

## Texas Tech University Energy Savings Program October 2011 Update

The Texas Tech Energy Savings Update is being submitted in accordance with Governor's Executive Order RP 49, Electric Conservation by State Agencies.

### A. Energy Goals

#### 1. University Energy Use

Energy units are converted to thousands of BTUs per square foot (kbtu/ft<sup>2</sup>) to allow for comparisons of the various energy forms. Goals and energy use are therefore stated in kbtu/ft<sup>2</sup>. Estimated savings are based on energy consumption for the same time period from the previous year normalized to current energy costs and campus square footage.

Through fiscal year FY11, the campus consumed 165.83 kbtu/ft<sup>2</sup>, a decrease of 2.5% and a savings of \$53,898 compared to the same time period for FY 10. Fourth Quarter energy use declined 0.94 kbtu/ft<sup>2</sup> (2.3%) below the monthly energy goals for that quarter.

Gas usage is down 12.4% due to a 38% increase in cogeneration steam received and due to selective operation of efficient equipment at the central plant. Cogeneration steam, provided *at no cost* to the university by a local utility company, is tabulated in the balance of university energy use, but dollar savings are not reported on the cogeneration line since they would be realized as a reduction of natural gas use.

In Table I, the campus energy use is broken down by utility type.

**Table I: University Energy Use (kbtu/ft<sup>2</sup>):** **September '10 – August '11**

Utility	FY10 Actual	FY11 Actual	% Change from previous year	Estimated Savings
Electricity	56.33	58.85	Up 4.5%	(\$ 310,215)
Natural Gas	99.27	86.93	Down 12.4%	\$ 364,112
Cogeneration Steam	14.53	20.06	Up 38%	NA
<b>Total</b>	<b>170.14</b>	<b>165.83</b>	<b>Down 2.5%</b>	<b>\$ 53,898</b>

## 2. House Bill 3693

In compliance with House Bill 3693, Texas Tech University has set a goal to reduce total electrical consumption by 2.5% for FY11. Table II shows the kilowatt hours per square foot (kwh/ft<sup>2</sup>) for the campus in Lubbock County.

Through fiscal year FY11, cumulative electrical consumption is 17.5344 kwh/ft<sup>2</sup>. This cumulative consumption is up 4.4% compared to the same period for FY10 (16.9116 kwh/ft<sup>2</sup>) largely because the Lubbock area has experienced record weather extremes this past year. Average low temperatures for the winter season were 3 and 4 degrees lower than the previous year, and the summer averaged 5 – 8 degrees hotter. Fall 2010 and Spring 2011 enrollment set university records, utilizing classrooms and labs for more hours of the day which increased the demand for lighting and climate control. Also, Texas Tech’s new downtown Lubbock location and the new Rawls College of Business Administration building have been big energy users during their respective remodel and construction phases, but their combined 180,000 square feet have not yet been factored into the campus energy use equation. Campus square footage will be adjusted for FY 12.

**Table II: Campus Electricity Use (kwh/ft<sup>2</sup>):** **September ‘10 – August ‘11**  
(Lubbock County)

<b>Whole Campus Electricity Use in kwh/ft<sup>2</sup></b>	<b>FY 10 Reference Data in kwh/ft<sup>2</sup></b>	<b>2.5% Reduction Goal in kwh/ft<sup>2</sup></b>	<b>FY 11 Actual Consumption in kwh/ft<sup>2</sup></b>	<b>Percent Increase/Decrease from previous year, by quarter</b>
<b>1<sup>st</sup> Quarter</b>	4.1969	4.0920	4.4471	Up 5.9%
<b>2<sup>nd</sup> Quarter</b>	3.9671	3.8679	4.2825	Up 8.0%
<b>3<sup>rd</sup> Quarter</b>	4.1859	4.0813	4.2171	Up 0.7%
<b>4<sup>th</sup> Quarter</b>	4.5617	4.4476	4.5877	Up 3.3%
<b>Yearly Total</b>	16.9116	16.4888	17.5344	Up 4.4%

## 3. Fleet Fuel Management Plan (Vehicles)

In FY06, Governor Perry’s Executive Order RP-49 required agencies to establish an energy conservation program by setting a percentage goal for reducing its consumption of electricity, gasoline and natural gas.

