A contractor teaches Soldiers from B Company, 2nd Battalion, 34th Armor Regiment, how to set up a solar shade system on July 10, 2014, at Camp Buehring, Kuwait. These shades typically reduce the shelter's temperature by 15 degrees and result in a 22-percent fuel savings. (Photo by Sgt. Woodbridge Dean Bullock)

Why Energy Innovation Is Critical to Military Budgets

■ By Dr. Christopher Wedding

Solar power and alternative fuels are not just for tree huggers. And I say that as someone with a doctorate in environmental management. In fact, I would argue that the U.S. military has more reasons than environmentalists have to purchase and deploy clean energy technologies such as solar, fuel cells, and advanced batteries.

Consider the proposed troop reductions and significant cuts planned for Department of Defense (DOD) budgets. Energy efficiency and renewable energy are two ways the military can generate savings in the midst of these changes. Think of them as force multipliers.

Operational Energy

U.S. military energy use is rising. The energy used for training, moving, and sustaining military forces and weapons platforms for military operations has increased tenfold since World War II.

According to a retired brigadier general who served as chief logistician for Gen. David Petraeus in Iraq, the DOD's 2010 bill for air conditioning in Iraq and Afghanistan exceeded $20 billion when manpower, a portion of the required infrastructure, and associated logistics were included in the equation. As a reference point, this exceeds the entire annual budget for NASA.

Operational energy use accounted for 80 percent of all energy used by the DOD in 2012. Imagine the scale of possible cost savings if these funds were reallocated to other critical security needs.

Why We Need to Use Energy Better

Although saving money is a driver of energy innovation and efficiency in the military, other factors are of equal or greater importance.

Soldier safety. Roughly 50 percent of materiel carried by convoy is fuel. The need for millions of gallons of fuel at forward operating bases presents risks. Fuel convoys in 2010 experienced 1,100 attacks. As of 2011, it was estimated that more than 1,000 casualties had occurred while protecting fuel convoys.

Mission effectiveness. If Soldiers are not guarding convoys full of fuel, they can focus on core security functions. For example, the Navy SEALs are experimenting with solar options to create "a leaner, greener tactical force" with quieter on-the-move power generation and water purification technologies. As Dorothy Robyn, former deputy undersecretary of defense put it, "Unleashing warfighters from the tether of [fossil] fuel … will significantly improve our mission effectiveness."

Predictability and resilience. Given the scale of the U.S. military, when the cost per gallon of fuel increases by even 50 cents, the additional costs to the DOD go up by billions of dollars. Especially in a constrained budget environment, this variability creates an undesirable dependence on fuel suppliers.

Secretary of the Navy Raymond E. Mabus Jr. summed it up well when he told the National Clean Energy Summit in 2011, "We buy too much fossil fuel from potentially or actually volatile places on earth. We buy our energy from people who may not be our friends. We would never let the countries that we buy energy from build our ships or our aircraft or our ground vehicles, but we give them a say on whether those ships sail, whether those aircraft fly, whether those ground vehicles operate because we buy their energy."

Increasing Investment Returns

In 2010 the DOD created the Office of the Assistant Secretary of Defense for Operational Energy in part to drive down the ever increasing energy demands of our forces. Its mission is to strengthen the energy security of the U.S. military by improving military capabilities, cutting costs, and lowering operational and strategic risk through better energy accounting, planning, management, and innovation.

Military leaders, such as former U.S. Army G–4 Lt. Gen. Raymond V. Mason and Katherine Hammack, Assistant Secretary of the Army for Installations and the Environment, have pushed for a much needed energy-informed culture. In this new paradigm, every Soldier is challenged to be a better energy manager for reasons that have very little to do with environmental policy.

There are plenty of reasons for the DOD to aggressively pursue clean energy now, and it has been doing just that in recent years. Based on my conversations with military professionals on the topic, here are several ways that the DOD could do more to benefit from energy innovation.

Dedicate more resources. The DOD should use more print materials, web-based education, local champions, and success-based incentives to create an energy-informed culture throughout its military ranks. This strategic decentralization and individual empowerment can exponentially increase the number of innovative ideas to lower energy budgets and increase resilience. This kind of education and training will increase the odds that new energy-related products and behaviors will lead to the DOD's desired goals.

Improve alternative energy financing. The DOD should make it easier to leverage third-party financing for its new alternative energy infrastructure. Although the military is engaging in contracts with the private sector to finance the capital expenses of alternative energy projects, most businesses find it confusing, time-consuming, and risky to pursue large projects with the DOD. Simultaneously, most clean energy investors and developers see the military as an ideal customer and partner given its scale (in scope and geography) and long-term stability.

Change the metrics for energy-related decisions. Leaders should consider the following types of factors when deciding what energy sources to use and when and where to use them:

- ☐ What is the difference in the cost of a gallon of diesel fuel at a forward operating base in Iraq and at a fixed installation in Virginia, including the cost and risks of transporting this fuel?
- ☐ What are the financial and strategic impacts of the electrical grid going down or power to a DOD base being cut off from time to time?
- ☐ How does the energy used during the operating life of a piece of equipment relate to its initial capital costs?
- ☐ Most importantly, how does a given energy option relate to Soldier safety?

If these types of factors are considered when deciding what type of fuel is used, how much is used, and what kind of equipment is purchased, then energy costs and their related risks will likely go down.

By implementing the recommendations suggested in this article, the Army can create and nurture an energy-informed culture in which every Soldier is challenged to be a better energy manager, to innovate, to lower energy expenses, and to make well-informed decisions about energy use. This will go a long way toward stretching dollars in a budget-constrained environment.

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