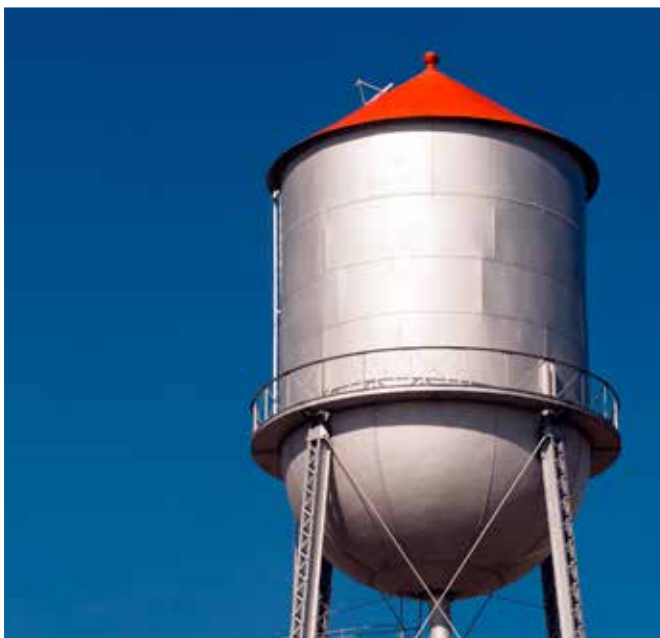




Glenn Hegar Texas Comptroller of Public Accounts

Utility Management Report 2016

Report on the Status of Utility Management and Conservation Efforts
of Texas State Agencies and Institutions of Higher Education



Utility Management Report 2016

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Utility Management Report 2016

One: Overview

Pursuant to Texas Government Code §447.009, state agencies and institutions of higher education are directed to set percentage goals for reducing their use of water, electricity, gasoline and natural gas, and to include these goals in a comprehensive energy and water management plan. This biennial report is a summary of these conservation efforts and an overview of state utility consumption data.

This is the second report provided since the passage of 2013's Senate Bill 700, which sought to merge the requirements of Government Code Section 477.009 with Executive Order RP49 to create consistent utility reporting by state entities. For the first report, state entities provided summary information of their utility data. For this report, many state entities reported monthly utility data by meter. This level of detail allows them to benchmark their buildings — that is, to compare their energy performance to past years or similar buildings. While not required, it's an important first step in identifying savings opportunities. According to the U.S. Environmental Protection Agency, benchmarked buildings see an average 7 percent reduction in energy consumption over a three year period. Given this deeper level of reporting and the initiatives outlined in the energy and water management plans, it's evident that many effective utility management and conservation efforts are under way. With reports such as this one, we hope to encourage state entities to learn from and adopt the best practices of others.

Two: Planning and Reporting Templates

SECO was charged with developing a template for state agencies and institutions of higher education to use in creating a comprehensive energy and water management plan. SECO created two templates, one for providing agencies and another for tenant agencies. *Providing agencies* are those that directly pay for their utility services, while *tenant agencies* are housed in facilities operated by others. These templates, located on SECO's website, can assist state entities in identifying and implementing cost-effective measures for minimizing utility consumption and costs.

SECO uses ENERGY STAR Portfolio Manager as its platform for capturing electricity, natural gas and water consumption data provided by state entities. Portfolio Manager is proven, government-developed software that is free, secure and accessible online. It allows agencies to report by individual

building or by meter. (Some agencies have elected to aggregate their data.) In addition, Portfolio Manager is interoperable with existing state agency utility accounting systems.

Three: Participants

All state agencies and institutions of higher education are required to report to SECO their utility management and conservation efforts as well as their consumption of water, electricity, gasoline and natural gas. For this report, 39 agencies and universities reported their consumption data online via ENERGY STAR Portfolio Manager while 57 submitted their energy and water management plans by email (**see Appendix A**).

Providing Agencies

Providing agencies typically have more control over their utility consumption and efficiency efforts than tenant agencies. It's an important distinction to keep in mind when examining the status and effectiveness of agency utility management plans and conservation efforts.

Conservation Efforts

In most cases, providing agencies own their buildings and thus can undertake larger-scale conservation efforts. **Appendix B** highlights the conservation efforts of several of the largest utility consumption agencies. The most common efficiency measures undertaken by providing agencies include:

- comprehensive lighting retrofits
- equipment upgrade or replacement
- building upgrades
- energy management systems and automation
- energy performance services
- equipment maintenance

Utility Expenditures

Exhibit 1 highlights the 12 state agencies with the highest utility expenditures in fiscal 2016, as reported in the Uniform State Accounting System (USAS).