As a result of that order, Texas Tech University established the following goals related to vehicles:

- Reduce fuel consumption by 5% per year
- Maintain an average miles per gallon of 12.4

In the fourth quarter of FY11, Texas Tech vehicles averaged 11.1 miles per gallon. These figures represent a decrease of 0.3 mpg compared to the same quarter of the previous year, and a 0.9 mpg shortfall of our intended goal.

**III: Historical University Vehicle Fleet Data**

	FY10 mpg	5% Reduction Goal	FY11 mpg	Variance from Goal
1 <sup>st</sup> Quarter	12.5	13.1	12.3	0.8
2 <sup>nd</sup> Quarter	11.0	11.6	10.8	0.8
3 <sup>rd</sup> Quarter	11.9	12.5	11.7	0.8
4 <sup>th</sup> Quarter	11.4	12.0	11.1	0.9
Average	11.7	12.3	11.5	0.8

**B. Current Energy Reduction Plans**

**1. Campus Energy Use**

**a. E&G**

- 1) Free Cooling Study at CHACP 1 – Equipment is being installed and should be online by November 2011.
- 2) Completed in-house re-commissioning of 2 buildings, Math and Science. Payback will be less than 1 year.
- 3) Perform in-house performance tuning for air handlers in Biology building, Holden Hall, Library, Mechanical Engineering and Civil Engineering.
- 4) Secured departmental approvals and reset air handler schedules to standard operating hours for 17 buildings that had air handlers running 24 hours per day / 7 days per week.

- 5) Energy Management has deployed multiple light/occupancy data-loggers to identify buildings that are candidates for the installation of permanent lighting controls. Currently, occupancy sensors are being installed in Civil Engineering corridors.
- 6) Building Maintenance and Construction is retrofitting the Biology growth chambers with an auxiliary chilled water pump that will enable the building's main chilled water pump to be secured at night.

**b. Auxiliaries**

- 1) Housing completed a three year lighting retrofit, effectively eliminating incandescent bulbs, replacing magnetic ballasts with electronic ballasts, and replacing old style fluorescents with T-8s.
- 2) Housing also completed a project to install VFDs on all chilled water pumps.
- 3) Housing Services Building programmed controls to extend heating load downtime during winter break for a greater energy savings.
- 4) Modifying the chill-water control system to reduce chill-water usage in the United Spirit Arena.

**c. Energy Audits**

The university has a goal to perform a minimum of 2 detailed energy audits per month beginning with the largest consumers of energy.

This quarter, Texas Tech completed 6 detailed energy audits at Mass Communications, Livestock Arena, Journalism, Agricultural Education, Civil Engineering and Mechanical Engineering.

**2. Fleet Management**

The Texas Tech University tactics to achieve this goal are:

- 1) Continue the aggressive Preventive Maintenance program to maintain all vehicles at their peak efficiency.

Monthly maintenance notices are sent to all vehicle custodians advising when preventive maintenance services are needed on their vehicles.

- 2) Continue to utilize the State's Fleet Data Management System.

Texas Tech continues to maintain an average 98% accuracy rate in the State Fleet Date Management System.

- 3) Educate personnel on the efficient use of university vehicles.

New initiatives will continue to be collected and shared with appropriate vehicle custodians and operators.

- 4) Document agency best practices for operation and maintenance.

New initiatives will continue to be collected and shared with appropriate vehicle custodians and operators.

#### **C. Energy Reduction Feasibility Studies**

Texas Tech is currently conducting several energy reduction studies such as zoned controls for 161 fan coils in West Hall; HVAC controls upgrades; adding economize mode to buildings where possible; and studying LED street lamps. Response will be based on feasibility, available funding and favorable payback.

#### **D. Fuel Consumption Reduction Plans**

The Vehicle Fleet Management Office will network with vehicle custodians to exchange information on vehicle efficiency and solicit additional best practices and other creative initiatives for the university vehicle fleet.