

Texas Tech University Energy Savings Program January 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/ft²) to allow for comparisons of the various energy forms. Goals and energy use are therefore stated in kbtu/ft². 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.

For the first quarter of FY11, the campus consumed 52.92 kbtu/ft², an increase of 6.5% compared to the first quarter for FY10. September and October of this year were exceptionally warm as compared to previous years. With an additional 1600 students enrolled in Fall 2010, TTU is utilizing classrooms and labs for more hours of the day which increases the demand for lighting and climate control.

Cogeneration steam, provided by a local utility company, is tabulated in the balance of university energy use, but savings are not reported on the cogeneration line since they would be realized as a reduction of natural gas use. For this quarter, the dollar value of the cogeneration steam was \$128,898.

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

Table I: University Energy Use (kbtu/ft²): **September '10 – November '10**

Utility	FY10 Actual	FY11 Actual	% Change from previous year	Estimated Savings
Electricity	14.16	15.15	Up 6.5%	(\$ 157,248)
Natural Gas	35.05	35.10	0%	\$ 0
Cogeneration Steam	0.000612	2.69	NA	NA
Total	49.21	52.94	Up 7.0%	(\$ 157,248)

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/ft²) for the campus in Lubbock County.

For the first quarter of FY11, cumulative electrical consumption is 4.4471 kwh/ft². This consumption is up 6.0% compared to the first quarter of FY10 (4.1969 kwh/ft²).

Table II: Campus Electricity Use (kwh/ft²): September '10 – November '10 (Lubbock County)

Whole Campus Electricity Use in kwh/ft²	FY 10 Reference Data in kwh/ft²	2.5% Reduction Goal in kwh/ft²	FY 11 Actual Consumption in kwh/ft²	Percent Increase/Decrease from previous year, by quarter
1st Quarter	4.1969	4.0920	4.4471	5.9%
2nd Quarter	3.9671	3.8679		
3rd Quarter	4.1859	4.0813		
4th Quarter	4.5617	4.4476		
Yearly Total	16.9116	16.4888	4.4471	

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 first quarter of FY11, Texas Tech vehicles averaged 12.3 miles per gallon.

Table III: Historical University Vehicle Fleet Data: September '10 – November '10

	FY10 MPG	5% Improvement Goal	FY11 MPG	Variance from Goal
1st Quarter	12.5	13.1	12.3	-0.8
2nd Quarter	11.0	11.6		
3rd Quarter	11.9	12.5		
4th Quarter	11.4	12.0		
Yearly Average	11.7	12.3		

B. Current Energy Reduction Plans

1. Campus Energy Use

a. E&G

- 1) Free Cooling Study at CHACP 1 – Project has been approved by the Board of Regents. A project budget has been developed and funded. A design firm, Fanning and Fanning Associates, has been selected for the design phase and they are in progress.
- 2) Completed in-house re-commissioning of 2 buildings, Math and Science. Payback will be less than 1 year.
- 3) The university is soliciting proposals for a consultant(s) to develop an energy conservation plan for the campus.
- 4) Replaced faulty air dampers at the Law School with new units. Payback is expected in 8 months.
- 5) Investigating a dedicated cooling pump for growth chambers in the Biology building; the dedicated unit will allow a larger building pump to cycle off, saving energy.
- 6) Secured departmental approvals and reset air handler schedules to standard operating hours for 5 buildings that had air handlers running 24 hours per day / days per week. Awaiting approvals on 5 more buildings.

b. Auxiliaries

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.

Housing also completed a project to install VFDs on all chilled water pumps.

Housing Services Building programmed controls to extend heating load downtime during winter break for a greater energy savings.

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. Focus this quarter has been on those buildings that are operating air handlers 24 hours per day, seven days per week.

This quarter, Texas Tech completed 6 detailed energy audits at Engineering and Technology Labs, Fish and Wildlife, University Greenhouse, Fiber and Biopolymer Research Institute and Food Technology.

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. Future Energy Reduction Plans

Texas Tech is currently evaluating several energy reduction projects such as rolling off-cycles for chillers, exterior LED lighting retrofits, smart ballasts on fluorescent lighting, building commissioning and re-commissioning procedures, HVAC controls upgrades, air-handler upgrades, Museum stack gas economizer, Museum chiller upgrades and adding economize mode to buildings where possible. The university will proceed with engineering analysis and take action 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.