EXHIBIT 1 Highest Utility Spending among Providing Agencies, Fiscal 2016

Agency	Electricity	Natural Gas	Water
696-Texas Department of Criminal Justice	\$45,021,743	\$11,175,050	\$29,712,873
601-Texas Department of Transportation	27,973,333	926,460	2,338,554
303-Texas Facilities Commission	12,713,226	844,033	1,923,534
405-Texas Department of Public Safety	6,454,602	303,489	391,972
539-Department of Aging and Disability	6,195,720	662,939	901,211
537-Department of State Health Services	5,695,094	653,586	898,215
802-Parks & Wildlife Department	5,035,928	222,687	739,208
529-Health and Human Services Commission	4,831,388	176,156	223,461
401-Texas Military Department	4,399,457	424,180	471,180
644-Texas Juvenile Justice Department	1,967,488	152,515	248,640
320-Texas Workforce Commission	828,464	47,189	86,805
582-Texas Commission On Environmental Quality	561,929	6,641	17,656

Source: Texas Comptroller of Public Accounts

Consumption Data

Exhibit 2 lists the 12 state agencies with the highest utility consumption in fiscal 2016, with electricity, natural gas and water consumption provided separately where available. As one might expect, agencies with the highest expenditures also have the highest consumption. Agencies reported consumption data to SECO through ENERGY STAR Portfolio Manager.

EXHIBIT 2 Highest Utility Consumption among Providing Agencies, Fiscal 2016

Agency	Electricity (kWh)	Natural Gas (kBtu)	Water (gal)
696-Texas Department of Criminal Justice	697,967,900	3,581,765,496	10,958,387
601-Texas Department of Transportation	251,920,600	134,212,103	Not Reported
303-Texas Facilities Commission	180,844,354	169,877,001	245,045
405-Texas Department of Public Safety	72,355,920	54,991,927	Not Reported
539-Department of Aging and Disability	82,760,374	191,601,351	203,168
537-Department of State Health Services	83,148,750	265,022	171,610
802-Parks & Wildlife Department	39,567,244	5,710,307	269,350
529-Health and Human Services Commission	48,665,776	258,775	26,039,300
401-Texas Military Department	44,041,510	50,026,000	56,232
644-Texas Juvenile Justice Department	27,952,841	30,595,321	44,603
320-Texas Workforce Commission	1,738,543	104,436	282
582-Texas Commission On Environmental Quality	3,379,686	557,515	2,126

Source: Texas Comptroller of Public Accounts

Tenant Agencies

Two-thirds of all state agencies are tenant agencies, located in buildings managed by another entity such as the Texas Facilities Commission. Most tenant agencies do not pay their own electric bills, but have implemented conservation strategies relying almost completely on employee awareness and involvement.

For reporting purposes, tenant agencies uploaded their utility information when available, provided a Conservation Efforts document and reported gasoline usage when applicable. The most common conservation efforts reported by tenant agencies were:

- training and education of employees about energy conservation
- procurement policies regarding energy-efficient products
- prohibition of appliances in personal work spaces
- regular communication with building landlord regarding maintenance
- after-hours shutdown and maintenance

Institutions of Higher Education

In most cases, universities own the buildings they occupy and thus can undertake larger-scale conservation efforts. **Appendix C** highlights the conservation efforts of several universities with the highest utility consumption. As with providing agencies, the most common efficiency measures taken by universities include:

- building upgrades
- comprehensive lighting retrofits
- equipment upgrade or replacement
- energy management systems and automation
- energy performance services
- equipment maintenance

Utility Expenditures

Exhibit 3 lists the 12 Texas public institutions of higher education with the highest utility expenditures in fiscal 2016, with electricity, natural gas and water consumption provided separately where available. Expenditure data was obtained from USAS, which reports the state's share of the utility expenses but does not include any federal share.

