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March 2016



Nellis AFB unveils DOD's largest solar array

By Airman 1st Class Rachel Loftis
99th Air Base Wing Public Affairs

NELLIS AIR FORCE BASE, Nev. -- The U.S. Air Force unveiled the Nellis Solar Array II during a dedication ceremony here Feb. 16, which, combined with Solar Array I, makes the installation's photovoltaic field the largest in the Department of Defense.

The energy generated between the two is enough to fully power the installation on renewable energy during daylight hours.

The new array is connected to a new substation provided by NV Energy on Nellis Air Force Base. This will allow the

installation's energy vulnerability to be reduced by providing a mission-critical redundant power source.

During the dedication ceremony, Col. Richard Boutwell, 99th Air Base Wing commander, was accompanied by representatives from NV Energy, SunPower Corp, Assistant Secretary of

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The solar photovoltaic power system, Nellis Solar Array I, at Nellis Air Force Base, Nevada, was expanded from 14 megawatts to 19 megawatts with the unveiling of Nellis Solar Array II. Combined, the Nellis solar arrays generate enough energy to fully power the installation during daylight hours. (U.S. Air Force photo/Released)

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AFCEC enhances base resiliency

By Breanne Smith
AFCEC Public Affairs

A blackout during an Alaskan winter is life-threatening. Without a constant supply of heat, building temperatures rapidly drop below habitable levels and require evacuation -- a major mission risk for Clear Air Force Station, Alaska.

In December 2015, the Air Force freed Clear AFS from its aging coal power plant and connected it to the local power grid. With the flip of a switch, the Air Force Civil Engineer Center increased energy reliability and significantly cut costs for a vital radar station.

Previously powered exclusively by a 53-year-old coal-fired plant on site, Clear faced an unpleasant future if the base remained coal-powered -- \$16 million in required plant modernization and continued high operating costs.

"The plant's operational costs were unsustainable," said Col. Scott Warner, Pacific division chief for AFCEC's Facility Engineering directorate. "We worked with the base to find a cost-effective solution to enhance base resiliency through energy assurance."

Rather than pay significant modernization costs, the team pursued an energy conservation investment project that connected the Alaskan transmission network using a newly-constructed electrical substation, and added a grid-powered heat plant and additional backup power. Cost avoidance from modernization and cost savings in operations, maintenance,

labor and fuel will save the Air Force approximately \$2.6 million in fiscal 2016 and \$1.9 million each year after -- meaning the \$23.5 million ECIP will pay for itself in savings in less than five years.

In addition to long-term cost savings, the ECIP also provides a backup capability that protects both the mission and base infrastructure.

"In winter (at Clear), pipes begin to freeze after about four hours without heat," said Maj. Scott Howe, the civil engineer at Clear AFS. "Evacuation issues aside, it would cost about \$200 million to repair damages from burst pipes."

Construction began in June 2014. With numerous agencies involved in the project -- AFCEC, the base, the U.S. Army Corps of Engineers, the State of Alaska, construction contractors and the utility provider -- coordination was key to staying on schedule and allowing the base to remain mission focused, said Maj. James Fitzgerald, project engineer for USACE-Alaska District

"The construction window in Alaska is narrow," Fitzgerald said. "Digging through snow and frozen ground isn't feasible and delays drive up project costs. We banded together to tackle obstacles and stay on schedule."

The heating situation at Clear was so precarious the base spent nearly \$1 million for a year-long backup emergency

boiler plant in November 2014, Howe said. The ECIP was far enough along the following winter the base was able to rely on portable heaters. At a cost of \$55,000, the heaters served as backup freeze protection until the power switch in December, Howe said.

While the work leading up to December's power switch was hectic at times, the switch-flipping moment was fairly anticlimactic, Warner said.

"Up until now, every winter for Clear has been a planning ordeal," Warner said. "With minimal manning and maintenance, the base can focus on the mission and spend less time and money preparing for winter -- that's how we provide mission assurance through energy assurance."

