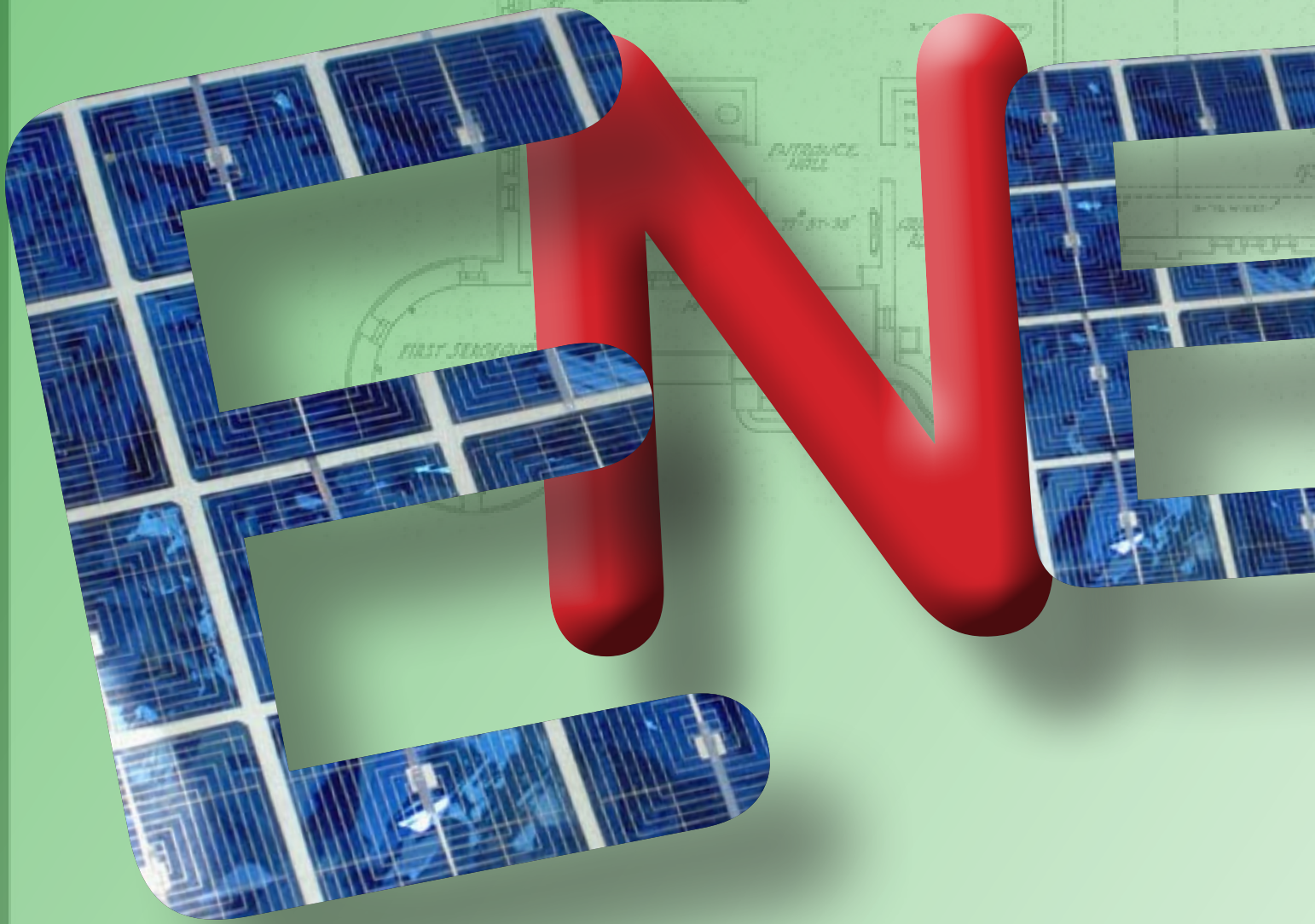
With several green initiatives

Guard facilities are using less



The environmental disaster in the Gulf got us thinking about how the Guard uses energy and what's being done to use it more efficiently. Like the rest of America, we rely on petroleum products to power our tanks, trucks, aircraft and ground equipment, allowing us to operate whenever and wherever needed.

