



TEXAS A&M
UNIVERSITY

Energy Management Report

2018



A. The extent to which the agency has met the percentage goal it established for reducing its usage of electricity, gasoline, and natural gas:

- Energy consumption per gross square foot has been reduced by 48% (364 mBtu per GSF to 191 mBtu per GSF) over a fifteen-year period from FY02 – FY18. The revised goal in the Energy Action Plan 2020 is to achieve an Energy Use Intensity (EUI) of 182 by FY2020.
- Total real energy consumption has decreased 20 percent over this same fifteen-year period, from 6.74 trillion Btu in FY02 to 5.42 trillion Btu in FY18, while the space served grew by 57 percent, from 18.5 million GSF to 29 million GSF.
- Energy consumption reduction measures over this same fifteen-year period (FY02 – FY18) have generated \$247 million in avoided cost. Texas A&M University has provided exemplary leadership in the area of energy efficiency improvement and conservation with these accomplishments. (see attached “EUI Chart”)

B. The steps the agency may take to increase the percentage goal for reducing its usage of electricity, gasoline, and natural gas:

- The University has established and actively manages an Energy Action Plan (EAP) 2020 which targets further reduction of energy consumption per gross square foot over five years - from FY15 through FY20. The goal of EAP 2020 is to reduce the overall campus EUI from the FY15 baseline of 208 mBtu/GSF to 182 mBtu/ GSF by the end of FY20, or a reduction of 13% per GSF over 5 years. (see attached “EUI Chart”)
- In January 2012, the University completed a \$15 million energy efficiency projects (phases 1 & 2) with Siemens acting as the Energy Services Company (ESCO) that included consumption reduction measures in 18 buildings and 5 parking garages. These efficiency improvements in the facilities included lighting upgrades, building automations system retrofits, and HVAC system improvements. The first year (FY12) energy consumption reductions in the buildings far exceeded the guarantee for avoidance by 173% for electricity, 182% for chilled water and 145% for heating hot water and similar results have been seen in FY13.
- In February, 2015, the University completed Phase 3 of the 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 5 million kWh of electricity, over 30,000 mmBtu of chilled water and almost 10,000 mmBtu of heating hot water.
- In March, 2017, the University completed Phases 4 and 5 valued at approximately \$11.3 million in HVAC, hydronic pumping and lighting improvements in 22 buildings and replacement of almost 2,710 exterior lights with LED replacement. These projects have an estimated energy avoidance of 7.5 million kWh of electricity, 20,792 mmBtu of chilled water and 8,267 mmBtu of heating hot water.



- A major energy conservation initiative for TAMU is the Energy Performance Improvement (EPI) program. Working in close coordination with departments from select buildings, the recently completed pilot program was designed to reduce energy consumption and avoid cost. In total, the four buildings in the pilot program combined to reduce utility cost by \$500,000 during the one year program. Based on the success of the pilot program, an expanded EPI Program will be implemented in FY19. The Energy Performance Improvement (EPI) Program has two primary objectives: 1) Raise awareness and identify opportunities for improved efficiency and sustainability through engagement with facility occupants and stakeholders, 2) Implement energy system technical solutions, with occupant engagement and participation, to improve facility operating efficiency and reduce energy consumption and cost. EPI begins with getting ‘buy-in’ from department leadership for any modifications proposed in the facility, with participating departments incentivized by sharing in the cost avoidance achieved through energy consumption reduction. The next step is a meeting with occupants about the building’s energy consumption - to brainstorm and identify solutions for reducing unnecessary building consumption and cost. An essential aspect of the EPI Program is that initiatives are discussed and agreed upon up front, with any changes to building operation monitored closely to achieve positive results.
- A Utilities & Energy Services Capital Plan was completed in 2017, which documented and justified \$47 million in production and major infrastructure improvements and replacements that are required over the next five years. The plan also focused on ensuring that the Building Automation Systems (BAS) in the campus buildings are up to date. There are some buildings on campus in which the BAS panels are older and no longer available which can lead to reliability issues. A project is on the capital plan and is scheduled for BOR approval in 2019.

