## "Make energy a consideration in all we do"

# ENERGY express

A product of the Air Force Civil Engineer Center

August 2015

## Arnold hosts site visit for one-of-a-kind ESPC

by Kevin Elliott AFCEC Public Affairs

Representatives from the Air Force Civil Engineer Center and several energy service companies recently conducted an energy savings performance contract site visit at one of the most unique Air Force bases in the world.

The Arnold Engineering Development Complex at Arnold Air Force Base, Tennessee, is the largest and most advanced complex of flight simulation test facilities on Earth, according to Arnold's website. AEDC operates 28 aerodynamic and propulsion wind tunnels, rocket and turbine engine test cells, space environmental chambers, arc heaters, ballistic ranges and other specialized units.

As such, Arnold is a small base with an enormous energy appetite.

"Both the number of personnel and the facility square footage at Arnold are pretty low compared to most Air Force installations," said Nick Hibdon, energy manager at the base. "But because of our test requirements, our energy load is comparable to some of the largest Air Force bases in the world."

So much so that Arnold has a direct phone line to the Tennessee Valley Authority to inform the utility when AEDC will be conducting tests.

"AEDC notifies TVA so the utility can have enough energy available for *continued on pg. 5* 

From left, Charlie Powell, R. Pierson Smith and Bob Bomar, stand on turning vanes inside Arnold Engineering Development Complex's 16-foot supersonic wind tunnel test facility at Arnold Air Force Base, Tennessee. Representatives from the Air Force Civil Engineer Center and several energy service companies recently conducted an energy savings performance contract site visit at AEDC. (U.S. Air Force photo/Phil Tarver/Released)

### In this issue:

## SPECIAL ESPC EDITION

- Edwards moves forward with DOD's first data center consolidation
- Schriever and Buckley release RFPs for fence-to-fence projects
- JBSA to get a lighting upgrade
- and more!



# Joint Base San Antonio to have base-wide ENABLE ESPC

by Kevin Elliott AFCEC Public Affairs

Contracting officials at Joint Base San Antonio, Texas, recently released a notice of opportunity for an ENABLE energy savings performance contract at the installation, a base-wide exterior lighting upgrade.

The projected scope of the effort includes replacing more than 4,000 exterior light fixtures with light emitting diode, or LED, units, and includes everything from simple wall pack fixtures to 135-foot aircraft parking lights.

"We targeted exterior lighting because it has the potential to bring us the most significant energy and cost savings," said Jorge Canavati, contract specialist for the project. "And we wanted to take advantage of the ESPC ENABLE model because of the streamlined process."

The ESPC ENABLE program is a Department of Energy Federal Energy Management Program initiative to provide "a standardized and streamlined process for small federal facilities to install targeted energy conservation measures, or ECMs, in six months or less," according to the DOE website. Traditional ESPCs, conversely, are larger budget, multi-year projects that sometimes include hundreds of energy conservation measures.

"The JBSA project is a great fit for the ENABLE process," said Les Martin, ESPC program manager at the Air Force Civil Engineer Center, the agency responsible for managing the Air Force's ESPCs. "It has targeted ECMs, in this case exterior lighting, and is conducive to the accelerated time table,"

The six-month time frame of ENABLE projects is possible through the use of Government Services Agency Schedule 84, special item number 246-5, and its list of pre-qualified vendors and prenegotiated pricing.

Per the FEMP website, ESPC ENABLE projects share some aspects with

traditional ESPCs, including zero upfront capital costs to the agency, guaranteed energy cost savings that exceed annual payment, prescribed measurement and verification to ensure savings are achieved, and project assistance and technical support from FEMP experts. Canavati has been pleased with the process so far.

"Third-party financing is still a relatively new concept for us in the Air Force, but everyone at FEMP and AFCEC has been really helpful and resourceful, and has been open to answering any questions I have."