EXHIBIT 3
Highest Utility Spending among Institutions of Higher Education, Fiscal 2016

Agency	Electricity	Natural Gas	Water
715-Prairie View A&M University	\$3,824,537	\$283,552	\$48,011
744-UT Health Science Center at Houston	3,193,951	Not Reported	269,525
556-Texas A&M Agrilife Research	2,813,928	228,562	168,449
754-Texas State University	2,472,816	Not Reported	Not Reported
732-Texas A&M University-Kingsville	1,930,857	48,750	227,886
709-TX A&M University System Health Science Center	1,769,196	86,981	210,051
719-Texas State Technical College	1,615,362	167,175	434,784
753-Sam Houston State University	1,611,877	5,328	261,765
713-Tarleton State University	1,572,968	120,078	61,878
760-Texas A&M University - Corpus Christi	1,508,104	133,670	379,951
739-TX Tech University Health Science Center	1,481,441	212,689	179,942
763-University of North Texas Health Science Center	1,419,143	1,113,053	485,626

Source: Texas Comptroller of Public Accounts

Consumption Data

Exhibit 4 shows the 12 institutions of higher education with the highest utility consumption in fiscal 2016, with electricity, natural gas and water consumption provided separately where available. The institutions reported consumption data to SECO through ENERGY STAR Portfolio Manager.

EXHIBIT 4
Highest Utility Consumption among Institutions of Higher Education, Fiscal 2016

University	Electricity (kWh)	Natural Gas (kBtu)	Water (kgal)
715-Prairie View A&M University	48,807,820	139,543,367	256,360
744-UT Health Science Center at Houston	74,759,220	77,146,981	144,220
556-Texas A&M Agrilife Research	Not Reported	Not Reported	Not Reported
754-Texas State University	Not Reported	Not Reported	Not Reported
732-Texas A&M University-Kingsville	47,317,430	26,795,451	114,726
709-TX A&M University System Health Science Center	28,431,216	33,405,700	56,954
719-Texas State Technical College	11,498,812	955,658	18,317
753-Sam Houston State University	74,226,430	95,529,144	124,055
713-Tarleton State University	38,224,900	70,690,999	52,713
760-Texas A&M University - Corpus Christi	42,993,850	37,802,229	135,052
739-TX Tech University Health Science Center	62,368,058	95,453,027	64,886
763-University of North Texas Health Science Center	Not Reported	Not Reported	Not Reported

Notes:

719-Texas State Technical College reported utility consumption for Harlingen campus but not for Waco campus.

709-Texas A&M University System Health Science Center was missing two months of electrical consumption data.

Source: Texas Comptroller of Public Accounts

Four: Gasoline Consumption and Conservation Efforts

Thirty state agencies and universities reported gasoline consumption by on-road fleet vehicles, off-road equipment and stationary equipment (**Exhibit 5**). In addition, many agencies with fleet vehicles reported fuel-efficiency strategies in their Conservation Efforts document, including:

- employee carpooling to off-site meetings
- meetings and trainings held via phone or webinar
- proper and consistent maintenance of fleet vehicles
- procurement of more fuel-efficient vehicles

EXHIBIT 5
Gasoline Consumption by Agency or Institution, Fiscal 2016

Agency	Gasoline (Gal)
405-Texas Department of Public Safety	8,128,039
601-Texas Department of Transportation	3,231,718
696-Texas Department of Criminal Justice	2,240,619
576-Texas A&M Forest Service	521,907
539-Department of Aging and Disability	378,067
537-Department of State Health Services	259,917
733-Texas Tech University	233,012
755-Stephen F. Austin State University	138,673
729-University of Texas Southwestern Medical	135,042
752-University of North Texas	130,979
763-University of North Texas Health Science Center	130,979
746-University of Texas Rio Grande Valley	86,191
714-University of Texas at Arlington	83,000
757-West Texas A&M University	52,810
529-Health and Human Services Commission	44,876
785-Ut Health Center at Tyler	40,223
808-Texas Historical Commission	38,916
751-Texas A&M University - Commerce	33,998
715-Prairie View A&M University	31,457
713-Tarleton State University	29,845
737-Angelo State University	28,892
743-University of Texas at San Antonio	22,434
774-Tx Tech University Health Science Center El Paso	14,188
709-Tx A&M University System Health Science Center	9,560
727-Texas A&M Transportation Institute	6,500
720-University of Texas System	4,386
750-University of Texas at Tyler	3,940
761-Texas A&M International University	3,505
770-Texas A&M University-Central Texas	3,382
744-Ut Health Science Center at Houston	2,915
320-Texas Workforce Commission	1,900

APPENDIX A
Reporting Agencies and Institutions of Higher Education

The following list of Texas state agencies and institutions of higher education reported utility consumption data in ENERGY STAR Portfolio Manager and/or submitted an updated energy and water management plan. It's important to note that some of the agencies listed below are "tenant" agencies and therefore not required to submit utility data in Portfolio Manager.

