"Make Energy a Consideration in All We Do"

ENERGY eXpress

The Air Force Facility Energy Center Newsletter September/October 2011

AFFEC Targets Heat Plants for Energy Savings

Jennifer Elmore
AFCESA/CEBH

Engineers in the Conservation and Awareness Branch (CENE) at AFCESA are on a mission to help save facility energy across the Air Force. They're targeting central heat plants, which have miles of distribution lines and are known to be inefficient according to Tom Adams, one of CENE's mechanical engineers. He has evaluated heat plants across the Air Force and says some of the 50-year-old structures are only 50 percent efficient.

"Today you can achieve up to 95 percent efficiency with facility condensing boilers," said Mr. Adams. "This technology improvement essentially makes central heat plants obsolete, at least from an energy efficiency standpoint."

The Air Force has decentralized ten heat plants; an additional decentralization project is under construction at McGuire AFB, N.J. Efforts are also underway at Tinker AFB, Okla. and Robins AFB, Ga., to award projects to decentralize heat plants. AFCESA engineers would like to see most heat plants decentralized and replaced with individual facility boilers, where cost effective.

"Back when central heat plants were constructed in the fifties and early sixties, energy wasn't an issue in our country," said Mr. Adams. "It was very plentiful, very cheap, and the larger you built the boilers, the more efficient they were. So many times, it was advantageous to have a central heat system."

Heat plants satisfy a base's heating requirements by burning oil or natural gas in large boilers to create hot water or steam, usually distributed in underground pipes throughout the base. Each building taps into the hot water or steam distribution system to access the heat.

"We always want to propose a solution that makes sense for the base and the MAJCOM," said Mr. Adams. "We have to satisfy the mission first. Sometimes decentralizing a heat plant is not going to allow you to accomplish your mission as effectively."

Mr. Adams recently evaluated the heat plant at Arnold AFB, Tenn., and says it is operating at 50 percent efficiency. However, Arnold may not be a candidate for decentralization because the base has a large heat requirement for test facilities. He says AFCESA is looking at repair options because small facility boilers may not be able to meet the steam demand for testing requirements.

"AFCESA is working with Arnold and HQ AFMC to determine the most beneficial and cost-effective way forward including heat plant improvements and repairs to the distribution system," said Mr. Adams. He estimates a $14 million investment could improve Arnold's efficiency 20 percent and save the base $920K a year in utility costs.

CENE engineers will continue to evaluate opportunities throughout the Air Force and will actively pursue cost effective candidates as they are identified.

One of four central heat plants at Tinker AFB, Okla., under consideration for decentralization. Smaller, more efficient boilers in individual buildings could reduce natural gas consumption 40 percent and save up to $7M. (photo by Mr. Bill Dalky)

Air Force racks up awards

Margaret Breihan
SAF/PA

The Air Force was announced as the recipient of almost half of the U.S. Department of Energy Federal Energy Management Program's 2011 Federal Energy and Water Management Awards earned by Department of Defense entities, and a quarter of awards overall.

The awards are scheduled to be presented during a luncheon Oct. 13 in Washington.

In addition, the Air Force more than doubled the combined total it earned for the past two years, three each for 2009 and 2010.

The Air Force took four team and three individual awards this year.