Energy service companies, or ESCOs, had until June 30 to respond to the notice of opportunity. Then JBSA and AFCEC will review proposals, choose the ESCO with the best plan and schedule the work.

To learn more about the ESPC ENABLE program, visit www.energy. gov/eere/femp/espc-enable.





by Kevin Elliott AFCEC Public Affairs

441.444.44990

The Air Force Civil Engineer Center recently announced the energy service company selected to perform an investment-grade audit for an energy savings performance contract at Edwards Air Force Base, California, a project that targets the first ESPC data center consolidation in the Department of Defense.

Schneider Electric was chosen to conduct the IGA, a significant step in the ESPC process.

"It is an honor to be selected by the Air Force to help it achieve data center consolidation with an ESPC," said Michael Reed of Schneider Electric's Buildings Business Federal Team. "Schneider Electric's data center expertise ensures Edwards will receive the deep energy retrofits it needs to reach its sustainability goals."

Edwards has hundreds of servers and miscellaneous telecommunications equipment in operation in multiple facilities across the base. By upgrading to more current hardware and improving processes, the plan is to reduce both energy usage and the amount of square footage used by information technology equipment at the base.

Ittill tillt

Energy will be saved through a sheer reduction in the number of servers, said John Broughton, ESPC project manager at AFCEC.

"From an energy perspective, think of a server as a heating element," he said. "If you reduce the number of elements in a building by several hundred, you consume less energy and necessarily make less heat, which means the cooling requirements and equipment for that building can be downsized. Consolidations like this create ancillary energy-saving benefits."

The proposed scope of the ESPC includes other facilities beside the data centers at Edwards. However, because of the increasing pace of IT development "Air Force IT experts are watching to see how this project goes and will then, if all goes well, duplicate the process for their centers."

– John Broughton

and the large amounts of energy consumed by data centers across the Air Force, a third-party financed consolidation would be a meaningful success and a paradigm-shifting project for the Air Force.

"The Air Force has many data centers around the country, and this is the first one to be consolidated using the ESPC third-party financing model," Broughton said. "So, Air Force IT experts are watching to see how this project goes and will then, if all goes What is an energy savings performance contract?

ESPCs are a powerful tool to accomplish base-level energy conservation projects with no up-front cost to taxpayers. ESPCs provide energy-efficiency improvements that are financed with thirdparty funds, and typically have a performance period of 10 to 25 years.

Projects are executed by pre-qualified energy service companies, or ESCOs, that are then responsible for maintenance and operation of those upgrades over the life of the contract. The Air Force pays the ESCO back from dollars made available via lower utility and operation and maintenance costs.

To learn more about ESPCs, visit www.afcec.af.mil/energy or call the Air Force Civil Engineer Center Reach Back Center at 1 (888) 232-3721.

Air Force Facilities Energy Consumption (FY14)





Data Source: Air Force Energy Reporting System



An F135-PW-100 engine undergoes ground testing in the Arnold Engineering Development Complex's J-2 test cell. Updating this unique equipment is a goal of the energy savings performance contract at AETC. (U.S. Air Force photo/Rick Goodfriend/Released)

#### ARNOLD cont.

testing," said Morgan Hurst, ESPC manager at AFCEC. "If AEDC powered up its test equipment without notification, the amount of electricity drawn from the grid could cause brownouts or blackouts in other parts of the state."

AEDC's singular nature and disproportionate energy requirements make it both a prime candidate and a complicated site for an ESPC.

"A lot of our equipment is one of a kind, and functions as a critical piece of our mission," Hibdon said. "The ESCOs won't have a lot of down time to make repairs or replacements. And because of the unpre-

dictability of our testing schedule it will be difficult to gauge energy savings in the out years."

Despite these limitations, Hibdon is confident the ESPC will deliver results.

"I think this project is going to be good for Arnold. It will be a challenge identifying exactly which ECMs will bring the most value, but at the end I think we will have some real savings. Also, part of the value for us is that, under the ESPC model, the risk for the project is on the ESCO, and that if the risk is too high, they won't proceed. It's a fail-safe for the Air Force to make sure money isn't spent unless it will bring the expected energy savings."

