



Energy Management Purpose, Plan, & Procedures

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District Energy Manager

Purpose

In accordance with Texas Education Code Section 44.902, the school board must establish a long-range energy plan, which includes strategies for achieving energy efficiency. This plan and procedures document will serve as the district's long-range Energy Plan. Salaries are the most important and largest budgeting factor for Texas ISD. Utilities are the second largest expenditure for a school district. Waco ISD's Energy Department understands the sustainability of our natural resources and will aid tremendously in maintaining the highest level of responsibilities towards the comfort and indoor air quality of our staff and students. With research-based practices and implementing programs such as "*Last Out, Light's Out*," and "*Classroom Energy Monitors*" have help change the culture of our District's employees and students. By making students aware of the importance of saving energy will promote awareness for sustainability of our natural resources. These programs have contributed in ensuring more of every taxpayer dollar is used for creating the appropriate environment for exceptional student achievement.

Implementation

Implementation of this plan requires the joint effort of the Board of Trustees, our Superintendent, all administrators, teachers, staff, custodial/support personnel, and especially the students of Waco ISD. Our goal is to save our utilities while ensuring a comfortable environment to learning and working.

Energy Management Objectives

- A collaborative awareness of utility consumption, waste and opportunities for utility savings
- A measurement of utility data usage in order to maintain our goal of reduction for every Waco ISD campus/building
- Exploring avenues to reduce electrical service fees such as capacitor storage for peak demand from our IDR metered campuses, 4CP awareness and electrical load shed, enhanced variable frequency drives, continuous commissioning of our chiller plants, LED lighting, and water/irrigation strategies
- Waco ISD's participation in the ERCOT Demand Response program to help in load shed of our Texas Grid System during peak electrical load. By doing our part, we help to reduce the possibility of rolling electrical brownouts throughout Texas.
- Utility tracking and recording used to analyze specific areas of improvement
- In addition, and most importantly, a comprehensive effort of maintaining comfort for our students and staff while saving utilities in every possible and reasonable way.

Energy Management Goals

Waco ISD Energy Management focus is to reduce utility usage by finding and identifying ways that directly curbe the unnecessary Utility waste. Our goal is to provide the best environment for academic and sports, yet, focusing on every possible way to save on utilities.

We do this by:

- To meet with all staff and students to have a moderate change in how they can help do their part to reduce energy in the classroom as well as the entire campus.
- Create awareness and focus with support of our students and teachers, a program called Energy Monitors in each classroom
- Auditing of our campuses/buildings for infiltration of hot humid air, inefficient HVAC equipment and lighting to find possible solutions to rectify the issues that lead to discomfort
- Districtwide energy committees to discuss energy usage and how to improve their environment
- To have a successful energy management practice while providing the best possible comfort so our students and staff can focus on academics and sports.

Facility Use Guidelines

Scheduling Guidelines

In order to pre-condition an after hour event, we ask all campuses to send in information 48 hours in advance such as:

- Date & Time of the event from start to end time
- Campus/building zone
- What the event is for

Regular Campus hours are;

- Elementary Schools: 8:00 a.m. – 4:30 p.m.
- Middle Schools: 8:00 a.m. – 4:30 p.m.
- High Schools: 8:00 a.m. – 4:30 p.m.
- Campus Administrative offices – 7:00 a.m. – 5:00 a.m.

HVAC Guidelines

- The Energy Manager will set temperature set points that provide a reasonable level of comfort within the appropriate mode of either academics, physical education, or sports activity.
- District standard is 68 degrees for heating, 74 degrees for cooling (within a 1 degree)
- Unoccupied times are 64 degrees for heating, 82 degrees for cooling
- If a health issue is substantiated by a doctor's excuse to the human resources department, adjustments to temperatures will be made.

