"Make energy a consideration in all we do"

ENERGY express

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From front to back, Lt. Gen. John Cooper, the Air Force deputy chief of staff for logistics, engineering and force protection; Lt. Gen. David Halverson, the Army assistant chief of staff for installation management; Miranda Ballentine, the assistant secretary of the Air Force for installations, environment and energy; and Katherine Hammock, the assistant secretary of the Army for installations, energy and environment sign a memorandum of agreement that formalizes the partnership between the services' energy offices at the Pentagon, Washington, D.C., April 6, 2016. (U.S. Air Force photo/Tech. Sgt. Bryan Franks/released)

Air Force, Army build partnership for energy assurance

By Tech. Sgt. Joshua DeMotts
Secretary of the Air Force Command Information

WASHINGTON (AFNS) -- The military's ability to accomplish its missions -- whether executing today's fight or training for future ones -- is dependent on electricity that powers installations. The Army and Air Force have identified energy resilience as a critical objective, advancing the capability for their systems, installations, and personnel to respond to and recover from unexpected disruptions.

The Air Force recently established its Office of Energy Assurance, which will develop an integrated facility energy portfolio. The Army's Energy Initiatives Task Force was established in September 2011, and became an enduring organization, the Office of Energy Initiatives, in October 2014. The OEI serves as the central management office for implementing large-scale renewable and alternative energy projects, while leveraging private-sector financing.

Now, both offices will share support

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Earth Day 2016

AFCEC's dedication to environment through energy

By Nathan Smith
AFCEC Public Affairs

President Barack Obama issued Executive Order 13693, "Planning for Federal Sustainability in the Next Decade," March 19, 2015, where he outlined his policy initiatives for the federal government to cut greenhouse gas emissions.

Paula Shaw, Air Force sustainable design and development subject matter expert at the Air Force Civil Engineer Center, said this order bodes well for the federal government's broader effort to reduce its carbon footprint.

"There's a recognition, not only at AFCEC, that using renewable energy sources contributes to the reduction in greenhouse gas emissions," Shaw said.

As the order states, "… we have the opportunity to reduce agency-direct greenhouse gas emissions by at least 40 percent over the next decade while, at the same time, fostering innovation, reducing spending and strengthening the communities in which our federal facilities operate."

As part of a larger push to achieve that goal, the AFCEC Energy Directorate at Tyndall Air Force Base, Florida, has outlined its own set of goals to do its part in reducing the federal government's carbon footprint.

The engineers at AFCEC achieve these goals by approaching each base's energy needs on a case-by-case basis and using their own ingenuity to find renewable energy sources at each specific base.

For example, at Joint Base San Antonio, Texas, where AFCEC headquarters is located, engineers identified an opportunity to make the installation more sustainable by taking advantage of South Texas' sunshine with an enhanced use lease. The EUL led to the construction of a solar array that produces 4.5 megawatts of renewable energy, enough energy to power 738 homes.

Click here to see an AF Energy video for Earth Day 2016

Green Spotlight:

Air Force sustainability gains new leader

By Amanda Pagan
AFCEC Public Affairs

As part of the Air Force's commitment to sustainability, the Air Force Civil Engineer Center recently established the official Air Force Sustainable Design and Development Subject Matter Expert, or SME, position.

The position is being filled by former subject matter specialist Paula Shaw who has been widely recognized for her work in advancing Air Force sustainable design practices.

"[Paula] has essentially developed the program for the Air Force and over the years has become very well-known across the Department of Defense and numerous other federal agencies who are required to incorporate sustainability in their design and construction programs," said Gene Mesick, AFCEC's technical services division chief.

Before working for AFCEC, Shaw began her Air Force career at Loring, McChord and Holloman Air Force bases. After achieving a degree in mechanical engineering from the University of Maine at Orono and graduation from the Air Force PALACE Acquire program, she quickly gained experience across the engineering and energy fields that ultimately prepared her for her current sustainability work.

"The beginnings of sustainability within the Air Force are traced back to 2001 with the first Air Force policy letter," Shaw said.

In the following years, sustainability would continue to transition across the federal portfolio with executive laws and orders released by the president's office

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Army-Air Force, continued from pg. 1

staff, business processes and best practices.

