

October 31, 2016

Mr. Dub Taylor
Director
State Energy Conservation Office
111 East 17th Street, #314
Austin, Texas 78774

RE: TTUHSCEP - Energy and Water Management Plan

Texas Tech University Health Sciences Center El Paso (TTUHSCEP) during this past fiscal year 2016, transferred all reporting and initiative execution responsibilities from Texas Tech University Health Sciences (TTUHSC), making this plan the first plan issued independently by our institution. TTUHSCEP continues with the efforts previously made by TTUHSC of having energy reduction a priority. For over 20 years our institution has complied with the state mandated reporting requirements per 4 Texas Gov. Code §447.009 (c) and (e), 34 Texas Admin. Code §19.14 and § 19.16, Governor's Executive Order #RP 49, and SECO directives. Our institution has energy utilization and cost index (EUI & ECI) values less than the median EUI and ECI values of similar health related institutions in the state of Texas. We are in compliance with the water efficiency standards outlined by applicable building codes and SECO water conservation guidelines. Attached 'EXHIBIT-I' shows the historical energy and water consumption data for fiscal years 1999 through 2016, and the energy benchmarking index values for comparison.

Energy Consumption Index and Energy Utilization Index were reduced this Fiscal Year by a large margin. Energy conservation efforts were implemented and better energy conservation monitoring led to better results when compared with previous fiscal years. Another factor that indirectly contributed to this decrease in energy consumption was the increase in square footage, where new properties were added which have very low occupancy at the moment. However, this will change for this coming fiscal year, where occupancy levels are expected to grow before the end of Fiscal year 2017, which will increase energy consumption.

Other factors such as programmatic changes, weather fluctuations, increase in research space and energy density significantly change energy consumption. TTUHSCEP continues to emphasize fuel conservation awareness with strategies such as group travel and regular preventive maintenance to best achieve savings.

The institution implemented several energy conservation projects that had positive results and solid payback periods. 'EXHIBIT-II' shows a list of energy conservation projects that were completed during the period of FY-16. Anticipating further growth in academics, healthcare (clinical), operations, and research during fiscal years 2017 through 2020, our institution adopts a plan with a goal to reduce energy consumption by 2%, this includes Electrical, Water and Gas utilities. For Vehicle fuel consumption, the institution's goal is to increase efficiency by 1%. Energy consumption will be below the median value of the EUI of health related institutions in the state of Texas (288.7 kBtu/ft² as per CLEAResult, 2016). Texas SECO water conservation guidelines indicate efficiency benchmark range for schools and offices to be 26 to 93 Gal/sf/year. The energy and water benchmark goals will be incorporated into our new construction, renovations, and other conservation programs.

To attain the above mentioned goal, our institution has a progressive plan to implement energy and water conservation projects as detailed in the attached 'EXHIBIT-III'. Projects will be prioritized based on considerations such as acceptable payback period, and/or life-cycle cost- benefit analysis. The implementation of these projects will be dependent on available funding. The successful application of these projects will form



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the basis of the energy plan for the subsequent fiscal years. The current plan identifies potential financing strategies available to implement these projects.

TTUHSCEP also continues to emphasize fuel conservation awareness with strategies such as group travel and regular preventive maintenance. "EXHIBIT-IV" compares the last few fiscal years in regards to Gasoline Consumption. Energy efficiency has been slowly but steadily been increasing.

TTUHSCEP maintains specific Operating Policies and Procedures relating to the Energy Conservation Program and Utility Review. This policy makes the responsibility of Energy Conservation the obligation of every employee and Department with support from Engineering Services ATTACHMENT I lists the Awareness Plan in detail, and the designated contact person at the institution.

Your consideration of our efforts and this information is appreciated.

Sincerely,

A handwritten signature in blue ink, appearing to read 'JD'.

Jose G. Dominguez, P.E.
Sr. Director, Engineering Services

A handwritten signature in blue ink, appearing to read 'Leopoldo Pereyra'.

Leopoldo Pereyra, P.E.
Managing Director
Physical Plant and Support Services

Enclosed: EXHIBITS I, II, III & IV.

