Glenn Hegar
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

for

Eanes ISD

601 Camp Craft Rd
Austin, TX 78746

EANES ISD
COMMITTED TO EXCELLENCE

Prepared by:

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SECO
State Energy Conservation Office

Schools & Local Governments Energy Management Program

Eanes ISD

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Austin, TX 78746
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Phone: 512-732-9040

Executive Summary

Eanes ISD, now referred to as the District, requested that Texas Energy Engineering Services, Inc. (TEESI) perform a Preliminary Energy Assessment (PEA) of their facilities. This report documents that analysis.

This service is provided at no cost to the District through the Schools and Local Governments Energy Management Program as administered by the Texas Comptroller of Public Accounts, State Energy Conservation Office (SECO). This program promotes and encourages an active partnership between SECO and Texas schools for the purpose of planning, funding, and implementing energy and water saving measures, which will ultimately reduce the District's annual utility costs. The annual cost, energy, and water savings; implementation cost estimate; and simple payback for all Utility Cost Reduction Measures (UCRM's) identified in this preliminary analysis are summarized in Figure 1 below. Individual UCRM's are summarized in Section IX of this report.

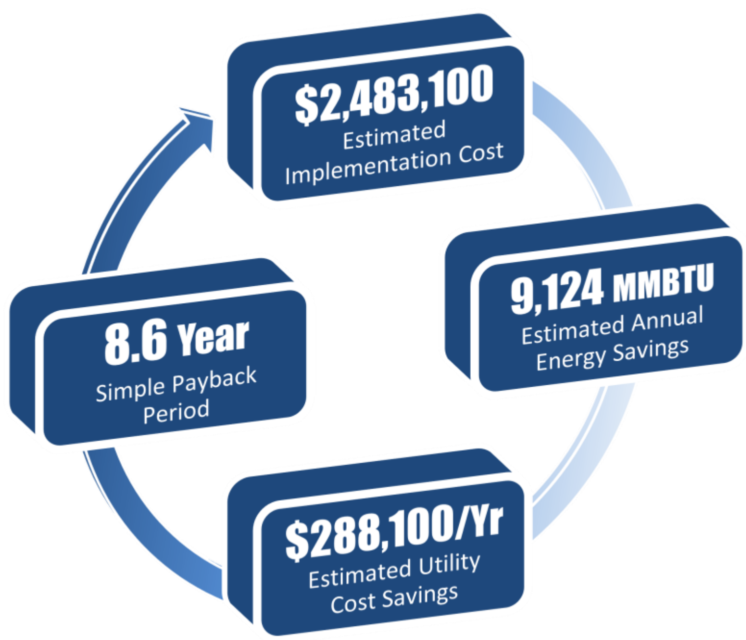

Figure 1. Cost and savings summary for UCRMs identified.

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In addition to energy and cost savings, the potential projects identified also represent a commitment to environmental sustainability through a resulting reduction in greenhouse gas emissions equivalent. Implementation of the measures identified in this report could reduce the District's carbon footprint by an estimated **1,612 Metric Tons of CO2 per year**. Figure 2 below demonstrates the scale of this potential reduction in every-day terms.

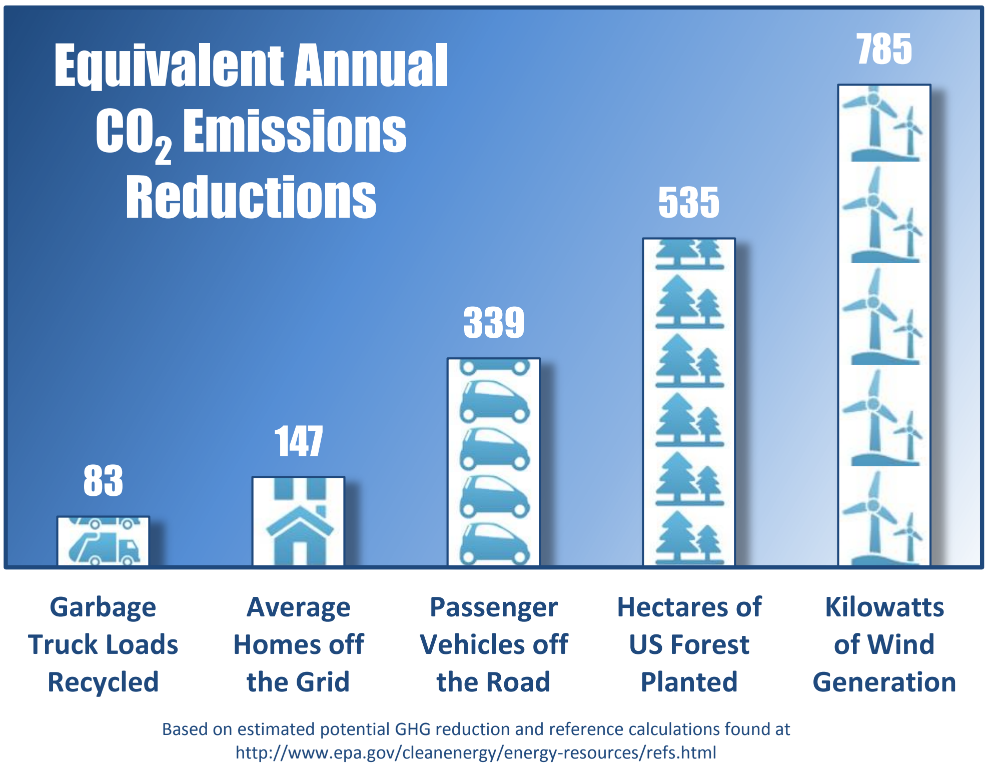

Figure 2. Potential UCRM CO_2 reduction equivalencies.

This report includes a summary of the facilities surveyed along with baseline energy/water consumption and costs, opportunities for savings, and information regarding energy management and options for funding retrofit projects. A follow-up visit to the District will be scheduled to address any questions pertaining to this report, or any other aspect of this program.

SECO is committed to providing whatever assistance the District may require in planning, funding and implementing the recommendations of this report. The District is encouraged to direct any questions or concerns to either of the following contact persons:

SECO / Mr. Stephen Ross	**(512) 463-1770**
TEESI / Saleem Khan, P.E.	**(512) 328-2533**

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Appendices

I. Facility Descriptions

This section provides a brief description of the facilities surveyed. The purpose of the onsite survey was to evaluate the major energy consuming equipment in each facility (i.e. Lighting, HVAC, and Controls thereof). Figure 3 shows the geographic locations of the facilities surveyed, with facility survey summaries on the following pages.

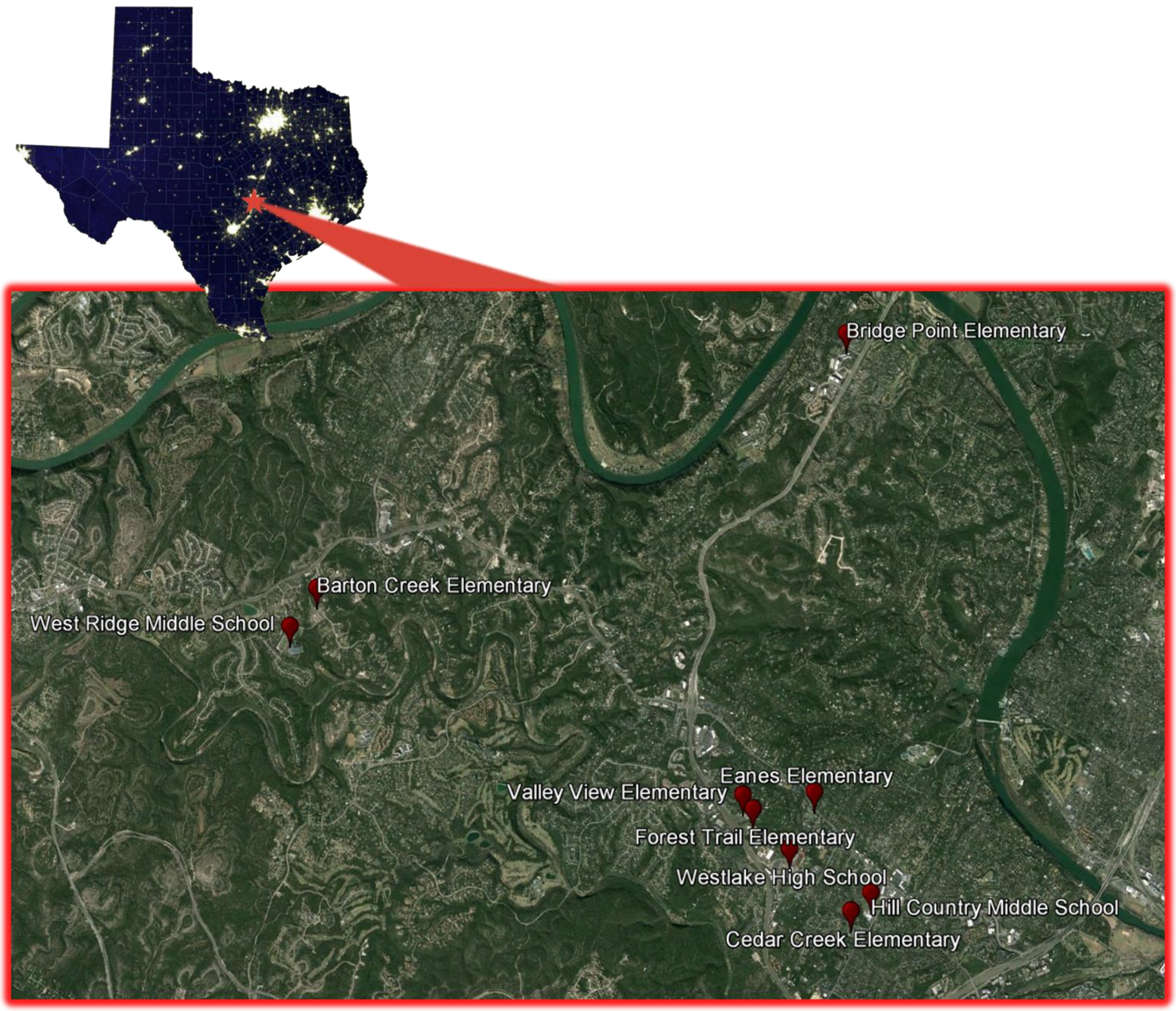
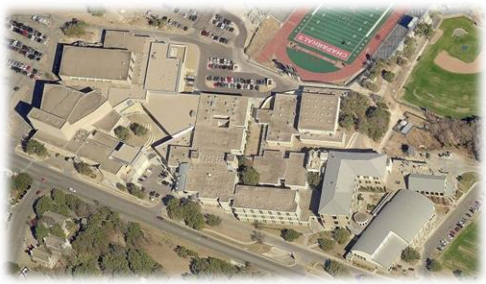


Figure 3. Eanes ISD PEA facility locations.