Workers stand before a large transformer at Clear Air Force Station, Alaska. An energy conservation investment project recently completed at Clear connected the base to the Alaskan transmission network using a newly-constructed electrical substation, and added a grid-powered heat plant and additional backup power. (US. Air Force photo/Released)



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the Air Force and Sen. Harry Reid.

"The partnership we have with NV Energy and SunPower began over nine years ago with the ribbon cutting of our first solar photovoltaic array, and combined today with the second array will be the largest PVA in the Department of Defense," Boutwell said. "This goes hand-in-hand with one of the key purposes of our mission here in Nevada -- to be a good neighbor, to find ways where economic growth is compatible with military requirements."

To promote the Air Force's commitment to being good stewards of the environment, Solar Array II construction began in March 2015. SunPower Corp. built the \$50 million Nellis AFB project that is owned and operated by NV Energy on land leased by the U.S. Air Force.

"It is a privilege to be here today as (NV Energy) partners with Nellis Air

Force Base, but as importantly with the men and women who serve our country and protect our freedoms every day -- thank you all for your service," said Paul Caudill, NV Energy CEO. "Our power plant will provide clean, renewable energy for years to come for Nellis. Make no mistake about it; Nellis is an exceptional community partner and customer for NV Energy."

Miranda A. A. Ballentine, Assistant Secretary of the Air Force for Installations, Environment and Energy, said the Air Force is focused on continuing critical community partnerships like these that also advance the service's energy resiliency, and deliver cost effective and cleaner power.

"These goals are important to us, but this solar array doesn't stop at making better use of land, meeting Air Force renewable energy goals and saving money," Ballentine said. "This

project also enhances our mission assurance through energy assurance and showcases how interlocked our national security is with our energy, the economy and our environment."

According to the U.S. Environmental Protection Agency's data, the new solar power system will avoid producing 27,000 tons of carbon dioxide emissions annually, which is equal to removing 159,867 cars from Nevada's roads over the next 31 years - the term of the lease.

According to a proclamation signed by President Barack Obama, the Nellis solar array projects enhance the installation's energy security by providing uninterrupted availability of energy at an affordable price; help the Air Force reach federal goals to increase our nation's prosperity; combat climate change; protect the interests of taxpayers; and safeguard the health of our environment.



From left to right, Sen. Harry Reid; Paul Caudill, NV Energy CEO; Miranda A.A. Ballentine, assistant secretary of the Air Force for installations, environment and energy; Tom Werner, SunPower Corp. CEO; and Col. Richard Boutwell, 99th Air Base Wing commander, stand before the Nellis Solar Array II at Nellis Air Force Base, Nevada Feb. 16, 2016. The U.S. Air Force unveiled the new array during a dedication ceremony on base. (U.S. Air Force photo/Airman 1st Class Kevin Tanenbaum/Released)

