy sources: 1) growing renewable energy supplies to power parts of our base grid; 2) investing in more energy efficient technologies to drive down demand; and 3) promoting "energy ethos" which is a personal drive to reduce individual energy requirements. Bottom line: Marines must use less, conserve more, and become increasingly aware of their individual effect on the success of Marine Corps missions. Using less is easy, cost-effective, and reduces supply and financial risk that could affect readiness levels. Assistant Secretary of the Navy for Energy, Installations, and Environment Dennis McGinn describes the U.S. Department of the Navy energy mindset as "squeez[ing] as much mission capability as we possibly can out of every kWh [kilowatt hour] of electricity."

When Gen Joseph F. Dunford began his term as Commandant, he reinforced this thought by making energy a priority, as reflected in his *2015 Planning Guidance* (Washington, DC: HQMC, October 2014):

> Installation commanders will ensure the safety and security of Marines and their families at Marine installations throughout the world, develop Base Master Plans to support new weapons platforms and future force structure, improve aging infrastructure and conserve energy resources.

Benefits of Engaging on Energy

The smart use of energy is as important on installations as it is in a combat environment. Reducing consumption on our installations will benefit the Corps in three major ways:

Increased mission effectiveness. Training our Marines to reduce energy use in daily activities on installations makes Marines more flexible and energy aware when on deployed bases and when confronted with restrictions on electricity and water use. Further, decreasing energy dependence on the battlefield reduces the number of personnel dedicated to fuel supply. This allows more Marines to be available for mission essential operations.

More resilient installations. With the ever-present prevalence of severe storms and efforts by our enemies to deny us the fuel and electricity we need, base personnel must optimize energy and water consumption so they have less to reconstitute in the event the supply is compromised. But it is when the lights go out that the Marine Corps is called on to do more, whether in combat operations or humanitarian aid.

Reduced operating costs. Future fiscal constraints will require the Marine Corps to cut back all base operating costs, but Marines cannot live or train without fuel and electricity. Energy expenditures on base account for almost 20 percent of the base operating support budget. Reducing the $262 million spent by 10 percent would mean saving $26 million—almost as much as it costs to hold five integrated training exercises. Decreasing energy use means more money for other priorities.

The Role of Technology

Reducing energy use and avoiding rising fossil fuel costs are a two-fold effort, requiring both technology and behavior change. The Marine Corps invested $955 million in technology-based energy demand reduction efforts since FY03, leading to an 18.92 percent decrease in energy usage intensity.

Energy-efficient technology ensures the Marine Corps has access to energy when and where it is needed. Individual installations are making strides in this effort. Marine Corps Base Camp Lejeune invested in steam decentralization, reducing energy waste by constructing individual steam generators at multiple locations across base that prevents steam from losing essential heat while moving through long pipes. This switch to an energy-efficient technology

Lieutenants stationed on Okinawa discuss the potential of the energy efficient advanced power system following briefings conducted in February. *(Photo by Cpl Britanny A. James.)*

is expected to reduce energy demand by approximately 70,000 MBtu (1,000 British Thermal Units) and save $2.1 million annually. Likewise, Marine Corps Air Station Miramar made investments in technology and is able to generate 51 percent of its energy from renewable sources including photovoltaic panels and landfill-generated methane gas. This will allow the installation to avoid costly fluctuations in the price of fossil fuel-fired electricity and reduce its reliance on the civilian electrical grid.

The Marine Corps, as a whole, is also investing in micro-grid technology that has the capability to completely remove installations from the commercial grid, allowing entire installations to avoid blackouts and help Marines assist civilians off base in case of an emergency. These grids will eventually be coupled with an advanced metering infrastructure that will read building meters in real time to show Marines how much electricity or water is being used by a building at any given moment. The real time results will help drive smart energy behaviors, enforced by the Marine Corps' "energy ethos."

Driving an Energy Ethos

While HQMC forays into a range of these innovative technology solutions via MCICOM GF-1 and the Expeditionary Energy Office (E2O), HQMC is also focusing on the human behavior element of energy and water use. By understanding how we individually and collectively impact usage, we can devise tactics to extend the operational reach of our units and our budgets, thus better enabling the mission. This shared vision that the efficient use of energy resources is a crucial component of mission readiness has been referred to as an energy ethos. Just as the Marines' "warrior ethos" emphasizes the Corps' unique role as "first to fight," the energy ethos recognizes that Marines are expected to do more with less—and this includes energy consumption. That ethos begins not on the battlefield, but at home where we live, work, and train for operations abroad.

Marines who live by this energy ethos apply the "use only what you need" mentality to energy and water. There are three main objectives in developing the energy ethos:

1) Provide tenant and supported commands with greater visibility of energy use;

2) Emphasize and encourage end user controlled reductions; and

3) Sustain commitment to the efficient use of energy resources.