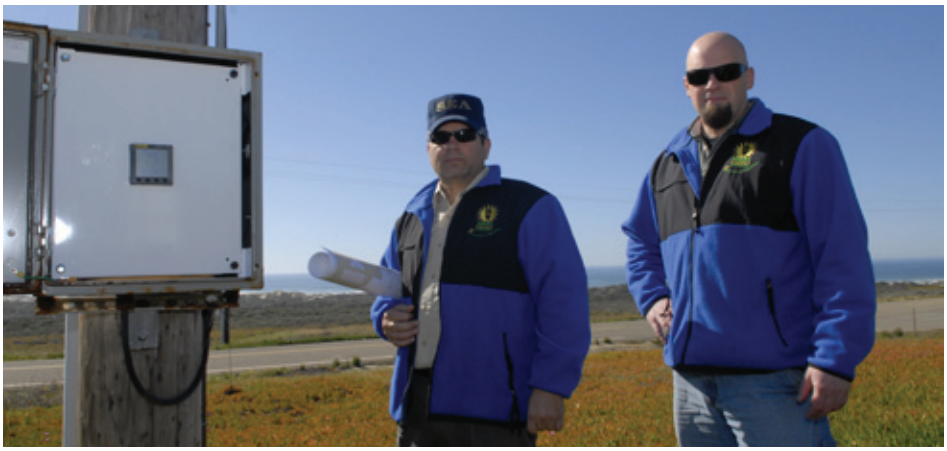
The awards, cosponsored by the DOE and Federal Interagency Energy Policy Committee, spotlight federal organizations and individuals who make significant contributions to improve energy efficiency and water conservation. A primary goal of the program is to "recognize and encourage agency staff who are implementing game changing energy and water management practices that support meeting federal energy management goals," according to the DOE officials.

Air Force team program award winners:

The Vandenberg Energy Conservation Program, Vandenberg Air Force Base, Calif. Group members include 2nd Lt. Julian Vaiana, Scott Bly, Bradley King and Pernell Rush. The team saved more than 144 million Btus in energy and 336,000 kilo gallons of water through awareness and training programs, building retrofits, and innovative energy management and control systems.

The Headquarters Air Combat Command Energy Program, Joint Base Langley-Eustis, Va. Group members include Steve Dumont, Mark Hunt, John McDuffie, William Turnbull and Steven White. The ACC team used a power purchase agreement to acquire a 14.5 megawatt photovoltaic array at Davis-Monthan AFB, Ariz., and installed smaller PV arrays at 14 bases by reusing excess solar panel equipment, which is expected to yield an estimated 582,536 megawatt hours in renewable energy over their life cycles.

The Air Mobility Command Aviation Fuel Efficiency Program, Scott AFB, Ill. Team members include Col. Kevin Trayer, Lt. Col. Michael Lepchenske, Maj. Philip Morrison, Tony Hart and Rick Turcotte. The AMC team saved almost 48 million gallons of fuel in fiscal 2010 through policy changes, innovative data collection methods and focused culture change across the full spectrum of their operations.



Resource Efficiency Manager Scott Bly and Energy Manager Bradley King are part of the winning energy team at Vandenberg AFB, Calif. (Air Force photo)

The Energy Efficiency Program, 171st Air Refueling Wing, Pittsburgh International Airport, Pa. 171st ARW team members include Brig. Gen. Roy Uptegraff, Col. David MacMillan and Lt. Col. Jeffrey Jones. The wing saved more than 1.5 million gallons of fuel in fiscal 2010 through leadership involvement, application of innovative tools and focused culture change.

Individual award winners:

Rose Forbes, Air Force Center for Engineering and the Environment, Massachusetts Military Reservation, Cape Cod, Mass. As the lead environmental engineer for AFCEE's Installation Restoration Program at the Massachusetts Military Reservation, Forbes is responsible for planning and initial implementation of an initiative that will result in "100 percent on-site renewable" status for the installation. One of three planned wind turbine generators is online now and, once the additional two go live, more than 6,600 metric tons of carbon dioxide greenhouse gas emissions will be eliminated per year. Lifetime cost savings exceeding $68 million are also expected.

Michael Miller, 92nd Civil Engineer Squadron, Fairchild AFB, Wash. As the energy management control system lead operator at Fairchild AFB since 1991, Miller has managed installation and operation of three energy management control systems on 110 buildings, accounting for 12 percent of Fairchild's total decrease in energy intensity between fiscal 2003 and 2010.

Clifford Richardson, 377th Civil Engineer Squadron, Kirtland AFB, N.M. Mr. Richardson spearheaded implementation of more than $22 million in energy saving performance contracts at Kirtland AFB, saving more than 202 billion Btu per year and reducing energy consumption by almost 10 percent. Richardson also developed a water management plan that will save 62 mega gallons in groundwater annually.