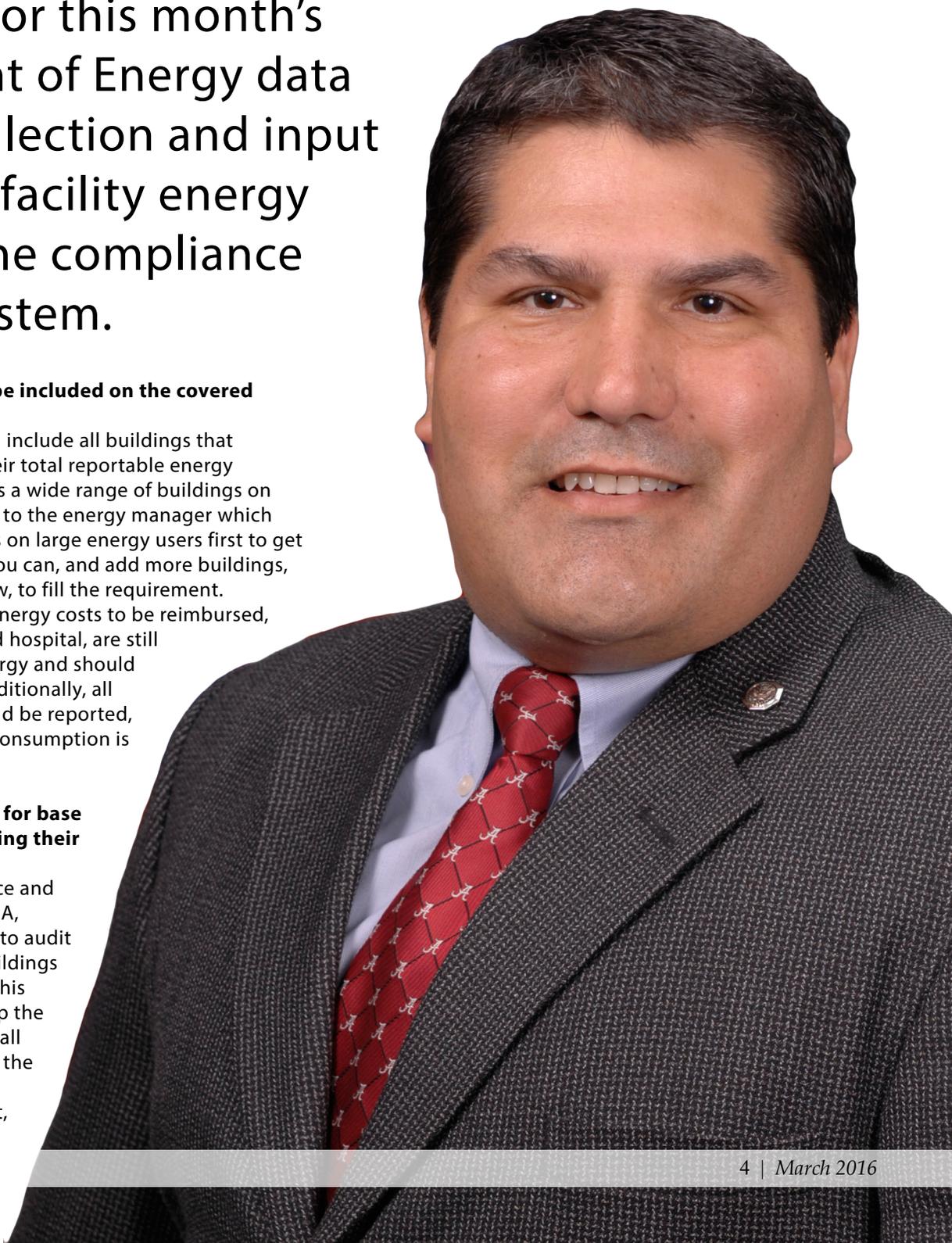
Dan Soto offers his advice to energy managers preparing for this month's Department of Energy data call, the collection and input of covered facility energy data into the compliance tracking system.