The scope of capital upgrades that are **completed** include:

- Replacement of Chiller 103 @ SUP1
- Replacement of Chiller 07 @ CUP
- Addition of Heat Recovery Chiller 207 @ SUP2
- CUP & SUP1 Cooling Tower Upgrades
- Chilled Water Production Optimization @ CUP, SUP1, SUP2 & SUP3
- Installation of Chiller 206 @ SUP2
- Installation of Thermal Energy Storage @ SUP2
- Replacement of Chiller 10 @ CUP
- Replacement of Chillers 301 & 302 @ SUP3
- Cooling Tower Upgrade @ SUP3
- Addition of a Heating Hot Water Capacity @ SUP1
- Refurbishment of Chiller 8 & 9 @ CUP
- Cooling Tower Upgrade @ SUP2
- Replacement of Chiller 201 @ SUP2



C. Any additional ideas the agency has for reducing energy expenditures relating to facilities:

- The University continues to focus its Energy Stewardship team and other resources on Top 50 campus buildings, which consume 50% of the campus energy. This strategy will continue to allow a more detailed focus on identifying and correcting the issues to reduce overall energy consumption. While the other buildings will still be carefully managed, this more focused approach will lead to improved performance on a campus that exceeds 24 million GSF.
- In FY16, the University went operational with a chilled water optimization program. This program greatly reduces the pumping energy required by the campus by carefully monitoring the building loads and only moving the water when as required to meet load. With chilled water loops that exceed one million gallons, this will lead to significant energy savings.
- In addition to identifying opportunities to improve operating efficiency of building HVAC, BAS, and lighting systems, UES is evaluating opportunities to more precisely regulate the face velocity associated with over 1,000 fume hoods located on the Texas A&M University campus – to ensure safe operation with improved energy efficiency.
- The University uses the EnergyCAP program to track all utility cost by building, by utility, and by customer across the College Station campus. In addition, the campus uses the Schneider PME system to make data from all meters across the campus available in real-time to provide feedback to technicians when making efficiency improvements.
- TAMU continues leveraging the combination of its Energy Stewardship program, Energy Performance Improvement program and its own workforce of (26) building automation system (BAS) technicians to accomplish energy reduction. Having people in the buildings identifying opportunities and the technical staff to correct the issues is invaluable to a successful energy conservation program.



D. Any additional ideas the agency has to minimize fuel usage in all vehicles and equipment used by the agency.

The following procedures have been and still are in place:

- Reduced bus service hours to match reduced ridership levels – focus on efficiencies
- Reduced fleet vehicles – retiring older, less efficient vehicles
- Photocell lighting used on exterior of all garages
- Conservation tips have been posted on our website
- A brochure has been produced regarding fuel conservation
- We continue to communicate our efforts with Communication Representative from EAP 2020 Advisory Committee and offer assistance where needed with University-wide conservation efforts
- Contracted with Alta Inc. to develop a comprehensive bike plan to encourage alternative transportation. This is currently being implemented.
- Established an agreement with Zipcar to provide car share at various locations on campus to reduce vehicular traffic.
- New technology provides guidance in our facilities to available spaces. This has been implemented in our new Cain Garage. It reduces circulation and emissions by getting vehicles in place faster and more efficiently.
- Converted most parking lot lighting around campus to LED lighting.
- Aggie Spirit provides over 7 million rides annually, reducing vehicular traffic on campus.
- Implemented the largest campus dock less bike share system in the country with over 500,000 rides since implementation.

University Fleet Fuel Consumption (provided by Transportation Services)

University Fleet		FY2017	FY2018	(Reduction) / Increase	
Fuel Consumed				Actual	(%)
Gasoline Fleet	Gallons	324,021	330,211	6,190	2%
Diesel Fleet	Gallons	633,437	582,779	(50,658)	-8%
Natural Gas Fleet	MMBTU	867	493	(374)	-43%



Energy Use Intensity (Energy Consumption per GSF)

Texas A&M University, College Station, Texas