MCICOM is the primary driver behind installation energy efforts and installation commands are responsible for the physical infrastructure, but the largest population of energy end-users on installations consists of Marines assigned to tenant commands. Thus, tenant command knowledge of facility energy levels and assets, an understanding of how to reduce consumption, and a commitment to changing the way the unit uses energy are critical to the energy ethos.

The Power of Information

One essential element of creating energy efficiency is incorporating a feedback loop to measure energy consumption habits with metered data. This data will be generated by installing smart meters and drawing quarterly reporting of metrics. This measurement will show energy managers usage levels and reveal opportunities to reduce consumption and integrate renewable energy. It can also compare, verify, and forecast utility data. Providing this energy information to tenant and supported commands enables greater visibility of consumption levels, creates a sense of ownership over energy resources, and draws attention to areas for improvement.

Clear information about ways to save energy is vital to a Marine's ability to internalize the energy ethos. It is easy to tell Marines to "save energy," but successful instruction will require actionable tips and recommendations for what each Marine can do in barracks, homes, and workspaces to conserve energy and water. Marines must also be further educated about the correlation between energy and mission success through facts, statistics, and anecdotes. Educating Marines about the importance of energy and water in relation to mission execution is an essential component of behavior change.

The UEM Program

To help drive energy use reduction across installations, the Marine Corps is implementing a Unit Energy Manager (UEM) Program that establishes a touch point between installation commands and tenant units regarding energy use. Tenant commands will appoint a UEM who will act as the energy point of contact (POC) within the or-

Assistant Secretary of the Navy for Energy, Installations, and Environment Dennis B. McGinn tours the ground source heat pump project at Albany, GA. *(Photo by Nathan Parks.)*

ganization. UEMs will receive training and resources to execute their responsibilities and possess sufficient authority to suggest energy requirements at each command.

The UEMs will enable installation and MCICOM leadership to communicate with the Marines who are the end users of installation and expeditionary energy and water. UEMs will promote resourceful behaviors while collaborating with energy professionals to identify efficiencies and gain valuable professional experience. Their roles will include educating Marines about how to reduce energy use, acting as the POC for energy issues within their unit, and conducting regular facility walkthroughs to identify inefficiencies. UEMs will have the support of the already established installation energy managers who will give the UEMs a primer on Marine Corps energy and any features or issues unique to their installation or region, act as their POC, and provide them with vital usage and utility data.

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Training materials, including computer-based training, interactive activities, and links to valuable resources, have been developed to ensure that UEMs are well-educated on energy issues. Operational and installation commanders are expected to foster supportive command environments, promote awareness initiatives, and recognize successes and concerns through awards and accountability measures.

For a Marine, acting as a UEM has valuable, career-long incentives. The UEM Program provides opportunities to demonstrate initiative and leadership while developing experience in the growing field of energy management.

Awards and Accountability

There will also be tangible benefits to the unit beyond improved effectiveness and resilience. Under the UEM Program, Marines will become conscious of their energy and water savings, and leaders will begin communicating their support for the energy ethos. The UEMs will drive the competitions in a role similar to a team captain, track metrics, and communicate successes and areas for improved efficiency.

As metering technology matures and the exact energy footprint of all units can be better determined, high achieving units will be recognized through awards. Installations will be encouraged to make funds available to exemplary units as permitted. In the meantime, Marine behavior contributions to energy reduction will be calculated at the installation level, and units will be judged on qualitative elements determined by leadership.

Leaders will also be encouraged to hold Marines accountable for their energy and water consumption habits. From modeling efficient behaviors to doing periodic spot checks of Marines in the working environment and recognizing achievement and correcting errors, the chain of command is expected to play a large role in encouraging accountability and behavior change to ensure the Marine and the unit use only what they need.

Changing Behavior

Through the UEM Program and energy ethos communications efforts, Marines will learn exactly how they can reduce their individual (and, as applicable, family and unit) energy use footprint. Tip sheets, instructions, and posters will aid UEMs in educating their units. These materials may be altered as technology transforms and seasons change, but the basics are the same: use only the energy and water you need.

Data shows that some private companies that emphasize behavior change through comparisons between neighbors and family have seen cost savings of 2.5 percent, and a Naval Facilities Engineering Command building energy monitor program that encouraged efficiency saw energy use savings of 3 percent. By building on those ideas, using the diligence and competitive spirit of Marines, and instituting new policy and culture surrounding energy use in the Corps, we can see savings sustained in the long term.

Reaching a sustained state of energy and water savings and developing new habits will require the support of leadership and energy managers. Overhauling the way energy and water is used sounds like a massive task, but simple changes will add up to large savings and good habits over time. The essential avenue to success is motivating each individual Marine to change his behavior in the short and long term. This is not a one-time campaign—it is meant to create lasting change. An ideal end state is a force that habitually considers energy, like safety, in everything it does.

Closing

The energy ethos is vital to Marine Corps success. Understanding energy, changing the way it is produced and procured, and altering our habits is essential to keep our force flexible and strong throughout changing global environments. By taking energy and water saving actions on base—whether at a U.S. installation or at an operating base—Marines have the power to make the Corps more effective and secure.

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