
# "KILL-A-WATT"

APRIL 2020 NEWSLETTER

-VINCENT ESQUEDA

JBSA ENERGY PROGRAM

AIR FORCE ENERGY

*Add "Saving Energy" to your To Do list.*

*Next year JBSA is going to save almost an additional $9,000,000 in Energy Savings.*

# ENERGY SAVINGS PERFORMANCE CONTRACT (ESPC)

The 802d Civil Engineer Squadron (CES) Energy team is currently implementing a 22-year Energy Savings Performance Contract (ESPC) project that will save Joint Base San Antonio (JBSA) an estimated $9,000,000 in Energy Savings during the 1st year after construction. During the 22nd year JBSA will save over $17,000,000 in Energy Savings. The estimated cost savings over the duration of the Contact will be around $286,000,000!

We are currently implementing the following energy conservation measures in around 900-buildings across JBSA. In the near future the 802d Energy team will be adding energy conservation measures to other JBSA buildings.

## Lighting

We are upgrading approximately 140,000 light fixtures to LED lamps. LED lamps provide the following benefits over traditional incandescent and fluorescent lamps: 80 – 90% more efficient (more light with less heat), much longer lamp life (3 to 5 times longer than a fluorescent lamp and 25 to 30 times longer than a standard incandescent lamp), and since the LED lamps generate less heat we will have lower air conditioning costs. Here is a cost savings comparison between different lamp types:

| Upgrade | Cost Savings from Conversion |
|---|---|
| Incandescent to LED | 85-87% |
| Compact Fluorescent to LED | 40-45% |
| Fluorescent to LED | 60% |

## Building Controls

Have you ever walked into a building and wondered why it was either to hot or too cold in there? Well we are upgrading the controls for the Heating Ventilation and Air Conditioning (HVAC) system to fix this problem. Some of the items that we are installing to better control the HVAC system and to save energy are: occupancy sensors so that the HVAC system knows when people are in the area, control system schedules so that the system knows for example to increase the temperature of the air conditioning system at night in the summer when nobody is in the building, and we are also replacing old pneumatic (air) controls with modern digital controls. Since the HVAC system will be running less we also get the benefit of saving water that is used by the mechanical equipment.

## Thermal Energy Storage Tanks

The HVAC system uses chilled water to cool the air that is used in a building. Since our air conditioning systems run the most during the hottest part of the day this creates "peak period energy demand" that adversely affects our CPS energy bill all year long. But with Thermal Energy Storage (TES) tanks we can chill the water at night time (during off-peak hours), store the chilled water in the TES tanks, and use the chilled water during the day; this helps us to save money on our electric bill. We will install (5) TES tanks at Lackland with an overall capacity of 2,000,000 gallons of water.


Existing Thermal Energy Storage tank at Lackland.

## Solar Power

We will be installing 18-Mega Watts of roof mounted solar panels on (64) buildings at Fort Sam Houston and Lackland. These solar panels will be used to provide electrical power to these specific buildings when the sun is out. At night or on cloudy/rainy days these buildings will continue to receive power from CPS Energy. In addition, at Lackland Civil Engineer building 5595 we will be installing covered parking with solar panels on top.

Lackland Civil Engineer building 5595.

## New Sources of On-Base Power and Heat Generation

We will be installing the following items to increase resiliency during electric utility outages and disturbances and to improve energy assurance for mission critical operations.

Gas-fired microturbines or combined heat and power (CHP) plants. These will be used at Fort Sam Houston and Lackland to generate electricity from a gas fired turbine while recovering waste heat that will serve domestic hot water loads. By capturing the heat generated while producing electricity, a CHP plant may be more energy efficient and cost effective than purchasing electricity from the utility and natural gas for boilers.

Stand-by Generators at Lackland to provide power to critical loads during CPS Energy outages.

Lithium ion battery energy storage system (BESS) at Lackland. This system will be used to reduce periods of high electrical demand (for example during the summer when the air conditioning systems are running). This system will also work in conjunction with the on-base generation assets and the new Microgrid Control System (MCS), allowing the base to continue mission critical operations in the event of a utility grid failure, brownout, or utility request for demand reduction.

Microgrid Control System (MCS) to significantly enhance the energy security and resiliency of Lackland. The MCS will operate in two modes: Grid Connected mode and Islanded mode. In Grid Connected mode, the MCS will continuously monitor the health of the connection with the CPS Energy utility grid and react accordingly when an outage or disturbance on the grid is detected. When a disturbance or interruption is detected the MCS will switch to Islanded mode, disconnect the base from

the CPS Energy utility and coordinate the on-base generation and storage assets to continue to serve the base's critical loads.

## Transformers

These are the building interior electrical transformers that step-down the building voltage to a level that is used for lights and electrical outlets in the buildings (similar to how CPS Energy steps-down the voltage to your home). The transformers that we are replacing are older transformers that are near their end-of-life (~ 25-years old), they are less energy efficient, and they generate excessive noise and heat. Our new energy efficient transformers look like the following:

*Powersmiths E-SAVER High Efficiency Transformer*

## Window Film

The window film will reduce solar heat radiation into our buildings by around 44% and therefore reduce our cooling energy usage in the building. Here are a few pics of our installed window film: