"Leading the Way in Delivering Air Force Installation Energy Assurance"

ENERGY express

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AF awards first energy savings performance contract of 2018 at Hill AFB

By J. Brian Garmon
AFIMSC Public Affairs

TYNDALL AIR FORCE BASE, Fla. — The Defense Logistics Agency recently awarded a $42 million energy savings performance contract, to be executed and maintained by Energy Systems Group, at Hill Air Force Base, Utah. This represents the Air Force's first such awarded contract of 2018.

"This joint CE and ALC project was a team effort among Hill, Ogden Air Logistics Complex, the Air Force Civil Engineer Center, DLA, and Headquarters Air Force Material Command," said Les Martin, program development division chief, AFCEC Energy Directorate. "This project will modernize 255 buildings totaling more than 9 million square feet, increasing energy resiliency, efficiency, and reliability with particular emphasis on industrial infrastructure process improvements."

An ESPC is a partnership between federal

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U.S. Air Force photo by Staff Sgt. Andrew Lee

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Capt. Jared Struck, an aircraft maintenance officer assigned to the Ogden Air Logistics Complex, poses beside an F-22 Raptor aircraft undergoing modifications at Hill Air Force Base, June 27. (U.S. Air Force photo by R. Nial Bradshaw)

agencies and energy service companies that provides energy savings, resiliency, and facility improvements to government agencies. The nature of these contracts allow agencies such as the Air Force to accomplish these goals with no up-front capital costs to the government.

This project will reduce energy consumption at Hill by over 217 billion British thermal units per year and save the base approximately $3.2 million annually, which will in-turn be used to pay for the project's total cost over the 22-year term of the contract.

The projected reduction in the base's utility spend represents an annual savings of 16.7 percent. This is equivalent to the consumption of more than 3,353 homes each year.

A variety of energy conservation measures will be implemented in this project that will help Hill add energy resiliency and offset conventional energy sources with renewable green-energy production.

New LED lighting and, where appropriate, lighting controls, will be installed on 162 buildings to save energy and improve lighting conditions. Additionally, a new 3.55 Megawatt solar array that feeds directly to the base grid will be added to Hill's renewable energy production capability. Other upgrades will be made to the steam distribution system, compressed air system, and various other ventilation and control systems.

Nickolas King, base energy manager at Hill, was asked to describe how AFCEC contributed to the success of this project.

"The AFCEC ESPC team provided valuable technical knowledge and experience that was instrumental in ensuring an ESPC that reduced energy consumption while maintaining compliance with applicable unified facilities criteria and Air Force regulation," said King.

Installations wishing to learn more about implementing energy projects such as this one may contact AFCEC through the reachback center at AFCEC.RBC@us.af.mil.

AFRL Advanced Power Technology Office seeks innovative tech solutions

By Holly Jordan
Air Force Research Laboratory

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Research Laboratory Advanced Power Technology Office, known as APTO, is reaching out to innovative entrepreneurs to help build the future of energy resiliency.

Through an Advanced Research Announcement, published May 4, 2018, on the Federal Business Opportunities website, APTO is looking to tap into new and fresh ideas to enhance energy security and readiness for Air Force installations and military operations. According to APTO Project Engineer Capt. Harold Gotwald, innovative thinking, with an eye toward efficiency and environmental impact, is critical to meeting future energy goals for the Air Force.

"What we are looking for are new and emerging ideas for advanced power generation and energy efficient technologies that can be further developed

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These lightweight solar panels on Mt. Koke'e, Hawaii, are part of the Energy Assurance at Remote Radar Sites project, a one-year effort managed by the AFRL Advanced Power Technology Office to demonstrate rapidly-deployable, off-grid energy technologies for increased mission energy resiliency in remote locations. (Photo courtesy of University of Dayton Research Institute/AJ Mouser)

Assistant Secretary John Henderson

On February 22, 2018, the United States Senate confirmed the Honorable John Henderson as the Assistant Secretary for Installations, Environment and Energy. Previously, Mr. Henderson served as the District Commander of the U.S. Army Corps of Engineers, Omaha District. In his new role, Assistant Secretary Henderson is responsible for installations strategy and strategic basing processes; infrastructure; energy; environment, safety and occupational health; and to ensure the sustainability and operational readiness of the Department of the Air Force. Shortly after his arrival, Energy Express took the opportunity to ask Mr. Henderson a few questions as he settles into his new role.