Under the ESPC model, energy service companies compete to finance, design,

"It will be a challenge identifying exactly which ECMs will bring the most value, but at the end I think we will have some real savings."

– Nick Hibdon

construct and manage energy projects, and maintain the systems long-term. ESPCs range from 10 years to a maximum of 25 years, with the Air Force paying the ESCO back over the term of the contract from cost sav-

ings garnered by the higher-efficiency equipment.

The ESCOs that were present for the Arnold site visit will now prepare a preliminary assessment of the project to submit to AFCEC for review. The ESCO with the most beneficial plan, as determined by Arnold and AFCEC, will then be chosen to move forward with the effort.

#### DATA CENTER cont.

well, duplicate the process for their centers."

In August 2010, the Federal Data Center Consolidation Initiative was created to reverse the historic growth of federal data centers. The Secretary of Defense mandated the consolidation of DOD IT infrastructure to achieve savings in acquisition, sustainment and manpower costs. The purpose of consolidation is to optimize DOD computing centers and establish core data centers to support critical enterprise services, according to the DOD 2011 Data Center Consolidation Plan and Progress Report.

Executive Order 13693, released March 19, also addresses data center energy use as an ongoing concern. The implementing instructions for the EO state that centers that cannot achieve a power usage effectiveness, which is calculated by dividing the annual energy consumption of a data center by its yearly IT equipment energy use, of 1.5 should either be consolidated or closed.

However, current budget constraints make it difficult to fund data center consolidations at federal agencies, including the Air Force. So, the service decided to leverage third-party financing through energy savings performance contracts to accomplish the work.

"IT leaders are looking at this project and saying, 'If we can get this [data center consolidation] done through third-party financing, it will help our budgets and upgrade our equipment at the same time," Broughton said. "That would be significant."

Under the ESPC model, energy service companies compete to finance, design, construct and manage energy projects, and maintain the systems long-term. ESPCs range from 10 years to a maximum of 25 years, with the Air Force paying the ESCO back over the term of the contract from cost savings garnered by the higher-efficiency equipment.

# U.S. Air Force Academy launches energy overhaul of iconic facilities

by Kevin Elliott AFCEC Public Affairs

he Defense Logistics Agency Energy released a notice of opportunity recently for a unique energy savings performance contract at the U.S. Air Force Academy.

The purpose of the ESPC is similar to most – to discover and implement energy conservation measures for facilities across the installation. What sets this project apart, however, is USAFA's status as an educational institution and historic site.

"The academy is unlike any other Air Force installation," said Steve McLellan, energy program manager at the Air Force Civil Engineer Center, the agency responsible for managing the USAFA ESPC. "It's a major college campus and, as such, the primary criteria for selecting an energy service company for this project will be the contractor's demonstrated experience executing an ESPC for a college campus. While all buildings are available for consideration, academy staff wants the ESPC to focus on the cadet area and believes this is where the bulk of opportunities will be found."

Buildings in the cadet area include the cadet chapel, the Vandenberg and Sijan Hall dormitories and several other academic, dining, entertainment, administration and sports facilities.

"The academy has about 6.4 million square feet of facility space, and 4.5 million of that is in the cadet area, so that's a major target of opportunity," said Russell Hume, mechanical engineer at USAFA. "Also, 25 percent of that, 1.6 million square feet, is concentrated in two of our academic buildings, Fairchild Hall and the Consolidated Education and Training Facility."

Even for a university, USAFA's buildings and academic schedule are singular, according to Hume.

"Our facilities are unusual. For instance, our athletic complex has an ice rink and basketball arena with essentially no physical separation between them," he said. "USAFA has the largest dining facility in the Air Force, which feeds 4,000 cadets all at the same time, three times a day. These types of facilities present challenges. Also, we don't take the normal summer break that most universities do. Cadets are on campus most of the year, with very small breaks, so it is difficult to close buildings for renovations."

