

Marines Are Molding Energy Savings Along With Young Troops

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SAN DIEGO -- Richard Hatcher is devoted to saving energy, but there are some things he refuses to do to save kilowatts -- like changing the strict training regimen to teach young Marines how to survive in the toughest of circumstances.

The message has been clear from the beginning: Don't mess with the Marine Corps Recruit Depot's mission of turning fresh-faced recruits into efficient troops to win wars, said Hatcher, 54. "I'm not going to tell them that, 'Hey, if you lower the temperature of the training tank water ...,'" he said, jokingly.

Nevertheless, in his three years as energy manager, Hatcher has turned the energy profile of the depot around. The 388-acre Marine Corps Recruit Depot, nestled between Interstate 5 and the San Diego airport, is one of two bases where each year 17,000 young men undergo 12 grueling weeks of basic training.

It's also home to a certified sustainable barracks with 3.6 megawatts of solar power and an artificial wetland that sanitizes wastewater and feeds it through sprinklers and into toilets. Hatcher has been working at the depot as a civilian for 20 years, first as an engineering technician and, for the last three, as the energy manager. He has an easygoing demeanor that softens the edges of the tough Marines who roam the campus amid the bugle calls, the "yes, sirs!" and the marching orders of the drill instructors.

Nevertheless, his reasoning for supporting renewable energy and water reflects the Spartan image of the Marine Corps. Cutting costs and training soldiers are part of the Marine Corps' driving philosophy.

"Every dollar saved on energy is a dollar spent somewhere else," Hatcher said. "Right now, it's to the war-fighting effort." Climate change mitigation is a side benefit. Carbon emissions "are not what were driving the project to start with," said Hatcher, but rather the result of the strict cost savings imposed by the military.

Marshaling energy independence

"The [Department of Defense] has the intent to continue energy security, to continue operations that won't be affected by rest of grid," said Maj. Ernesto Bulli-Cruz, the depot's facilities director. "It makes this a sustainable installation, it makes it that it is less costly for

Last year, the base offset nearly one-third of its electricity from the grid with its solar panels, saving \$725,000.

The driving force behind the effort was the 2007 Grow the Force initiative, the George W. Bush-era order to increase Army and Marine Corps personnel to support the wars in Iraq and Afghanistan. In that same year, the Department of Defense announced a voluntary goal to source 25 percent of energy from renewable sources by 2025.

Planning for the first photovoltaic system began about seven years ago, said Hatcher. The second system was a recipient of stimulus funds from the 2009 American Recovery and Reinvestment Act. Hatcher purchased panels from Dynalectric, a subsidiary of Connecticut-based EMCOR Group Inc., and planned the installation with the help of local utility San Diego Gas and Electric.

Given the area, a 1.3 MW project was originally proposed for the site. But by using a ballast system developed at the nearby Camp Pendleton Marine base, Hatcher and his team were able to fill more of the underground space in between the utility pipes and wires than they could have with a traditional post-

driven system. The team was able to install 1.7 MW for the same price as 1.3 MW: about \$8.8 million, Hatcher said.

About 1.9 MW is scattered around the base, on buildings, carports and other structures. The total of 3.6 MW of solar generation at the depot is enough to power the base at peak demand.

A flower bed that shapes up the water

The barracks, which include a clinic for injured Marines, is certified Platinum under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. Here, the rooms take maximum advantage of the natural light, and lights are brightened in only certain cases, like to perform minor surgery.

The barracks recycle graywater -- water from showers and sinks -- to use in toilets.

"Once we got to the sustainability of the design, we realized that we weren't that far off from Platinum," Hatcher said.

Although the base has completed its expansion of photovoltaic panels, there is much work that remains in energy efficiency. The depot plans to replace air conditioning units and install more LED lighting outside the barracks and in other buildings. Hatcher expects to install solar thermal hot water tanks on some of the barracks by mid-February. This would offset between 50 percent and 75 percent of the steam needed to supply hot water.

The artificial wetland is located behind a life-sized bronze to honor the depot's drill instructors. It is next to the site of the graduation ceremony that sweeps exhausted recruits from basic training into the world of *semper paratus*: the Marines motto meaning "always faithful."

The wetland -- called a "living machine" by its Virginia-based manufacturer Living Machine Systems -- is disguised as a raised flower bed brimming with red and yellow flowers, native and naturalized plants to the San Diego region. The flower bed is filled with two types of soil that filter the impurities in the water. Buried under the bed are two storage tanks, one in which solids are allowed to settle to the bottom. The other tank receives the water in its final stage, where it is chlorinated to kill microbes and dispersed through a sprinkler system.

Once the permitting is complete, the living machine will take 100,000 gallons of wastewater per day and clean it for use on the site's lawns and shrubs.

"We're one filtration step away from being able to drink that water," Hatcher said.

Deploying 'watchdogs for energy'

Hatcher expects the depot to convert to natural gas by 2017, replacing the inefficient steam system from a nearby cogeneration plant.

Hatcher has also placed synthetic grass on many of the site's fields. In combination with the planting of drought-tolerant plants, the synthetic grass has allowed the depot to save about 357,000 gallons of water. These achievements earned the depot two awards last year, the White House Council on Environmental Quality's GreenGov award in the "Building the Future" category, and the Department of Energy's Federal Energy and Water Management Better Buildings award.

The depot stood out from about 200 nominees for the 2013 GreenGov awards, said John Powers, federal environment executive for CEQ.

"It's an opportunity not only to lead, but to educate incoming Marines on the importance of their issues," said Powers. The depot found innovative ways to seamlessly incorporate sustainability, Powers said. Hatcher and his team placed a solar array over bleachers to provide both energy to the base and shade to families and friends watching recruits graduate.

The biggest challenge yet may be changing the mindset of the recruits, who come to San Diego to learn how to fight. Here, officers and managers must "change the energy ethos" of young Marines, said facilities manager Bulli- Cruz.

"The education part will be the next big focus," he said. He hopes to establish an energy manager program by this fall, in which people will be trained to be "watchdogs for energy" on different parts of the base, switching off lights, reporting leaky pipes or disconnecting appliances to reduce vampire loads.

Despite accolades from Washington, Hatcher is humble.

"We're not doing anything here that hasn't been done somewhere else in some way, shape or form," he said. "We're taking the success stories and some failures from other places, military and private, and incorporating what we see best for our footprint on the depot."

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