Q. You have more than 20 years of experience as a practicing engineer. How has that shaped the perspective you bring to your current role as Assistant Secretary for Installations, Environment, and Energy?
A. First, I am very grateful to the President for nominating me for this position, and Secretary Mattis and Secretary Wilson for their confidence and support. Our role as engineers is to be the professionally trained and experienced problem solvers, designers, and innovators for our respective teams. Generally speaking, our engineers find value in developing solutions to tough challenges to make our military more lethal, effective, modern, and agile. Given this, our Air Force needs our engineering professionals to step up in a big way to help our team solve some of the toughest infrastructure challenges in our history. Our engineers operate well in the uncertain environments created by complex, ill-defined problems, and work with patience and discipline toward an optimal solution set. We cannot underestimate the high level of trust and confidence that our entire Air Force team places in our engineering and science professions, and we have a responsibility to continue earning that trust as a function of our technical competence, our moral obligation to practice ethically, and total commitment to our mission and our team.

Q. I am sure you see some overlap of the energy issues from your last position and your new role. With regard to your experience in the energy sector, what is something that still keeps you up at night?
A. The short answer is energy resilience. The United States is home to some of the most robust and reliable energy infrastructure in the world, and to most people it is an afterthought until you go to turn on the switch and nothing happens. When critical installation or operational energy resources are not available at an Air Force installation, the consequences are serious. Ready and Resilient Air Force installations are critical, integral components to support the priorities of the Department of Defense; they signal commitment to our friends and serve as a credible deterrent to our foes by demonstrating we can defend the homeland, own the high ground, and project power anywhere, anytime. With today's rapidly evolving global security environment, we can no longer take our energy supply chain for granted. The threats, both natural and manmade, are far too great. Therefore, one of our highest priorities is to incorporate energy resilience into our policies and projects across the Air Force enterprise to ensure our Airmen have the energy resources they need, when and where they need it.

Q. What do you see as the biggest challenge in achieving this?
A. While we currently have many innovative energy project proposals in play, successfully operationalizing them requires adequate funding. As we work to be peerless stewards of every hard-earned dollar our taxpayers provide to us, every year we must optimize how to spend a finite budget which is prioritized to ensure that we improve lethality, readiness, and affordability across the force. Faced with this challenge, there is opportunity for the Air Force to continue improving our resilience by utilizing innovative financing solutions like ESPC, ERCIP, or PPAs, and we highly encourage Energy Managers to continue to pursue those opportunities.

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U.S. Air Force photo by Ken Holder

Henderson

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Q. In addition to energy, water is also in your portfolio. As water scarcity emerges as one of the nation's most serious threats, what opportunities do you see for solutions to address this growing threat?

A. It is important to recognize there are two principal threats related to water. First are the threats water scarcity could have on our operations at Air Force installations, and second, the risk of geopolitical instability and humanitarian crises that water scarcity in arid regions around the world could create. For example, Cape Town, South Africa could be forced to turn off the municipal water supply to about 1,000,000 homes due to the current water scarcity challenges in this region. Besides the obvious destabilization drinking water shortages would cause, Cape Town could also expect to see failures in the sanitation system, disease outbreaks, and widespread chaos created by the competition for this life supporting resource. Closer to home, to address this growing threat in the Air Force, we must first recognize and clearly communicate the risks associated with water scarcity, then continue to identify and implement opportunities to use water more-efficiently. These include innovative technologies, best management practices, building design criteria updates, sustainable landscapes, and developing alternate and resilient sources of water in areas where there is a need. Fortunately we have already started this work, as SAF/IEE Deputy Assistant Secretary Mark Correll mentioned in his March letter to the energy community.

Q. What emphasis do you place on professional development, including education, training, and certification opportunities?