Westlake High School



Area (Estimated)	573,800 ft^2.
Year Built (Estimate)	1969 with several renovations and additions since.
Building Components	Brick building, built up roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, hallways, cafeteria, and Main Gym. T5 fixtures in practice gym and LED fixtures around the exterior.
HVAC	Water cooled chillers, natural gas-fired hot water boilers, primarily single duct Variable Air Volume (VAV) Hot Water (HW) and Chilled Water (CHW) air handlers in the building.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

Hill Country Middle School

Area (Estimated)	146,300 ft^2.
Year Built (Estimate)	1975 with several renovations and additions since.
Building Components	Brick building, built up roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, hallways, and library. T5 fixtures in gyms and LED fixtures around exterior.
HVAC	Air-cooled chillers, natural gas-fired hot water boilers, package RTU's, some with heat recovery, Chilled Water (CHW) air handlers in the building.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

West Ridge Middle School

Area (Estimated)	169,600 ft^2.
Year Built (Estimate)	1987 with several renovations and additions since.
Building Components	Brick building, pitched metal roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, cafeteria, and hallways. T5 fixtures in gyms and LED fixtures around the exterior.
HVAC	Water cooled chillers, natural gas-fired hot water boilers, primarily single duct Fan Powered Box (FPB) Hot Water (HW) and Chilled Water (CHW) air handlers in the building. Heat pumps in weight and locker rooms. Fan Coil Units (FCU) in the 300 Wing.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

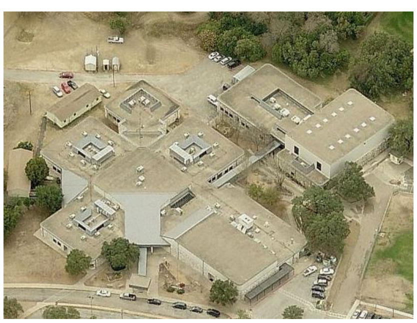
Barton Creek Elementary School

Area (Estimated)	83,700 ft^2.
Year Built (Estimate)	1991.
Building Components	Brick building, built up roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, cafeteria, and hallways. T5 fixtures in gyms and LED fixtures around the exterior.
HVAC	Water cooled chillers, natural gas-fired hot water boilers, dual duct system with Fan Coil Units (FCU).
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

Bridge Point Elementary School

Area (Estimated)	94,200 ft^2.
Year Built (Estimate)	1997.
Building Components	Brick building, pitched metal roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, cafeteria, and hallways. T5 fixtures in gyms and LED fixtures around the exterior.
HVAC	Predominantly split-DX Units and Fan Coil Units (FCU) with Heat Recovery Units throughout the school, with packaged RTU's for Gym spaces.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

Cedar Creek Elementary School



Area (Estimated)	76,000 ft^2.
Year Built (Estimate)	1978 with several renovations and additions since.
Building Components	Brick building, built up roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, cafeteria, and hallways. T5 fixtures in gyms and metal halide pole fixtures in the parking lot.
HVAC	Split-DX RTU's with Heat Recovery Units (HRU) on the roof.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

Eanes Elementary School

Area (Estimated)	73,900 ft^2.
Year Built (Estimate)	1964 with several renovations and additions since.
Building Components	Brick building, pitched roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, cafeteria, and hallways. T5 fixtures in gyms and LED fixtures around the exterior.
HVAC	Split-DX units and packaged RTU's with FCU's.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

Forest Trail Elementary School

Area (Estimated)	79,400 ft^2.
Year Built (Estimate)	1985 with several renovations and additions since.
Building Components	Brick building, pitched metal roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, hallways, and cafeteria. T5 fixtures in gyms and LED fixtures around the exterior.
HVAC	Water cooled chillers, natural gas-fired hot water boilers, primarily single duct Variable Air Volume (VAV) Hot Water (HW) and Chilled Water (CHW) air handlers in the building.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

Valley View Elementary School

Area (Estimated)	71,800 ft^2.
Year Built (Estimate)	1982
Building Components	Brick building, pitched metal roof.
Typical Lighting Fixtures	T8 linear fluorescent fixtures in classrooms, library, and hallways. T5 fixtures in gyms and LED fixtures around the exterior.
HVAC	Water cooled chillers, natural gas-fired hot water boilers, primarily single duct Variable Air Volume (VAV) Hot Water (HW) and Chilled Water (CHW) air handlers in the building.
Controls	Energy Management System (EMS) by Automated Logic Corp. (ALC).

II. Energy Consumption and Performance

A site survey was conducted at several of the District's facilities. The facilities surveyed comprised a total gross area of approximately 1.3 million square feet.

Annual electric and natural gas invoices for the buildings surveyed were approximately $1.45 Million for the 12-month period ending July 2016. A summary of annual utility costs is provided in **Appendix B**, Base Year Consumption History.

To help the District evaluate the overall energy performance of its facilities TEESI has calculated their Energy Utilization Index (EUI) and Energy Cost Index (ECI). The EUI represents a facility's annual energy usage per square foot; it is measured in thousands of BTUs per square foot per year (kBTU/ft²/Year). Similarly, ECI is measured as cost per square foot per year ($/ft²/Year). The EUI and ECI for facilities surveyed are summarized below:

Table 1. Energy Cost and Consumption Benchmarks

Facility Name	Approx. ft²	Electric kWh/Yr	Electric kWh/ft²/Yr	Electric $Cost/Yr	Heat'g Fuel [1] MMBTU/Yr	Heat'g Fuel[1] kBTU/ft²/Yr	Heat'g Fuel $Cost/Yr	Total MMBTU/Yr	Total $Cost/Yr	EUI kBTU/ft²/Yr	ECI $/ft²/Yr
Westlake High	573,800	5,669,240	9.9	$605,717	4,949	8.6	$21,264	24,292	$626,981	42.3	$1.09
Hill Country Middle	146,300	1,163,490	8.0	$151,043	452	3.1	$1,174	4,422	$152,217	30.2	$1.04
West Ridge Middle *	169,600	1,331,359	7.8	$151,129	892	5.3	$10,824	5,435	$161,953	32.0	$0.95
Barton Creek Elementary *	83,700	881,000	10.5	$96,836	286	3.4	$6,072	3,292	$102,908	39.3	$1.23
Bridge Point Elementary	94,200	917,000	9.7	$121,514	305	3.2	$1,004	3,434	$122,519	36.5	$1.30
Cedar Creek Elementary	76,000	580,318	7.6	$76,295	218	2.9	$904	2,198	$77,198	28.9	$1.02
Eanes Elementary	73,900	604,639	8.2	$78,397	273	3.7	$1,804	2,336	$80,200	31.6	$1.09
Forest Trail Elementary	79,400	682,800	8.6	$79,462	276	3.5	$1,020	2,605	$80,482	32.8	$1.01
Valley View Elementary	71,800	736,124	10.3	$92,622	481	6.7	$2,462	2,992	$95,083	41.7	$1.32
TOTAL	1,368,700 ft²	12,565,970 kWh/Yr	9.2 kWh/ft²/Yr	$1,453,014 Electricity	8,131 MMBTU/Yr	5.9 kBTU/ft²/Yr	$46,527 Heating Fuel	51,006 MMBTU/Yr	$1,499,541 Energy	37.3 kBTU/ft²/Yr	$1.10 per ft²/Yr

1) Campuses with diesel heating denoted with *, remainder use natural gas. All heating fuel consumption converted to MMBTU heat input using factors 1 MCF = 1.03 MMBTU for natural gas and 1 gallon = 0.139 MMBTU for diesel.

Knowing the EUI and ECI of each facility is useful to help determine the District's overall energy performance. In addition, the District's EUI was compared to TEESI's historical data for Texas schools. See **Appendix C** to determine how the EUIs of these facilities compared to those of other schools in Texas.

The following charts summarize the data presented in the previous table. See **Appendix B** for further baseline utility data detail. **Note:** West Ridge Middle School and Barton Creek Elementary School use diesel fuel instead of natural gas.

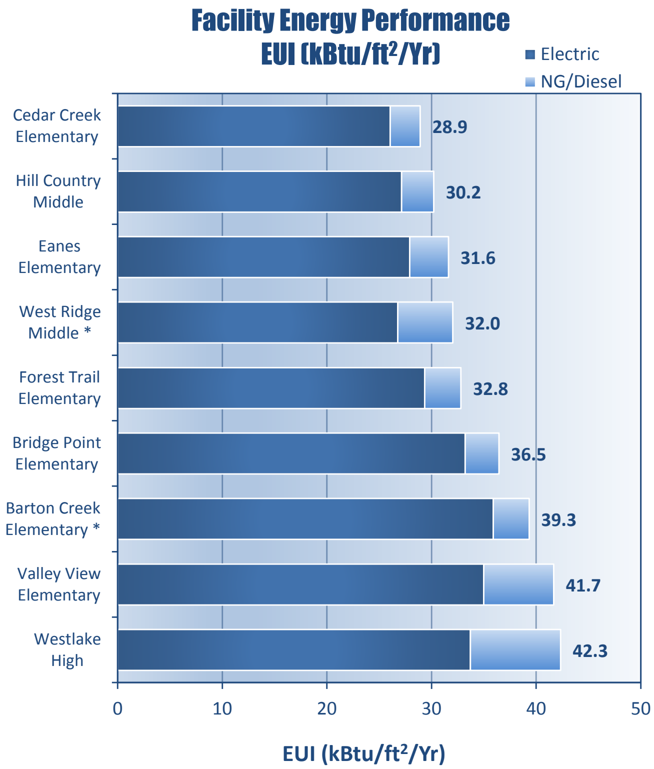


Figure 4. Facility EUI graphical comparison.

