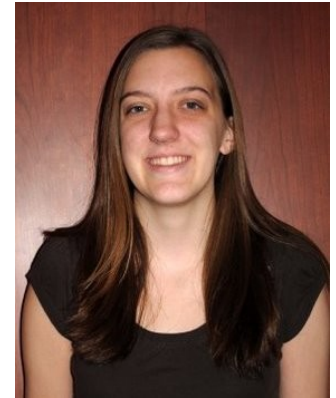


2011 Case Study

Kansas Army National Guard

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Company background

The Kansas Army National Guard is one of three parts of the Army; the others are the Active Army and the Army Reserves. The Guard is primarily composed of civilians, called Guardsmen, who serve their country, state, and community part-time. The state governor can call the Guard into action during local or statewide emergencies, while the President of the United States can activate the Guard for federal missions.

The Kansas Army National Guard is spread throughout the state amongst 56 armories, 10 field maintenance shops, and many additional buildings. There are more than 5,500 soldiers within Kansas and many other National Guard employees. The Kansas Army National Guard headquarters are located in Topeka's State Defense Building.

Project background

Paige Brewer's internship consisted of energy-saving and water-conserving projects. These included replacing paper towel dispensers with hand dryers, changing the power settings on the computers, turning off sprinkler systems, printing double-sided, creating an energy audit form, and performing an air-leak audit.

Incentives to change

Executive Order (EO) 13423 states that the Guard must reduce water use by 16% between fiscal year (FY) 2008 and FY2015, at a minimum of 2% each year, compared to a baseline from FY2007. It also states that the Guard must reduce energy consumption by 3% annually between FY2006 and FY2015 or 30% total, compared to a baseline from FY2003. Hence, the Kansas Army National Guard is doing whatever it can to try to save energy and water. Having more than 50 buildings with different purposes scattered all over the state makes this task rather difficult. Also, the Kansas Army National Guard has been forced to close many of its armories due to budget reductions; it is possible it could save enough money through energy and water savings to prevent additional closures.

Projects reviewed for E2/P2 potential

1. Hand dryers

The first project involved researching hand dryers and determining if they should be installed in four bathrooms in the State Defense Building. It was found these restrooms already had hand driers, but there did not seem to be much use of them because they were inefficient styles. Both women's restrooms contained World Dryer Model A hand dryers. The upstairs men's restroom contained World Dryer-Nova 1 dryers, while the men's restroom downstairs contained World Dryer-Airspeed dryers. Paper-towel dispensers are still located in these restrooms. The intern found that these four bathrooms go through 22 cases of paper towels every three and a half months, which costs \$3879 per year. Five new hand dryers were researched and analyzed: Dyson Airblade, Xlerator, World Dryer Airforce, World Dryer SlimDri, and World Dryer AirMax. Cost savings were calculated for different percentages of people switching to hand-dryer use. Savings were also calculated with the theory that some people might be using the currently installed hand dryers, and with the idea that they would continue to use the new hand dryers. If the paper-towel use was decreased by only 50%, \$1939.5 and 0.5063 tons of paper would be saved annually. Depending on the type of hand dryer purchased, the maximum payback under these conditions would be 2.57 years.

2. Power strips

The second project involved research of smart/green power strips to determine their benefits and savings. The purpose of this green power strip is to eliminate the vampire load of electricity used by electronics in standby mode. In order to determine if the power strips would be helpful, the intern took a survey of the power strips and the items plugged into them in the energy and environmental offices. Wattmeters and the website <http://standby.lbl.gov/summary-table.html> were used to estimate the vampire load of each electrical device. It was calculated that even if the cheapest power strip was purchased, only \$18.95 would be saved per year and the payback would be 17-25 years. Therefore, the project was not recommended.

3. Computer settings

The third project required changing settings on the

computers from turning the display off after 10 minutes and the computer never putting itself to sleep, to turning the display off after five minutes and putting itself to sleep after 10 minutes. Using the wattmeters, the power usage of the computer monitor and CPU was measured for each setting. It was calculated that 3505.407 kWh, 2.490 MTCO₂e of greenhouse gas emissions, and \$315.49 could be saved by applying these settings to all 11 computer monitors and CPUs in the environmental and energy offices.

4. Sprinkler systems

The fourth project entailed determining which facilities owned sprinkler systems and calculating how much money could be saved if they were not used. It was determined the following facilities have sprinkler systems by graphing their yearly water usage: Colby Armory, Iola Armory, Salina Great Plains Training Center, Salina KSRTC Nickell Hall, Salina KSRTC OpenBay Barracks, and Salina RTSM Maintenance 558. If these six facilities quit irrigating, 1,611,369 gallons of water and \$18,020.83 could be saved each year. This is equivalent to 12% of the Kansas Army National Guard's current annual water usage.

5. Duplex printing and copying

The fifth project involved calculating potential savings if the five printers and copier were changed to automatically print/copy double-sided instead of single-sided. It was found that in order to change the default settings to duplex printing, it must be changed on each employee's profile when they are logged in. Data was collected for each of the printers and the copier to determine usage. From this it was calculated that 49,620 sheets of paper, 23 trees, five metric tons of CO₂ equivalent (MTCO₂e), and \$414 could be saved by printing double-sided. It was also calculated that 31439 sheets of paper, 15 trees, four MTCO₂e, and \$264

could be saved by copying double-sided. To prevent people from reverting back to simplex printing, the intern made fliers advertising how much paper, greenhouse gas emissions, and trees could be saved by printing duplex. These were posted by the printers and copier.

As required by Army Regulation (AR) 420-1 Chapter 15, the Kansas Army National Guard is required to perform energy audits of 25% of their square footage every year and must complete an audit of all of their square footage every four years. Currently there is no efficient way in place to perform these audits. The intern used energy-audit resources in order to create an energy-audit form that will be able to be used uniformly at all facilities. This form should help make sure all the necessary information is gathered and help reduce the amount of trips that are taken to each facility.

6. Air-leak audit

The last project involved using K-State's Ultraprobe 9000 at two different facilities in Salina: Crisis City and the RSMS Trailer Program. At Crisis City there have been problems keeping the building heated in the winter and cooled in the summer, so the leak detector was used to check the building envelope. Many of the windows and doors were leaking great amounts of air and it is suggested to look into ways to reduce this loss. The RSMS Trailer Program does a lot of work on army vehicles. There are at least 20 or more air compressors located at this building. Many had large leaks; some leaks could even be felt with the bare hand. Overall, it was estimated that 75,015,431 gallons of compressed air and \$2007.79 could be saved if the seven leaks found on the air compressors were fixed.

Summary of 2011 E2/P2 intern recommendations for Kansas Army National Guard

| Project description | Annual estimated environmental impact | Annual estimated cost savings | Status |
|--|--|-------------------------------|-----------------|
| Hand dryers (50% reduction in paper towel use) | 0.5063 tons | \$1,939.50 | Recommended |
| Power strips | 210.503 kWh | \$18.95 | Not recommended |
| Computer settings | 3,505.407 kWh | \$315.49 | Recommended |
| Sprinkler systems | 1,611,400 gallons | \$18,020.83 | Recommended |
| Duplex printing/copying | 1.6152 tons | \$678.38 | In progress |
| Air-leak audit | 22,308.78 kWh | \$2,007.79 | Recommended |
| Total savings * | 1,611,400 gal water, 25,814.187 kWh, 2.1215 tons of paper | \$22,961.99 | |
| GHG reductions * | 36.3534 metric tons CO₂e | | |

* Does not include projects that are "not recommended" or "further research is needed."