Though the Guard won't be operating any solar-powered jet fighters or battery-powered tanks any time soon, and its demand for petroleum products is unlikely to wane, it is making great strides in how it heats, cools and lights its many facilities.

Like never before, the Guard is installing renewable energy systems based on solar and wind power and constructing more sustainable buildings. It's all part of a plan to use less energy but still remain a formidable fighting force.

Air Guard works to lower its utility bills

By Air Force Master Sgt. Greg Rudl
NATIONAL GUARD BUREAU

The Air National Guard is working to lower its utility bill or at least slow the increase over the next few years.

Last year, it paid $82 million for power to its 100 or so bases and 77 geographically separated units (GSUs), according to the ANG Renewable Energy Office. Two-thirds of that cost came from electricity and one-third from gas.

The Air Guard and the entire DoD must meet a goal of reducing energy intensity by 30 percent by 2015. It's a 10-year, 3-percent-a-year requirement that started in 2005.

"Energy intensity" is based on the power used per square foot of facility space.

Helping to meet that goal is Bob Bossert, the ANG's facility energy program manager, and his team at the Civil Engineering Technical Services Center at Minot Air Force Base, N.D. They support the field in all facility-related issues, including heating and air conditioning and roofing systems.

They also make sure that the Air Guard achieves its energy goals by "reducing consumption and generating energy using renewables." The blueprint for that plan is conducting energy audits, installing smart meters and performing retro commissioning.

Energy audits

One way that Bossert's team helps the field save money on utility bills is by facilitating energy audits.

They contract with a team that visits a facility, identifies energy conservation opportunities and measures and assists them with programming projects.

He said the team will visit all ANG bases by the end of 2010.

The teams are typically made up of four to five people that spend two weeks on-location.

"We'll take those energy audits and [from them] generate projects that upgrade our systems to make the buildings more efficient," said Bossert.

For the record, ANG facilities consumed 4.2 million MMBTUs (one million British Thermal Units), split roughly between electricity and natural gas, he said.

Smart meters

It's not using only less power, but consuming it at the right time. Energy used during peak hours costs more.

Bossert's office has facilitated the installation of smart meters at ANG facilities that monitor electric, gas and water consumption in real-time.

"We can track building by building the energy used … every 15 minutes" and identify high-consumption buildings and high-demand times, he said.

The data supplied can be used to change work processes, like staggering the startup of shop equipment, which decreases the use of electricity during peak demand.

"Let's take washing an aircraft: Can we do that in the morning when the electricity is cheaper than in the afternoon when we'll pay more for it?" said Bossert.

Efficient systems

Along with energy audits and the smart meters, his office is doing the "blocking and tackling" of the ANG's energy program, so that bases can win at the utilities game.

They are doing facility retro commissioning – a process that seeks to improve how building equipment and systems function together – of between 1 to 1.5 million square feet of space at ANG bases per year.

"That's where a contractor will go in, evaluate how the heating, AC and lighting systems are working … calibrate what needs calibrating, fix what's broken and get those systems working as efficiently as they can," he said.

Homemade green energy

Another way the Guard is controlling its utility bill is by producing its own renewable energy. Several facilities have installed or will be installing solar and wind systems. These systems produce power for the base and power that can also be fed back into the grid for energy credit.

The Air Guard must meet a goal of having at least 25 percent of its energy come from renewable, domestically produced sources by 2025.

Fresno Air National Guard Base in California has been operating solar arrays for about three years that produce 700-750 kilowatts per year, said Mark Bailey of the ANG renewable energy office, who works with Bossert. The 180th Fighter Wing (FW) of the Ohio Air Guard has also built one.

Bailey said that the Air Guard realizes that solar power can be produced in places where one wouldn't normally think it could and during the winter.

"Toledo [180th FW] found out that even when they have snow on the ground and snow on the solar panels, they're still producing electricity," said Bailey, adding that newer technology that improves performance is making this possible.

Arizona's 162nd Fighter Wing installed mobile solar floodlights on its flight line at Tucson International Airport. (Photo by Maj. Gabe Johnson)

On a smaller scale, Arizona's 162nd FW set up six trailer-mounted solar lighting systems to replace fuel-burning generator flood lights around its base at Tucson International Airport.

