

**FY - 2019**  
**UTSA ENERGY & WATER**  
**MANAGEMENT PLAN**

**FOR**

**UTSA**® **Facilities**



**THE UNIVERSITY OF TEXAS OF TEXAS AT**  
**SAN ANTONIO**

## **Progress Report**

The following is a list of projects and savings actions implemented from 2015 through 2019 with a summary of performance results.

### **2015**

Participation in CPS Energy Demand Response Program resulted in \$116,982 payment from CPS for shedding an average 1,746 kW during response events.

A 2500-ton, variable speed electric driven chiller replaced a 2000-ton steam driven at the North Thermal Energy Plant. The new chiller is more energy efficient and uses a more environmentally friendly refrigerant. Estimated savings are \$150,000/year (2,300,000 kWh/yr saved). UTSA received a \$375,000 efficiency rebate from CPS Energy for this project.

Completed the construction of a cooling coil condensate reclamation system at the John Peace Library air conditioning systems that directs cooling coil condensate water to the Sombrilla Fountain. Various funding sources were pursued to implement this project (Green Fund, Alumni Association, and “Fill the Fountain Campaign”). Annual water savings verified at 92,000 gallons resulting in cost savings of approximately \$500/yr.

New natural gas rate structure implemented for demand shedding engine generator at the Main Campus resulted in annual savings of approximately \$6,800.

Natural gas agreement with CPS Energy was established and approved by the General Land Office resulting in long term cost savings.

Replacing T8 lamps with T5 lamps at the Monterey Building has saved approximately \$30,000/yr (650,000 kWh/yr).

Installation of improved efficiency air cooled chillers at the Monterey Building are expected to save \$17,000 annually. UTSA received a \$37,800 efficiency rebate from CPS Energy for this project.

### **2016**

First-year participation in CPS Energy Automated Demand Response Program resulted in \$7,432 payment from CPS for shedding an average 149 kW during response events. As part of the program the Main Campus performs a variety of the following adjustments where feasible: chiller supply temperature adjustments, cold deck set point adjustments, duct static pressure adjustments, fan speed adjustments, & room temperature adjustments. Campus Housing uses thermostats controlled by CPS Energy to load shed during high electrical peak conditions.

Campus metering project is adding utility meters to campus buildings to track energy and water consumption. Meters remotely monitored by Facilities staff obtain real-time consumption and thus identify areas of improved efficiency and reduce unnecessary energy use by establishing and understanding consumption patterns. Expected savings as a result of identifying areas of improvement are being quantified and documented.

The Bio-Sciences Building is currently being converted from Constant Air Volume to Variable Air Volume. Conversion will reduce the number of air changes to improve efficiency, allow for building to self-modulate based on occupancy, and modifications will allow for improved monitoring via the building automation system. Project is expected to save approximately \$58,000/yr.

## **2017**

Ongoing participation in CPS Energy Automated Demand Response Program is producing an average load shed of 855 kW during summer response events. As part of the program the Main Campus performs a variety of the following adjustments where feasible: chiller supply temperature adjustments, cold deck set point adjustments, duct static pressure adjustments, fan speed adjustments, & room temperature adjustments. Campus Housing uses thermostats controlled by CPS Energy to load shed during high electrical peak conditions.

Nightly temperature setbacks were implemented over the summer on all but research and critical operations facilities. Savings will be evaluated to determine if successful or if an alternate approach will generate improved savings.

New 800 HP boiler at the North Thermal Energy Plant was completed and is under performance testing. Heating reliability and efficiency will be improved and assessed as it becomes operational.

Project is underway to install to retrofit Monterey Building cooling coils with UV lights that will kill microbiological growth on these coils. UV lights will improve indoor air quality and cleaner coils are expected to reduce fan power on these aging units.

## **2018**

**LED Retrofits** -- Implemented in various campus buildings as lights are routinely replaced. Facilities will stock only LED lights in place of T-8 lamps and replace lamps on a room-level basis to ensure a complete change out of fluorescent lamps over time.

**Downtown Campus Chiller** -- Will be replaced with an energy efficient chiller. Efficiency rebate has been applied for.

- Installed in December 2018 and \$37,536 rebate received

**North Thermal Energy Plant Boilers** - Replaced the final two remaining vintage 1973 boilers with higher efficiency boilers.