There are additional considerations. Founded in 1954 and expanded over the years, most USAFA facilities were designed in an iconic, International Style modernism. As such, they are historically significant and can only be altered in limited ways.

"The majority of the cadet area is in the National Historic Landmark District, so the buildings' features, and even the *continued on pg. 8* 

Photo: The Defense Logistics Agency Energy released a notice of opportunity recently for a unique energy savings performance contract at the U.S. Air Force Academy in Colorado. The majority of the projects will include facilities in the cadet area. (U.S. Air Force photo/Released)



A welder works in Building 9001 at the Oklahoma City Air Logistics Complex at Tinker Air Force Base, Oklahoma. The building is included in the energy savings performance contract going on at the base. (U.S. Air Force photo/Released)

he Defense Logistics Agency recently announced the energy service company chosen to move forward with an energy savings performance contract, or ESPC, for the Oklahoma City Air Logistics Complex at Tinker Air Force Base, Oklahoma.

Honeywell, Inc. has been invited to perform a preliminary assessment of the project, which is due to Tinker, Defense Logistics Agency Energy and the Air Force Civil Engineer Center for review by Oct. 22.

The proposed scope of the ESPC includes up to 60 buildings at the OC-ALC, totaling more than 10 million possible square feet, according to the notice of opportunity for the contract.

"The idea behind this project is to look at our facilities in a very holistic manner," said Joseph Cecrle, energy manager at the OC-ALC. "We're asking for special attention to industrial process improvements that will increase efficiencies across all of our systems. We want to address every possible opportunity."

This is the third ESPC Honeywell has conducted at Tinker. In 2006 the ESCO was awarded a project in the Navy's Strategic Communications Wing 1 area on the south side of the base. The effort involved 12 buildings and the decentralization of a small boiler plant. In 2012, a \$91 million steam plant decentralization contract was awarded to the ESCO. The project involved shutting down three central high pressure steam plants, improving a fourth and fitting 56 individual buildings on the base with high-efficiency, natural-gas fired heating equipment. Construction was completed June 29, and the effort has reduced Tinker's natural gas consumption by 30 percent.

"The Air Force Civil Engineer Center energy team is looking forward to supporting this ESPC opportunity as Tinker meets or exceeds its energy reduction goals," said Tom Laney, ESPC project manager at the AFCEC, the agency responsible for managing the Air Force's ESPCs. "Tinker is a forward-thinking base. Its previous ESPC was very successful; this one has the potential to achieve significant energy efficiency gains for the Air Force."

The OC-ALC is one of the largest units in Air Force Materiel Command. The complex performs programmed depot maintenance on many aircraft and aircraft engines for the Air Force, Air Force Reserve, Air National Guard, Navy and foreign military sales.

"One of the Air Force Sustainment Center's goals is to transform organic repair facilities into the 'Complex of the Future," Cecrle said. "This ESPC is a great opportunity for our organization to invest in that vision."

## RFP released for Schriever ESPC

by Kevin Elliott AFCEC Public Affairs

The Army Corps of Engineers, in conjunction with the Air Force Civil Engineer Center, recently released a request for proposals for a basewide energy savings performance contract at Schriever Air Force Base, Colorado.

The ESPC is to be a "fence-tofence" project, meaning energy service companies interested in the project should consider every possibility when assessing and proposing energy conservation measures.

"There are secure areas that are off limits, but for the most part, everything is on the table," said Sidney Mohseni, ESPC project manager at AFCEC. "We suggest some energy conservation measures to the ESCOs, but we encourage them to bring us their best ideas."

According to Les Martin, AFCEC ESPC program manager, one of the crucial elements of an energy conservation project is a base's energy management control system, a centralized platform for monitoring and managing facility systems across an entire base. A robust EMCS is to be part of the plan for Schriever.

