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Support the Troops

Eneref Institute reports on how the U.S. Military has adopted solar technology – including solar heating – in its approach to become energy efficient

Five months before the 9/11 attacks, Army General Tommy Franks told lawmakers that protecting energy resources was vital for the interests of America and it was a key role for Central Command. Franks later led the fight against the Taliban in Afghanistan as well as the war against Iraq as Commander of the U.S. Central Command.

“And so, one of our responsibilities—in fact, one of our objectives—is to maintain access to these energy resources,” Franks told lawmakers in April of 2001.

Now, ten years later, the Dept. of Defense is taking a new approach to energy practices by placing far more emphasis on efficiency and sustainability. The military’s implementation of new technologies often pushes markets to become mature and self-sustaining. In 2010, 10 percent of the department’s electric energy was from renewable energy sources. And the future looks greener still for the armed services.

TECHNOLOGIES

The Navy, for example, is now turning to alternatives. And that makes sense. Our maritime force’s energy technology has advanced since the days of the Continental Navy’s first encounter with King George’s reign at the Battle of Nassau—powered by wind—to coal, then oil, then nuclear power.

The Department of Defense is the world’s largest institutional energy user and will therefore greatly influence the future of energy innovation, just as they have for many other American technologies and markets. Fortunately, solar heating is a technology set for deployment.

Solar water heating is a clean, reliable and cost-effective technology that is reducing utility bills for thousands of homes and businesses. Today, Americans across the country are at work manufacturing and installing systems

that significantly reduce our dependence on imported fuels.

The scale of the military’s purchasing power will widen energy research and development and expedite solar heating technologies to market. The military’s use of solar heating will ultimately result, not only in increased security for the military, but increased opportunities for American jobs and manufacturing.

NATIONAL SECURITY

The military sees their energy need as a security issue. The risks of transporting fuels to and on the battlefield are significant. During wartime, bases require additional energy; for electronics, lighting, heating and cooling. Better managed energy use makes sense for facilities.

Alternative and renewable energy can be domestically produced or, when on foreign soil, locally sourced. But



Solar water heating panels aboard the Marine Corps Base Camp Lejeune in Jacksonville, NC. FLS Energy photo

what is crucial, both on and off the battlefield, is to also reduce dependence on imported oil and invest in clean energy. This will save soldiers' lives, allow for more intelligent places to spend the military budget and better protect the country they serve.

FACILITIES

The Department of Defense manages over 2 billion square feet of space across 500,000 structures worldwide. One quarter of the department's energy bill is spent on facilities energy.

In installations overall, the Department of Defense has reduced energy use per square foot by about 10 percent since 9/11. But the current goal is more aggressive. Dorothy Robyn, deputy un-

dersecretary of defense for installations and environment, says that for technologies that prove effective, the DOD will serve as an early customer.

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One promising initiative is the Installation Energy Test Bed program, which began with \$20 million in stimulus funds and focuses on energy efficiency, energy management, energy storage, decision-making and renewable energy. The program, which has more than 45 demonstration projects underway, hopes to reduce demand by 50 percent in existing buildings and 70 percent in new construction.

PROJECTS

Today, solar heating, solar photovoltaic and geothermal systems are in operation in nearly 500 Department of Defense structures.

At the Tooele Army Depot in Utah, passive solar heating walls on 11 buildings save \$100,000 in annual heating costs. Tooele also installed the Army's first wind turbine.

The Marine Corp Base Camp Lejeune, in Jacksonville, NC, installed the largest residential solar thermal project in the United States, with 2,200 solar hot water systems. The project is a model for military bases across the country. Each house was fitted with one panel that will heat 45-50 gallons of hot water per day, approximately three-quarters of a family's hot water needs.

In San Antonio, 178 solar collectors were installed on the fourteen-story Army Residence Community—a 180 unit apartment building. The system

feeds two existing 2.5 MBtu boilers. At maximum output, the facility generates almost 1.5 MBtu's per hour.

The Fort Hood Military Base in Texas installed solar heating to meet the domestic hot water needs of five dining halls and a fitness center. Meanwhile, in the Kirtland Air Force Base, New Mexico, 72 collectors preheat water for the swimming pool aquatic center.

Beyond facilities, the Department of Defense is seeking opportunities to reduce the petroleum dependence of its fleet. Not only with alternatives, but also with electric or efficient vehicles and the use of lightweight materials, thermal management, and hybrid propulsion systems.

On the ground, soldiers carry almost 10 pounds of batteries for each day on a mission, so the military is looking into longer-lasting, lighter batteries to expand mobility. Advancements in fuel cell technology, which can outperform traditional batteries, are foreseeable as well.

The Air Force expects 50 percent of its domestic fleet to use alternative aviation fuels within 5 years. Next year, the Navy plans to demonstrate a carrier strike group called the Great Green Fleet, which will be powered solely by alternative fuels.

DOD ADVANTAGES

Over the next few years, the Department of Defense will help to accelerate the adoption of many clean energy technologies, including solar heating. That's not just good news for the military, but good news for America. Solar water heating is affordable and offers the fastest return on investment of any solar technology. A properly designed and installed solar water heating system provides a significant percentage of home or building's hot water needs. And just as significantly, contributes to America's security as well. ●



This article is part of an ongoing initiative by Enerref Institute to

demonstrate the benefits of solar heating and cooling. Seth Warren Rose is founder and director of Enerref Institute (www.enerref.org) a non-profit research and advocacy organization that reports regularly on ecologically sensible innovations.