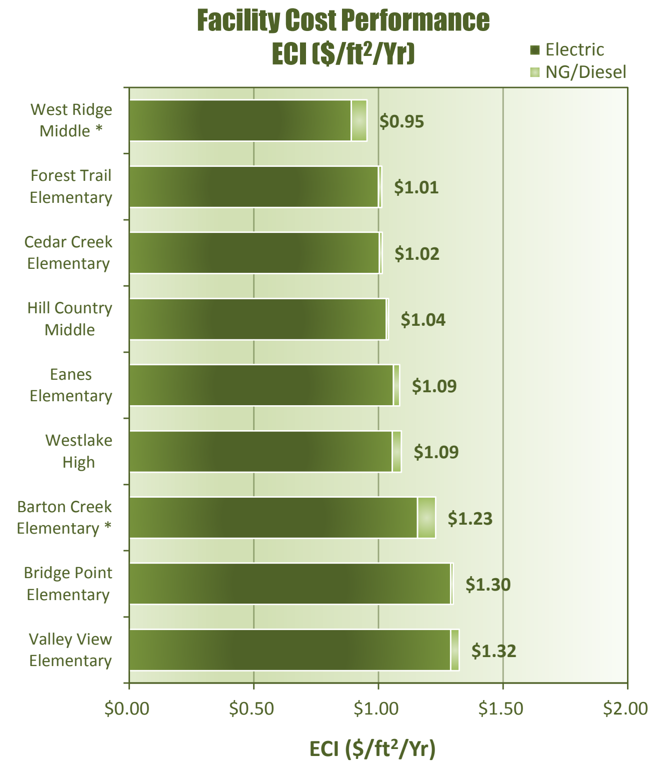


Figure 5. Facility ECI graphical comparison

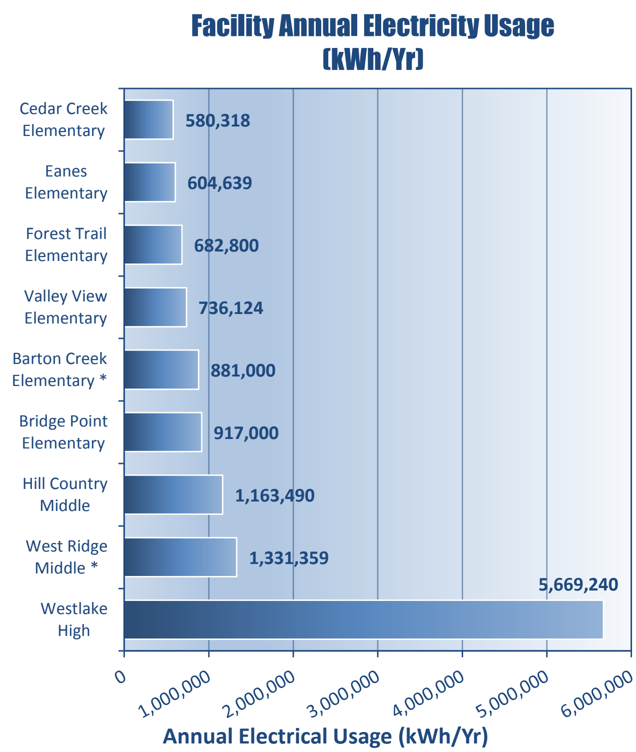


Figure 6. Facility electrical consumption comparison.

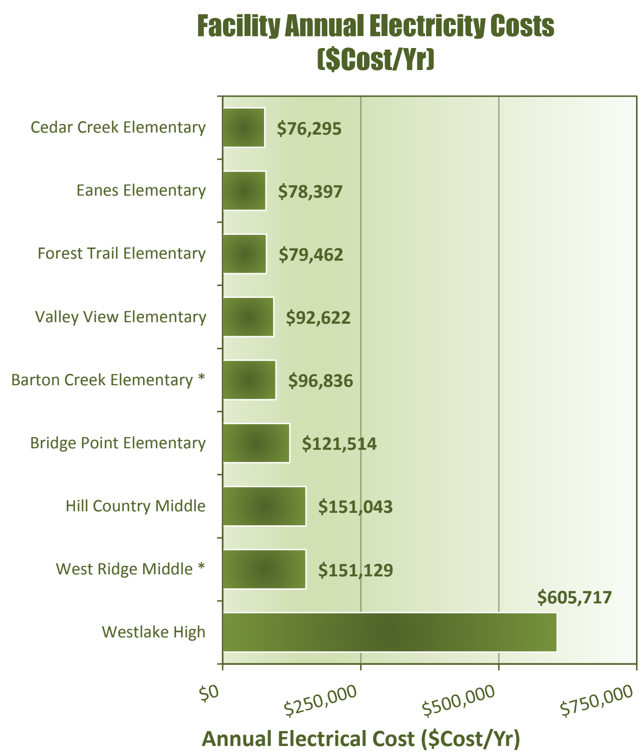


Figure 7. Facility electrical cost comparison.

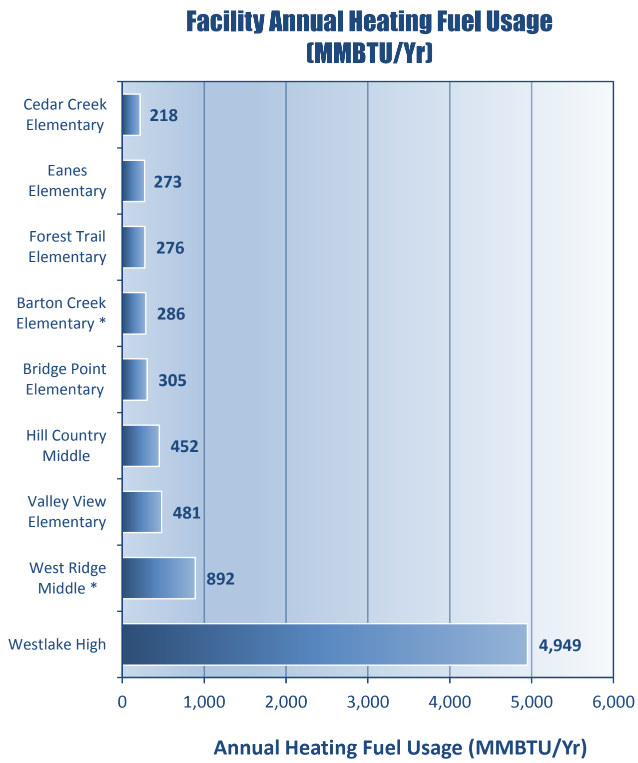


Figure 8. Facility heating fuel consumption comparison

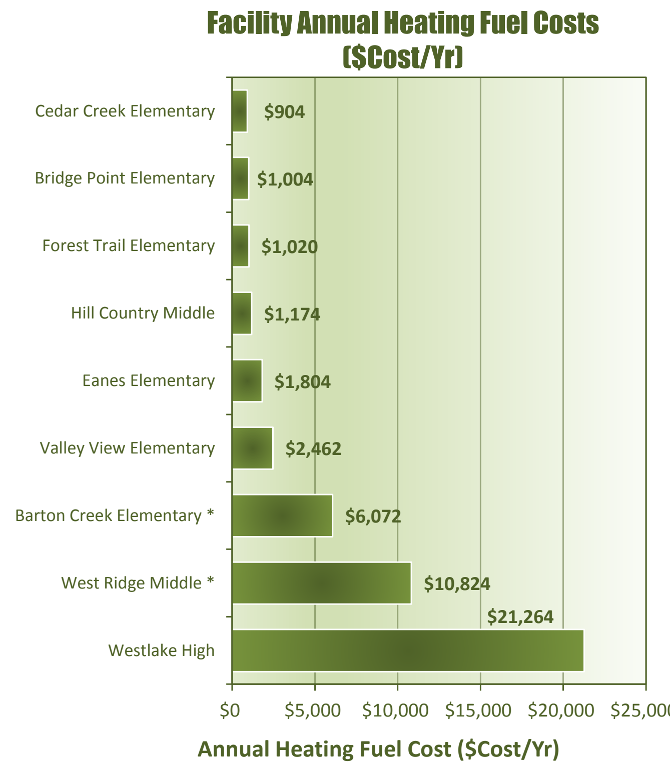


Figure 9. Facility heating fuel cost comparison.

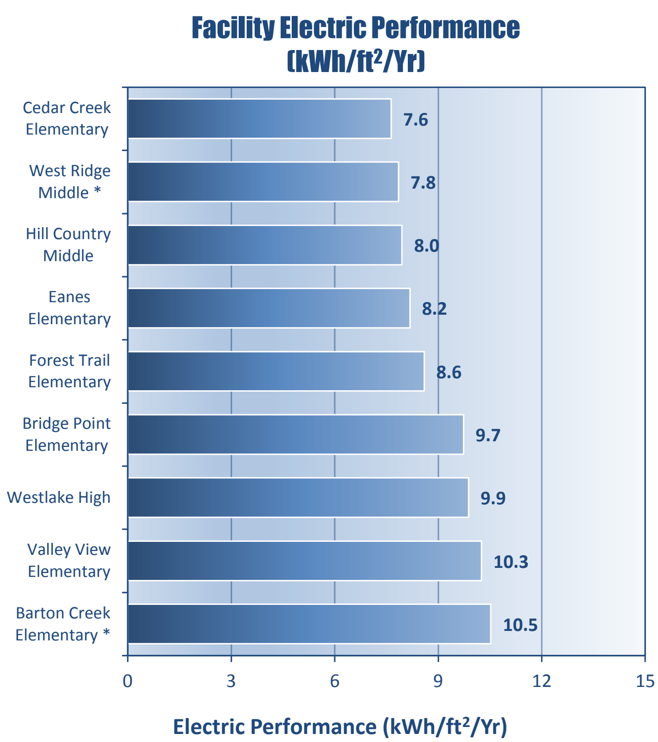


Figure 10. Facility electric performance indices.