Even micro wind farms are being considered in geographically unlikely Guard bases like Duluth, Minn., and Columbus, Ohio, said Bailey. The base at Great Falls, Mont., home of the 120th FW, is looking into putting a fair-sized wind generation system in, which could be the largest so far for the Air Guard, he said.

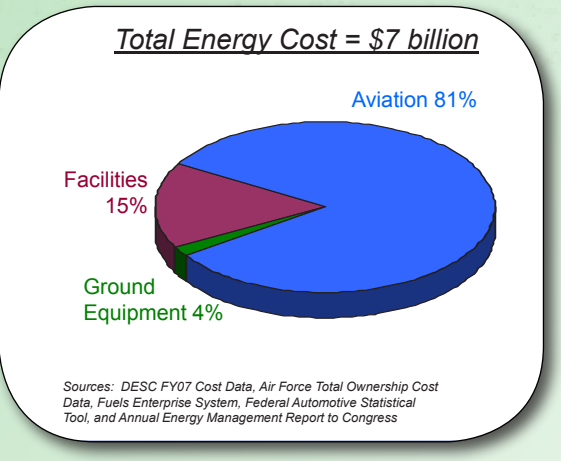
The Virgin Islands Air National Guard on the island of St. Croix is considering one

Truax Field in Wisconsin is installing geothermal power. (Photo by Tech Sgt. Ashley Bell)

as well, which could satisfy all of its energy needs. "They get a lot of wind and they pay a lot for power [too]," said Bailey.

Bailey said some bases, like Truax Field in Madison, Wis., home to the 125th Fighter Wing, are specifying in their contract with their power supplier that they only want power from renewable sources.

"They are 100 percent-purchased green power—their power comes from wind sources from throughout the Midwest," he said.



Facility energy consumption is only a small part of the Air Guard's total. This was the energy cost for the entire Air Force in 2007.

But renewable for renewable sake is not in the ANG's energy plan. "We're trying to implement and install it where it makes sense, and not where it doesn't," said Bossert.

Bases in sunny areas that are paying a lot for electricity are prime candidates. Also important is whether the state supports it. Bossert singled out New Jersey, California and the Northeast.

Even if installing solar panels isn't economically feasible today, the Air Guard is constructing buildings that can be retrofitted later: "So, if all of sudden three years from now panels are half what they cost today, a facility will be ready for them."

Other efforts

Roofs are being scrutinized as well. The nearly completed ANG Readiness Center at Joint Base Andrews, Md., will be topped with Sedum, a small plant with special water-storing leaves. The plants will not only insulate but reduce storm-water run-off, an issue in the Chesapeake Bay watershed.

Bailey said Rickenbacker International Airport in Columbus has installed white "cool roofs" on several of its buildings. They reflect sunlight better, reducing heat transfer to the building and cooling costs in the summer.

And then there's mother earth.

"About 25 percent of the bases either have or are putting in at least one geothermal system – either a retrofit or a new construction," said Bailey. A building at Truax Field is putting in a geothermal system that consists of 70 wells with pipes inside to tap mother earth's energy potential.

New construction

The ANG is saving on its utility bills now and will be in the future by erecting buildings that use less energy. It's called sustainability.

Bossert said it's done by, "orientating the building on the lot so it takes best advantage of daylight and any existing trees … so that you have to use less heating and cooling and lighting."

The ANG Readiness Center received a Leadership in Energy and Environmental Design (LEED) silver certification – the industry standard for green buildings – and more are on the way.

Ben Lawless, chief of the operations division for the ANG's Installations and Mission Support directorate, said recently that "green" buildings "are lower cost to operate, lower cost to maintain and provide a better work environment for the folks who have to do the day-to-day work in them."

Using less

Along with information campaigns that remind troops to turn off lights and computers during off-hours, and installing sensors that do that for them, the ANG is even looking at other energy drainers. The cost of lighting pop machines at bases got the attention of process managers with the ANG's waste-busting AFSO21 office. They saw thousands of dollars in energy savings by dimming the machines.

