



October 30, 2015

Office of the Governor  
1100 San Jacinto  
Austin, Texas 78701

Mrs. Ursula Parks, Director  
Legislative Budget Board (LBB)  
Robert E. Johnson Bldg. – 5<sup>th</sup> Floor  
1501 North Congress  
Austin, Texas 78701

**RE: Annual Energy Report, FY2015**

The Texas Tech University Health Sciences Center (TTUHSC) Annual Energy Report for FY-2015 is being submitted in accordance with Senate Bill 700 (83R) 4 Tex. Gov. Code §447.009 (c) and (e). 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 FY2015, the institution consumed 473,784,714 kBtu. FY2015 energy utilization index (EUI) is 225 kBtu/gsf, which decreased by 5% compared to FY2014. FY2015 energy cost index (ECI) is \$2.97/gsf, which decreased by 3% compared to FY2014. The gross area (gsf) of the institution in FY2015 has increased by 2% as compared to FY2014. Heating Degree Days (HDD) for the FY2015 has decreased by 5.5% as compared to FY2014, and Cooling Degree Days (CDD) for the FY2015 has decreased by 8% as compared to FY2014, which contributed significantly to lower energy consumption.

TTUHSC continues to undergo capital and system improvements, increase in overall occupancy and steady growth, which are generally expected to increase the overall energy consumption. Attached Exhibit 'A' shows FY2015 energy consumption and cost breakdowns. It includes FY2014 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-2015 with the median index value range of health related institutions in Texas.

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

TTUHSC has a continuous program to educate the employees regarding energy conservation. TTUHSC Engineering Services Department maintains specific operating policy and procedures relating to the energy conservation program and utility review. Operating policy and procedures make the responsibility of energy conservation the





obligation of every employee. Flyers, brochures, and periodic reminders are in process. 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 were completed in FY-2015 or are currently being designed and/ or implemented.

1. Replace air handling units in Lubbock HSC which are inefficient and beyond their expected service life with newer energy efficient air handling units. *Four air handling units were replaced with new AHUs with DDC and fanwall system. Six more air handling units are planned to be replaced and are expected to be completed in next two years.*
2. Upgrade electrical power systems to improve safety and reliability at Lubbock HSC, which include panel and breaker upgrades, K-rated transformers, etc. *Project is being implemented as and when funding is available.*
3. Install six new 270W LED fixtures for parking lot at Amarillo WHRI/LBIWH building. XCEL Energy provided incentives for energy reduction. *Project is completed.*
4. A total of 16 exterior LED light fixtures with occupancy control and dimming capability have been installed at the Lubbock campus to date. These are being used for parking lots, and the lights dim to 50% when unoccupied.
5. Replace existing (13) metal halide wall packs with new LED wall packs. This is for Odessa Clinic and HSC buildings. *Project is completed.*
6. Replace (17) downlights with new LED downlights. This is for a classroom in the Odessa HSC building. *Project is completed.*
7. Replace (36) 175W exterior soffit building lights by (18) 34W LED light fixtures which serve exterior soffit area. *Project is completed.*
8. Complete installation of occupancy sensors for automatic lighting control. *Project is being implemented through new construction and renovations.*
9. Replace inefficient motors with premium efficiency motors. *Motors are being replaced at the end of their service life.*
10. Replace (350) T8 fluorescent tubes with new LED T8 tubes. *The LED tubes were procured and will be installed in the Lubbock HSC building in the FY-2016 term.*





11. Install new direct digital control (DDC) system at the WHRI/LBIWH building, Amarillo. Project includes upgrade of air handling units (AHU), terminal boxes, and pumps as funding allows. *In phase I, DDC controls for AHUs, new pumps, and few VAV boxes were installed.*
12. Retro-commissioning of building automation systems to ensure the HVAC equipment function as intended. *Energy saving features are being evaluated and adapted as necessary.*
13. TTUHSC Physical Plant policy is 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 being implemented through maintenance and renovations.*
14. New energy efficient LED lights are being tested for performance and reliability. *Project is in testing, evaluation, and analysis phase.*
15. A preliminary design guide draft report has been prepared with the intent of improving reliability and increased energy savings for new construction and renovation projects.

**C. Future Energy Reduction Plans**

TTUHSC Engineering Services is involved in continuous improvement of mechanical and electrical systems. Old, inefficient, and pneumatically controlled air handling units are being replaced with newer units and DDC systems. Chillers, boilers, pumps, motors, which are nearing the end of expected service life, are being replaced by high efficient equipment. A comprehensive list of projects is included in the ‘Resource Efficiency Plan’, and ‘Energy & Water Management Plan’.