Jennifer Elmore
AFCESA/CEBH

This October, the Air Force joins our nation once again to observe Energy Awareness Month. This year's theme, "Power the Force, Fuel the Fight," encourages us to do more than just be "aware." Instead, military personnel and civilians alike should take action.

"The Air Force is making excellent progress toward satisfying federal energy mandates," said Rick Stacey, chief of the Air Force Facility Energy Center, a division of the Air Force Civil Engineer Support Agency, Tyndall Air Force Base, Fla. "Some of the more prominent goals require us to reduce energy intensity 30 percent by 2015, reduce water intensity 26 percent by 2020, and increase renewable energy to 25 percent of all electricity use by 2025. But as time goes by, the goals are getting tougher. We need everyone doing all they can do to help the Air Force continue our energy program successes."

Since 2003, the Air Force has reduced energy use nearly 15 percent and water consumption 11 percent. The Air Force energy strategy for meeting these goals is to reduce demand, increase supply, and change the culture.

Reduce demand

The Air Force uses facility energy audits, utility meters, energy recommissionings, and a variety of other tools to pursue aggressive reduction targets. At Kirtland AFB, N.M., audits led to an upgraded energy management control system that is expected to save $3.7 million over the lifetime of the system. Newly installed meters at Vandenberg AFB, Calif., allowed for better resource management and generated $2 million of new revenue through more accurate billing of non-Department of Defense tenants. And Air Combat Command's facility recommissioning, or building "tune-up," program incurred enough energy savings to cut $433,000 from utility bills in 2010.

Increase supply

The Air Force leads the Department of Defense as the number one producer and user of renewable energy. More than six percent of our electric supply comes from on-base renewable energy projects including wind, solar, geothermal, and landfill gas. "We are evaluating ways to expand our portfolio to include waste-to-energy and biomass projects as we work toward producing 25 percent renewable energy by 2025," said Ken Gray, AFFEC Rates and Renewable Branch chief. Two new wind turbines will come online this fall at the Massachusetts Military Reservation. Additionally, construction will soon begin on a 14 megawatt solar array at Davis-Monthan AFB, Ariz.

Change the culture

Our ability to truly change the Air Force culture and develop a new mindset when it comes to energy, depends on you. "Each individual can and must contribute," said Mr. Stacey. "No matter how small or how large the action, it is people who will ultimately make the difference. Take a moment to turn off lights and appliances when not in use; make saving energy and water a habit every day; and encourage your family, friends, and co-workers to do their part."

Take "ACTION" this Energy Awareness Month.

Appliance reduction
Refrigerators, coffee pots, and microwaves should be consolidated into break rooms.

Computer log off
Remember to "log off" to ensure your computer goes into sleep mode.

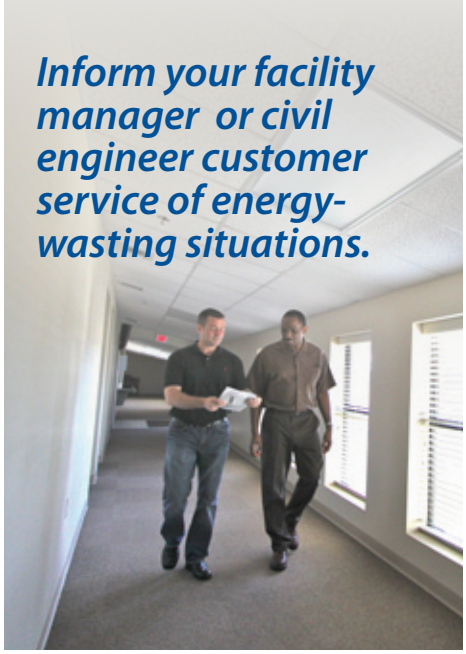
Temperature Control
Dress appropriately for the temperature in your facility. Most bases follow set points of 68 degrees in the winter and 78 degrees in the summer.

Inform your facility manager
Report incorrect temperature set points, leaky faucets, blocked air vents, cracked windows, and other problems to your facility manager or civil engineer customer service.