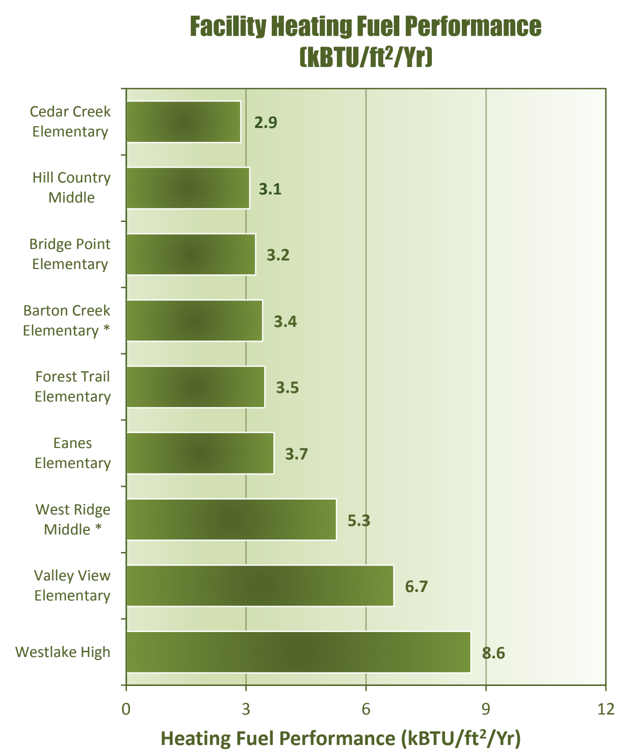


Figure 11. Facility heating fuel performance indices.

The following charts summarize each facility's monthly utility data. See **Appendix B** for further detail. Note, diesel consumption at West Ridge Middle School and Barton Creek Elementary has been averaged across months between deliveries and may not be indicative of monthly consumption.

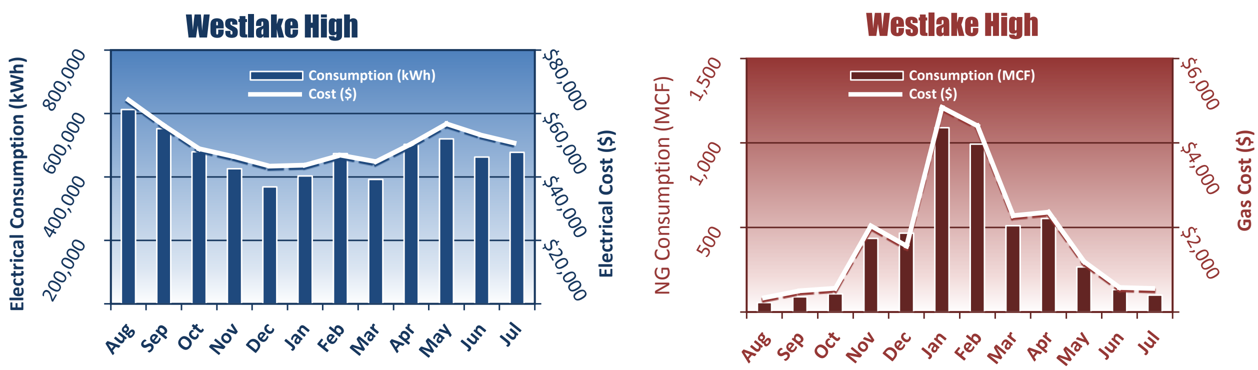


Figure 12. Energy consumption and cost base year for Westlake High School.

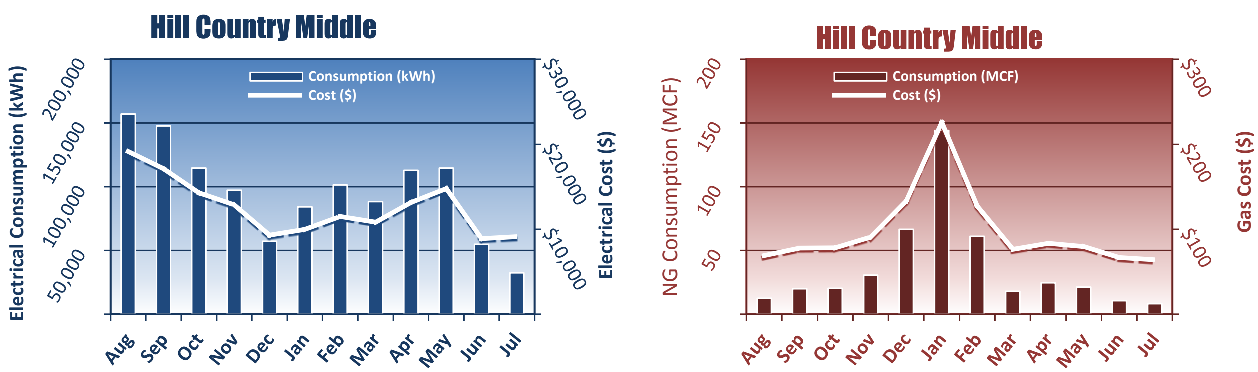


Figure 13. Energy consumption and cost base year for Hill Country Middle School.

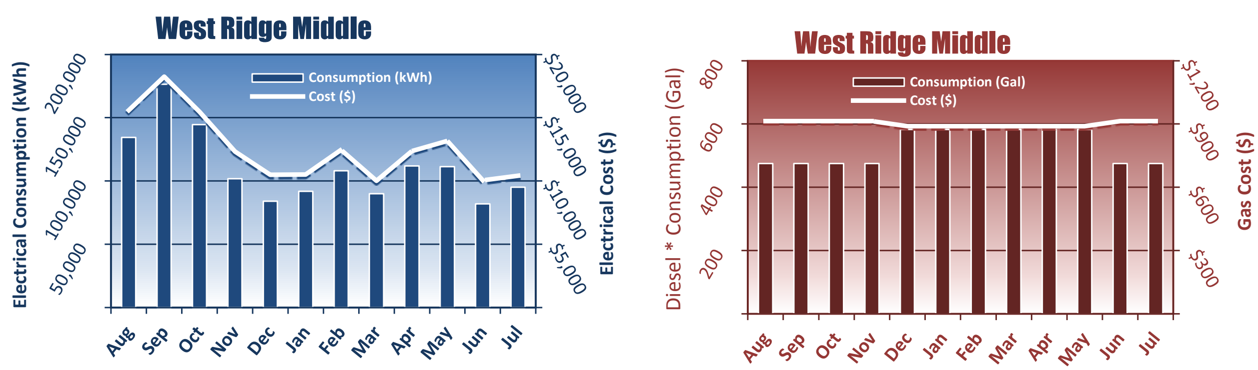


Figure 14. Energy consumption and cost base year for West Ridge Middle School.

State Energy Conservation Office

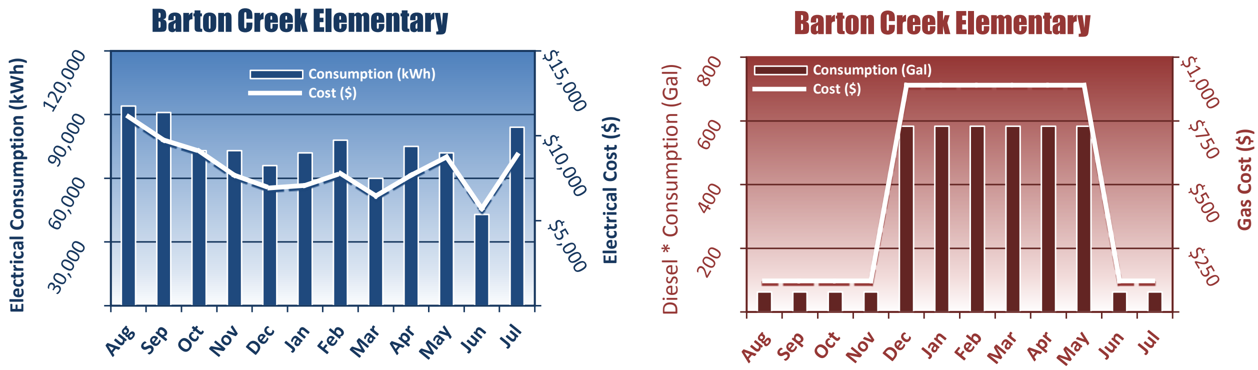


Figure 15. Energy consumption and cost base year for Barton Creek Elementary School.