**D. Fuel Consumption Reduction Plans**

TTUHSC continues to emphasize fuel conservation awareness with strategies such as group travel, regular preventative maintenance to gain economies. FY-2015 total fuel consumption has decreased by 5% as compared to FY-2014. TTUHSC has several remote regional campuses in West Texas, which require employees to drive to those locations frequently.

Fuel (gasoline/propane/diesel) Data:

FY15 Consumption	FY15 Cost	FY14 Consumption	FY14 Cost
27,986 Gallons	\$69,656	29,410 Gallons	\$ 93,999

The total miles driven in FY2015 have increased by 0.2% as compared to FY2014.





TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER

Your consideration of this update and information is appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Morales'.

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

Attachment: 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 1118, Austin, Texas 78774

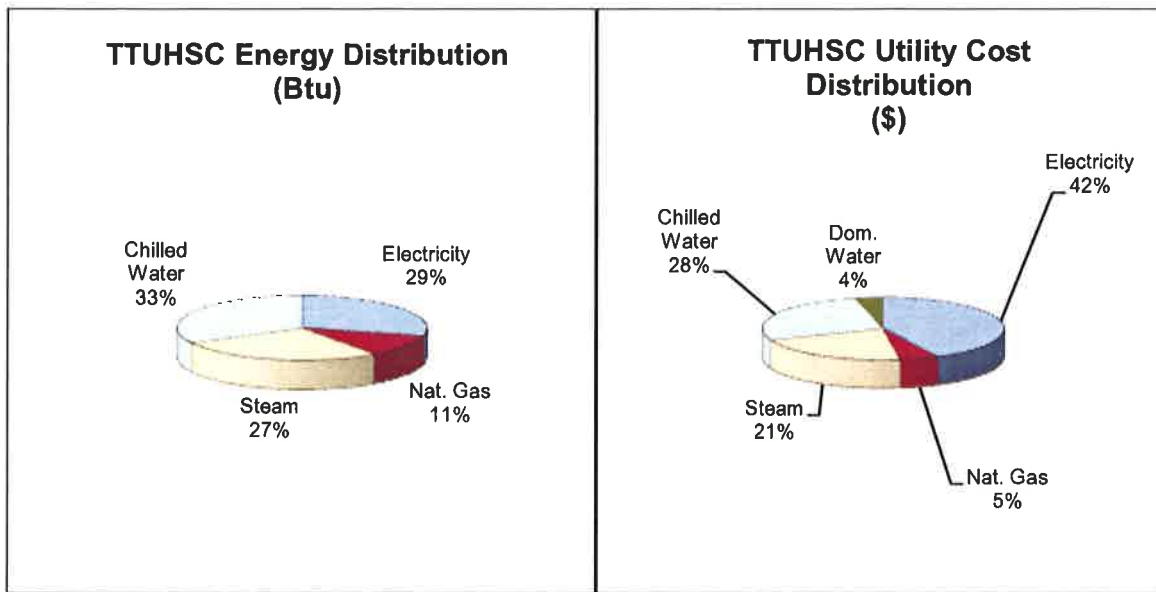




**EXHIBIT 'A'**

ANNUAL ENERGY CONSUMPTION AND COST				
ENERGY TYPE	CONSUMPTION		COST	
	FY 2015	FY 2014	FY 2015	FY 2014
ELECTRICITY, kWh	41,081,589	38,188,260	\$ 2,761,685	\$ 2,625,163
NATURAL GAS, ccf	536,829	535,389	\$ 338,233	\$ 358,576
STEAM, Mlb	116,033	138,487	\$ 1,373,523	\$ 1,506,032
CHILLED WATER, Ton-hr	13,306,802	14,674,700	\$ 1,787,189	\$ 1,850,536
TOTAL ENERGY (kBtu), COST (\$)	473,784,714	490,462,422	\$ 6,260,630	\$ 6,340,307

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



Note: The annual water consumption intensity for the institution is 21 Gal/sf, which is within the limits of SECO (State Energy Conservation Office) water conservation guidelines.





**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-15)	<b>225</b>	<b>\$2.97</b>
Texas Tech Univ Health Sciences Center (FY-14)	<b>236</b>	<b>\$3.06</b>
Texas Tech Univ Health Sciences Center (FY-13)	<b>236</b>	<b>\$2.83</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>
Health Related Institutions in Texas (Median)	<b>289</b>	<b>\$3.90</b>
TTUHSC Energy Management Plan Target	<b>226 - 250</b>	<b>&lt; \$3.37</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.

