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ENERGY express

A product of the Air Force Civil Engineer Center

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New waste-to-energy system unveiled

By Hawaii Air National Guard and Department of Business, Economic Development and Tourism staffs
154th Wing Public Affairs

JOINT BASE PEARL HARBOR-HICKAM, Hawaii -- The High Technology Development Corporation's Hawaii Center for Advanced Transportation Technologies sponsored a demonstration of a $6.8 million renewable and clean, waste-to-energy generating system here Feb. 19.

The demonstration runs through this summer at Joint Base Pearl Harbor-Hickam, near the campus of the Hawaii Air National Guard, and was done through a contract with Biomass Energy Systems, Inc. The waste-to-energy project showcases the efficacy of converting 10 tons of waste per day

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Onlookers view the demonstration of a $6.8 million renewable and clean, waste-to-energy generating system at Joint Base Pearl Harbor-Hickam, Hawaii, sponsored by the High Technology Development Corporation's Hawaii Center for Advanced Transportation Technologies, Feb. 19, 2016. The new system is one part of the Hawaii Air National Guard's renewable energy strategy. (U.S. Air National Guard photo/ Senior Airman Orlando Corpuz/released)

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AFSOC facility successfully runs with net-zero energy

By Jess Echerri
AFCEC Public Affairs

The Air Force Special Operations Command's Source Selection Facility at Hurlburt Field, Florida, is the first Air Force facility to operate at a net-zero energy capacity.

The facility was designed to produce more energy than it consumes, making it a net-zero energy building, or NZEB.

Photovoltaic solar panels on the north-facing roof collect sunlight during the day and feed that energy into the commercial grid. The local utility then pays for the energy in the form of a credit on the installation utility bill.

"The very first month we did this, we saved $214 with our solar panels," said Romeo Reyes, contract administrator at Hurlburt's 1st Special Operations Contracting Squadron. "And we did not even have a full staff working inside the building at that time."

In order to reduce the energy required to run the facility, numerous energy-efficiency and energy-conservation components were integrated into the building design. Heating, ventilation and air conditioning, and lighting enhancements were designed to reduce energy usage.

"When you are in this building, it is basically like you are standing in a cooler," Reyes said. "It has extra insulation so it cuts down on HVAC costs."

The lighting and HVAC systems are motion activated, so each system will only be turned on when someone is in that room. This feature is especially useful in a source selection facility, because some rooms are only used when a selection is in progress.

Water conservation is also integrated into the facility design. Rain water is collected outside the facility and that grey water is recycled for use in toilets while potable water is used for sinks.

"These facilities help to educate the military," said John Kitson, resource efficiency manager at the 96th Civil Engineer Group at Eglin Air Force Base, Florida. "We want to change the perspective on energy so everyone views each electron of energy or each drop of water the same way they look at fuel."

Photovoltaic solar panels line the north-facing rooftop of the Air Force Special Operations Command Source Selection Facility. These panels collect enough energy during the day to power the facility and supply excess energy back to the grid, making the facility a net-zero energy building. (U.S. Air Force photo/Jess Echerri/released)

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to electricity using a state-of-the art gasification technology.

The Air Force Research Labs selected the HIANG's 154th Wing to demonstrate an integrated microgrid concept that tests the viability of using renewable energy and microgrids to assure that the Air Force can continue mission critical operations regardless of the state of the public utility grid or cyber-attack. Phase I of the microgrid will utilize a rotary kiln gasifier that turns waste into fuel, heat and electricity.

"The Air Force's effort to develop a microgrid testbed in Hawaii will help ensure that the Air National Guard has access to the energy it needs to execute its defense and homeland security missions, while providing a proof of concept that clean energy and microgrid technologies can support the Air Force's broader energy security goals," said Sen. Brian Schatz.

JBPHH was selected based on Hawaii's variety of renewable energy sources, the high cost of electricity and complexity of the Hawaii Air Guard's 154th Wing, which operates the F-22.

"The Hawaii Guard's flying wing is as complex as any Air Force fighter wing, but in a much more compact footprint," said Gen. Stan Osserman, HCATT director and former HIANG commander.

The waste-to-energy project represents an investment by the Air Force to determine the feasibility of solving the challenge of waste disposal with the opportunity to offset the cost of electricity on base. The system at JBPHH was built by BESI. It is designed to handle between two and ten tons of waste per day and generate a net 200 to 300 kilowatts of baseload power using four generators run from the syngas produced by the gasifier.

"The system is clean, reliable and rugged," said Renee Comly, president and CEO of BESI. "We are pleased to demonstrate how a system like this can be a real asset as we move towards a world run on clean energy."