A. Our Air Force takes the responsibility of growing a force of ready, trained, educated, and credentialed Airmen very seriously. We must serve as the subject matter experts for our chosen profession, and a key part of mastering our craft is working toward professional licensure and credentialing. For example, our Airmen and mission deserve the support of professionally licensed engineers as a matter of life, health, and safety just like they deserve the support of board-certified doctors for the same reasons. Part of earning the trust of the people we serve is a demonstration that we have mastered our trade, and the entire process that leads to licensure or credentialing is evidence of this mastery. Once we have mastered our craft, we must keep our skills sharp through experiential development, broadening opportunities, and professional development forums like Energy Exchange. This is a strategic investment by our Air Force for the long term benefit to our mission and the amazing people who get it done. Finally, we must constantly work to develop the next generation of builders, innovators, inventors, and problems solvers, to ensure we always have the technological advantage in any battle that we fight. We do this through STEM outreach in our schools, involvement in professional societies, and mentoring young professionals so that they too are postured well to master their craft.

John Henderson, the assistant secretary of the U.S. Air Force for installations, environment, and energy (left) listens to Trent Simpler, Army Corps of Engineers project manager for the bulk fuels facility, present tools used in the groundwater treatment facility at Kirtland Air Force Base, New Mexico, March 26. Henderson toured the groundwater treatment facility during his visit to the base. (U.S. Air Force photo by Staff Sgt. J.D. Strong II)

Q. Any final thoughts for the CE community?

A. First, it is an immense honor to serve on this awesome team of Air Force professionals. Our Air Force is on track to build a more lethal and ready force, strengthen alliances and partnerships, and deliver greater, more affordable performance in accordance with our National Defense Strategy. This requires the right size and mix of agile capabilities to compete, deter, and win. We rely on our Airmen to achieve mission success, and our CE community plays a critical role in our success by ensuring that our power projection platforms are ready and resilient. Thank you for your service to our Air Force and great Nation, and thank you for all you do every day.

A letter from Lt. Col. Josh Aldred
Deputy Director, AFCEC Energy Directorate

As I look back on the last two years I've served in the AFCEC Energy Directorate, I'm proud of the progress our team has made in transcending organizational silos across AFCEC to improve the delivery of energy to mission owners across the Air Force. This has not been an easy task given the size and conflicting priorities we balance everyday within AFCEC; and I will admit there is definitely room for more collaboration. However, our team has made considerable progress in discovering new innovative methods for analyzing data, improving community resilience, and developing new concepts to make energy a key consideration in the Air Force's common operating picture.

One of our most notable achievements is the rapid prototyping of a machine learning algorithm to analyze disparate datasets (e.g., work order history, BUILDER SMS data, linear segmentation info, and meter data). The algorithm will be used to determine when and where to invest our next energy dollar. The prototype was contracted through a non-FAR based Other Transactional Authority (OTA) contract, which allowed for a collaborative and speedy acquisition process. More importantly, we've been incorporating feedback from base energy managers to improve the user experience and optimize the algorithm to help return valuable time to our teammates at base level.

Our team has also made considerable progress in enhancing community partnerships and resilience. Over the last year, we have been working with the National Renewable Energy Laboratories (NREL) to develop a community resilience modeling tool to help identify critical energy connections between the local community and an Air Force installation. The intent of the project was to identify opportunities for investment that would be mutually beneficial for the community and the installation. Tyndall Air Force Base and Bay County, Florida, were used for the pilot study and our team plans to take the model to Patrick Air Force Base and Cape Canaveral, Florida, as a follow-on study for the 45th Space Wing. There have been numerous lessons learned from the Tyndall study and our team plans to incorporate some of NREL's best practices into the template for Air Force-wide Installation Energy Plans.

Finally, our Advanced Meter Reading System team led by Mr. Dan Gerdes and Major Matt Joseph has been working on a concept to highlight the connections between energy and mission success via a common operating picture (COP) system. The concept is still in development, but the intent is two-fold: 1) inform mission owners on real time energy system reliability in order to insure optimal mission success, and 2) help bases with "touchless" data collection and enable the roll-up of real time data from multiple types of sensors (e.g., meters, HVAC sensors, motor sensors, etc.) from multiple installations to a centralized enterprise energy operations center. This is similar to what industry is already doing and our team is working through the cybersecurity hurdles to make this vision a reality.