**Main Campus Demand Response Program** -- Producing an average load shed of 841 kW during summer response events. Expected incentive payment to the University is estimated at \$59,000. As part of the program the Main Campus performs a variety of the following adjustments where feasible: chiller supply temperature adjustments, cold deck set point adjustments, duct static pressure adjustments, fan speed adjustments, & room temperature adjustments. Campus Housing uses thermostats controlled by CPS Energy to load shed during high electrical peak conditions.

**Downtown Campus Demand Response Program** -- Currently under evaluation.

- Funds from Main Campus Demand Response incentive payment will be used to program

the building automation system.

- Honeywell, in partnership with CPS Energy, provided their recommendations to include space & chilled water supply resets, and disabling of VAV electric strip heating

**Science & Engineering Building** -- Under construction and efficiency rebates for the chiller installation and LED lighting is currently under evaluation.

- LED lighting does not qualify for rebate as it is new construction
- Chiller is still being considered for rebate by CPS Energy

**Controls at North Paseo Building** -- Being reviewed by graduate students under the supervision of faculty and Facilities staff to identify areas of potential improvement. Several set points have been updated and more robust recommendations will be presented and evaluated.

- Strategies were not practical for implementation

**Applied Engineering Technologies and Alvarez Hall Building Commissioning** -- Under initial evaluation to implement building commissioning through the local utility's energy conservation program.

- Program provider has had staff turnover and work has been delayed
- Alvarez Hall will be postponed

## **2019**

**LED Retrofits** -- Flawn Science building was retrofitted with LED lamps. Four-foot lamps at the Main Buildings were retrofitted with LED lamps. All 32-Watt, T-8 lamps were replaced with LED lamps obtained at a discounted rate as part of CPS Energy's energy efficiency program. Arts Addition photo lab and Business Services Annex were upgraded with LED lamps using this same program. Multi-Disciplinary Studies building was audited by a lighting consultant that will provide a retrofit proposal for consideration.

**Downtown Campus Chiller** – 500 Ton constant speed chiller was replaced with an energy efficient Variable Frequency Drive chiller. \$37,537 Energy efficiency rebate was awarded for this project and the estimated savings are \$24,500/yr (303,000 kwh/yr).

**Main Campus Demand Response Program** -- Ongoing participation in CPS Energy Demand Response Program is producing an average load shed of 799 kW during summer response events. Incentive payment of \$55,953 was awarded. \$6,000 was awarded for winter participation. As part of the program, the Main Campus performs a variety of the following adjustments where feasible: chiller supply temperature adjustments, cold deck set point adjustments, duct static pressure adjustments, fan speed adjustments, & room temperature adjustments. Campus Housing uses thermostats controlled by CPS Energy to load shed during high electrical peak conditions.

**Irrigation Remote Metering & Monitoring Upgrade** -- Several meters along with monitoring software is under evaluation. San Antonio Water System is aware and may fund a portion of future installations if savings can be quantified.

**Trane Energy Coaching Program** -- Downtown and Hemisfair Park Campuses were evaluated and yielded several energy conservation recommendations that will be taken into consideration for

implementation. Recommendations include enrollment in the CPS Energy Demand Response Program, HVAC system scheduling optimization, over-ventilation detection & control, and possible errant electrical peak.

**Exterior LED Retrofits** -- Main Campus Service Drive was retrofitted with LED lamps. \$10,366 Energy efficiency rebate was awarded for this project and the estimated savings are \$16,400/yr (228,000 kwh/yr). 250W Metal Halide fixtures were replaced with 85W LED fixtures. 71 fixtures were replaced.

**Conservation Awareness Competition** -- Office of Sustainability is coordinating with Campus Housing to undergo an energy conservation competition. The Office of Facilities will provide conservation education and tips and monitor/report on reductions.

## Goals

As established by the UT System Board of Regents in November of 2011, UTSA will continue to implement savings initiatives to achieve a 5% reduction of EUI (btu/sqft/yr) over the 10-year period from 2010 through 2020.

As established by the UT System Board of Regents in November of 2011, UTSA will continue to implement savings initiatives to achieve a 3% - 5% reduction of WUI (gal/sqft/yr) over the 10-year period from 2010 through 2020.