Bossert said leadership has bought-in to the energy conservation movement. He credited Col. Bill Albro, who leads the ANG's Installations and Mission Support Directorate, for his vision in many of the areas mentioned. He has been proactive and even ahead of the Air Force, not only in discussion and planning, but allocating money for energy audits, meters and an improved ANG energy plan.

That plan states that facilities need to reduce and change their energy use because of rising utility costs, national security and energy independence issues, limited resources, climate change and the need to meet federal goals.

And it also states that "it's the right thing to do."

In a world that's getting smaller every day, who could argue that it's not?

ANG's renewable energy systems

Operational

Fresno, CA – 660 KW
Toledo, OH – 734 KW
Camp Perry, OH – 220 KW
Phoenix, AZ – 16.8 KW

In development

Burlington, VT
Otis, MA
Tucson, AZ
Channel Island, CA
Buckley, CO

States going green with renewable power

The Kentucky National Guard is a little "greener" with the help of its partners in state government and the private sector.

Crews installed solar panels at the Wendell H. Ford Regional Training Center in Muhlenberg County earlier this year. This state-of-the-art 10,000-acre training facility for the Kentucky Guard will be partially powered by the 84 kilowatt photovoltaic solar arrays found on the administration building and two of the center's barracks.

Kentucky installed 400 solar panels on the three buildings this year.

The 400 solar panels on the three buildings are "grid-tied," meaning that the power produced will first be used by electrical loads within the facility. Any excess power produced will flow back onto the grid, running the facility power meter backward and creating a credit. The net effect of the system will be to reduce the cost of electricity for the facility.

This initiative was driven by Kentucky's Comprehensive Energy Plan released by the governor and presidential executive orders. Both the state and federal directives strive for a greener environment and reduced CO_2 emissions through the utilization of renewable energy sources such as solar.

"The Kentucky Guard and the Department of Military Affairs continue to implement energy projects that include geothermal, solar and high-efficiency energy upgrades," said Maj. Gen. Edward W. Tonini, adjutant general for Kentucky.

The project was completed in association with Finance and Administration Cabinet through the utilization of $553,499 in American Recovery and Reinvestment Act funds.

One of the largest solar installations in Kentucky, the system is capable of producing about 100,000 kilowatt hours of renewable green energy annually. Reductions in greenhouse emissions by 79.2 tons are expected, equivalent to the CO_2 emissions from 8,078 gallons of gas consumed, or the amount of carbon sequestered by the planting of 1,841 tree seedlings grown for 10 years. The subsequent reduction in commercial power, potential flow-back credits to the utility companies and the sale of sustainable/renewable energy credits on the open market should reduce the training center's annual utility expense by $40,000 to $60,000 or more.

In Nevada

A 1.2 megawatt solar panel was recently installed at the Joint Force Headquarters in Carson City, Nev. Large arrays of solar panels now tower over portions of the parking lot like an energy efficient shade for cars.

The solar panels are expected to be completed by August. Once they're up and running, the solar panels will be able to completely power the facility in prime conditions when skies are clear and the temperature in the '70s. The facility also will feed unused energy back into the power grid.

Nevada Joint Force Headquarters' solar project is nearing completion. (Photo by Sgt. 1st Class Erick Studenicka)

Over the next 20 years, the energy savings are expected to be in the millions, McElroy said.

The project is being funded and constructed by the private firm Sierra Solar, which will sell the power back to the National Guard at a fixed rate of 15 cents per kilowatt hour for the next 20 years.

McElroy said the project is estimated to cost about $18 million.

In Ohio

The Ohio National Guard cut the ribbon July 6 on a new photovoltaic solar field at Beightler Armory in Columbus.