Agency / University	Submitted an Energy and Water Management Plan	Reported Consumption Data in Portfolio Manager
302-Office of the Attorney General	X	
303-Texas Facilities Commission		X
320-Texas Workforce Commission	X	X
327-Employees Retirement System of Texas	X	
360-State Office of Administrative Hearings	X	
362-Texas Lottery Commission	X	
401-Texas Military Department	X	X
405-Texas Department of Public Safety		X
409-Commission on Jail Standards	X	
460-Texas Board of Professional Engineers	X	X
477-Commission on State Emergency Communication	X	
479-State Office of Risk Management	X	
529-Health and Human Services Commission	X	X
537-Department of State Health Services	X	
539-Department of Aging and Disability	X	
580-Texas Water Development Board	X	
582-Texas Commission on Environmental Quality	X	X
601-Texas Department of Transportation	X	X
696-Texas Department of Criminal Justice	X	X
727-Texas A&M Transportation Institute	X	
802-Texas Parks and Wildlife Department	X	X
808-Texas Historical Commission	X	X
813-Texas Commission on the Arts	X	
506-UT M.D. Anderson Cancer Center	X	X
576-Texas A&M Forest Service	X	
709-Texas A&M University System Health Science Center	X	X
710-Texas A&M University System	X	
713-Tarleton State University	X	X
714-University of Texas at Arlington	X	X
715-Prairie View A&M University	X	X
718-Texas A&M Galveston	X	
719-Texas State Technical College		X
720-University of Texas System	X	X
721-University of Texas at Austin	X	X

Agency / University	Submitted an Energy and Water Management Plan	Reported Consumption Data in Portfolio Manager
723-University of Texas Medical Branch	X	X
724-University of Texas at El Paso	X	X
729-University of Texas Southwestern Medical Center	X	X
730-University of Houston	X	
731-Texas Woman's University	X	X
732-Texas A&M University-Kingsville	X	X
733-Texas Tech University	X	
735-Midwestern State University	X	
737-Angelo State University	X	X
738-University of Texas at Dallas	X	X
739-Texas Tech University Health Science Center	X	X
742-University of Texas of the Permian Basin	X	X
743-University of Texas at San Antonio	X	X
744-UT Health Science Center at Houston	X	
745-UT Health Science Center at San Antonio	X	X
746-University of Texas Rio Grande Valley	X	X
749-Texas A&M University-San Antonio	X	X
750-University of Texas at Tyler	X	X
751-Texas A&M University - Commerce	X	X
752-University of North Texas	X	X
753-Sam Houston State University	X	X
755-Stephen F. Austin State University	X	X
757-West Texas A&M University	X	
760-Texas A&M University - Corpus Christi	X	X
761-Texas A&M International University	X	
763-University of North Texas Health Science Center	X	
764-Texas A&M University - Texarkana	X	
765-University of Houston - Victoria	X	
770-Texas A&M University - Central Texas	X	
774-Texas Tech University Health Science Center El Paso	X	X
785-UT Health Center at Tyler	X	X

APPENDIX B

State Agency Conservation Efforts

This appendix documents the conservation efforts of several Texas state agencies with the highest reported energy consumption. The information comes directly from agency reports submitted to SECO.

Texas Department of Criminal Justice (TDCJ)

Utility and energy consumption reduction remains a high priority for TDCJ, which is committed to the goal of a 2.5 percent reduction in its use of electricity, natural gas, water and gasoline. Examples of TDCJ's energy efficiency and conservation efforts include:

- partnering with CLEAResult Consulting to enter the Texas City Smart Program, which offers no-cost services for energy efficiency and monetary incentives for qualifying measures in new construction and renovation projects.
- conducting employee awareness campaigns about reducing energy consumption.
- presenting monthly utility consumption reports to sergeants, lieutenants and captains and including them in training for regional wardens and majors.
- purchasing flex-fuel vehicles that can use an 85 percent blend of ethanol with gasoline.