The services formalized this partnership April 6 during a ceremony at the Pentagon. The memorandum of agreement, signed by Katherine Hammack, the assistant secretary of the Army for installations, energy and environment; and Miranda Ballentine, the assistant secretary of the Air Force for installations, environment, and energy, shows the importance both services place on clean, reliable and affordable energy.

Hammack stressed this partnership was vital for the Defense Department and would continue to push the Army's energy goals.

"The Departments of the Army and the Air Force share a common commitment to securing our installations with energy that is clean, reliable and affordable," Hammack said. "I am pleased that through this agreement, we can share lessons learned and leverage the relationships we have developed with government, industry and utilities for the benefit of both our services."

While the establishment of the Air Force OEA cemented the Air Force's focus on energy resiliency and strategic energy agility, Ballentine said this partnership would advance that capability.

"This Army-Air Force partnership will accelerate our goal of providing mission assurance through energy assurance," she said. "The Air Force, Army and Navy fight the fight together; we are one joint force, and our jointness is what makes us formidable around the world. Installation energy projects are another area where a joint approach and strong collaboration can help us do more, faster."

Lt. Gen. John Cooper, the Air Force deputy chief of staff for logistics, engineering and force protection, also signed the memo and said the Air Force is a globally networked force with critical missions and operations that are reliant on access to energy to accomplish the mission.

"We execute almost all our missions from our air bases, so building partnerships like this will ensure our resources and approaches are focused on mission assurance and resiliency," he said.

Lt. Gen. David Halverson, the Army assistant chief of staff for installation management, also signed the memo on behalf of the Army.

"This agreement is a framework for collaboration between the Army and the Air Force on policies, procedures and partnerships that support our energy missions," Halverson said. "We are excited to work with the Air Force in this effort. This partnership will identify and expand potential renewable energy opportunities across Army and Air Force installations."

According to the memo, the partnership provides a framework for cooperation and support in the development of renewable energy projects, establishes the expectations and requirements of each service, and demonstrates both services' focus on achieving energy assurance.

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and with the Energy Policy Act of 2005.

"When I came to AFCEC in 2006, the federal sustainability requirements were beginning to be better defined," Shaw said. "There were many documents that comprehensively defined our project requirements including integrated design process, energy efficiency, water conservation, maintaining our indoor spaces so that they are healthy and material selection such as using recycled and low VOC (volatile organic compounds) materials."

As a result of all the new changes, a decision was made to begin a collaborative effort amongst the services to write a guidance document that would include all of the federal requirements—an effort Paula continues to participate in today.

"To the extent that we can standardize what we ask from our contractors, it not only benefits the Air Force and all of DOD (Department of Defense), but also it makes it easier for our industry partners to understand the goals of our projects," Shaw said. "So to have a document with all the federal requirements in it—an agreed-upon document by all of the services—was a big step forward."

Since Paula has been with AFCEC, sustainability in the Air Force has continued to grow to encompass more than just energy-saving practices, evolving into a much larger program that impacts all design and construction activities with the aim to increase efficiency, conserve resources, save money and create a better working environment. Establishing the new AFCEC SME position was another step forward.

"We finally have a Design and Development Sustainability SME," Mesick said. "We received approval to accredit the position once AF leadership recognized this function as critical to our construction programs, resource conservation, and quality of life."

Mesick explained that they needed a kind of "jack of all trades" to fill the position—someone who could successfully take on the diverse responsibilities of the sustainability field. Shaw, who had to compete for the position and was ultimately chosen, is someone Mesick believes absolutely fits that role.

"For Paula, from a day-to-day standpoint, her work really hasn't changed significantly. She has been in the function effectively for the last 10 years and has made the program what it is, and has advanced sustainability across the Air Force, bringing it to its current prominent state," Mesick said.

In her new role as a SME, Shaw will be recognized as a technical expert in her field and given a certain measure of authority when it comes to making decisions. She will continue to interface with Air Force and other agency leadership and help with interpreting requirements.

While Shaw is humbled to have been selected for the position, she emphasized that she didn't act alone.

"So many people have contributed to the program along the way," she said. "It's important to me to acknowledge their efforts. It's been a journey and we have so much yet to do."

