

December 4, 2019

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

RE: Texas Tech University Health Sciences Center El Paso - Energy and Water Management Plan

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. Attached 'EXHIBIT-I' shows the historical energy and water consumption data for fiscal years 1999 through 2019, and the energy benchmarking index values for comparison.

Energy Consumption Index and Energy Utilization Index were reduced this fiscal year once again by a large margin. Energy conservation efforts were implemented and better energy conservation monitoring led to better results when compared with previous fiscal years. Several energy conservation initiatives were implemented throughout the campus which aided in reducing energy consumption.

Other factors such as programmatic changes, weather fluctuations, increase in research space and energy density contributed to changes in 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-19. Anticipating further growth in academics, healthcare (clinical), operations, and research during fiscal years 2019 through 2023, our institution adopts a plan with a goal to reduce energy consumption by 2% from an average of the 3 past fiscal years, this includes: electrical, water and gas utilities. For Vehicle fuel consumption, the institution's goal is to increase efficiency by 1%. 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 upon available funding. The successful application of these projects will form 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 slowly but steadily increased over the past fiscal years.

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.

During Fiscal Year 2018, TTUHSCEP's Physical Plant department met with personnel from CleaResult, Austin, to perform an Energy Benchmark for the campus. This resulted in a more clear representation of where the university stands in comparison with other health related universities in the area, the progress made since the last benchmark (2012) and also, it allowed to redefine the goals and focus points to continue to reduce energy consumption throughout the campus.


Sincerely,



Sue M. Fuciarelli, MBA, CPA
Vice President for Finance & Administration, CFO, TTUHSCEP



Al Flores, Jr., EFP
Interim Managing Director, Physical Plant and Support Services



Alex Gardea
Assistant Director, Engineering Services

Enclosed: EXHIBTS I, II, III & IV.



EXHIBIT-I
Historical energy and Water Consumption
Data
FY1999 — FY2019

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)
FY'17	115,625,708	692,427	166.986	19,904 (29)
FY'18	109,822,996	692,427	159.945 ¹	22,342 (33)
FY'19	57,632,837.6	692,427	145.800	24,209 (35)

****NOTE:**

gsf: Gross Square Feet

Mgal: Thousands of gallons

kBTU: Thousands of BTU's

¹For the calculation of EUI, please note that Gas is not recorded for all of the buildings. Building 3527- Mesa Psychiatric Center has a contract for the Electric Utility under Texas Tech Health Sciences Center El Paso. Gas and Water utilities reside under the responsibility of a different entity. Hence, EUI for Electric utility uses a gross area of 692,427 ft², but for gas 678,593 ft² is considered.



(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-19)	146	\$2.07
Texas Tech Univ Health Sciences Center El Paso (FY-18)	<u>160</u>	\$2.23
Texas Tech Univ Health Sciences Center El Paso (FY-17)	<u>167</u>	\$2.58
Texas Tech Univ Health Sciences Center El Paso (FY-16)	<u>171</u>	\$2.46
Texas Tech Univ Health Sciences Center El Paso (FY-15)	<u>207</u>	\$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)	133	\$2.39
TTUHSCEP Energy Management Plan Target	<u>< 130</u>	< \$2.34

N.B.:

1. EUI can increase significantly with more research and clinic space, occupancy density, year of construction; building plug loads etc.
2. CLEAResult, 4301 Westbank Drive, Austin, TX 78746, provided the median EUI and ECI of HRIs in Texas for year 2017.

****NOTE:**

gsf: Gross Square Feet

kBTU: Thousands of BTU's



EXHIBIT — II
Energy Conservation Efforts, FY-19

1. Lighting – Retrofit to LED Fixtures: Several buildings have been continuously retrofitted to LED fixtures. Some of these buildings and areas that have been retrofitted are the following:
 - a. Building 3000- Academic and Education Center
 - b. Building 3001- Clinical Science Building:
 - c. Building 3005- Medical Science Building
2. The cooling system for building 3006- Medical Education Building was upgraded with new isolation valves for the chillers in order to stage the chillers so that they operate only when required. Before all three chillers had to be operated at the same time due to the lack of isolation capabilities to each chiller.
3. Control optimization for fan coil units and VAV boxes in building 3001- Clinical Science Building, in order to implement occupied/ un-occupied schedules and reduce energy waste. Schedules have been implemented as these units are retrofitted, resulting in substantial energy savings.
4. Control optimization for terminal units in building 3006- Medical Education Building, in order to implement occupied/ un-occupied schedules and reduce energy waste. Schedules have been implemented as these units are retrofitted, resulting in substantial energy savings.
5. A demand limiting strategy was implemented in building 3001- Texas Tech Medical Center & 3005- Medical Science Building, which allows to control the building’s electric demand during peak hours and thus helps in reducing the “ratchet” from El Paso Electric Co.(utility provider), which will be used for demand charges purposes.
6. Installed automatic pressure regulating valves to operate with steam system for building 3005- Medical Science Building to reduce gas consumption and optimize system performance.
7. Implemented smart thermostats (Ecobee) for remote buildings to have better control of the HVAC systems.
8. Performed an optimization of the boiler’s control sequencing for building 3006- Medical Education Building.
9. Performed an optimization of the chiller’s control sequencing for building 3010- School of Nursing Building.
10. All new construction and existing building renovations meet applicable energy code.



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. The new lighting standard for the campus is to implement LED light fixtures.
2. Continue insulation replacement project to identify and replace damaged, missing, or inadequate insulation.
3. Continue the re-commissioning of existing facilities to ensure they are performing as designed.
4. Evaluation of the existing energy management control systems and control sequences to optimize building system performance.
5. Improvements to the building envelopes.
6. Installation of lighting controls, more specifically in corridors and areas with high occupancy variation like laboratories and classrooms where lighting schedules can be implemented to reduce energy consumption.
7. Implementation of a heat load mapping system to have better control of each zone of each building and thus have better control of the lighting and HVAC systems.
8. Continue the implementation of electric sub metering throughout the campus to better identify energy deficiencies and future projects.
9. Implementation of a campus-wide smart irrigation system.
10. Continue with the implementation of “Smart” thermostats in remote buildings.
11. Installation of pressure independent control valves for chilled water flow control for the air handlers in major buildings.
12. Installation of low water flow controls for the toilets, sinks, and urinals.
13. Reutilize the captured condensate water from air handling and fan coil equipment.
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.
16. Installation of variable frequency drives for the laboratory exhaust fans in building 3005- Medical Science Building I.
17. Continue with the controls retrofit of fan coils in building 3001- Clinical Science Building.
18. Continue with the controls retrofit of fan coils in building 3006- Medical Education Building.

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. Utilize money saved from previous energy efficiency initiatives to fund new initiatives
3. 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'19	13,662	\$35,163	144,403	10.57
FY'18	14,751	\$39,087	154,479	10.47
FY'17	14,223	\$33,686	149,330	10.49
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 & 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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