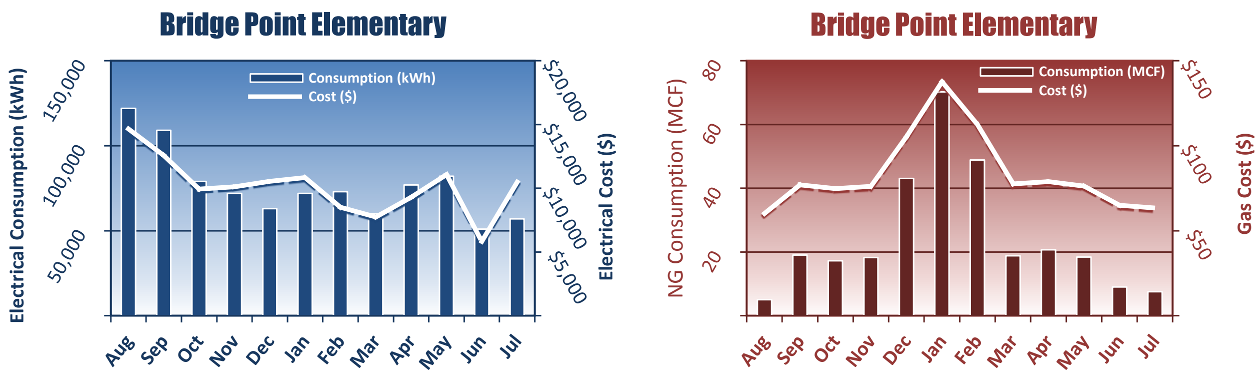


Figure 16. Energy consumption and cost base year for Bridge Point Elementary School.

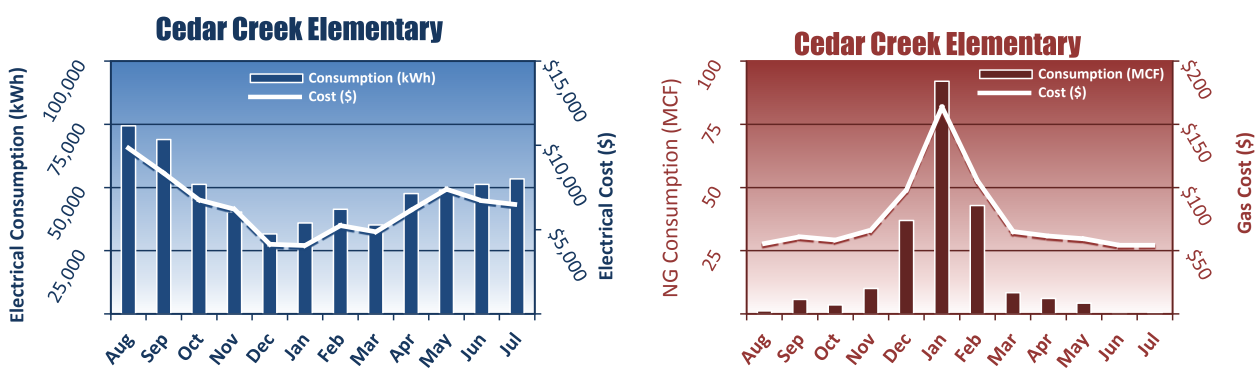


Figure 17. Energy consumption and cost base year for Cedar Creek Elementary School.

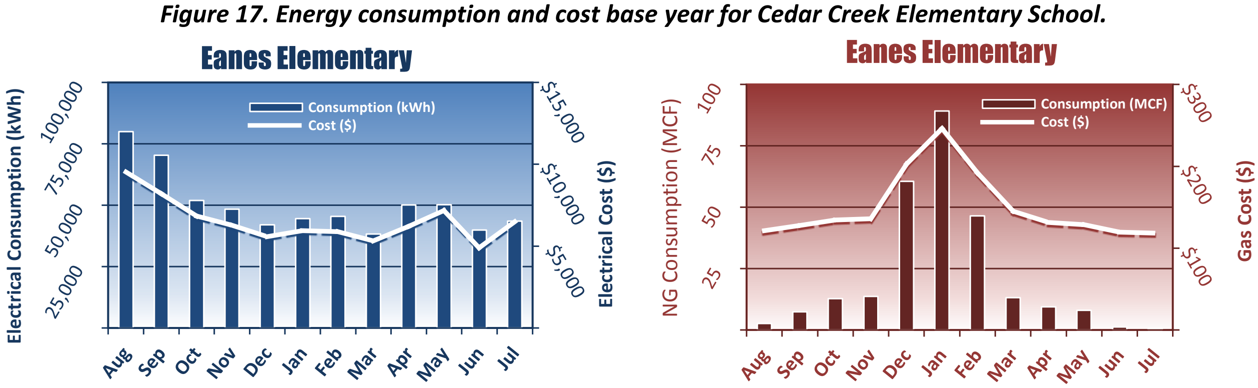


Figure 18. Energy consumption and cost base year for Eanes Elementary School.

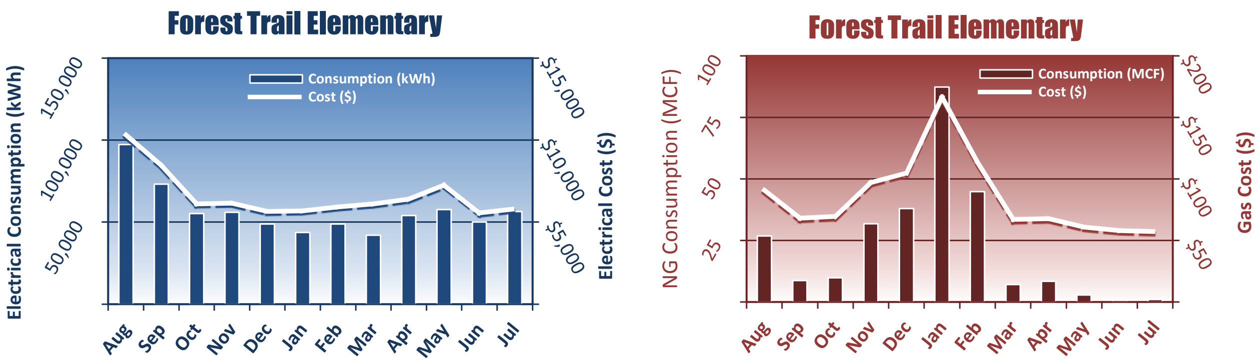


Figure 19. Energy consumption and cost base year for Forest Trail Elementary School.

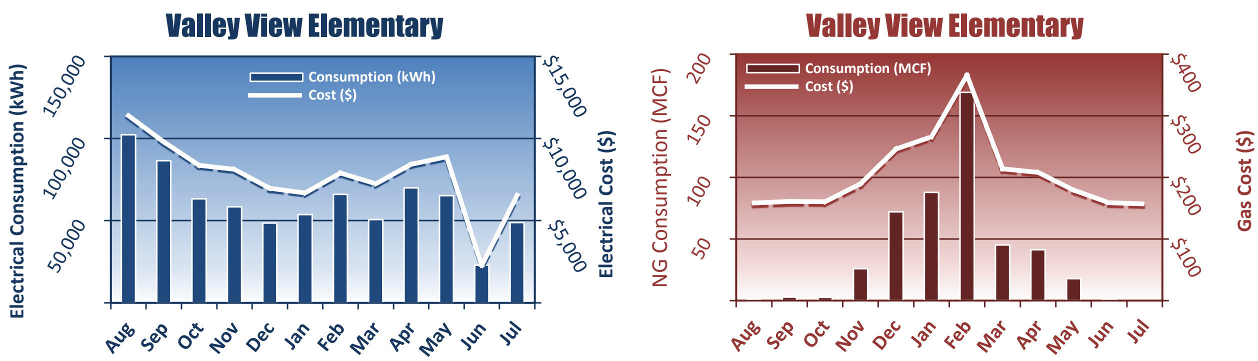


Figure 20. Energy consumption and cost base year for Valley View Elementary School.

III. Water Consumption and Performance

Crossroads Utility Services (Water District 10) provides water and sewer services to the District. Reference Section VI: Utility Rate Analysis for a list of providers at each school as well as average effective rates. Annual water and sewer invoices provided were approximately **$180,000 for the 12-month period ending July 2016**. Table 2 below shows the water cost and consumption for the facilities analyzed, as well as some sample benchmark indices.

Table 2. Water Cost and Consumption Benchmarks

Facility Name	Approx. Bldg ft²	Approx. Number Stud'ts[1]	Domestic[2] Water kGal/Yr	Irrigation Water kGal/Yr	Total Water kGal/Yr	Total[3] Water $Cost/Yr	Domestic Water Gal/ft²/Yr	Domestic Water Gal/Stud't/Day
Westlake High	573,800	2,541	7,422	95	7,517	$40,687	12.9	8.0
Hill Country Middle	146,300	905	971	711	1,682	$9,666	6.6	2.9
West Ridge Middle	169,600	840	3,574	N/A	3,574	$13,393	21.1	11.7
Barton Creek Elementary	83,700	530	2,734	N/A	2,734	$11,327	32.7	14.1
Bridge Point Elementary	94,200	736	1,563	N/A	1,563	$52,564	16.6	5.8
Cedar Creek Elementary	76,000	476	1,553	N/A	1,553	$26,151	20.4	8.9
Eanes Elementary	73,900	686	1,168	626	1,793	$10,030	15.8	4.7
Forest Trail Elementary	79,400	605	1,591	N/A	1,591	$8,704	20.0	7.2
Valley View Elementary	71,800	502	1,927	N/A	1,927	$10,745	26.8	10.5
TOTAL	1,368,700 ft²	7,821 Stud'ts	22,502 kGal/Yr	1,431 kGal/Yr	23,933 kGal/Yr	$183,266 Water	16.4 Gal/ft²/Yr	7.9 Gal/Stud't/Day

(1) Student enrollement data downloaded from Texas Education Agency (TEA) database.
(2) Includes all accounts not specifically marked for irrigation. May include some irrigation consumption if not separated by the utility.
(3) Cost includes all water, irrigation, and sewer charges as applicable.

The benchmarks shown are gallons of water per building square foot per year and gallons per student per day. Indoor (domestic) and irrigation water usage were separated where able, as noted in the table. The water consumption benchmarks provided are based on the isolated indoor usage only for better comparison. At some locations, and even for some meters billed as domestic but potentially serving some irrigation end-uses, indoor water consumption could not be readily isolated. Therefore, the benchmarks will vary from location to location depending on the amount of outdoor applications, which are largely independent of both building area and occupancy. Nonetheless, these measures may still be utilized to set baseline consumption benchmarks for each school, and compare any changes from year to year to track the success of any water conservation efforts at particular facilities.

