



September 30, 2013

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Austin, Texas 78701

Mr. John O'Brien  
Deputy Director  
Legislative Budget Board (LBB)  
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**RE: Annual Energy Report, FY2013**

The Texas Tech University Health Sciences Center (TTUHSC) Annual Energy Report for FY-2013 is being submitted in accordance with Governor's Executive Order, RP 49 and Senate Bill, SB5. TTUHSC continues to promote energy conservation measures and strategies and seek new ideas to reduce consumption and improve building system efficiencies.

#### **A. Energy Consumption & Cost**

In FY2013, the institution consumed 612,803,053 kBtu. FY2013 energy utilization index (EUI) is 243 kBtu/sq ft, a decrease of 3.6% as compared to FY2012. FY2013 energy cost index (ECI) is \$2.90/sq ft, which remained same compared to FY2012. The gross area (gsf) of the institution in FY2013 has increased by 2.5% as compared to FY2012. Heating Degree Days (HDD) for the FY2013 increased by 3.5% compared to FY2012 and Cooling Degree Days (CDD) for the FY2013 decreased by 10.7% compared to FY2012 due to weather.

TTUHSC continues to undergo capital and system improvements, increase in overall occupancy and steady growth, which are expected to increase the overall energy consumption. Attached Exhibit 'A' shows FY2013 energy consumption and cost breakdowns. It includes FY2012 energy consumption, cost, and energy equivalents to facilitate comparison between annual totals. Exhibit 'B' shows a benchmarking report for comparison of energy index (EUI & ECI) values of TTUHSC from FY-2010 to FY-2013 with median index values of health related institutions in Texas.

#### **B. Energy Conservation Plan & Action**

TTUHSC has a continuous program to educate the faculty and staff regarding energy conservation. TTUHSC Engineering Services Department maintains specific operating





policy and procedure relating to the energy conservation program and utility review. Operating policy and procedures make the responsibility of energy conservation the obligation of every employee. A key element of the plan is to prevent waste and assure the conservation of resources.

TTUHSC Engineering Services has identified several projects for potential consideration in reducing the campus energy consumption. Projects were prioritized based on a variety of factors including return on investment, and cost. Projects that were implemented in the past were listed in the previous annual reports. Below is a partial list and status of projects that are completed in FY-2013 or currently being designed and/ or implemented.

1. Replace old conventional boilers with new high-efficient condensing boilers at the WHRI/ LBIWH building, Amarillo. *Project completed.*
2. Replacement of an old, inefficient chiller with a new energy efficient variable speed drive chiller at Texas Tech Medical Center, El Paso. *Project completed.*
3. Install dedicated cooling units for Medical Pavilion data/ communication rooms. *Project is completed.*
4. Mechanical system modifications to reduce energy consumption at the Medical Science Building, El Paso. *Project completed.*
5. Complete installation of dual duct air distribution systems for Academic Education Building at El Paso. This has been done to operate the HVAC systems according to the design intent. *Project completed.*
6. Install variable frequency drives for air handling units which operate at partial load frequently. *Project completed.*
7. Implementation of centralized Computer Maintenance Management System (TMA) to effectively manage maintenance work orders. *Project completed.*
8. Replace DX air handling units which exceeded expected service life, and install centralized control system at the Southwest campus, Lubbock. *Project is currently in implementation phase.*
9. Upgrade electrical power systems at Lubbock HSC, which include panel and breaker upgrades, improved protection of transformers and testing of equipment. *Project is currently in implementation phase.*
10. Complete installation of occupancy sensors for automatic lighting control. *Project is being implemented through new construction and renovations.*





11. Replace inefficient motors with premium efficiency motors. *Project is currently in implementation phase.*
12. Replace air handling units in Lubbock HSC which are inefficient and beyond their life cycle, by newer energy efficient air handling units. *Project is being planned and implemented at a rate of up to two new units per year.*
13. Install new direct digital control (DDC) system at the WHRI building, Amarillo. Project includes upgrade of air handling units, terminal boxes, and pumps as funding allows. *Project is currently in design phase.*
14. Install chiller optimization module in the PFSOM and MSB1 facilities, El Paso. *Project is currently in implementation phase.*
15. Re-commissioning of air handling units at the HSC building, Lubbock. *Project is currently in implementation phase.*
16. Energy recovery system in Medical Science Building, El Paso. *Project is currently in planning and design phase.*
17. It's our operating policy to use F28T8 lamps for office/laboratory/classroom and other such areas, and F25T8 lamps for hallway/toilet and other areas which need less illumination. This is being done to comply with the lighting power density requirement of the state energy code. *Project is ongoing.*
18. New energy efficient LED lights are being tested for performance and reliability. *Project is in testing and analysis phase.*

### **C. Future Energy Reduction Plans**

Terracon/ Energy Systems Associates (ESA) conducted a walk-through energy analysis of HSC buildings at Lubbock and Amarillo campus, in the month of August 2011. This was provided through a program sponsored by the State Energy Conservation Office (SECO). The preliminary energy assessment report identified twelve energy conservation projects which are projected to cost up to \$2.6M with an estimated payback of 9-1/2 years.

In addition to above, TTUHSC Engineering Services has conducted energy audits and identified various energy reduction projects which are estimated to cost up to \$5 million with solid energy savings. The details of which are included in the 'Resource Efficiency Plan' prepared in accordance with 34 TAC, Chapter 19.