Xc:
Frank Stout,
Chief Operating Officer, TTUHSCEP

EXHIBIT-I
Historical energy and Water Consumption
Data
FY1999 — FY2016

Fiscal Year	Energy Consumption in KBtu	Total Area (gsf)	EUI (KBtu/gsf/yr.)	Water Consumption in Mgal (Gal/sf/yr.)
FY'99	23,132,538	201,570	114.762	2,984 (15)
FY'00	22,096,416	201,570	109.622	2,650 (13)
FY'01	22,914,552	201,570	113.680	2,622 (13)
FY'02	19,519,373	208,794	93.486	2,365 (12)
FY'03	20,669,328	218,909	94.420	2,577 (12)
FY'04	23,203,760	218,909	105.997	3,012 (14)
FY'05	29,169,808	262,207	111.247	3,703 (14)
FY'06	49,790,235	325,619	152.909	9,662 (30)
FY'07	72,858,419	357,325	203.900	12,117 (34)
FY'08	96,332,454	476,814	202.034	13,279 (28)
FY'09	123,763,444	476,814	259.563	16,104 (34)
FY'10	139,080,128	484,467	287.079	16,343 (34)
FY'11	129,600,586	488,557	265.272	17,887 (37)
FY'12	136,912,562	495,555	276.281	21,637 (44)
FY'13	131,883,525	508,547	259.334	19,711(39)
FY'14	119,655,209	578,247	206.928	16,920 (29)
FY'15	128,544,571	621,242	206.915	17,488(28)
FY'16	116,045,449	678,593	171.009	17,872 (26)

****NOTE:**

gsf: Gross Square Feet

Mgal: Thousands of gallons

kBTU: Thousands of BTU's



(Energy Benchmarking Report)

Institution	Energy Utilization Index (EUI) in kBtu/gsf	Energy Cost Index (ECI) in \$/gsf
Texas Tech Univ Health Sciences Center El Paso (FY-16)	171	\$2.46
Texas Tech Univ Health Sciences Center El Paso (FY-15)	207	\$2.97
Texas Tech Univ Health Sciences Center El Paso (FY-14)	207	\$2.99
Texas Tech Univ Health Sciences Center El Paso (FY-13)	259	\$3.34
Texas Tech Univ Health Sciences Center El Paso (FY-12)	276	\$3.83
Texas Tech Univ Health Sciences Center El Paso (FY-11)	265	\$3.48
Texas Tech Univ Health Sciences Center El Paso (FY-10)	287	\$3.71
Health Related Institutions in Texas (Median)	289	\$5.22
TTUHSCEP Energy Management Plan Target	226-250	< \$3.37

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 year 2016.

****NOTE:**

gsf: Gross Square Feet

kBTU: Thousands of BTU's



EXHIBIT — II
Energy Conservation Efforts, FY-16

1. Lighting retrofits that have replaced all electro-magnetic ballasts, and T12 & T8 lamps with LED lamps respectively throughout the campus. We have completed over 60,000 square feet of building's LED lamps.
2. Building envelope repairs for a few HSC facilities to reduce heating and cooling loads and thus, reduce energy consumption.
3. Conductivity meters and moisture eliminators were added to use evaporative coolers inside the air handling units in more effectively. This is expected to significantly reduce chiller load at the Medical Science Building (MSBI) and provide longer life to the media. This also will allow to reduce water consumption for these evaporative coolers.
4. Fire tube boiler controls were modified to meet the operation need at a lower steam pressure, and this has resulted in a reduction in natural gas consumption at the Medical Sciences Building.
5. Variable Frequency Drives were replaced for all Existing Air Handling Units in the Clinical Sciences Building (CSB). This tactic will allowed more Energy Efficient operation of the HVAC System.
6. Replacement of 2 existing Scroll compressor chillers with 1 more efficient screw compressor chiller for the CSB Central Plant. This new chiller adds to an existing screw compressor chiller which allows to operate the system in a more efficient way.
7. Control Optimization for Fan Coil Units in the CSB building in order to implement occupied/ un-occupied schedules and reduce energy waste.
8. Installed new energy efficient mini-split systems in all data rooms (IDF) in the CSB. This will enable to remove this load from the chiller and allowed to performed night setbacks to the chiller.
9. Completed installation of the dual duct air distribution systems for the Academic Education Center building. This should ensure operation of the air handling units according to the design intent and reduce energy consumption on the fan motors.
10. All new construction and existing building renovations meet applicable energy code.
11. The School of Nursing building has been operational for the past year and a new control sequence was implemented to provide occupied/unoccupied modes. Also, a temperature standard of 74 degrees F was implemented for all spaces in the building.
12. Replaced boiler burners in the CSB Central Plant. This will allow the plant to operate by load requirement in stages, in lieu of full load per boiler. New boiler fire tubes have been replaced that will reduce pumping requirement and thus energy consumption.
13. In the MSBI building, 13 fume hoods and 7 biosafety cabinets were recommissioned. This will decrease in the energy consumption of the fan motors by the exhaust system. Also, filter banks have been replaced with more efficient HEPA filters.

EXHIBIT — III
Energy Conservation Projects and Finance Strategies

TTUHSCEP has identified the following projects for potential consideration in reducing the campus energy consumption. TTUHSCEP Engineering Services has performed cost benefit analysis of all the identified energy conservation projects. Currently, these projects are in various stages such as in planning, design, or implementation. The implementation schedule will be established according to the availability of funds and building resources.

Projects:

Evaluate and secure funding for the following projects.

1. Lighting retrofit to replace parking lot pole lights with LED light fixtures.
2. The new lighting standard for the campus is to implement LED light fixtures.
3. Continue insulation replacement project to identify and replace damaged, missing, or inadequate insulation.
4. Re-commissioning of the existing facilities to ensure they are performing as designed.
5. Evaluation of the existing energy management control systems and control sequences to optimize building system performance.
6. Improvements to the building envelopes.
7. Installation of Lighting Controls, more specifically in corridors, where lighting schedules will be implemented to reduce Energy consumption.
8. Implementation of Electric Sub metering to better identify energy deficiencies and future projects.
9. An energy recovery system for the MSBI. This would recover energy from boiler flue and building exhaust system.
10. Installation of pressure independent control valves for chilled water flow control to the air handlers.
11. Installation of low water flow controls for the toilets, sinks, and urinals.
12. Reutilize the captured condensate water from air handling and fan coil equipment.
13. Boiler control sequencing to the Medical Education Building.
14. Continue to retrofit automatic controls for HVAC Equipment as necessary.
15. Energy Management System continuous upgrades to allow better monitoring and control of Mechanical Equipment and Lighting.

Additional Tactics not requiring financing:

1. Ensure that all renovations and new building construction meet or exceed the most current edition of energy conservation codes.
2. Review all utility tariffs and ensure that the most favorable terms are being realized by TTUHSCEP.
3. Keep abreast of new and proven technologies and apply these technologies where opportunities exist.
4. Monthly review of the energy consumption from TTUHSCEP facilities and the immediate investigation into any variances from plan to correct and prevent future inefficiencies.
5. Continuously develop and update the list of energy conservation projects.
6. Broaden the application of xeriscaping and utilization of reclaimed waste water.
7. Participate in the forums presented by the State Energy Conservation Office, AEE, and ASHRAE.



8. Maintain a process of educating, training, and communicating the policies, best practices and every day conservation practices for the occupants within the facilities TTUHSCEP owns, operates and leases.

Finance Strategy

Listed below are some of the available methods of financing energy savings projects.

1. Internal Funding
2. Rebates from Utility Providers
 - SCORE Program by El Paso Electric Company

Evaluate options to internally fund energy projects by leveraging funded projects and through re-investment of utility savings.



EXHIBIT-IV
Gasoline consumption for TTUHSCEP

FISCAL YEAR	GASOLINE CONSUMPTION (GALONS)	GASOLINE COST (\$)	MILES DRIVEN (MILES)	FUEL EFFICIENCY (MILES/GALON)
FY'16	14,188	\$29,468	152,668	10.76
FY'15	14,347	\$38,491	148,684	10.36
FY'14	13,903	\$46,655	138,216	9.94

*Information provided by TTUHSCEP Department of Parking and Transportation Services Department

ATTACHMENT I
Employee Awareness Plan

TTUHSCEP is continuously on the lookout for means by which to communicate energy conservation practices to the personnel and patients that occupy the facilities. Avenues available to the institution are the announcement webpage for TTUHSCEP “The Scope”, memorandums, and emails.

The key elements of TTUHSCEP Utility Awareness Plan are to prevent waste and assure conservation of resources follow. These initiatives are broken down into two categories: Direct (effecting change in behavior) and Indirect (not designed to affect behavior, but will increase awareness):

Direct Initiatives:

- Require all personnel to turn off lights, computers, printers, and any other office machine when labs and offices are unoccupied.
- Turn off lights in classrooms when classes are over.
- Do not allow idle classrooms to be used as study halls. Use the library or small study rooms instead.
- Allow vent hoods to be operated only when necessary.
- Do not allow comfort-heating appliances to be used to supplement the building heating system.
- Instruct custodians to turn off lights in hallways and offices after cleaning.
- Implement Control logics such as economizer operation using a combination of enthalpy and dry bulb temperature, discharge air reset inversely to return air temperature, chilled water return temperature control needs to be reviewed and incorporated.

- Identify equipment that can be switched OFF during nights and weekends for all facilities.
- Replace filters on air handling units frequently.
- Periodically check temperature and humidity sensors for proper operation. Install minimum air flow stops to ensure appropriate outside air at all times.
- Check ducts and pipes for missing or damaged insulation.
- Perform regular preventive maintenance on all major and high energy use equipment.

Indirect Initiatives:

- Reduce the operating hours of Air Handling units and other main mechanical equipment.
- Reduce temperature of water used for domestic purposes to 125°F.
- Consolidate Laboratory Functions
- Install lighting Occupancy sensors
- Ensure Venetian Blinds and/or solar shades are fully extended and closed as appropriate to reduce heating and cooling losses.



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