Outdoor conservation
If you notice a broken sprinkler head wasting water or area lights left on in a parking lot during the day, report it to your local civil engineer customer service.

No waste
If you see something that doesn't need to be on, turn it off. If you see a problem, report it.

Inform your facility manager or civil engineer customer service of energy-wasting situations.



Air Force moving forward on more efficient energy

MSgt. Amaani Lyle
Air Force Public Affairs Agency

The Air Force has taken a service-wide approach to create a robust, resilient and ready energy security posture, said the deputy assistant secretary of the Air Force for energy at the Air Force Association's 2011 Air & Space Conference and Technology Exposition Sept. 20.

Mission requirements include about 900 Air Mobility Command flights daily and additional intelligence, surveillance and reconnaissance operations -- all spurring a greater focus on energy use in aviation, installations and acquisitions and technology, Dr. Kevin Geiss explained.

"The current economic environment highlights that energy offers the Air Force opportunity to become a more efficient, more effective fighting force," Geiss said. "By decreasing our reliance on imported oil and increasing our use of alternative and renewable sources of energy, we can enable our warfighters, expand operational effectiveness and enhance national security."

With an annual purchase of some 2.5 billion gallons of fuel, totaling about $8 billion, the Air Force is the largest consumer of energy in the federal government, he said. To decrease overall demand for petroleum-based fuels, Air Force officials have sought to instill fuel efficiency into daily operations.

"We're certifying our fleet to fly on alternative fuels; we've already certified 99 percent of our fleet to fly unrestricted operations on synthetic fuels without compromising safety or airworthiness, and we've moved on to certifying our fleet on bio-fuels, which we should complete by 2013," Geiss said.

Other measures include Air Mobility Command's fuel tracker; monthly data indicates the command hauls about 27 percent more cargo using only about three percent more fuel, as compared to 2006.

On installations, the Air Force has made energy efficiency a priority for several years, Geiss asserted.

"In 2010, about 6.4 percent of our electricity ... comes from renewable sources," Geiss said. "We've reduced the energy intensity, that's consumption per square foot, in our facilities by 14.8 percent, as compared to a 2003 baseline."

The Air Force is currently operating more than 80 on-base renewable projects on 43 bases, and has identified 30 new photovoltaic, wind, waste-to-energy, geothermal, landfill gas, and biomass projects to pursue. The funding mechanism for these projects will be third-party contracts and could total nearly $400M.

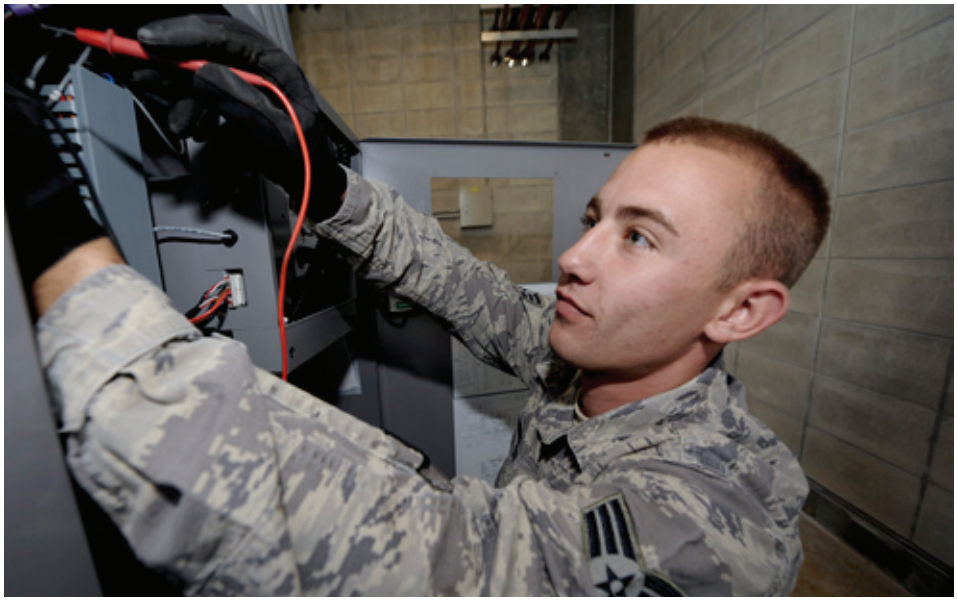
To create energy assurance in the expeditionary environment, Air Force officials are pursuing the basic expeditionary airfield resource, or BEAR program, to tap into indigenous resources such as solar and wind energy. Geiss also noted, the engine behind such great advancements in energy consumption is the acquisition community.