**D. Fuel Consumption Reduction Plans**

TTUHSC continues to emphasize fuel conservation awareness with strategies such as group travel, regular preventative maintenance, and an emphasis on tire pressure and conditions to gain economies. FY-2013 total fuel consumption has increased insignificantly as compared to FY-2012. TTUHSC has several remote regional campuses in West Texas.

Fuel (gasoline/propane/diesel) Data:

FY12 Consumption	FY12 Cost	FY13 Consumption	FY13 Cost
34,282 Gallons	\$ 112,116	37,884 Gallons	\$ 127,893

The total miles driven in FY2013 have increased by 4.6% as compared to FY2012.

Your consideration of this update and information is appreciated.

Sincerely,

George G. Morales, P.E., M.B.A.  
Assistant Vice-President for Physical Plant & Support Services

Enclosures: EXHIBITs 'A' & 'B'

XC:

1. Elmo Cavin,  
Executive Vice-President, TTUHSC Finance & Administration
2. Director, State Energy Conservation Office  
111 E. 17<sup>th</sup> Street, Suite 1114, Austin, Texas 78774

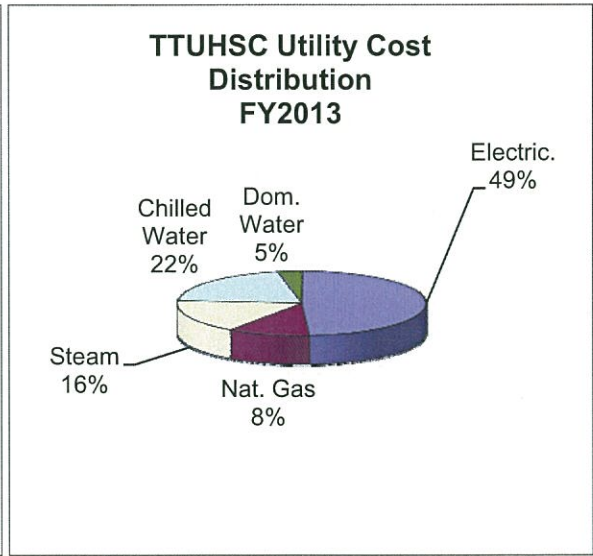
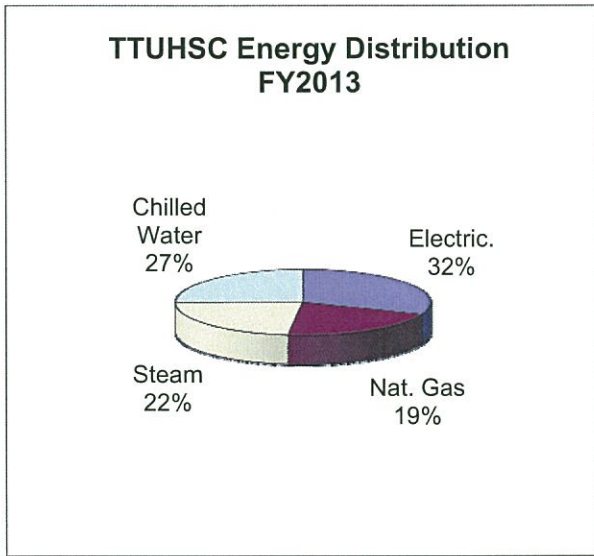




**EXHIBIT ‘A’**

ANNUAL ENERGY CONSUMPTION AND COST				
ENERGY TYPE	CONSUMPTION		COST	
	FY 2013	FY 2012	FY 2013	FY 2012
ELECTRICITY, kWh	57,973,519	58,227,699	\$ 3,804,111	\$ 3,908,962
NATURAL GAS, ccf	1,150,896	1,187,891	\$ 634,237	\$ 727,391
STEAM, mlb	123,766	120,509	\$ 1,258,587	\$ 1,054,821
CHILLED WATER, tn-hr	13,985,041	14,511,811	\$ 1,740,865	\$ 1,583,559
TOTAL ENERGY (kBtu), COST (\$)	612,803,053	630,319,670	\$ 7,437,800	\$ 7,274,733

N:B: Natural Gas is used to produce the Thermal Energies of Steam and Chilled Water





**EXHIBIT ‘B’  
(ENERGY BENCHMARKING REPORT)**

Institution	Energy Utilization Index (EUI) in kBtu/gsf	Energy Cost Index (ECI) in \$/gsf
Texas Tech Univ Health Sciences Center (FY-13)	<b>243</b>	<b>\$2.90</b>
Texas Tech Univ Health Sciences Center (FY-12)	<b>252</b>	<b>\$2.90</b>
Texas Tech Univ Health Sciences Center (FY-11)	<b>246</b>	<b>\$2.90</b>
Texas Tech Univ Health Sciences Center (FY-10)	<b>245</b>	<b>\$2.95</b>
Health Related Institutions in Texas (Median)	<b>289</b>	<b>\$3.90</b>

N.B.:

1. EUI can increase significantly with more research and hospital space; occupancy density; year of construction; building plug loads etc.
2. ECI can vary significantly with the local utility cost.
3. CLEAResult, 4301 Westbank Drive, Austin, TX 78746, provided the median EUI and ECI of HRIs in Texas for years 2011 & 2012.