The plots below show the monthly consumption and cost trend for each District water account.

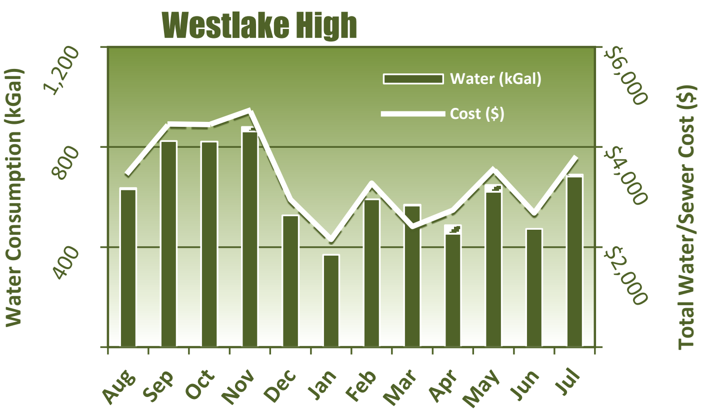


Figure 21. Westlake High School baseline water data.

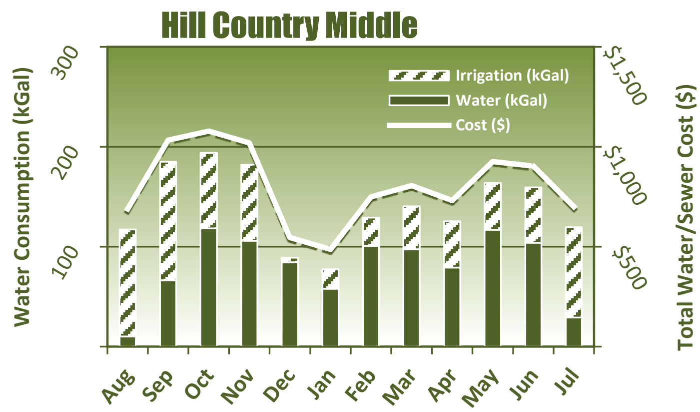


Figure 22. Hill Country Middle School baseline water data.

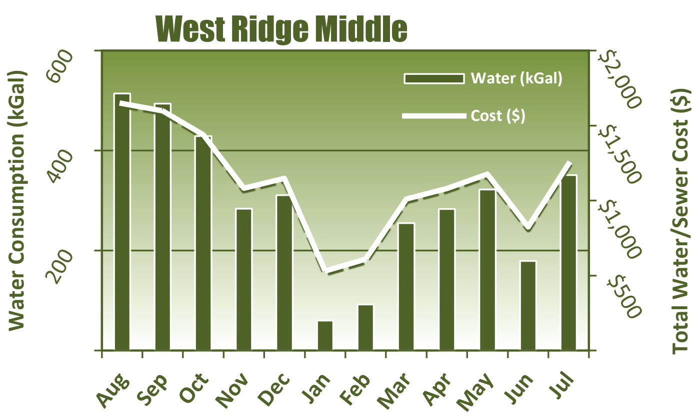


Figure 23. West Ridge Middle School baseline water data.

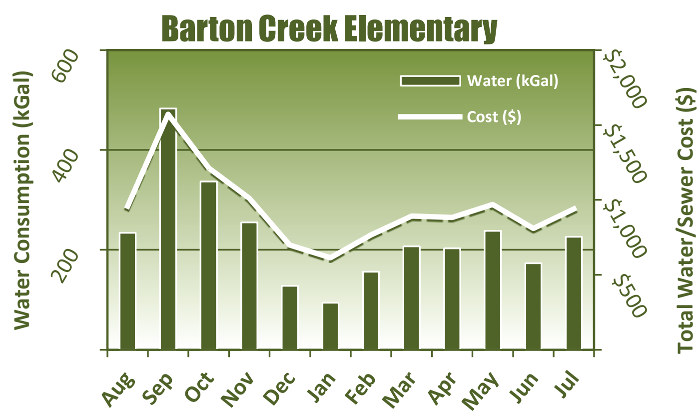


Figure 24. Barton Creek Elementary School baseline water data.

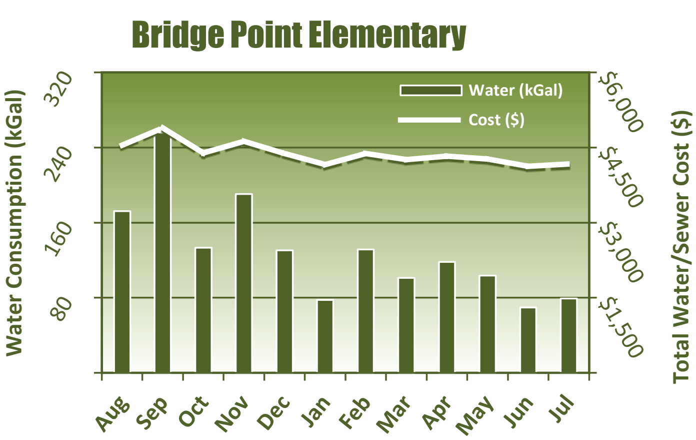


Figure 25. Bridge Point Elementary School baseline water data.

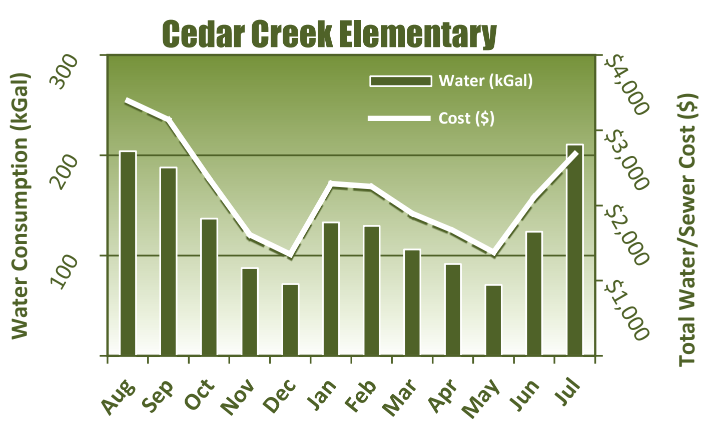


Figure 26. Cedar Creek Elementary School baseline water data.

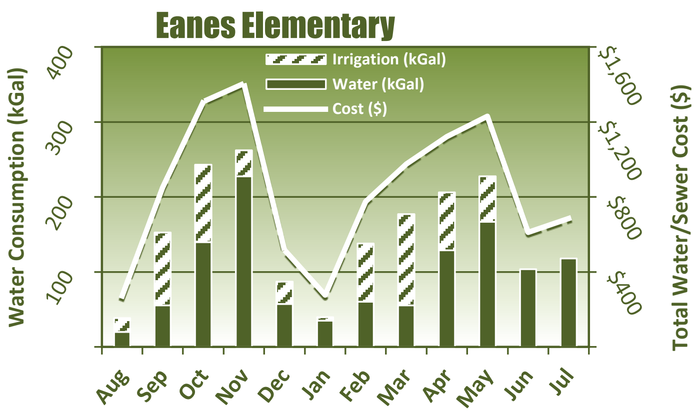


Figure 27. Eanes Elementary School baseline water data.

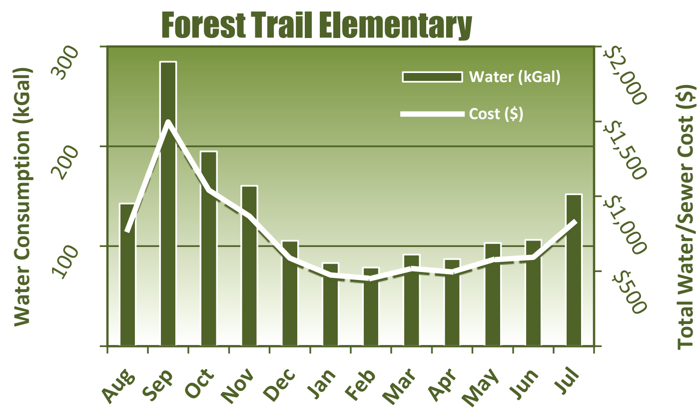


Figure 28. Forest Trail Elementary School baseline water data.

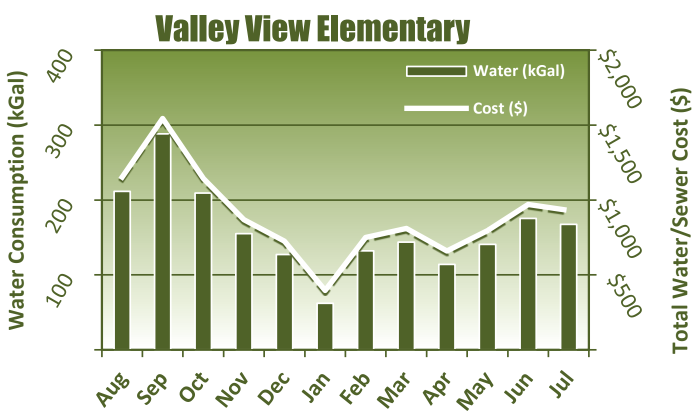


Figure 29. Valley View Elementary School baseline water data.

Note the consumption and costs do not share a similar trend at Bridge Point Elementary. This is due to the $3,866 facility fee charged every month. The District has made multiple efforts to contact the water utility (AQUA) as the District has no account representative and AQUA does not have an office in Texas. After speaking with AQUA, the District has learned that the provider does not have special rates for schools, and the District is on a commercial rate based on the 4 inch water main.

Following are some general recommendations for water conservation measures, some of which may already be under consideration by the District. This is intended only as a general starter guide. A detailed analysis and water audit would be required to assess the overall feasibility and economics of these and other water conservation projects.

Low Flow Plumbing Fixtures – Low flow aerators on existing sinks and low flow shower heads can yield significant water savings. In addition, existing toilets and urinals may be retrofitted with low gallon-per-flush fixtures. These retrofits typically have simple paybacks of 5-10 years.