Green Spotlight:

Air Force Design Awards winners are more than a pretty facade

By: Paula Shaw, PE, LEED AP
Air Force Sustainable Design and Development Subject Matter Expert

Winning one of the Air Force Design Awards requires more than just a pretty façade. All three award categories — Facility Renovations and Additions, Landscape Architecture and Facility Design — require nominees to submit specific details on how sustainability, including energy efficiency and water conservation, was addressed by the project. The award winners are representative of outstanding accomplishments Air Force wide. A recent example is a 2015 Merit Award in the Facility Design category – the Luke Air Force Base F-35 Academic Training Center in Arizona, which achieved the following:

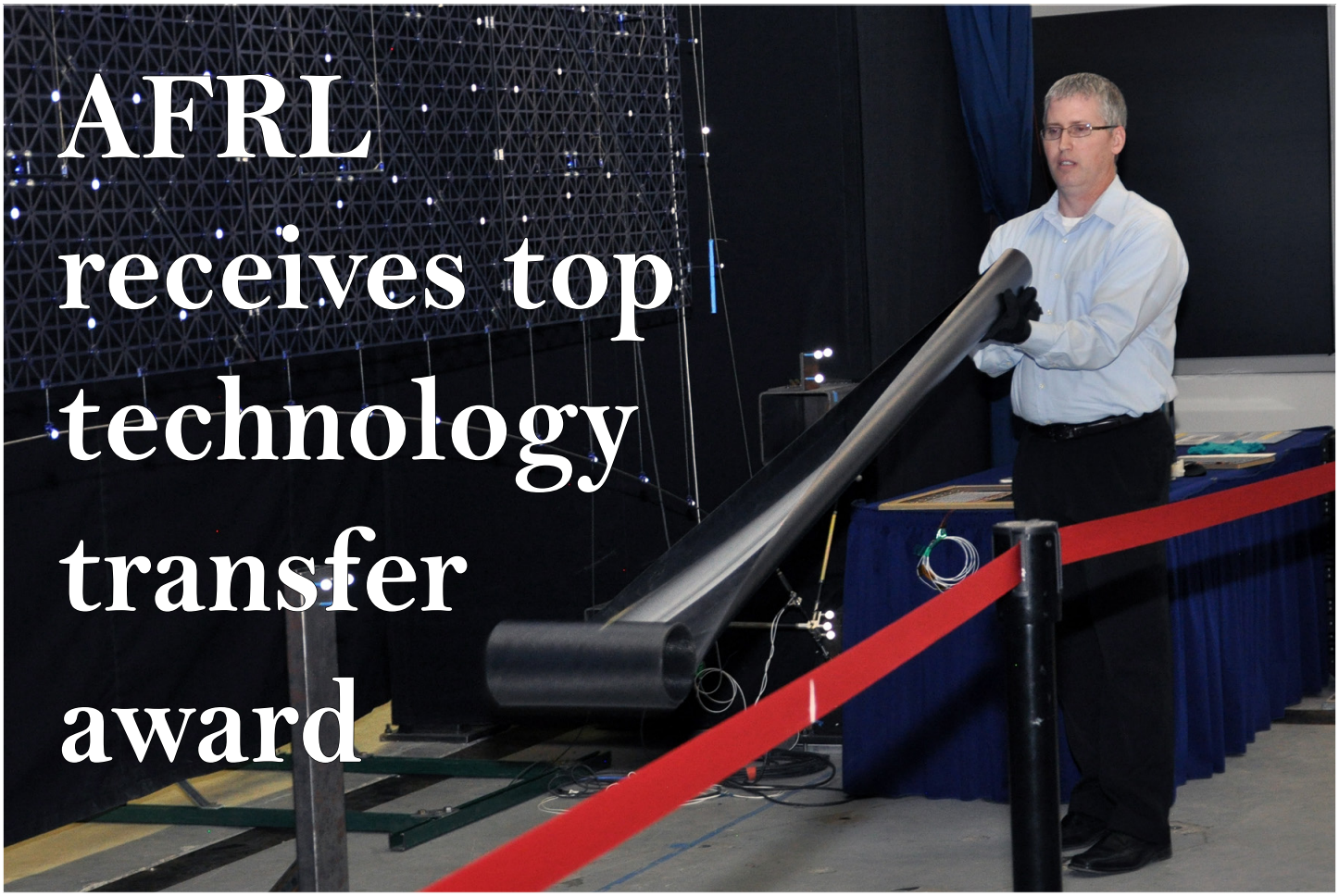
- 52 percent estimated energy consumption reduction
- 40 percent estimated reduction in electricity consumption
- 42 percent estimated reduction in potable water use
- 70 percent demolition and construction waste diversion

The award jurors were particularly impressed by region-specific features such as light-colored masonry and insulated metal wall panels; a white, standing-seam metal roof; and pre-weathered steel window shades which contributed to the energy efficiency of the facility. The overall effect was described by jurors as a stunningly-creative design.