Col. Brian May

Facility Engineering Director
Air Force Civil Engineer Center

AFCEC's Facility Engineering Directorate provides centralized design, panning and execution for military facility construction, sustainment, restoration and modernization. As the directorate's leader, May gives his support to mission assurance through energy assurance and offers advice to base civil engineers on how to do the same.

How does AFCEC's Facilities Engineering Directorate influence Air Force energy objectives?

The Facilities Engineering Directorate supports AF energy objectives by building sustainable, resilient installations. New construction and major renovation projects provide ideal opportunities to incorporate energy-efficient systems and sustainable building technologies. Whether we're completing an Energy Conservation Investment Project—like constructing thermal energy storage — or replacing an aging building, we seek opportunities to include cost-effective, sustainable energy solutions.

Return on investment and system maintainability drive our energy design and construction decisions. New buildings are required to be 30 percent more energy efficient than the American Society of Heating, Refrigerating, and Air-Conditioning Engineers 90.1 baseline building. This creates a challenge as the efficiency of each new version of ASHRAE 90.1 increases. We also take life-cycle cost effectiveness into account.

The Facilities Restoration, Sustainment, and Modernization program enables us to improve energy efficiency of the Air Force's existing building portfolio by incorporating energy improvements to building systems that are part of the renovation, to the extent that it is life-cycle cost-effective.

The Facilities Engineering Directorate

also supports AF energy objectives by providing technical guidance. For example, the primary goal of the Air Force Corporate Facilities Standards is to optimize mission success while reducing initial cost, life-cycle costs, energy use and water use. This guidance defines expectations for Installation Facilities Standards and professional A-E design decisions. This shapes AF design and construction decisions world-wide.

In your experience, how has energy's role changed for installations and within the Air Force civil engineering enterprise?

The Air Force has long emphasized reducing installation operating costs through improved energy efficiency. This has resulted in a higher degree of energy-minded thinking within the civil engineering culture. Energy considerations used to be an afterthought instead of driver in our facility projects. Today, energy considerations are an integral part of planning and design. We recognize the link between energy assurance and mission assurance, and that energy assurance is more than having backup generators at critical facilities. Today's Air Force invests in energy generation where the resources exist and are life-cycle cost-effective. We also consider islanding, microgrids and energy storage — especially where solar and wind technologies have been deployed.

In today's fiscally constrained environment, I expect the AF to rely heavily on public-private partnerships to meeting energy goals.

Today, energy considerations are an integral part of planning and design.

How do you apply "Mission Assurance through Energy Assurance" to your projects?

Conservation, reliability, redundancy, islanding and microgrids are key components of energy resiliency. Energy and water conservation have long been standards applied to projects; conquering the other components requires an integrated approach across all CE business lines to identify critical mission elements and the opportunities to enhance their energy assurance.

For example, an ECIP we recently executed at Clear Air Force Station, Alaska took the base's 53-year-old coal-fired plant offline and connected the base to the Alaskan power grid with a newly-constructed substation. Alongside the Army Corps of Engineers, we also added a grid-powered heat plant and additional backup power. This is imperative in a location where prolonged loss of heat requires evacuation. On top of gaining a reliable energy source, the base also avoided $16 million in required plant modernization and cost savings in operation, maintenance, labor and fuel will save the Air Force approximately $2.6 million in Fiscal Year 2016 and $1.9 million each year after.

Project siting is also key to enhancing resiliency — locating projects adjacent to redundant infrastructure and programming to capture connection costs. This ensures projects include the proper design and construction elements to connect to existing redundant components and microgrids when they exist, and expand and develop when they do not.

How does sustainability support Air Force energy initiatives?

Sustainability is a measure of an entity's capacity to remain viable in a dynamic, resource-constrained environment. Energy is a key component of sustainability for Air Force installations. In order to Fly, Fight and Win, the Air Force needs installations with reliable energy sources — installations with on-site power generation, backup power capabilities and cost-effective energy-efficient buildings.