Central Irrigation Control – Smart irrigation controls may be installed on existing District irrigation systems. These systems can offer the following water-saving features:

> *Weather-based irrigation:* The systems will water on-demand depending on prevailing weather conditions and plant evapotranspiration data, thereby eliminating unnecessary irrigation associated with standard constant or manually adjusted watering schedules.

> *Networked Flow Sensors:* Flow sensors installed on irrigation feeds at different locations allow for remote monitoring of individual site water usage. This can in turn facilitate more strategic targeting of high use sites for further curtailment measures, as well as early detection of potential leaks and system malfunctions.

> *Master Flow Shutoff Valves*: Along with flow sensors, master shutoff valves for irrigation systems and other main water lines may be controlled remotely. This allows for automatic leak detection and shutoff so that the problem may be fixed with little to no wasted water.

Cooling Towers – At facilities using water cooled chillers, evaporative cooling towers can represent significant portion of overall water consumption. Cooling tower water consumption comes from two sources: evaporative losses and blowdown.

> *Evaporative Losses*: Cooling towers reject heat through evaporation as water flows over tower fill. This evaporation must be replaced in the system, requiring more fresh water. Although little can be done to reduce this source of cooling tower consumption (apart from reducing building cooling loads), many water utilities will exempt users from sewage charges on evaporative tower losses. This can represent a major cost reduction since sewer charges are most often greater than water charges on a per unit basis. **It is recommended to consult with the District's water providers about potential cooling tower evaporative credits**. The process would involve installation of submeters on tower makeup and blowdown lines, a small initial cost but with rapid payback potential where eligible.

> *Blowdown:* As cooling tower water is evaporated, dissolved minerals in the source water are left behind. High concentrations of these minerals can cause harmful scaling of the system's heat exchange surfaces. To keep these concentrations down, tower system water is periodically dumped or "blown down" to a drain, as shown in Figure 30, and replaced with fresh supply.

Figure 30. Typical cooling tower system blowing down.

The decision of when to blow down is made by the conductivity controller, which measures the concentration of dissolved solids and attempts to maintain it at a given setpoint. The higher this setpoint, the less often blow down will occur and the lower tower water consumption will be. Typically, central plants have conductivity setpoints of approximately 2,300 µS (units of conductivity). This is a typical recommended setpoint for galvanized steel towers. Stainless steel towers can tolerate higher conductivity levels, up to 4,000 µS according to a major tower manufacturer's literature. The allowable conductivity for scaling prevention will also depend on other factors such as source water quality and chemical treatment methods (pH control etc.) It is recommended to consult with the specific manufacturers of the District's newer towers and with the District's chemical treatment company on allowable conductivity settings and potential adjustments for water savings.

Perhaps more important than the conductivity setpoint is the calibration of the controllers' conductivity sensors. Regardless of the setpoint, an out-of-calibration conductivity sensor can lead to more frequent or constant blow down and water/chemical waste. It is recommended to periodically verify calibration, ideally independently of chemical treatment service visits for added quality control.

***Artificial Turf* –** Recent advents in artificial turf technologies have made this a viable replacement for traditional field turf, and requiring no watering, fertilization, etc. It is recommended to assess artificial turf as an option for water conservation at District outdoor sports facilities.

***Xeriscaping* –** Landscaped areas should move toward use of native plants requiring little to no supplemental watering. Use of turf grasses in non-essential areas should be avoided. This applies to selected existing landscapes, as well as new designs.

***Water-conscious Design* –** In addition to possible water-efficient retrofits to existing facilities noted above, the District should make water-efficient design a standard practice for all new construction projects. Designing for water efficiency from the very beginning will have a greater impact on future consumption and will allow for more extensive measures such as plumbing for air-conditioning condensate capture and reuse, rainwater collection, cooling tower water blow-down/make-up reduction, etc.

Consumption Tracking – Utilities tracking databases such as ENERGY STAR Portfolio Manager and School Dude spreadsheet applications may be used to monitor and track the District's water usage over time. Consumption tracking can aid in benchmarking individual facilities, identifying, and taking action at high-use sites, and promoting and exemplifying low-use ones.

IV. Energy Star Portfolio Manager

The District has been importing its utility data into ENERGY STAR Portfolio Manager through School Dude services. One of the key reasons for using ENERGY STAR Portfolio Manager is its ability to normalize the District's baseline according to several key factors (i.e. Weather, Square Feet, Hours of Operation, Number of Computers, etc.). It is also a free online resource available to all registered users, and is a user-friendly web-based tool.

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). ENERGY STAR has developed Portfolio Manager, an innovative online energy management tool, designed to help organizations track and assess energy and water consumption of their facilities. Portfolio Manager helps organizations set investment priorities, identify under-performing buildings, verify efficiency improvements, and receive EPA recognition for superior energy performance.

Portfolio Manager is an energy performance benchmarking tool. Portfolio Manager rates a building's energy performance on a scale of 1–100 relative to similar buildings nationwide. The rating system is based on a statistically representative model utilizing a national survey conducted by the Department of Energy's Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), is conducted every four years, and gathers data on building characteristics and energy use from thousands of buildings across the United States. A rating of 50 indicates that the building, from an energy consumption standpoint, performs better than 50% of all similar-use buildings nationwide, while a rating of 75 indicates that the building performs better than 75% of all similar-use buildings nationwide.

In addition, Portfolio Manager is used to generate a Statement of Energy Performance (SEP) for each building, summarizing key energy information such as site and source energy intensity, greenhouse gas emission, energy reduction targets and energy cost. The Statement of Energy Performance can be used in applying for an ENERGY STAR Building label or satisfying LEED for Existing Buildings (LEED-EB) requirements. ENERGY STAR certification, as well as the LEED-EB Minimum Energy Performance Prerequisite, both require an ENERGY STAR score of at least 75. **Note that SEP verification for purposes of ENERGY STAR certification includes additional requirements such as onsite confirmation of building space use data and compliance with lighting, ventilation, and other building codes.**

To develop the District's baseline, 12 months of utility consumption, cost data, and Building Space Use information is required. Table 3 is a sample of the Building Space Use data required by Portfolio Manager to generate the Energy Performance Rating. Many of these inputs are critical, may vary over time, and can significantly influence how Portfolio Manager computes the ENERGY STAR Rating. If an ENERGY STAR Label is pursued, these key inputs will need to be verified and certified by a Portfolio Manager Licensed Professional (Professional Engineer or Registered Architect). Since 2013, additional space usage data are also required for verification, though they are not currently included in the algorithm to compute the ENERGY STAR Score. Although these data do not affect a building's rating, they may eventually be considered once a large enough sample is created. Thus, verification of these inputs is required as well when submitting the Statement of Energy Performance for ENERGY STAR's review.

Table 3. ENERGY STAR Portfolio Manager Example Space Use Data

Facility Type: K-12 School
Space Data Used in Computing Score • 12 Months of energy consumption data • Gross floor area • Open weekends (Y/N) • # of PCs • # of Walk in refrigerators/freezers units • Presence of cooking facilities • Percent cooled • Percent heated • High School (Y/N)
Space Data Required but not Currently Used in Computing Score • Building percent occupied and in use • Number of workers on main shift • Student seating capacity • Gymnasium floor area • Months open per year

Figure 31 indicates the District's current energy performance ratings for the base year ending in July 2016.

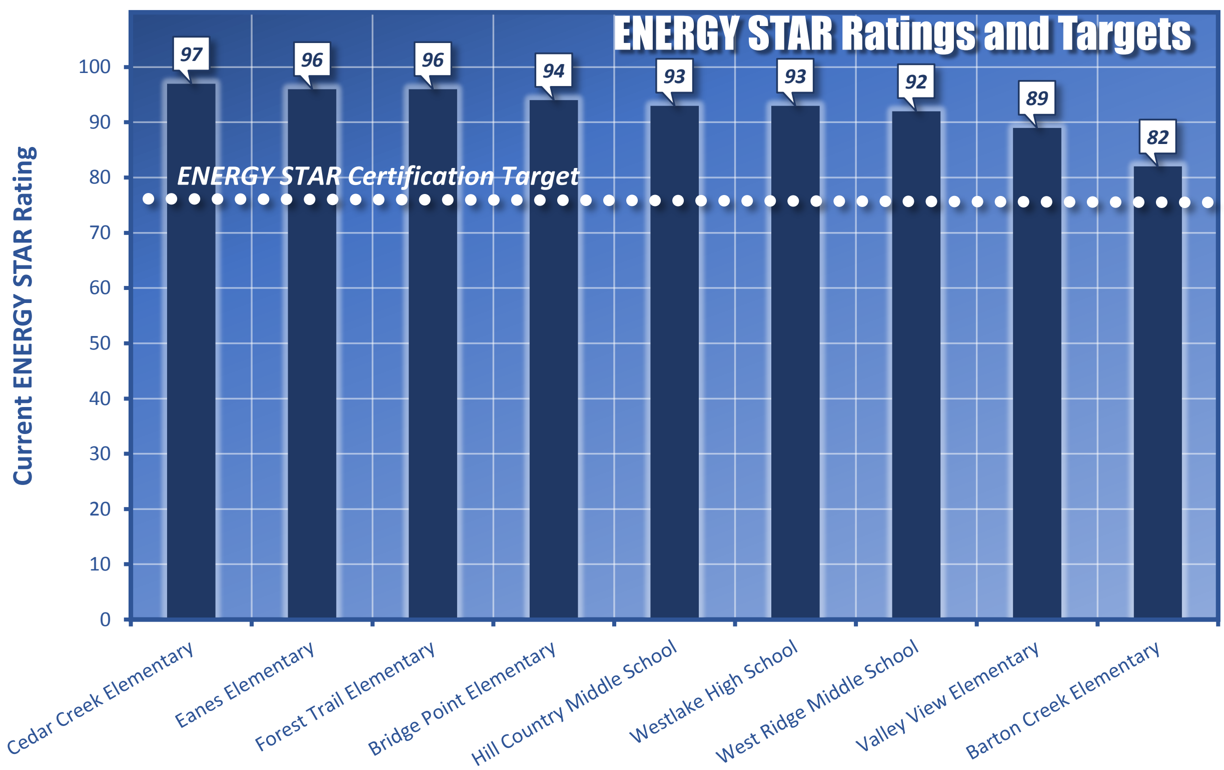


Figure 31. Current District Facility Energy Star ratings.