- Hot or cold temperatures will be submitted via work order
- Portable buildings or other areas in which the room is occupied should follow the same guidelines as described

Other Guidelines

- Personal energy using devices and/or appliances such as mini-fridges, coffee makers, radios, microwaves are strongly discouraged. At this time, mini-fridges are allowed. Microwaves are to be located in the teacher's lounge or kitchen where dedicated electrical circuits can handle the electrical output or load.
- When not in use, projectors in any classroom must be turned off
- When not in the classroom, all lighting must be turned off (***Last Out, Lights Out***)
- Natural lighting must be used during indirect light is present. Use window blinds when direct sunlight is present
- Computers, monitors and printers should be turned off unless directed by Technology for updates
- Irrigation at any location in the district is not to on during school hours or evening times. Irrigation is to be programmed by our Grounds Department in conjunction with energy management

When we started

September 2014, the Energy Department analyzed the Districts campuses and buildings for infiltration, type of HVAC equipment, lighting, and other factors that increased the over-all loads in the Waco ISD buildings.

HVAC

In 2014/2015, an Engineering firm was hired to establish a comprehensive mechanical and electrical report (FCA – facilities condition assessment) which included electrical panels. The Energy Department dissected the report and categorized the District's HVAC based on life expectancy. We then started an HVAC replacement schedule list of eminent failure, 2 to a 3-year life, and last, a 5 to 10+ life expectancy on all of the District's HVAC equipment. This would target the non-energy efficient equipment that uses more electricity to operate, as well as what equipment would not last due to deteriorated condenser coils and deteriorated oxidized evaporator coils that have little to no heat transfer that cause an inability to remove humidity and cool as they once did.

In 2018/2019, another FCA was performed to update the list of older inefficient air conditioning equipment for replacements. This direction and support helps the district focus on securing our goals for making an environment comfortable for students and the Waco ISD staff as well as contributing to a more efficient school district.

This report/schedule would be the basis of annual budgeting for the District's HVAC equipment. The District's intensions are to provide the best quality indoor ambient temperatures and humidity control for our staff so that students can focus on their academics and sports.

Electrical

The next focus was the lighting in our classrooms and buildings. We found very in-efficient T-12 lamps and fixtures, metal halide lighting, old electrical service panels as well as older model in-efficient step-down transformers.

We provided a study on an in-house LED (light emitting diode) lighting replacement replacing the older model T-12 lamps at Waco High School. To no surprise, we found that replacing the Old T-12's to LED lighting paid for themselves in less than 1.3 years after installation. We then started a Districtwide LED replacement with an annual budget for this program.

We then started to replace all of the old electrical panels with upgrades for bonding. We have now upgraded most of District's electrical panels making the new installations safe per State and National codes and easily accessible.

We also have focused our attention on replacing very old District step-down transformers in our Waco ISD buildings. In-efficient older transformers in our buildings have been changed to more energy efficient and quieter models.

The Energy Department's efforts have paid off with lower kilo-watt usage, therefore, directly effecting the District's electrical budgets. With the help from our Administration, Project management Team, the District is able to achieve our goals to a more efficient, a more comfortable, quality lighting and safer environment.

Water

The approach to water issues were simple. A collaborative effort from the plumbing department and our custodial staff consisted of training and locations to cut water off as soon as a leak was discovered. This reduction of water waste and damage became minimal through-out the years. Also, attention to energy saving commodes, waterless urinals, and a continuous regard to conserving water with the District's CNS and custodial staff have reduced our water budgets.

The training received by Texas A&M on commercial irrigation and turf management has greatly improved our approach to our sports fields and common areas. With the help from our grounds/irrigation department and the direction we had from Texas A&M, we have learned how to manage our irrigation water distribution for our lawns and turf grass. Our main concern was the safety for students and staff. In addition to our focus to lawn care, we are updating our irrigation computerized controls for selected campuses this year. Our hope is to add additional controls through-out the District.