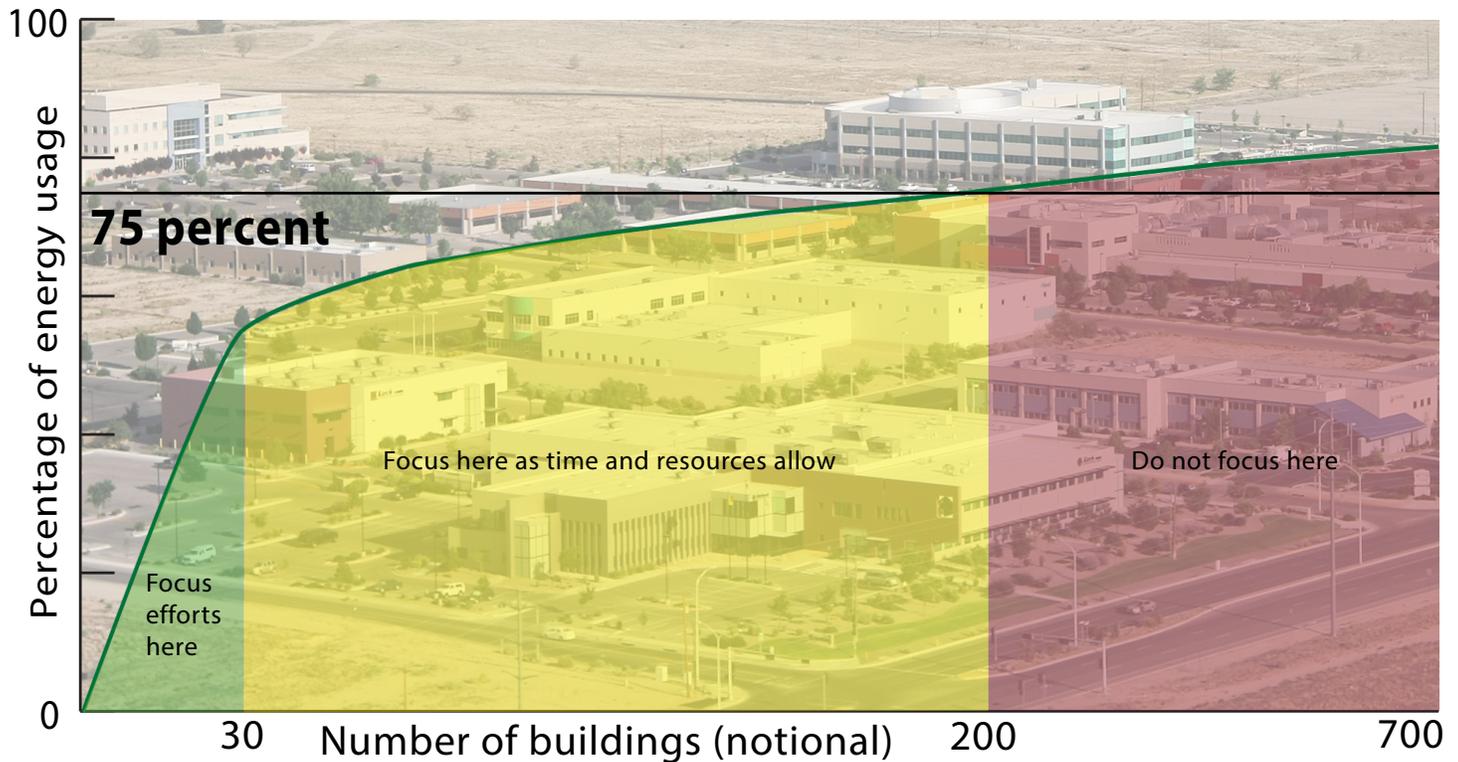
Which buildings should be included on the covered building list?

Energy managers should include all buildings that comprise 75 percent of their total reportable energy consumption. This includes a wide range of buildings on a facility, and it is really up to the energy manager which buildings to include. Focus on large energy users first to get as close to 75 percent as you can, and add more buildings, as time and resources allow, to fill the requirement. Buildings that qualify for energy costs to be reimbursed, like the Base Exchange and hospital, are still considered reportable energy and should be included on the list. Additionally, all energy consumption should be reported, not just electricity. Water consumption is also tracked.

What advice do you have for base energy managers compiling their covered building lists?

The Energy Independence and Security Act of 2007, or EISA, requires energy managers to audit 100 percent of covered buildings every four years. To make this audit more attainable, keep the covered building list as small as possible. Depending on the size of the installation and the types of buildings on it,





the covered building list could range anywhere from one to 400 buildings. Take into consideration the manpower available to conduct audits, develop energy conservation measures and track energy consumption data when deciding how many buildings to include. Time will be spent more effectively auditing and managing 10 large energy hogs rather than 100 smaller energy use buildings.

For example, in the graph above, energy managers should focus their effort on the green area, the largest energy consumers. Focus on the yellow area as time and resources allow. And, of course, the red area is not included on the list.