The Air Force plans to have 30 percent of facility power requirements met by renewable energy sources by 2025. Meeting this goal requires eliminating excess infrastructure and investing in renewable energy technologies. AFCEC plays a leading role in the European Installation Consolidation. The EIC will divest three installations in the United Kingdom. Organizations at two of these installations will be consolidated in new facilities at RAF Croughton. The consolidation will reduce annual base operating costs by $75 million through a net reduction of its installation footprint in England and the construction of sustainable, energy efficient facilities. A similar divestment of RAF Mildenhall is projected to save the Air Force $125 million annually, with a significant portion associated with reduced facility sustainment costs.

What advice do you have for base civil engineers with respect to working energy assurance into their projects? What are the benefits?

The key to working energy assurance into projects is considering opportunities in the early stages of project planning. Efforts to force energy assurance into a project as an afterthought are more likely to drive redesign, suboptimal solutions and additional costs. When leaders place emphasis on increasing energy efficiency and resiliency and reducing the total cost of ownership from the onset, end users and subject matter experts can work together to increase energy assurance without adversely impacting facility functionality or construction costs.

AFCEC's new AMRS lab

By Jessica Dupree
AFCEC Public Affairs

Engineers and information technology specialists at the Air Force Civil Engineer Center at Tyndall Air Force Base, Florida, officially opened a new advanced meter reading system lab during a ribbon cutting ceremony April 12, 2016.

The AMRS lab will be used to test multiple meters for cyber security measures and compliance with AMRS before the meters are installed at an installation. It also allows AMRS experts at AFCEC to find the appropriate retrofits for meters that are not AMRS compliant, preventing an installation from replacing all existing meters and potentially saving Air Force dollars.

"It is much cheaper to install an adapter to all the meters on a base than it would be to replace them with an AMRS-compliant meter," said Nate Shiflett, a communications engineer at AFCEC. "Now, we can get those answers here."

By feeding electric and gas data to the meters at the lab, engineers and technicians will measure each meter's performance using a monitor similar to what energy managers can expect to see at their installations.

"It lets us see what they will see," said Shawn Wilson, information technician at AFCEC.

The AMRS team is expected to roll out the program at eight installations in fiscal year 2016.

"This lab is definitely a big step forward for advanced meter reading," said Shannon Brittain, AMRS program manager at AFCEC. "And a big step forward for AMRS is a big step forward for energy resilience in the Air Force."

(Above) Different meter models are lined up along the new advanced meter reading system lab's wall. Researchers can change the configurations that connect the meter to the AMRS to test compliance and cyber security. (Below) Nate Shiflett, a communications engineer at the Air Force Civil Engineer Center, explains the different features of the advanced meter reading system to Abel Luna, an AFCEC budget analyst, left, and David Bek, AFCEC energy director. (U.S. Air Force photos/Jessica Dupree/released)

AFCEC Energy Director David Bek bids farewell

Bek has led AFCEC's energy directorate since September 2013. Since then, the Air Force has made amazing strides in facility energy, partly due to his leadership and support.

For the past two-and-a-half years, I have been on a journey of energy conservation, assurance and resilience as the Air Force Civil Engineer Center's energy director. On that journey, we have made amazing strides in spite of limited resources. Since I began my leadership role, we, as an Air Force, have saved more than three trillion British thermal units of energy while accomplishing our missions, translating to a utility cost avoidance of $50 million per year. Truly, those in the facility energy arena have done an awesome job. Let me go into more detail.

Renewable Energy

The Air Force produced 72 megawatts of renewable energy in 2014. That number has grown to 120 MW with several projects in the acquisition pipeline that will provide an additional 300 MW when complete. Each megawatt of renewable energy generated on base is the basic building block for energy security and energy resiliency. In the future, we will be adding microgrids and battery storage capabilities to provide a measure of protection against commercial grid failure for our most critical missions.

Energy Saving Performance Contracts

We had only two or three energy saving performance contract projects valued at about $100 million total in development. Now, we have 32 projects valued at more than $1 billion in the ESPC pipeline. When these projects are complete, we will save about one trillion BTUs. That's one trillion BTUs of power we will no longer need for our Air Force missions.

Energy Conservation Investment Program

The energy conservation investment program, or ECIP, is a subset of the Department of Defense-wide military construction program, which is designed to fund smaller-scale projects that generally run from $750,000 to $20 million each. The projects are designed to save energy or water, produce energy or generally reduce the DOD's energy costs.