"By far the greatest savings that can be achieved for all bases, including Schriever, is through a base-wide EMCS," he said. "The ESCOs can and do make many valuable upgrades, but without a mechanism to centrally monitor and control all base systems, we are not taking full advantage of these opportunities."

A site visit is scheduled for early August to allow representatives from interested companies to examine a sampling of facilities included in the scope of work, from which the ESCOs will develop a proposal for the Air Force to consider.

ESCOs have until Aug. 20 to submit their proposals.



he Army Corp of Engineers, in cooperation with the Air Force Civil Engineer Center, released a request for proposals recently for an energy savings performance contract at Buckley Air Force Base, Colorado.

AFCEC is asking interested energy service companies, or ESCOs, for a "fence-to-fence" review of possible energy conservation measures across the entire base, to maximize energy savings opportunities.

"There are plenty of energy and waters savings opportunities in this project," said Sidney Mohseni, ESPC project manager at AFCEC. "Many bases like Buckley are operating with outdated faucets and shower heads, high gallons-per-flush commodes and urinals. There is still a lot of high-intensity discharge and sodium lighting that can be upgraded. These are ready-made types of upgrades for an ESPC."

During a site visit scheduled for this August, ESCOs will be able to examine several representative buildings on the base in order to create a preliminary assessment of the project and offer their ideas for energy savings.

"We give the ESCOs the energy conservation measures that we [the Air Force] think are most valuable," said Les Martin, ESPC program manager at AFCEC. "But the companies are free to find others and bring us their ideas."

According to the RFP, proposals from interested ESCOs are due to AFCEC no later than noon CST Aug. 20.

ESPCs are third-party financed contracts that require no upfront cost to taxpayers. The ESCOs are responsible for securing financing for the projects, completing the energy upgrades, and maintaining the systems over the life of the contract, from 10 to a maximum of 25 years.

The Air Force pays for ESPCs from utility cost and operations and maintenance savings generated by energyefficiency upgrades.

Photo: Buckley Air Force Base, Colorado, plans to execute a base-wide energy savings performance contract. (U.S. Air Force photo/Senior Airman Marcy Copeland/Released)

#### USAFA cont

view-shed, are protected," Hume said. "Those will be contributing factors when considering the technologies and applications that can be used for this project. However, the ESCOs are clever and creative, so we're looking to their expertise to find valuable ECMs for this project."

The needs for innovation and industry best practices are why officials at the academy turned to the ESPC model to gain energy efficiencies.

"We've done a really good job at the academy of going after the 'lowhanging fruit' projects, those that are easy to do and gain quicker energy savings," Hume said. "But we need to go further now, and that's why we considered the ESPC process."

Under the ESPC model, energy service companies compete to finance, design, construct and manage energy projects, and maintain the systems long-term. ESPCs range from 10 years to a maximum of 25 years, with the Air Force paying the ESCO back over the term of the contract from cost savings garnered by the higherefficiency equipment.

Kirk Weiss, USAFA's energy manager, sees this project as a chance to gain significant energy savings, even considering the academy's distinctive mission and architecture.

"The ESPC contract model brings in several structural components that make it pretty attractive," he said. "The incentives, accountability and financing all make this a great way to achieve our energy goals. And there is plenty of opportunity within these buildings, even setting aside the exterior skins, so we're excited."



**Reach-Back Center** (888) 232-3721 DSN 523-6995 AFCEC.RBC@us.af.mil Energy Express is a publication of the Air Force Civil Engineer Center, Detachment 1, Tyndall AFB, Florida.

Please send your comments, story ideas and photos to afcec.pa@us.af.mil.



AFCEC Director Mr. Randy Brown

AFCEC Deputy Directors Dr. Marilyn Croach Col. Anthony A. Higdon

Director of Energy Mr. David Bek

Public Affairs Mr. Mark Kinkade

Editor Mr. Kevin Elliott

Graphic Designer Mr. Kevin Elliott