## Strategy for Achieving Goals

Research facilities, because of their elevated energy intensity, will be focused on as top priorities for proper operation and as candidates for efficiency upgrades.

- AET commissioning will be pursued in 2020 through CPS Energy Program

Utility metering will baseline and monitor building operations and also be used to measure and verify implemented conservation measures.

- Software and server upgrade will be completed by November 2019
- Ongoing funding proposal will be prepared to ensure system is operational and to ensure calibration takes place so data is reliable

UTSA has adopted State Energy Conservation Office energy and water design standards in all new buildings to ensure efficient operations.

- Review & ensure compliance at the Guadalupe Hall, Park West Complex, Student Success Center, and the Roadrunner Athletics Center for Excellence.

A building commissioning program is under development to ensure existing facilities are operating as efficient as possible. If the local utility's commissioning program is successful, these programs will be leveraged and combined.

- AET commissioning will be pursued in 2020 through CPS Energy Program

Non-E&G customers like the Recreation/Wellness and Student Union are monitored closely and consumption information is shared with building occupants and management. Facilities staff partner with building occupants to determine ways to lower costs yet maintain comfort levels for facility users.

Housing and Facilities staff meet periodically to identify ways to lower utility costs and recognize consumption patterns to identify outliers. Housing staff take part in Demand Response operations by allowing CPS Energy to control thermostats during peak electrical demand periods.

Optimized scheduling of building operations is conducted by identifying each building occupancy schedule and adjusting start and stop times accordingly.

Demand Response at the Downtown Campus is being evaluated and will undergo implementation. Controls and sensing upgrades/repairs will be conducted as needed to ensure implementation is successful.

Existing 3,000-ton chiller at the North Thermal Energy Plant will be replaced with a 2,500-ton chiller. Existing chiller is reaching the end of its useful life and use a refrigerant that is being phased out. Design is underway, efficiency savings calculated, and potential rebate will be applied for as the project progresses.

- Follow up with design team and CPS Energy to determine rebate potential

Guadalupe Hall Student Housing Project is under design and is using specifications to attain LEED Certification.

Cooling tower blowdown reclamation was evaluated by graduate students as part of an Energy/Water Nexus class. Regulatory requirements were considered as the Main Campus is over the Edwards Aquifer Recharge Zone.

## **Implementation Schedule**

**Campus Metering Project** – Complete and expected savings as a result of identifying areas of improvement will be quantified and documented. Software and server upgrade will be completed by November 2019 and an ongoing funding proposal will be prepared to ensure system is operational and to ensure calibration takes place so data is reliable.

**North Thermal Energy Plant Boilers** - Replaced the final two remaining vintage 1973 boilers with higher efficiency boilers.

- Performance will be evaluated in 2020 to determine efficiency improvement and quantify savings

**Meter Calibration and Repair Program** – Proposal to be submitted to ensure satisfactory operation of campus metering devices.

**Downtown Campus Demand Response Program** -- Currently under evaluation.

- Obtain quote for programming work and implement by April of 2020 for implementation in the Summer 2020 Program

**Science & Engineering Building** -- Under construction and efficiency rebates for the chiller installation and LED lighting is currently under evaluation.

- Follow up with CPS Energy to determine rebate potential

**Applied Engineering Technologies Commissioning** -- Under initial evaluation to implement building commissioning through the local utility's energy conservation program.

- AET will be prioritized and in internal commissioning firm within UTSA will provide a proposal

**LED Retrofits** – Arts Addition Recital Hall is under design to replace with LED lamps. Multi-Disciplinary Studies building was audited by a lighting consultant that will provide a retrofit proposal for consideration.

**Main Campus Demand Response Program** -- Control system will be checked and calibrated for continued optimal performance.

**Energy & Water Conservation Code Compliance** -- Review & ensure compliance at the Guadalupe Hall, Park West Complex, Student Success Center, and the Roadrunner Athletics Center for Excellence.

**Conservation Awareness Competition** -- The Office of Sustainability is coordinating with Campus Housing to undergo an energy conservation competition. The Office of Facilities will provide conservation education and tips and monitor/report on reductions.

- Spring 2020 semester is targeted for implementation

**Irrigation Remote Metering & Monitoring Upgrade**

- Determine savings potential for implementation

**Trane Energy Coaching Program**

- Conduct further research into electrical peak and determine if further discussion is warranted with CPS Energy for a potential
- Verify and present recommendations for funding consideration

## **Finance Strategy**

Utility savings and rebates have been and will continue to be used to fund conservation projects. The savings keep utility costs low and the savings from performing under utility budget will be used to fund future projects.