Do you know of a project you want to nominate for a USAF 2016 Design Award? Visit http://afdesignawards.wbdg.org/AFDawards/index.asp

Luke Academic Training Center received the 2015 Merit Award in the Facility Design. The white, standing-seam metal roof challenges longstanding architectural standards. (Alistair Tutton Photography/released)

AFRL receives top technology transfer award



By Alarie Ray-Garcia
Air Force Research Laboratory

KIRTLAND AIR FORCE BASE, N.M. -- An Air Force Research Laboratory technology, and the scientists and engineers who developed it, are being honored with one of the nation's top technology transfer awards.

The Federal Laboratory Consortium for Technology Transfer selected AFRL to receive a 2016 Excellence in Technology Transfer Award for the Roll-Out Solar Array, or ROSA, a technology which revolutionizes how satellites are powered.

For the past four decades, satellites have relied on power from rigid, heavy solar arrays that require cumbersome mechanics for deployment once in space. ROSA is a lighter-weight, flexible array that stows compactly and unfurls in space using a rollable high-strain composite tube.

By eliminating the need for the complex, expensive and heavy components used on traditional panels, ROSA makes satellites much more cost-efficient. ROSA can also provide significantly more power than traditional panels because it can easily be scaled larger for more capacity.

It is estimated ROSA's technology advancements could save the Air Force's communication and navigation programs $1.4 billion. It is being embraced by both government and commercial customers.

"ROSA is a wonderful example of revolutionary in-house AFRL research being linked to the energetic, product-focused nature of small business to produce a remarkable cost savings for our nation's space assets," said Jeremy Banik, ROSA's principle investigator.

AFRL was selected for the FLC award for its outstanding work in transferring the ROSA technology into the private sector for commercial applications.

Two companies, Deployable Space Systems Inc. located in Goleta, California, and LoadPath, LLC, located in Albuquerque, New Mexico, worked with AFRL to advance the technology and get it into the market.

Since then, several Department of Defense prime contractors have evaluated ROSA for various missions, including Space Systems Loral, which is currently qualifying ROSA for use on future communication satellites. By 2017, DSS will offer ROSA as a commercial product available to all satellite builders.

The ROSA team will be honored at an award ceremony April 27 at the FLC National Meeting in Chicago. They include Banik, 1st Lt. Nathan Gapp, David Chapman, Joy Stein, Bernard Carpenter and Paul Hausgen.

Air Force Research Laboratory Scientist Paul Hausgen demonstrates deploying the composite Roll-Out Solar Array slit-tube boom. The booms do not require external power, but deploy under their own stored strain energy. AFRL was selected to receive a 2016 Excellence in Technology Transfer Award for ROSA, a technology which revolutionizes how satellites are powered. (U.S. Air Force photo/Anita Collins/released)

Solar energy project completed on AFLCMC leased property

By Bryan Ripple
88th Air Base Wing Public Affairs

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- The Air Force Life Cycle Management Center has spearheaded an effort to generate alternative energy for the southern California market and generate revenue for Air Force Plant 42 in Palmdale, California, through a unique enhanced use lease agreement with NRG Solar Oasis LLC. The project was jointly funded by both NRG Energy, Inc. and its subsidiary NRG Yield, Inc. through a previously announced partnership between both companies.

Officials from the AFLCMC's Acquisition Environmental and Industrial Facilities Division at Wright-Patterson, along with NRG Solar Oasis LLC representatives, signed the lease in February 2015 at no cost to the Air Force. NRG has since completed installation of approximately 98,000 photovoltaic solar panels on 180 acres adjoining Air Force Plant 42. The project is situated on 160 acres of Air Force-owned property.

A photovoltaic system is a method of converting solar energy into electricity using semiconducting materials. The solar plant will provide 20 megawatts of electricity, making it among the largest single solar projects undertaken on Air Force property. The electricity produced is enough to power approximately 3,280 homes. The project will avoid 41,000 tons of carbon emissions, equivalent to taking 8,600 cars off the road.

The acquisition environmental and industrial facilities division is part of AFLCMC's Agile Combat Support Directorate, while the company is a subsidiary of NRG Energy, a New Jersey- and Texas-based Fortune 500 power-generating firm.