Texas Department of Transportation (TxDOT)

The following summarizes TxDOT's energy conservation efforts and results:

- Between 2014 and 2015, TxDOT Support Services achieved a 34.2 percent reduction in water usage, a 2.24 percent reduction in electrical usage (despite a 0.89 percent increase in electrical accounts) and a 121 percent reduction in natural gas for buildings (a significant factor in the latter reduction is a decrease in heating degree hours from 2014 to 2015).
- TxDOT operates in both regulated and deregulated utility locations within the state. Its Facilities Management Section has negotiated a contract with a retail electric provider containing a provision that all electricity provided to TxDOT buildings in deregulated areas will be "green" energy from renewable sources. Green energy represented about 13 percent of the agency's total energy in 2015.
- The Energy Use Index (EUI) for the top 10 energy-using buildings in TxDOT's portfolio includes four that could achieve an ENERGY STAR rating (Riverside, Dallas HQ, Houston HQ and El Paso HQ).
- From 2014 to 2015, TxDOT Fleet Operations achieved a 16.7 percent reduction in gasoline usage, a 24.4 percent reduction in diesel usage and a 22 percent increase in its use of flex fuel.
- As part of a renovation of its Dallas district office, TxDOT evaluated the use of a geothermal heating and cooling system. This measure should reduce the building's carbon footprint in a way that equates to removing 65 cars from the road annually.

Texas Facilities Commission (TFC)

The following summarizes TFC's energy conservation efforts and results:

- TFC's Office of Energy Management (OEM) has cooperated with Austin Energy on its ongoing Load Coop program to reduce demand peaks for TFC-managed buildings during the summer.
- OEM is in the final phase of completing a contract for a LoanSTAR-funded, multi-building energy savings project. This project includes multiple energy-saving areas such as lighting and control upgrades. This project will be the first of its kind in Texas and is expected to result in major energy savings.
- OEM recently completed a project in cooperation with Energy System Laboratory and SECO to improve the efficiency of a condensing water system at the Sam Houston Building central that feeds the Capitol, Capitol extension and most buildings in the vicinity. The \$150,000 project was funded by SECO and will result in about \$100,000 in annual energy savings.
- OEM is continuing its effort to retrofit or replace its remaining metal halide garage lighting to LED lights. Projects in Garages Q and R are under way; OEM expects the project to be completed in early 2017.
- OEM is upgrading the existing fluorescent T-8 lighting in TCEQ Building E to LED lighting. This project too should be completed in early 2017.
- OEM is managing and monitoring utility usage at all TFC facilities, representing more than 7 million square feet.
- In 2015, OEM hired a commissioning engineer and began in-house retro-commissioning of existing facilities.
- OEM provides ongoing support for deferred maintenance projects.
- OEM has helped to develop design guidelines for future building construction projects in downtown and the north complex.

Texas Health and Human Services Commission (HHSC)

Energy and water conservation projects at state-supported living centers and state hospitals continue to reduce the consumption of electricity, natural gas, water and associated costs. The savings are being used to repay principal and interest on loans secured to implement energy-efficiency projects. These projects used energy savings performance contracts.

As energy and water costs continue to rise, HHSC will ensure employees do their part in conserving resources and controlling costs. Employee awareness posters are available for local offices.

Texas Military Department (TMD)

The following summarizes TMD's energy conservation efforts and results:

- TMD initiated an energy management master plan (EMMP) revision in fiscal 2016. A working group agreed to update the EMMP to the Texas Energy Security and Sustainability Strategy (TES3), in order to align with the U.S. Army's Energy and Security and Sustainability Strategy.
- TMD has implemented energy conservation design guidelines as applicable for facility maintenance, renovation and construction.
- TMD continues refining its demand-response program with the city of Austin and will improve response capabilities for fiscal 2017.
- TMD has completed a renewable energy resource potential study, in cooperation with the Environmental Defense Fund, which analyzed the generation potential and economic feasibility of renewable energy technologies at more than 60 TMD facilities.
- TMD's newly hired energy manager completed the Army Energy Manager's Course and the DOE Energy Exchange.

Texas Parks and Wildlife Department (TPWD)

TPWD's "2020 Sustainability Plan," a five-year plan adopted in November 2014, helped define the agency's efforts in resource conservation and environmental stewardship. TPWD's energy goals for 2020 are:

- reduce net consumption of electric energy and natural gas by 10 percent from 2010 levels through investments in energy-efficient equipment and behavioral changes.
- install or acquire more than one MW of solar photovoltaics for TPWD facilities.
- track energy use at all applicable facilities through the ENERGY STAR Portfolio Manager.
- develop and implement division-level plans to educate staff and/or constituents about energy conservation and efficiency.
- convert 75 percent of all agency vehicles to alternative fuel or low-emission vehicles.