Energy Management

Since the beginning, we have improved on our energy management controls system (EMCS) to better serve our District HVAC, lighting and irrigation. Our controls have a single managing platform that has an open BACnet frontend to allow contractors meeting the criteria to engage in our bid process for new and existing replacement of controls. The District has engaged in demand response/emergency response service to help the Texas grid system and have adjusted our EMCS system to smooth stream this process. The energy department deploys an in-house button on our controls when asked by ERCOT for either a test or deployment. This supports the Texas grid system and also brings revenue to the District. The energy department also engages in 4CP (4 Coincident Peak), a power correction on our IRD metered campuses during the four Summer months of June, July, August & September. Simply put, we reduce the power factor that in-turn, reduces our transmission cost of service charges (extra fees) on our electric bills. We have qualified campuses for the Energy Star program, a rating that put's 1/3rd of our campuses in a high standard for energy efficiency in a commercial setting. The Energy Department has composed and modified spread sheets for populating monthly utilities, spreadsheets for analytical cost comparisons since 2014. Keeping track of our utilities help in finding anomalies as well as aids with budgeting for next year's utility costs. We also post in our District's website utility costs as per Texas House Bill 3693 80th Legislature. The Energy Department has also established a relationship with ENCOR (the District's electrical service provider), Atmos Energy (our natural gas provider), and the City of Waco Water, Trash and Recycling departments. Working with these entities provides close support for establishing electrical repair needs, repairs to natural gas leaks and anomalies, and providing our water, trash pick-up and recycling.

At the Campus level

It's critical to involve the campus in managing their utilities. Involvement of the lead custodians in this process have been the Energy Department's eyes and ears. The reporting of any issues such as faulty leaking flush valves, water line breakages, Irrigation leaks or scheduling issues, lighting and air conditioning issues. By visiting with Campus Administration and Staff, the Energy Department generated awareness have cultivated a change in behavior. Focus has been geared to reduce lighting usage (last out, lights out), projectors left on, window shades, tightening of our campus envelopes and reducing our utilities wherever we can. Buy-in to our goal of reducing utility waste starts from all District employees and students. A continued visitation of campuses with emphasis on lighting, plumbing, HVAC usage/scheduling has influenced overall usage, the basis of decreasing all utilities. Student and Teacher involvement also has created awareness of utility waste with involvement in student activities such as classroom energy monitors. The students become aware of energy management, that, in-turn, is implemented at their homes. The students also recognize the importance of sustainability and their future.

Coronavirus & Severe Weather

The effects of the coronavirus at Waco ISD presented a new challenge with at-home/virtual learning for students and teachers teaching from home. With a deadly virus swirling the world, a virus we've never encountered before, the maintenance and facilities departments jumped into action with focused on providing a clean and safe environment at all of the district campuses and buildings. Filters, adjustments to fresh air and with efforts from the Maintenance and Facilities staff as well as our Custodial department improvisation made our campuses and buildings safe and secure.

The ice storm URI in 2021 presented challenges with unusual ice and snowy conditions that our district prepared for as best as we could. 12 out of 26 campuses were without power for several days. Our Maintenance department with direction from our Operations Director reacted immediately to repair broken water pipes and prevented major damages that would have resulted in extreme costs. As the district moves forward, and with the challenges never before encountered by Waco ISD, we'll be better prepared for it!

Now and the future

The Energy Department continued efforts have cultivated an awareness to energy waste, and with these efforts has had a great impact to the Waco ISD's utility budget. Since September of 2014, the District has had a reduction in usage which in-turn has had major impact on utility costs. Since Fall of 2014, a reduction in energy costs have totaled over 1 million dollars in savings.

As we look to the future of energy management, we continue to have an open mind to all opportunities and training to help improve our goals of reducing energy costs, a comfortable atmosphere for our staff and students set forth by our Superintendent, Board of Trustees, and support Staff at Waco ISD.

Contact Information

For any additional thoughts or comments, they can be directed to the Energy Management Department, Waco Independent School District, Energy Manager – Roger Perez 254-752-3497 or roger.perez@wacoisd.org