"Whether developing and procuring technology that increases a range in endurance, or building new capacity into existing and emerging weapons platforms, we look to our acquisition and technology experts to position us to meet emerging threats and provide mission assurance," Geiss said.

The Air Force Research Laboratory based at Wright-Patterson Air Force Base, Ohio, is studying engine and airframe design to gain greater mileage out of every gallon of fuel, he added.

"Adaptive Versatile Engine Technology, or ADVENT, will combine high-performance capability of military engines with fuel efficiency of engines used in the commercial industry," Geiss said.

These developments, Geiss explained, will help to support reduction and reliance on foreign sources of energy and create a larger market for clean engine technologies that support the Air Force's mission at home and abroad.



SrA Derek Hunter checks electrical circuits on an HVAC system at Kadena Air Base, Japan. Base officials replaced old, outdoor AC chillers with protected, indoor equipment to save the Air Force potentially millions of dollars in parts and energy. (Photo by SSgt. Jonathan Steffen)

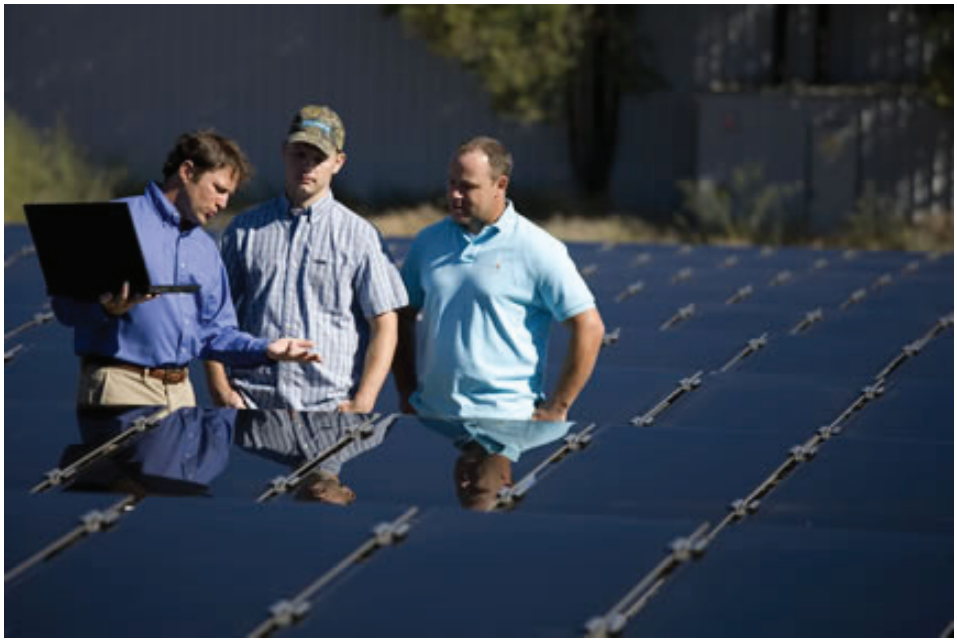
Spotlight on Success

Burlington ANGB installs solar project

Vermont ANG received an $8.8M grant to fund a solar power array research development testing and evaluation project. Completed in September, the 1.4MW system will save the base an estimated $237K annually. The system is a combination of a fixed ground mount, a roof mount, and a ground mounted dual-axis tracking array.