The agreement provides AFLCMC lease revenues over the next 20 years in exchange for NRG's rights to install solar panels on Plant 42 land and sell the generated electrical energy to public utilities in southern California. The agreement has two additional five-year options which, if exercised, would extend the partnership to 30 years.

"The Air Force is pursuing innovative solutions by partnering with industry to develop renewable energy sources on underutilized land," said AFLCMC Commander Lt. Gen. John Thompson. "Budgetary constraints are motivating Air Force installation and community partners to re-evaluate the way we do business and seek alternatives. When leveraging installation and community resources, savings and economies of scale can be achieved."

Plant 42 is a U.S. government aircraft manufacturing plant. It supports NASA operations and is home to several large contractors including Northrop Grumman, Lockheed Martin and Boeing. The Air Force property used for the solar project previously contained an Air Force firing range and a sewage treatment plant. The property was environmentally remediated by the Air Force before development of the solar project.

According to Jared Scott, industrial facilities branch chief, the lease is the culmination of a herculean effort among multiple agencies to develop efficient, effective solutions for renewable energy while maximizing the utilization of Air Force-owned real property.

"NRG first approached the Air Force about the possibility in November 2013," Scott said. "At that point, organizations ranging from the Office of the Assistant Secretary of the Air Force for Acquisition, the 412th Test Wing at Edwards AFB (California), Sandia National Laboratories, the Air Force Encroachment Management Working Group, to the city of Palmdale worked together to move this initiative forward."

Frank Tokarsky, community planner for Air Force industrial facilities, explained that the Air Force and NRG evaluated and assessed the potential environmental impacts associated with the proposed solar development.

"The assessment was coordinated with local agencies and Native American tribes and it was subject to a citizen public review process," Tokarsky said. "Together we concluded that there would be no significant environmental impact."

An enhanced use lease is a lease, or out-grant, between the Air Force and a public or private interest willing to pay rental value or in-kind consideration for the use of the Air Force's non-excess real property. Energy EULs encourage the development of renewable energy - helping the Air Force save money while meeting congressionally established Air Force renewable energy goals and enhancing the commercial grid's resiliency.

AFLCMC will oversee the EUL. Lease revenues will help maintain the Air Force's industrial plant properties. The 412th TW will continue to provide base operating support and airfield management functions to Plant 42.

SecAF announces Office of Energy Assurance

By Secretary of the Air Force Public Affairs

JOINT BASE SAN ANTONIO-LACKLAND, Texas (AFNS) -- Air Force Secretary Deborah Lee James announced the establishment of the Air Force Office of Energy Assurance and conducted a ribbon-cutting ceremony at Joint Base San Antonio-Lackland March 22.

"Through innovative technologies and business models, we'll create strategic energy agility on our installations, allowing us to sustain our mission even when traditional resources are disrupted," she said.

According to the OEA memorandum of establishment, signed last month by James and Air Force Chief of Staff Gen. Mark A. Welsh III, the office will develop, implement and oversee an integrated facility energy portfolio, including privately financed, large-scale clean energy projects that will provide uninterrupted access to the electricity necessary for mission success.

James said the OEA will take an enterprise-wide approach to identify and facilitate energy projects that provide resilient, cost-effective, cleaner power to Air Force installations.

Secretary of the Air Force Deborah Lee James addresses basic trainees currently in the Basic Expeditionary Airmen Skills Training course March 22, 2016, at the 319th Training Squadron on Joint Base San Antonio-Lackland, Texas. (U.S. Air Force photo/Johnny Saldivar/released)

Miranda Ballentine, the assistant secretary of the Air Force for installations, environment and energy, said the office is already beginning to operate and anticipates having 10 large-scale projects in service or procurement across the U.S. by the end of 2017.

"The establishment of OEA further cements the Air Force's focus on energy resiliency," Ballentine said. "The Air Force is taking a holistic approach to our installation energy resources and looking to resilient, cleaner and cost-effective energy projects as a way to enhance the Air Force's mission assurance through energy assurance."

Upcoming DCO

Mark Correl, deputy assistant secretary for environment, safety and occupational health, will host a defense collaboration services meeting for energy personnel April 14, from 2 - 3 p.m. EST.

DCS Conference topics include:

- Energy Master Planning
- Status of Office of Energy Assurance (OEA) Stand Up
- Data Centers' Energy Efficiencies
- Department of Energy 2016 Energy Exchange

If you would like to participate in this event or be added to the DCS contact list for future meetings, please e-mail your request to michelle.g.coghill.ctr@mail.mil with your contact information including name, phone number and email address.

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