Texas Historical Commission (THC)

The following summarizes TMD's energy conservation efforts and results.

For Capitol Complex buildings:

- The five THC buildings in the Capitol Complex have eight air conditioners that are 18 to 20 years old. THC is reviewing plans to replace these with more efficient systems, and will solicit bids for replacements in fiscal 2017.
- THC is replacing outside sprinkler zones with a buried drip-irrigation system. Such systems are more efficient because they eliminate evaporation and overspray onto sidewalks.
- THC plans to replace 110 failing T-12 fluorescent fixtures at the Christianson-Leberman and El Rose buildings with LED lights in 2017.

For historic sites:

- At the Fort Lancaster State Historic Site, THC completed an expansion of the visitor center that included all-new HVAC systems, new LED exhibit lighting and new restrooms that include modern, water-efficient plumbing fixtures to replace the original 1970-era fixtures.
- At Landmark Inn, THC completed a six-building renovation project that replaced older plumbing fixtures with new, more efficient versions. Window-mounted HVAC units at the Vance Hotel and Vance House were replaced with a central split-system HVAC unit.
- Currently in development are new museums at the Levi Jordan State Historic Site and San Felipe de Austin State Historic Site that will integrate best practices in sustainable design.

Other agency-wide improvements:

- THC has replaced existing copiers and printers with newer, more energy efficient equipment.
- The agency added three new hybrid gas/electric Ford Fusion vehicles to its motor pool in fiscal 2016, and has prioritized the use of such vehicles when replacing older models or expanding the existing fleet.
- THC has posted Texas Facility Commission recycling brochures around THC buildings to increase staff awareness and participation in recycling.

APPENDIX C

Institutions of Higher Education Conservation Efforts

This list provides a sampling of universities that submitted an energy and water conservation plan.

Prairie View A&M University (PVAMU)

Energy conservation initiatives have reduced PVAMU's Energy Use Index (EUI) from 216.2 mBtu per square foot in December 2014 to 199.5 mBtu per square foot in August 2016, a 7.7 percent reduction.

PVAMU has reduced energy consumption by embarking on an aggressive HVAC scheduling program to deactivate the systems when buildings are not in use.

PVAMU generates and reviews weekly utility consumption building profiles to ensure buildings are operating as designed.

Texas A&M University (TAMU)

The following summarizes TAMU's energy conservation efforts and results:

- TAMU energy consumption per gross square foot (GSF) fell by 45 percent (364 mBtu to 202 mBtu) between fiscal 2002 and fiscal 2016.
- Total real energy consumption fell by 27 percent over the same period, from 6.74 trillion Btu to 4.9 trillion Btu, while campus space grew by 34 percent, from 18.5 million GSF to 24.7 million GSF.
- Energy use reduction measures over the same period generated \$209 million in avoided costs.
- A goal in TAMU's 2005 Energy Conservation Plan to achieve an energy use intensity (EUI) of 275 by fiscal 2010 was achieved and surpassed.
- TAMU's Energy Action Plan (EAP) 2020 targets further reduction of energy consumption. The goal of EAP 2020 is to reduce overall campus EUI by 14 percent in five years, from the fiscal 2015 baseline of 208 mBtu/GSF to 180 mBtu/GSF by the end of fiscal 2020.
- In February 2015, TAMU completed Phase 3 of its SECO loan projects for an additional \$4.1 million in HVAC and lighting improvements in 10 buildings with a total of 802,000 GSF. This project is anticipated to avoid the use of 5 million kWh of electricity, more than 30,000 mmBtu of chilled water and almost 10,000 mmBtu of heated water.
- In April 2015, TAMU received SECO approval to move forward with Phases 4 and 5 of its loan projects, valued at approximately \$11.3 million, for HVAC, hydronic pumping and lighting improvements in 26 buildings and the replacement of almost 3,000 of 4,085 exterior lights with LEDs. These projects have an estimated energy avoidance of 8 million kWh of electricity, more than 20,000 mmBtu of chilled water and almost 8,000 mmBtu of heated water. The project is approximately 50 percent complete.
- TAMU's Energy Stewardship Program continues to pay dividends. The university currently has six full-time "energy stewards," each assigned an average of 2.6 million GSF. The stewards proved vital to recent SECO loan projects, facilitating the construction process and achieving additional

cost avoidances. The stewards identified additional opportunities through scheduling and setbacks that allowed the projects to exceed expectations by more than 50 percent.