In conclusion, I'm very excited for the future of the Energy Directorate and see a lot of goodness in store for the Air Force through some of our recent initiatives. I would like to thank the AFCEC Energy staff and our base energy managers for a very memorable and meaningful assignment. I've been blessed to be a member of a great team and I can't wait to see the great things AFCEC Energy accomplishes in the near future.

Civil engineers working to give Edwards bright future

By Laura Motes
412th Test Wing Public Affairs

F-35B Lightning II with the Royal Air Force 17th Test and Evaluation Squadron assigned to Edwards Air Force Base, Calif., is refueled by a KC-10 Extender with the 78th Air Refueling Squadron located at Joint Base McGuire-Dix-Lakehurst, New Jersey, over California Sept. 13, 2017. (U.S. Air Force photo by Staff Sgt. Michael Ki Hong/Released)

EDWARDS AIR FORCE BASE, Calif. — The 412th Civil Engineering Group is in phase two of a base-wide, major lighting upgrade, which replaces inefficient fluorescent lighting with new LED lighting complete with motion sensors and programmable controls. Each phase will take about a year to complete.

"In California the average home uses 6,684 kilowatts and we saved 2,310,108 kilowatt hours, which is equivalent to powering 345 California homes," said John Shartzer, 412th CEG Energy and Utilities engineering technician.

New LED lights are brighter and work more efficiently than what workers are accustomed to. Previously, lighting in some hangers was so inefficient that maintenance workers would need to bring in light stands to see what they were doing, according to Shartzer.

Lighting was not only replaced, but additional fixtures were also added to base aircraft hangers. The new light fixtures' motion sensors allow for only essential lights to be on when needed. Once a worker leaves a lighted area with the sensors, a timer times out and the lights are turned off, saving a lot of energy, Shartzer said.

Phase one cost $3.9 million with upgrades made to eight buildings consisting of hangers and administration offices. Lighting fixtures were replaced, and in some offices, retrofit kits were used to improve lighting.

The new LED lights can be controlled by an app downloaded to smartphones or tablets to regulate the brightness of the lights and control when lights turn on and off. Lighting can be customized for each office.

Shartzer said the cost savings for phase one is $927,000 annually. Cost savings is not just in the energy savings, but also in maintenance and demand charges. The lighting is made by a Southern California company who offers a 10-year warranty on all their products covering the lights if they break and if there is degradation.

"If I go in and take a light level reading today and its 100, and come back in 10 years and its 95, they will replace the light and pay for labor to have it reinstalled," said Shartzer.

The second phase of the project began April 16. Eight more buildings are being upgraded. Light fixtures in the Exchange and food court will be replaced as well.

In the third phase, 46 buildings will be upgraded throughout Edwards AFB making it the largest lighting effort. The additional annual savings for phase three will be $923,000 and it will save 4.6 million kilowatt hours.

"Our projects are geared to improve working conditions and save money not only on the base but for the taxpayer. That is important for our office to do and we are not done," Shartzer said.

JBSA continues its quest to be energy smart

By Mary Nell Sanchez
502nd Air Base Wing Public Affairs

JOINT BASE SAN ANTONIO–LACKLAND, Texas — As temperatures continue to climb, and summer is just around the corner, many people are keeping a close eye on their utility usage as they struggle to beat the heat.

Imagine this: an annual energy bill of approximately $72 million to keep the lights on; air conditioners cooling; water running; and gas appliances working all to meet the mission of Joint Base San Antonio. That is what 502nd Civil Engineering Energy and Utilities Section Chief Thomas Mieczkowski says JBSA spends.

"Our job in utilities and energies is to reduce that bill, find inefficiencies in the way we heat and cool our facilities, keep the lights on and be more effective with any other systems that use electric, gas, water or sewer," said Mieczkowski.

JBSA's energy bills encompasses JBSA-Lackland, Randolph, Fort Sam Houston, Camp Bullis, Medina Annex, Seguin, Canyon Lake, and four other smaller locations. As efforts to be more energy efficient continue, some projects are already underway with the hopes of reducing that annual amount.

"We have a number of projects to replace fluorescent lighting with LED lighting, which is a huge savings," said Mieczkowski.

Light-emitting diode, or LED, lights feature reduced wattage and last longer. Projects such as this are made possible by Air Force funding, but JBSA competes for those funds with other military installations.