The state also has fields at Guard facili-

What YOU can do to save

Preserving resources starts with the individual. The increased cost of energy has made a significant impact on everyone's finances, including the base you work at. Adopt some of the below suggested energy-saving ideas, and you can make a difference at work (and home):

- ☼ Close off unoccupied rooms
- ☼ Lower thermostat at night
- ☼ Use window blinds; open when sunny to heat room
- ☼ Utilize natural lighting when possible
- ☼ Use compact fluorescent bulbs
- ☼ Use task lighting in place of overall room lighting when possible
- ☼ Examine potential for lighting occupancy sensors
- ☼ Reduce the number of lamps in corridors without significant reduction in lighting levels
- ☼ Select energy-efficient office equipment
- ☼ Put air conditioner adapters on a power strip that can be switched off; adapters draw continuous energy
- ☼ Unplug battery chargers when the batteries are fully charged or chargers are not in use
- ☼ Attach door sweeps to the bottom of doors leading outside

Army Guard readiness centers conserving energy

The Army Guard has about 3,000 readiness centers (armories) across the country. While older ones have been demolished and others returned to the community for other purposes, several are scheduled for preservation, restoration or reuse. Some armories are being replaced by newer, more energy efficient structures or renovated with energy-saving enhancements. Some recent "green" accomplishments include:

⚙ The Arizona Army National Guard's 5,200 square-foot Eco-building in Phoenix is an adobe-style office building that is completely independent of conventional utilities, including electricity, sewer and municipal water. It is constructed with many recycled materials, including 5,000 used tires and windows taken from buildings previously scheduled for demolition. Other sustainable strategies include a closed-loop wastewater treatment system; passive solar design; day-lighting; solar-powered evaporative cooling; and rainwater harvesting and collection. The building is powered by four, 400-watt wind turbines and an 18 kilowatt photovoltaic array. Each year the building saves about $6,750 in electricity costs and 60,000 gallons of water.

⚙ The Colorado Guard has a new Army Aviation Support Facility that was constructed primarily from recycled and locally-made materials. In addition, the facility is lighted almost entirely (over 90%) by sunlight during day-time operations. The facility uses roof runoff to irrigate drought-resistant plants and makes use of waterless urinals. The facility also has a unique modular design that accommodates a full-time staff of 70 people and "expands" to handle the drill weekend staff of 350 Soldiers.

⚙ The Hawaii Guard is breaking ground on a new facility they will share with other agencies and that will make use of photovoltaic panels to help reduce energy usage and costs.

⚙ The New Mexico Guard is building a 30-module, 54-kilowatt photovoltaic solar farm. This solar project will not only reduce the amount of electricity bought from the service provider but will also reduce the amount of green house gases generated.

⚙ The New Jersey Guard recently completed a 170-kilowatt photovoltaic car port. It takes under-utilized space to provide shelter for parked vehicles and generates electricity for some of its Sea Girt training site facilities. The renewable energy produced will reduce approximately 165 tons of green house gas emissions annually.

-Compiled from 2010 Army Posture Statement and www.solaripedia.com

Eco-friendly in Pennsylvania

Two recent construction projects Fort Indiantown Gap, Pa., have illustrated what the Pennsylvania Army Guard and other states are doing to build more sustainable and eco-friendly structures.

The recently remodeled Unit Training Equipment Site there was made of renewable, recycled and regionally manufactured materials that take less energy to build and deliver. The facility used 27,000 square feet of translucent light panels that maximized natural light and reduced the need for the artificial kind. It also used light-colored material for concrete mixtures which decreases heat islands in the parking areas.

The Ammo Supply Point at Fort Indiantown Gap achieved the LEED Silver certification by having many of the aforementioned eco-friendly initiatives. It also created hybrid parking and car pool sections in the employee parking lot and included parking for bicycles

Additionally, the dozens of readiness centers that are being built or upgraded throughout the state are being outfitted with many eco-friendly features, to include: energy management control systems, oil-water separators, storm water detention facilities, high-efficiency lighting with occupancy sensors.

-Sgt. Matthew E. Jones, Indiana National Guard

ties in Toledo and Newton Falls. All three projects, including the 374-panel solar array in Columbus, were funded through the American Recovery and Reinvestment Act of 2009.

The state currently has five solar fields in operation and is determined to continue its efforts to explore renewable energy sources and move toward energy independence, according to its adjutant general.

The recently completed 75-kilowatt array is expected to save the Ohio Guard more than $11,500 and 135,000 kilowatt hours during its first year in operation. The three projects combined represent an estimated first-year savings of more than 360,000 kilowatt hours and nearly $62,000.

-Compiled from reports from the Kentucky, Nevada and Ohio public affairs offices