- In 2012, TAMU completed an updated utilities and energy services capital plan that documented and justified \$46 million in production and major infrastructure improvements for the following five years. These projects were placed on the university capital plan for the period of fiscal 2013 through 2017. The Texas A&M Board of Regents has approved design and construction on all phases of these capital improvements. The initial fiscal 2013 utility production upgrade project, with a \$15.4 million budget, will increase capacity for a growing campus, replace aging equipment and generate \$1.25 million annually in cost avoidance through improved operating efficiency. The fiscal 2014 project has a \$20.2 million budget and will continue upgrading campus production facilities to meet growing demands while avoiding more than \$1 million in costs annually. The fiscal 2015 project has a \$7.4 million budget that will further the production capacity and efficiency improvements.

University of Texas System (UT System)

The University of Texas System's total EUI for the past 3 fiscal years (Fiscal 2014 – fiscal 2016) fell by 21 percent between fiscal 2014 and 2016, from 614 mBtu to 508 mBtu. During the same period, water consumption fell by 8 percent, from 13.88 gal/gsf to 12.41 gal/gsf.

University of Texas M.D. Anderson Cancer Center

M.D. Anderson plans to implement or make significant progress toward the execution of the following energy conservation projects during fiscal 2017:

- South Campus Central Plant Optimization Project — this project will be completed during 2017. Activity by the O&M and Engineering teams to optimize the new controls and integrate the sequences and related reports into normal operation will lead to estimated annual electric savings of 5 million kWh.
- AHU dynamic resets — air handler discharge temperature resets will be added, using a dynamic reset strategy successfully adopted in other M.D. Anderson buildings. This sequence adjusts the air discharge temperature to an optimal set point based on space loads and set points that minimize reheating in air systems. Buildings targeted for implementation in fiscal 2017 include Alkek, Mays Clinic, the Cancer Prevention Building and Clark Clinic. This should reduce the chilled water and steam demand for these buildings.
- Operating room setbacks — implementation of unoccupied air-flow setbacks in the Alkek and Pavilion operating rooms to reduce energy needs when the rooms are not in use. Several rooms will remain in occupied mode at all times to ensure emergency surgery readiness.
- Humidification controls — the center will monitor for steam waste and control malfunction in vivarium areas requiring humidification, disabling humidification when not needed.
- High-efficiency HVAC filtration — for units with high volumes of outside air, M.D. Anderson has begun replacing coarse synthetic fiber filters with fine fiber, long-life filters. The new replacement strategies have resulted in energy and material/waste savings with short payback periods.

- KPI fault detection — M.D. Anderson has deployed an in-house, automated daily analysis tool to detect energy waste in three buildings. During fiscal 2017, this tool will be deployed at ACB, an 875,000-square-foot clinic facility that is one of the center's top three energy users by cost.
- 1MC energy audit — M.D. Anderson has selected a third-party consultant to provide an ASHRAE Level 2 energy audit of our 1MC office building. This building includes 1.5 million gross square feet and has an annual utility cost of about \$3 million. The energy audit will be performed in fiscal 2017; potential energy conservation measures identified during the audit will be evaluated for possible future implementation.

Texas Tech University

Texas Tech University has implemented the following energy reduction measures.

For educational and general space:

- Free cooling project at Central Heating and Cooling Plant (CHACP) #1 – the water side economizer provided more than 3.5 million ton-hours of free cooling this fiscal year for an estimated savings of \$66,118.
- A back pressure turbine at CHACP #1 supplied 16.6 percent of the plant's electricity for an annual savings of \$146,228.
- Replacement of a 6,500 ton steam-driven chiller with two variable frequency drive (VFD)-driven electric chillers with a combined capacity of 6,200 tons — project cost was \$6.2 million; TTU Energy Management will validate energy savings in fiscal 2017 report.
- Integration of automatic weather data, 15 chilled water meters, 20 electrical meters and 115 data points into the eSight Energy Accounting System — eSight has identified several repairs that have saved TTU over \$300,000 in the past year, most notably a single chilled water repair at English/Philosophy/Education that saved \$240,000. CHACP 1 Utilivisor service reports an annual savings of \$91,847. Installed nine irrigation water meters that have not yet been integrated into eSight.
- A second antenna has been added at the College of Media and Communications to expand the coverage of our exterior lighting controls.
- A dedicated cooling unit installed in Science lab 326 will allow the university to discontinue 24/7 operation of the main air handling unit and thus save about \$17,000 annually.
- A dedicated cooling unit installed in College of Media and Communications (COMC) server room 1217 will allow the university to discontinue 24/7 operation of the main air handling unit for the entire COMC tower, saving \$52,000 annually.
- A View Dynamic Glass (electronically dimmable glass) pilot project at COMC room 102 is expected to reduce heat loads and improve occupant comfort and productivity. TTU Energy Management will study the installation to project savings for a full-scope proposal for fiscal 2017. This project was sponsored in part by a gift-in-kind donation from View Dynamic Glass.