"To cool our facilities and to make them comfortable, costs a lot of money," said Mieczkowski.

There are over 4,000 facilities on JBSA, covering more than 34 million square feet inside the facilities and 47,000 acres of land, according to Erica Becvar, 502nd CES Portfolio Optimization (Programming, Planning, Energy) chief.

The practice of conserving energy is a daily challenge. All the JBSA buildings have different ages, insulation, and various hours of operation that must be considered. An example of this are the buildings at JBSA-Randolph and JBSA-Fort Sam Houston.

Courtesy U.S. Air Force

"We're limited by what we can and can't do in the buildings as we work with the Texas State Historic Preservation Office," Becvar said.

Teaching energy awareness is also an ongoing mission.

"I want to believe people are being more conscious of [energy use], said Mieczkowski. "We are trying to encourage people to allow thermostats to get turned up."

JBSA's policy calls for air conditioners be set at 76 degrees during summer months and 72 degrees in colder ones.

"Most of the HVAC systems are centralized, serving various zones within a facility. Unfortunately, if zones are not designed correctly or loads change over time, it can become very difficult for a centralized system to make everybody happy," he added.

Another measure, already implemented, to conserve energy is the Demand Response Program.

"At a call from City Public Service during peak time, we will trim back the temperatures in some buildings. We're only going to raise the temperatures a couple of degrees," said Mieczkowski.

He adds his office will see how people respond to that and still maintain comfortable levels. His office will then measure and verify energy savings. If the pilot program works well, he'll consider doing the same in other buildings.

Smart meters will also be installed on the facilities which make up 75 percent of the energy consumed at JBSA. The data received from these meters will allow JBSA energy managers to baseline buildings, establish benchmarks, and monitor improvements in energy usage.

JBSA hospital facilities pose a special challenge in the quest to keep them cool because they typically use 100 percent outside air.

"If we are taking 100 degree outside air and cooling it down to 55 [degrees] to make it comfortable in the facility, that requires a considerable amount of energy," Mieczkowski said.

Because every structure and mission is different, certain measures to conserve energy may not be able to be implemented. Looking ahead, newer buildings will be outfitted with energy saving features.

Overall Texas electric rates are favorable for consumers which can make the economic justification of projects more difficult.

For now, JBSA may explore a one-degree temperature setback. When calculated using the 34 million square feet of facilities space and the cost of electricity, just the one degree change in temperature results in over $4 million in annual savings for JBSA.

"This energy measure merely requires advocacy from base personnel," Mieczkowski said.

In October, the 502d Civil Engineering Energy and Utilities Section will partner with City Public Service at JBSA to educate people on how they can play a role in conserving energy.

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and transitioned to meet military needs," said Gotwald. "These products should maintain a focus on energy resiliency, efficiency, cost-effectiveness, and environmental sustainability with a demonstration and evaluation to further enhance the Technology Readiness Levels of those systems."

An Advanced Research Announcement such as this differs from Broad Agency Announcements in that it provides for more advanced types of research and development.

ARAs may involve special factors or requirements such as higher budget activities of R&D appropriations, non-R&D appropriations, prototyping, or system- or hardware-specific work.

This ARA, which remains open until May 2, 2023, calls for the development of "alternative energy and energy efficiency technologies to provide increased capabilities and benefits to Air Force installations, equipment, and aircraft."

> ***"What we are looking for are new and emerging ideas for advanced power generation and energy efficient technologies that can be further developed and transitioned to meet military needs."***
>
> ***— Capt. Harold Gotwald, APTO Project Engineer***

"The parameters of this announcement are broadly-defined because we want to explore a wide range of advanced solutions for a wide range of situations," said Gotwald.

APTO's mission is to guide the development and execution of numerous advanced technology demonstrations supporting a comprehensive framework for energy assurance projects that can be replicated across the Air Force.

The ARA, titled "Government Requirement for Advanced Power and Energy (GRAPE)," (FA8650-18-S-5008), can be found at the Federal Business Opportunities website at: https://www.fbo.gov/spg/USAF/AFMC/AFRLWRS/FA8650-18-S-5008/listing.html.

If you would like to nominate someone to be profiled in an upcoming issue, please contact us at afimsc.pa.workflow@us.af.mil.

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