Hill AFB utility cost avoidance

The Utah Public Service Commission has approved new electric rates for Hill AFB that will be significantly lower than the 13.4 percent increase requested by Rocky Mountain Power Company. The Commission approved an 8.5 percent increase. The Air Force Utility Law Field Support Center was involved with the rate case that ended in a settlement and created the $640K annual cost avoidance.



Joint Base Andrews explores solar potential

In coordination with the 11 CES, AFDW's Energy Team is in the process of evaluating the potential advantages a 25MW solar PV array might hold for the base. If the evaluation results in a project, hundreds of motorized photovoltaic panels similar to these would generate 25MW of renewable energy for JB Andrews.

Energy awareness displays

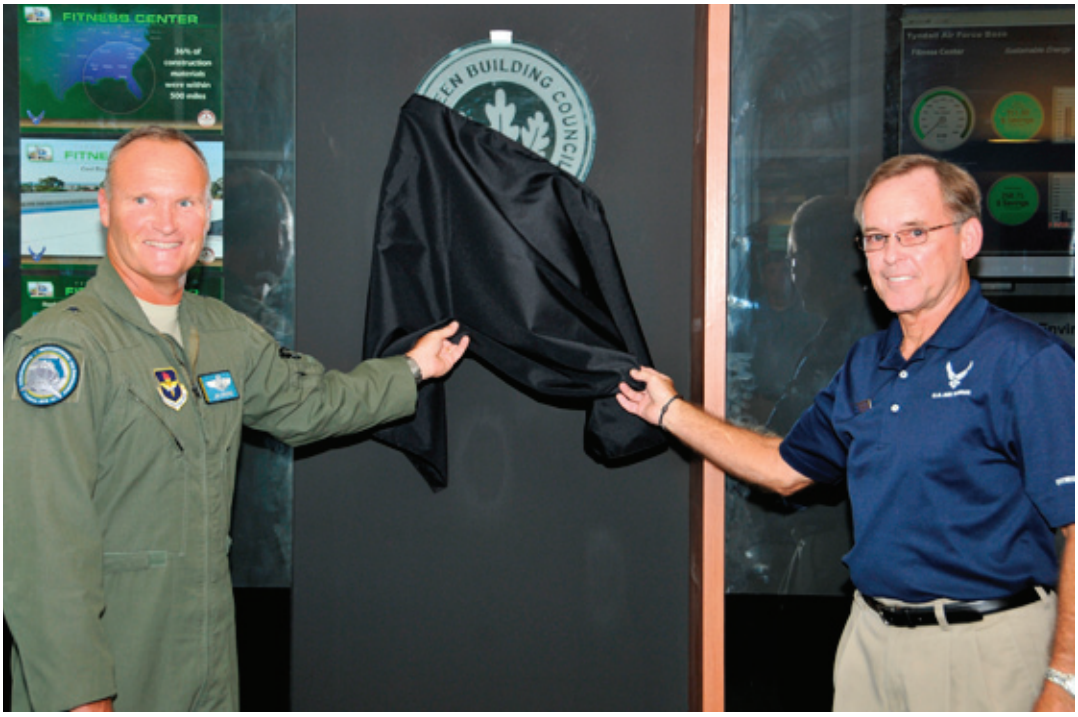
AFCESA has designed and purchased fabric pop-up displays and table throws for 110 Air Force installations. The displays illustrate the Air Force facility energy program with pictures of energy and water conservation and renewable energy. Expected delivery is 3 October.

More wind power for MMR

Two new 1.5 MW wind turbines are expected to come online in October giving the Massachusetts Military Reservation (MMR) a total of three wind turbines and making it 100 percent on-site renewable. As part of its environmental restoration program, the MMR pumps and treats more than 13 million gallons of contaminated groundwater per day. It was using more than $2M of fossil fuel-generated electricity per year until FY10 when the MMR's first utility-scale 1.5MW wind turbine came online. There are plans to add an 8MW photovoltaic system on MMR's 60-acre capped landfill.

