Texas Tech University Energy Savings Program
October 2013 Update

The Texas Tech Energy Savings Update is being submitted in accordance with Governor's Executive Order RP-49, Energy Conservation by State Agencies and Health and Safety Code, § 388.005(f).

A. Energy Goals

1. University Energy Use

Energy units are converted to thousands of BTUs per square foot (kbtu/ft^2) to allow for comparisons of the various energy forms. Goals and energy use are therefore stated in kbtu/ft^2. 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.

During FY13, the campus consumed 156.07 kbtu/ft^2, a decrease of 2.7% and a savings of $506,767 compared to FY12.

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 FY13, free cogeneration steam saved the University $847,589.

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

Table I: University Energy Use (kbtu/ft^2): September '12 – August '13

Utility	FY12 Actual	FY13 Actual	% Change from previous year	Estimated Savings
Electricity	58.45	56.96	Down 2.5%	$237,214
Natural Gas	81.73	72.90	Down 10.8%	$269,553
Cogeneration Steam	20.83	26.83	Up 28.8%	NA
Total	161.01	156.69	Down 2.7%	$506,767

2. House Bill 3693, Regular Session, 2007

In compliance with House Bill 3693, Texas Tech University has set a goal to reduce total electrical consumption by 2.5% for FY13. Table II shows the kilowatt hours per square foot (kwh/ft^2) for the campus in Lubbock County.

For FY13, electrical consumption was 16.9290 kwh/ft^2. This electricity use is down 2.6% compared to FY12 (17.3747 kwh/ft^2).

Table II: Campus Electricity Use (kwh/ft^2): September '12 – August '13
(Lubbock County)

Whole Campus Electricity Use in kwh/ft^2	FY 12 Reference Data in kwh/ft^2	2.5% Reduction Goal in kwh/ft^2	FY 13 Actual Consumption in kwh/ft^2	Percent Increase/Decrease from previous year, by quarter
1st Quarter	4.3765	4.2671	4.4623	Up 2.0%
2nd Quarter	4.2699	4.1632	4.0933	Down 4.1%
3rd Quarter	4.2089	4.1037	4.1403	Down 1.6%
4th Quarter	4.5194	4.4064	4.2331	Down 6.3%
Yearly Total	17.3747	16.9404	16.9290	Down 2.6%

3. Fleet Fuel Management Plan (Vehicles)

Texas Tech has reduced its consumption of gasoline by 2,888 gallons or 1.2% compared to FY12.

Table III: Historical University Vehicle Fleet Data September '12 – August '13

	FY12 Gallons Consumed	FY13 Goal (5% Decline)	FY13 Gallons Consumed	Percent Change
1st Quarter	68,022	64,621	60,885	Down 10.5%
2nd Quarter	51,763	49,175	50,410	Down 2.6%
3rd Quarter	62,520	59,394	66,792	Up 6.8%
4th Quarter	62,185	59,076	63,515	Up 2.1%
Total	244,490	232,266	241,602	Down 1.2%

B. Energy Reduction Measures

1. Educational and General Space

a) Free Cooling Project at CHACP 1 – Water Side Economizer has provided over 2,464,000 ton-hours of free cooling this fiscal year, an estimated savings of $50,073. Operating hours for the unit was extended into May by a coordinated increase of the chilled water loop supply temperature and by resolving cooling issues in the Chemistry building.

b) Issued a contract for the recommissioning of AHUs in five buildings: Electrical Engineering, Mechanical Engineering, Civil Engineering, Industrial Engineering, and Human Sciences.

c) Building Maintenance and Construction has retrofitted 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.

d) Building Maintenance and Construction has upgraded the electrical power circuits and retrofitted the HVAC controls in West Hall to allow 161 fan coil units to be secured at night.

e) Operations Division enacted a new winter Freeze Protection Protocol which has reduced EUIs for December, January and February while ensuring protection of the buildings.

f) The newly constructed Rawls College of Business Administration has been certified LEED Gold.

g) Audited AHU operating schedules and eliminated over $100,000 (annual) worth of undocumented operations.

h) Began a project to install BTU meters on chilled water in thirteen buildings.

i) Building Maintenance and Construction created a dedicated, two-person building tuning team and has begun tuning Holden Hall.

j) Installing lighting controls in the new Petroleum Engineering building.

k) Installing lighting controls in the Civil Engineering building.

l) Installed thirty 36 watt LED lamps in replacement of the 150 watt pedestrian lamps in front of the Rawls College of Business Administration.

m) Installed LED lighting in first floor control room and entryway of Central Heating and Cooling Plant #1.

n) Installed eighteen 50 watt LED lamps in replacement of the 175 watt pedestrian lamps around Memorial Circle and the Broadway entrance.

o) Began a project to install thirty two smart electric meters in eighteen buildings on campus.

p) Identified three Multizone air handlers that could be converted to Texas Multizones.

2. Auxiliary Space

a) Housing has just completed a new dormitory, Talkington Hall, which has been certified LEED Basic.

b) Identified $400,000 in chilled water waste (annual) in seven Housing buildings and began a project to correct the discrepancies.

3. Energy Audits

In FY13, Texas Tech completed twenty four detailed energy audits at Physical Plant, Chemical Engineering, Biology, Science, Ag Pavilion, Animal and Food Science, Engineering Center, Architecture, Art, Law, Lanier, Chemistry, Development, Library, Electrical Engineering, West Hall, College of Media and Communication, Agricultural Sciences, Music, Art 3D, Goddard Range and Wildlife, Student Rec Center, Math and Food Technology.

C. Energy Reduction Feasibility Studies

Texas Tech is currently conducting several studies of energy conservation measures such as:

- HVAC controls upgrades.
- Upgrading and integrating metering systems for electricity, heating and cooling.
- Retrofitting some AHUs to "Texas Multi-Zone" design.
- Providing dedicated cooling for certain laboratories and server rooms to reduce the load on the whole-building systems.
- Replace thirty three pedestrian lamps northwest of Murray Hall with LED lamps.
- Infra-red analysis of building envelopes.
- Implement a web based front end for continuous analysis of the utility plant control systems with a 3rd party performance validation contract to optimize energy performance of Central Heating and Cooling Plants #1 and #2. Terms of the contract will guarantee savings of over $107,000 each year for the next ten years.
- Perform two Housing audits each year.

Responses 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.

The Vehicle Fleet Office will facilitate an analysis of fleet usage within the Operations Division and recommend reductions in fleet size.