- Completion of phases 1 and 2 of a three-phase recommissioning project at Biology appears to have reduced electricity use by 7 percent. TTU Energy Management will validate this next year, once steam and chilled water meters are installed and integrated into the eSight Energy Accounting System.
- A cost analysis of historical energy use at the Student Union Building validated retuning work Energy Management initiated in January 2015. Total energy cost for the building was reduced by \$58,000 in the past year.
- Energy Management successfully negotiated operational measures with customers at several buildings including the Media Communications, Science, Art, and Art 3D buildings; the customers agreed to curtail air handler exceptions by calling 742-4OPS whenever they need service. By doing so, TTU has avoided energy costs of more than \$100,000 per year.
- TTU set up a project to correct duct work and install solar shades and blackout shades in Agriculture Education and Communications Room 104.
- A retuning and controls project at Library is 75 percent complete. Electrical costs fell by \$37,000 in the past year. TTU is waiting for installation and integration of steam and chilled water meters into the eSight Energy Accounting System before validation of thermodynamic energy savings as well as the electrical savings can take place.
- The Dean of the Library saved more than \$6,000 this year by securing air handlers during the winter break, making only the Croslin room available as conditioned study space during this time.

For auxiliary space:

- Energy Management validated a 43 percent energy reduction at the Robert Ewalt Student Recreation Center, as a result of a \$90,000, multi-year project initiated in fiscal 2013. Rec Center energy costs have fallen by more than \$268,000 annually since the program began.

Energy audits:

- In fiscal 2016, TTU completed two lighting audits, one at Drane and the other at Reese 555. Energy audits were completed at the Media and Communications, Agriculture Education, Experimental Science, College of Business Administration, Food Technology, English Philosophy, Library, Petroleum Engineering, West Hall, Music, United Supermarket Arena, and Student Wellness buildings. The energy audit for the Agriculture Education building led to a project to replace the chilled water pump and variable-frequency drive.

Stephen F. Austin State University (SFASU)

SFASU has reduced its utility consumption through various facility improvement measures as well rate reductions obtained with strategic negotiating techniques. As a result, SFASU has reduced its total annual utility spending (electricity, natural gas, water and sewer) by 48.3 percent since fiscal 2008.

Electricity:

- SFASU natural gas consumption peaked in fiscal 2008, at about 88.5 million kWh. Electricity costs peaked in 2010, at nearly \$7.9 million. Fiscal 2017 electricity consumption and costs are estimated at 63.86M kWh and \$3.97 million, respectively. This represents reductions of 27.9 percent in consumption and 49.7 percent in associated costs from the peak periods.
- Negotiated electric rate reductions for fiscal 2018 through 2020 are expected to save an additional \$700,000 annually.
- In addition, implementation of the Phase 4 HVAC improvement projects in fiscal 2019 should reduce annual onsumption by an estimated 4 percent (3,000,000 kWh) compared to fiscal 2016.

Natural Gas:

- SFASU reached its peak natural gas consumption in fiscal 2009, at about 227,000 MMBtu. Natural gas costs peaked in fiscal 2008, at just over \$2 million. Fiscal 2017 figures are estimated at 164,800 MMBtu and \$675,000, representing reductions from peak periods of 27.4 percent and 66.6 percent respectively.
- Implementation of phase 4 HVAC improvement projects in fiscal 2019 is expected to reduce annual electricity consumption by an estimated 3 percent (5 MMBtu) compared to fiscal 2016.

Water and Sewer:

- Annual water and sewer reduction results are more difficult to track at SFASU because of a lack of historical data and the influence of weather conditions on consumption.

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