FY11 Sustainable Infrastructure Assessments

AFCESA funded seven of the eight FY11 SIAs (bases were bundled by regions) for a total of 59 million square feet using Energy Focus funds. SIAs include not only the mandated facility energy audits, but also facility condition assessments, a validation of space use, and identification of requirements to meet the High Performance Sustainable Building standards. AFCESA also partially funded and awarded PACAF's version of the SIA called ECOs (Energy, Condition and Optimization).

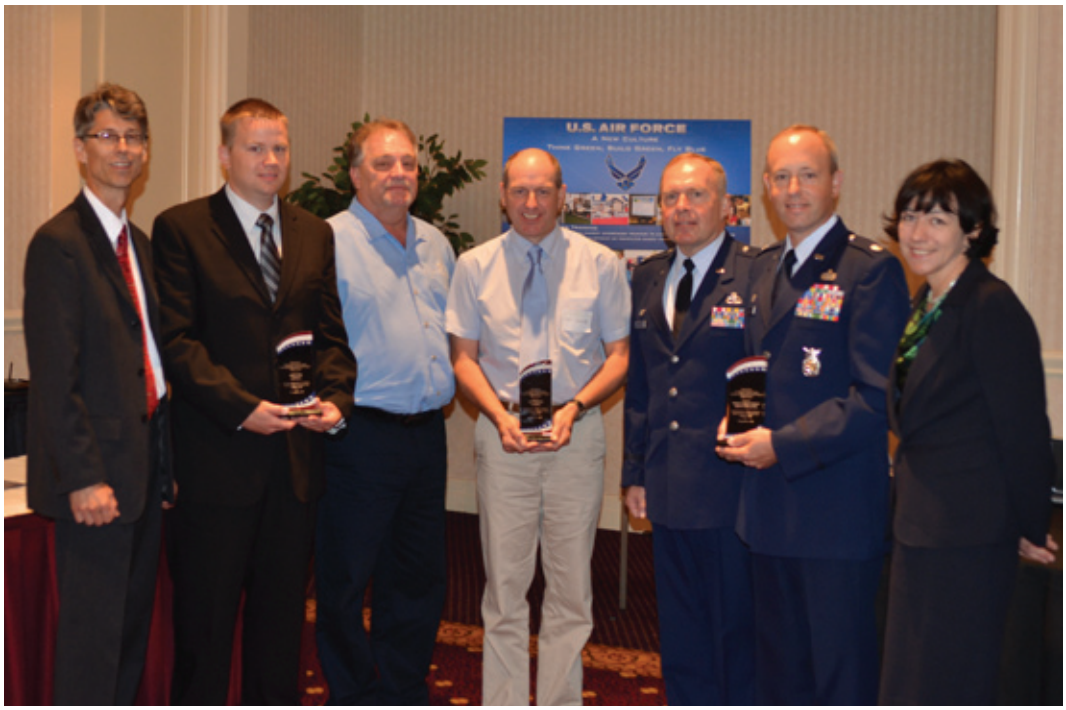


Air Force First Platinum LEED

Brig Gen James S. Browne, 325 FW/CC and Mr. Lou South, 325th Fitness Center Director, unveil the LEED Platinum award at a special dedication ceremony on August 17, 2011 at the Tyndall AFB Fitness Center. It's a historical first for the Air Force to obtain the highest award level rating. The 75,000 square foot facility uses 40 percent less energy and water than a typical building its size and features solar panels on the roof, a solar hot water heating system, daylighting, and low-flow water fixtures.
(photo by Ms. Lisa Norman)

Energy Conservation Recognition

Congratulations to this year's AFCESA "REAP" – Reduce Energy Appreciation Program – award winners. Winners received their awards at the annual AF Day meeting in August. Pictured L to R: Mr. David Bek, AFCESA; Mr. Jason Webster and Mr. Tim Thompson, Minot, AFB; Mr. Colin Berry, RAF Fairford; Col Jim Reagan and Lt Col William Giezie, Toledo ANGB; Ms. Carol Ann Beda, SAF/IEN.
(photo by Ms. Jennifer Elmore)



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