



# Fort Hays State University



*"This Energy Performance Partnership allowed us to both save money and use power at a greater level of efficiency. The recouped energy savings from the ESCO project helped pave the way for future energy projects and solidified Fort Hays State University as a national leader in institutional energy management."*

– Keith Dreher, Director of Energy Management, Fort Hays State University

## The Opportunity

Since its founding in 1902, Fort Hays State University (FHSU) has made a name for itself through its creative enrollment, financing, and sustainability initiatives. In 2008, the Kansas Board of Regents adopted a sustainability policy that required its institutions of higher education to respond with a sustainability report. FHSU has been proactively involved in environmental issues, as well as educating students on the value of service to the community, and the requirements for being a responsible civic member in the fast-paced, global environment. From a strategic perspective, FHSU includes sustainability as part of its planning process, as all renovation and new construction projects are designed to provide the most efficient energy use as possible amid scarce resources.

Not only has FHSU become an institutional example of creative enrollment growth while faced with declining resources for education, but it has also transformed the University into a model of innovation and fiscal responsibility. Like many other higher education campuses, FHSU wanted to improve the learning environment by upgrading facility infrastructure.

Starting in 1996, the University took on an overhaul of campus energy management systems (EMS) to reduce the rising energy and maintenance costs associated with aging electrical systems. The program initially focused on peak demand shaving via diesel generators in two flagship buildings. After implementation, this first initiative provided proof-of-concept and a source of funding for the next phase of EMS streamlining.

## The Partnership

For over 20 years, Fort Hays State has been leveraging technology solutions both in the classroom and in the energy management sector. In 2003, FHSU partnered with OpTerra Energy Services to expand its EMS upgrades from the two flagship

(continue on the back)

## Program Highlights

- **\$8.44MM** in total savings over the project life
- **977,245 therms of natural gas** savings and over **126 million gallons of water** savings over the project life
- Reduces emissions of **27,090 metric tons of CO<sub>2</sub>**, the equivalent to removing **5,722 cars** from the road for one year

## The Technical Scope

- 1.66 MW diesel generator system with parallel switchgear
- Heating and cooling improvements
- Lighting upgrades on over 9200 fixtures across 25 buildings
- Power factor correction, central boiler plant and energy management system upgrades and improvements
- Building steam zone controls
- Variable speed chilled water pumping
- Water conservation and treatment measures
- Rooftop HVAC unit replacements – replaced eight aging RTU's at two buildings

buildings to an additional 29 buildings across campus. A comprehensive energy analysis was started and completed during the first year of the partnership, followed by the design and implementation of the project throughout 2004 and 2005. The first step in improvements was to address a variety of campus-wide deferred maintenance issues that were affecting energy performance. Heating, cooling and lighting systems campus-wide were the core target for these long-overdue upgrades.

The replacement of critical infrastructure systems was another target area of the initiative. Upgrading the HVAC cooling systems to the more efficient variable-speed chilled water pumps removed one of the flagged energy sinks. By moving only the necessary amount of water needed for a chiller or boiler, and thus saving pumping energy, OpTerra was able to minimize daily operational costs. Additional savings were realized via upgrades to the central boiler plant, power capacitors, and building steam zone controls.

Another major savings area was the increase in the amount of electrical generation systems on campus. FHSU was able to realize increased efficiency by building upon the 1996 pilot program and greatly increasing its transfer of electrical generation to gas generators during peak usage periods. This tactic, called "peak shaving", allows the University to effectively reduce the peak load demand on the central energy utility.

Finally, the program was structured as a 17-year, self-funded performance contract. This program allowed the project to be paid for by the savings, which freed up valuable capital for other campus-wide improvements.

### The Impact

As one of FHSU's energy partners, OpTerra helped fulfill upgrades that included both more comfortable learning environments and lower energy expenditures. Prior to the start of the partnership, the University was spending roughly \$2.4 million per year on energy management. The \$8.4 million dollars in savings associated with the campus-wide upgrades proves FHSU to be a model of fiscal responsibility, and the peak shaving generators used during the high energy-demand summer months and beyond allows FHSU significant flexibility to manage campus loads, control electricity usage from their local utility and thus realize even more savings opportunities.

The success of this Energy Performance partnership also opened the doors for the University to develop a two-turbine wind farm of four megawatts in nameplate capacity of power generation, with the goal of making FHSU less dependent on the local utility and realizing even greater cost savings. After installing the campus-wide upgrades, FHSU showed its ability to control costs by proactively changing the way it uses energy over the past two decades.

Fort Hays continues to serve as an example of fiscal responsibility and energy efficiency to other colleges and universities in the state of Kansas and beyond.



Installation of a Remote Terminal Unit.