When I started this energy journey, AFCEC was awarded

about $35 million per year for ECIP funds. For the past three years in a row, we have been allocated more than $40 million per year. This is a measurement of our projects' strengths and their ability to compete well against the other DOD service requirements.

Utilities Privatization

We have privatized six systems through AFCEC Energy's utilities privatization program. The UP program now saves $520 million over the life of the contracts simply by bringing these utility systems up to industry standards. Plus, we have proven privatizing these systems reduces natural gas and water usage by an average of 32 and 28 percent respectively.

Sustainment Restoration and Modernization funds

We went backwards in this area. One of the initial consequences of retiring the energy focus fund was bases stopped submitting energy projects for SRM funds. This resulted in a low of $13 million dollars for projects in fiscal 2016. We have worked to turn that around and expect to produce more projects in fiscal 2017. At the base level, let me encourage you to submit energy savings and resiliency projects; they will compete well for funding! So, bring them forward in the comprehensive asset management plans.

Utility Rates

In the first six year cycle of utility rate analyses, we identified more than $100 million in utility rate savings. In partnership with the Air Force Legal Operations Agency, we have avoided costs of more than $733.32 million through engagements with state, public and private utility providers.

> As I wrap up my time as director of energy, I cannot contain my *pride*.

Advanced Meter Reading System

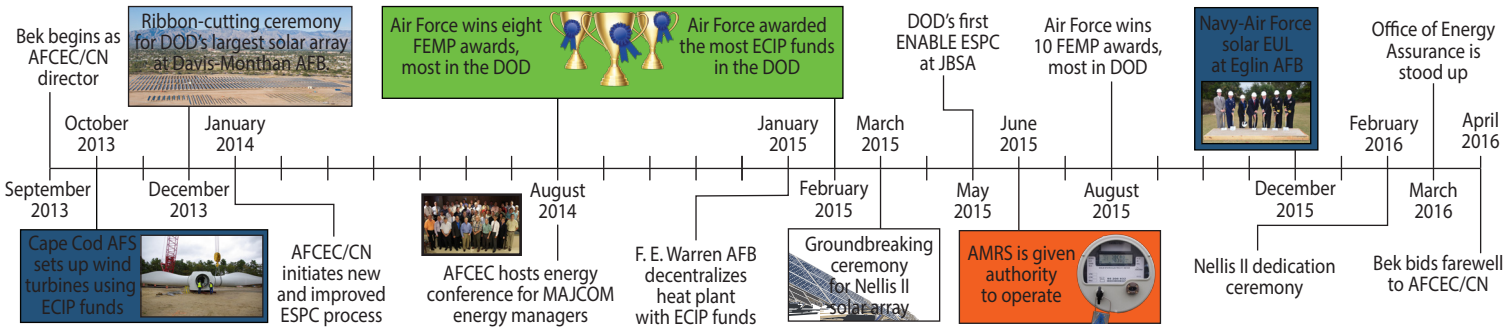
We were able to restart the advanced meter reading system program after establishing approval from the secretary of the Air Force. AFCEC will be implementing AMRS at 42 of our largest energy consumption installations. The ultimate goal is to capture 60 percent of all facility energy consumed. We have completed site surveys for 12 installations and awarded three contracts to date, with eight more contracts coming this year totaling $8.5 million.

Conclusion

When we sum it all up, the $1 billion Air Force facility energy utility bill for fiscal year 2015 would have been $700 million more had the bases not moved forward with their energy conservation and projection opportunities. I must extend my gratitude to the base staffs who worked with our teams of engineering, procurement and legal specialists. We have made real progress towards meeting mission assurance through energy assurance. As I wrap up my time as director of energy, I cannot contain my pride.

There is still a lot more work to be done within the Air Force facility energy realm, and so the future looks bright in terms of the impact we can have. We have had shining examples at many of our bases of the creative approaches taken to accomplish our energy goals through collaboration and teamwork. I encourage you to continue the path you are on, finding newer ways to provide resiliency, assurance and conservation, and addressing continual change as the bedrock for the journey we are on.

As I transition to my next leadership opportunity, I depart with extreme gratitude for the privilege of leading facility energy into the future! And, I will join those of you in the operational world in accomplishing much more in facility energy!



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