Energy audits are not the only action item required by the EISA. For example, EISA requires development implementation, measurement and verification of energy conservation measures, including recommissioning status, and benchmarking be completed for buildings on the covered building list. Again, it is important to maximize time and manpower effectively when tackling these requirements. I would rather energy managers focus on all EISA requirements for 25 covered buildings, than having them spend all of their time completing just the audit requirement for 400 buildings. In this way, we can ensure energy data is being reported and that we are doing something with the data.

What is the best way to estimate energy usage for an unmetered building?

There is currently no issued Department of Defense guidance on estimating energy usage for covered buildings,

but the best way would be whatever is most consistent and repeatable for the installation energy managers. Estimates should include any specialized equipment used or unique building aspects to be most accurate. I recommend estimating processes be well documented, so results will be repeatable if an audit is requested.

Should base energy managers anticipate any changes to the system when NexGen IT/TRIRIGA replaces the Air Force Energy Reporting System, or AFERS, as the AF energy software?

The main changes will be to energy reporting and automatic generation of covered building lists for the Air Force. Unfortunately, TRIRIGA initial setup is a lot of manual input, but once the data is in, we will be able to perform much of the compliance tracking system data call functions from here.

Is there anything you would like to add?

I really appreciate all of the hard work of the energy managers at each installation across the Air Force. The data they assemble for us is a huge asset to Air Force decision makers; without it, knowing where to focus energy initiatives like the advanced meter reading system and resource efficiency managers would be speculative at best.

Energy measurement and analysis experts at AFCEC are here to provide assistance to energy managers in the field. If there is anything a manager requires assistance with, I would encourage him or her to reach out to us via the AFCEC Reach Back Center at afcec.rbc@us.af.mil.

Energy service companies selected for three Air Force energy saving performance contracts

By Jess Echerri
AFCEC Public Affairs

Two Department of Defense contracting agencies recently released energy service company, or ESCO, selection letters to NORESKO, ESG and Schneider Electric.

These letters authorize the ESCOs to proceed with further assessments for the energy saving performance contract, or ESPC, at Arnold Air Force Base, Tennessee; Kirtland Air Force Base, New Mexico; and Seymour Johnson Air Force Base, North Carolina, respectively.

Schneider Electric and ESG will proceed with preliminary assessments, while NORESKO will conduct an investment-grade audit. The chosen ESCOs will identify and analyze potential energy conservation measures, or ECMs, at each base.

"It's great to see continual progress in a lot of these ESPCs," said Les Martin, Air Force Civil Engineer Center ESPC

program manager. "It takes a lot of team work with installation energy managers, contracting officers and the AFCEC team."

Kickoff events for the preliminary assessments and investment-grade audit, or IGA, are scheduled to start within the next three weeks. Each selected ESCO will perform the assessment or audit in order to provide sufficient information, such as determining energy consumption and estimating potential utility cost savings, for the Air Force to make a decision on proceeding with the ESPC projects.

The Arnold Engineering Development Complex, or AEDC, is a flight simulation test facility, one of the Air Force's largest energy consumers due to specialized testing requirements. The facility's power requirements make it an ideal, yet challenging, candidate for an ESPC.

"NORESKO has already identified some great potential ECMs at Arnold, including the AEDC," said Morgan Hurst,

AFCEC project manager. "I'm looking forward to seeing how they build on that in the IGA."

Due to a constrained budget environment, the Air Force is utilizing third-party financing tools like ESPCs to accomplish energy-efficiency upgrades at its installations. Under the ESPC model, ESCOs 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.

Researchers use this Sodium Guidestar laser at Air Force Research Laboratory Starfire Optical Range, or SOR, at Kirtland Air Force Base, New Mexico. ESG, an energy service company, was selected to conduct an energy saving performance contract at Kirtland that will seek to improve energy efficiency on the installation. (U.S. Air Force photo/Released)



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Energy Express is a publication of the Air Force Civil Engineer Center, Detachment 1, Tyndall AFB, Florida.

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