UTSA Green Fund has been re-implemented and will be considered as an alternate means for energy/water conservation initiatives and a mechanism for conservation awareness campaigns.

UTSA will procure funding of additional conservation projects thru funding requests based on their merits as weighted against other projects.

Utility budget performance is monitored via utility Key Performance Indicators that are reported on monthly via Operations Review Meetings with Facilities management to discuss performance. Energy Utilization Index, Water Use Index, Energy Rates, Water Rates, Total Utility Cost, and Budget-to-Actual performance is reported on.

[\(https://facilities.utsa.edu/departments/business-and-customer-services/\)](https://facilities.utsa.edu/departments/business-and-customer-services/)

Grants and partnerships with university researchers will be explored and initiatives that generate benefit will be submitted for funding consideration. The Office of Facilities additionally offers technical support to academic programs.

Deferred Maintenance and LERR Funding will continue to be used to fund conservation projects based on their benefits to the university.

## **Gasoline Consumption**

UTSA's vehicle fleet consists of 158 vehicles. Fuel types include Diesel, E-85, Gasoline, CNG (Compressed Natural Gas), and Gas/Electric Hybrids. 76,281 gallons of Diesel, 1,298 gallons of E-85, 57,077 gallons of Gasoline, and 3,410 gallons of CNG were used in 2019 by the vehicle fleet.

## **Employee Awareness Plan**

Some of the following ideas are being considered for viability and some have previously been implemented and may be re-introduced.

Training of Facilities staff to takes place to demonstrate how our actions affect cost. Facilities staff have direct access to energy operations and are uniquely able to identify areas of inefficiency because of their access to energy production and conversion systems. Additionally, a well-informed Facilities organization can offer vital conservation suggestions to new construction and renovation projects that will continue to be implemented as UTSA continues to grow.

Non-E&G customers continue to be provided with monthly reports detailing how their cost and consumption trended against previous month and previous year to determine performance. This ongoing practice provides customers with information on trends and assistance is offered to troubleshoot as well as assistance to reduce costs.

UTSA takes part in awareness campaigns such as Energy Awareness Month and Earth Day through support of Student Government, setting up awareness booths, and taking part in planning committees.



University and Facilities leadership and staff present on energy and water awareness at Sustainability and Equinox Festivals.

Education of students during Week of Welcome and Housing Move-Ins takes place and will continue to take place to bring awareness of common forms of energy and water waste.

Academic and Research Programs are currently being supported and will continue to be supported. Past projects include building energy audits, HVAC operational trending audits, student tours, and use of cost and consumption information to provide real-world data for research.

Articles on conservation projects have been and will continue to be included in campus newsletters (UTSA Today, Business Affairs – Business Horizons, The Paisano, and Sombrilla – UTSA’s Alumni Magazine) to bring awareness to ongoing efforts and to solicit ideas for future efforts.

STARS (Sustainability Tracking, Assessment & Rating System) report was supported in 2012 and 2016 to assess UTSA’s sustainability ranking. The 2012 Assessment yielded a Bronze designation and the 2016 Assessment yielded a conditional Silver designation. This assessment serves as an educational and awareness tool for students and is a mechanism by which information is shared amongst the UTSA community. The Office of Sustainability will participate the 2019 Assessment and will coordinate with the various campus offices to complete the assessment.

Facilities and Laboratory Safety staff have developed signage for lab spaces to educate on the energy intense nature of these facilities. The benefits of closing fume hood sashes are communicated.

Establish a “Last-One-Out” message to campus spaces will be shared through use of placards posted in select areas. The message has been communicated to Housekeeping staff as they leave spaces for the evenings.

Establish a waste hotline and email to communicate areas of improvement or places of suspected inefficiency.

Establish a recognition program for staff, faculty, and students that suggest conservation ideas and report waste. If quantifiable provide distribute a periodic report quantifying the benefits. Energy Champion pins can be presented to staff that present successful conservation ideas.

## **Designated Contact Person**

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Notes:

- Indicates an action taken or a note related to an initiative
  - Indicates an actionable function that requires follow up