A benefit of using ENERGY STAR's Portfolio Manager is its ability to set goals. It allows an energy performance target to be set for each facility and calculates the estimated savings per year required to reach the goal. For facilities already exceeding a given goal, Portfolio Manager will also calculate the estimated savings per year being realized compared to a baseline at the target score.

Note that the Energy Star Rating is heavily dependent on the number of computers data input by the user. The District provided TEESI with actual numbers of computers to input for each campus in place of the default value. The computer counts for each facility

It should be noted that just because a facility is at or above an ENERGY STAR Rating of 75 does not mean there aren't still opportunities for energy savings. A proper energy management program should of course still be applied to the entire District. The relative ratings of each facility in the District can, however, be used to prioritize projects at lower-performing facilities, which typically contain more "low hanging fruit."

Please see Appendix F for additional information regarding ENERGY STAR PORTFOLIO Manager.

Energy STAR Certification Application and Statement of Energy Performance

TEESI conducted onsite spot-checking of the facilities eligible for the Energy Star label. Following the site visits, the Statement of Energy Performance (SEP) was also generated for each campus in Portfolio Manager. The SEP was reviewed based on the findings of the site visits. As a result, all nine of the Eanes ISD campuses have applications for Energy Star Certification submitted to the EPA for consideration.

V. Energy Accounting

Utility Providers

City of Austin provides electric service to the District. Texas Gas Service provides Natural Gas service to the District. Tex-con Oil provides diesel service to the District.

Monitoring And Tracking

Currently, the District uses School Dude and ENERGY STAR Portfolio Manager to track electricity, natural gas, diesel, and water consumption as well as costs. The District should consider tracking demand, where applicable, of these utilities as well. An effective energy tracking system is an essential tool by which an energy management program's activities are monitored. The system should be centralized and available for all engaged staff members to use in verifying progress toward established targets and milestones. Having this historical data improves the District's awareness of their energy performance and will help in tracking their energy reduction goals.

The steps below are essential for an effective energy management tracking system:

1. Perform regular updates. An effective system requires current and comprehensive data. Monthly updates should be strongly encouraged.
2. Conduct periodic reviews. Such reviews should focus on progress made, problems encountered, and potential rewards.
3. Identify necessary corrective actions. This step is essential for identifying if a specific activity is not meeting its expected performance and is in need of review.

In addition, having this historical utility data would facilitate any legislative reporting requirements. Please see Section VII for additional information regarding these requirements.

VI. Utility Rate Analysis

Table 4 below shows average per-unit consumption rates for each utility service at each campus. These data give a general idea of cost implications for every unit of energy and water consumed or saved. However, these "blended" average rates also include various service charges, peak demand charges, and power factor penalties that can potentially be addressed individually to save costs without necessarily reducing consumption. For a detailed investment grade audit, if one is pursued, an in-depth rate analysis with individual costs per avoided kWh and kW would be required and conducted.

Table 4. Utilities Average Per-Unit Consumption Rates

Facility	Electricity[1] $/kWh	Heating Fuel Provider[2]	Fuel[2] $/MMBTU	Water/Sewer Provider[3]	Water[3] $/kGal
Westlake High	$0.107	Texas Gas Service	$ 4.30	Crossroads	$ 5.41
Hill Country Middle	$0.130	Texas Gas Service	$ 2.60	Crossroads	$ 5.75
West Ridge Middle	$0.114	Tex-Con Oil	$18.61	LCRA/WTCPUA	$ 3.75
Barton Creek Elementary	$0.110	Tex-Con Oil	$11.28	LCRA/WTCPUA	$ 4.14
Bridge Point Elementary	$0.133	Texas Gas Service	$ 3.29	AQUA	$33.64
Cedar Creek Elementary	$0.131	Texas Gas Service	$ 4.15	CoA	$16.83
Eanes Elementary	$0.130	Texas Gas Service	$ 6.60	Crossroads	$ 5.59
Forest Trail Elementary	$0.116	Texas Gas Service	$ 3.70	Crossroads	$ 5.47
Valley View Elementary	$0.126	Texas Gas Service	$ 5.12	Crossroads	$ 5.58

(1) Electric Provider: City of Austin

(2) Natural Gas Provider: Texas Gas Service & Diesel Provider: Tex-con Oil

(3) Water & Sewer Provider: Crossroads Utility Services (Water District 10), AQUA, City of Austin, Lower Colorado River Authority (LCRA) & West Travis County Public Utility Agency (WTCPUA)

Note the cost per kGal at Bridge Point Elementary is much higher than other facilities. As previously mentioned in Section III, the water provider charges a $3,866 facility charge every month. See Section III for more information. Additionally, the cost per kGal at Cedar Creek Elementary is approximately 3 times greater than those at other facilities. It is recommended that the District contact the City of Austin utilities to ensure the District is on the lowest, appropriate rate.

Electrical Demand

In addition to electric consumption (kWh), the District's electric provider also bills for Transmission and Distribution, also known as demand or kW charges. The District paid approximately $371,000 in electric demand charges over the twelve month period ending July 2016. This comprised over 27% of total electricity costs during this time.

Demand (kW) charges stem from a facility's peak power draw during a billing period, as opposed to consumption (kWh) charges, which total the energy usage over this period. The following plots show the metered demand and demand charge over a 12-month period for each applicable campus.

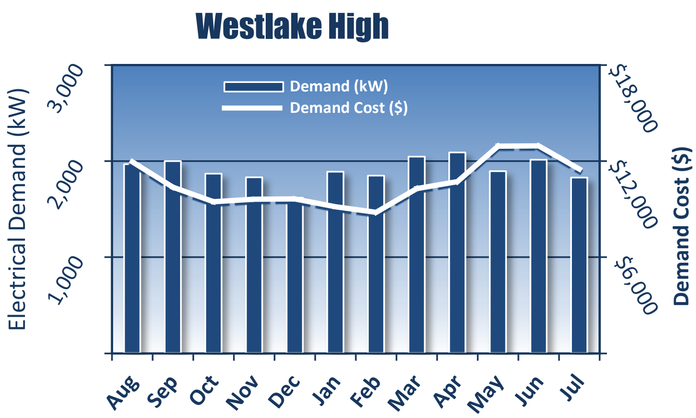


Figure 32. Westlake High School baseline kW demand data.

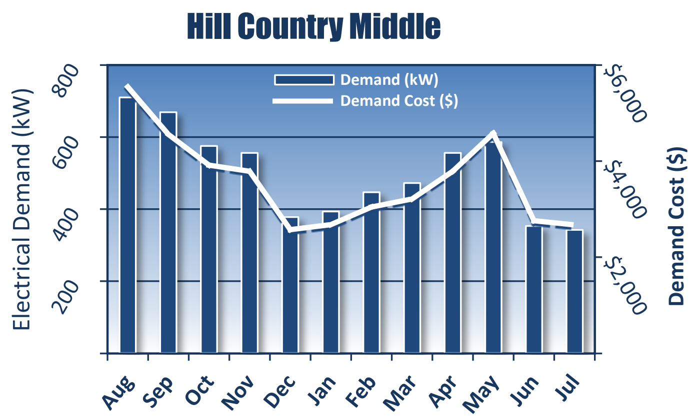


Figure 33. Hill Country Middle School baseline kW demand data.

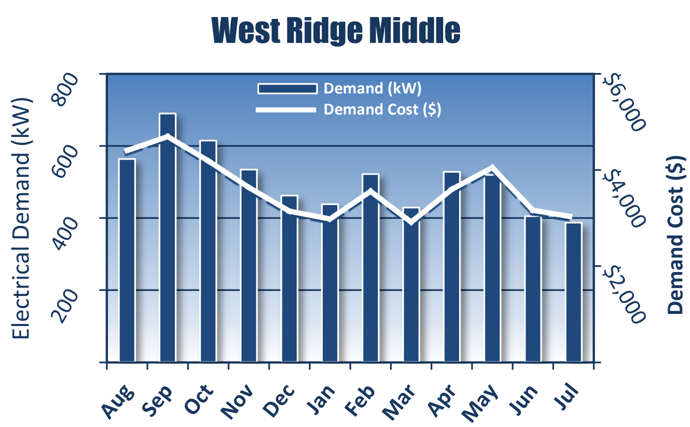


Figure 34. West Ridge Middle School baseline kW demand data.

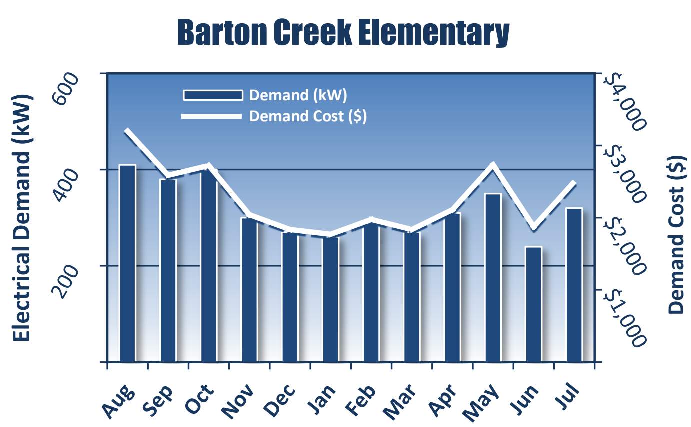


Figure 35. Barton Creek Elementary School baseline kW demand data.

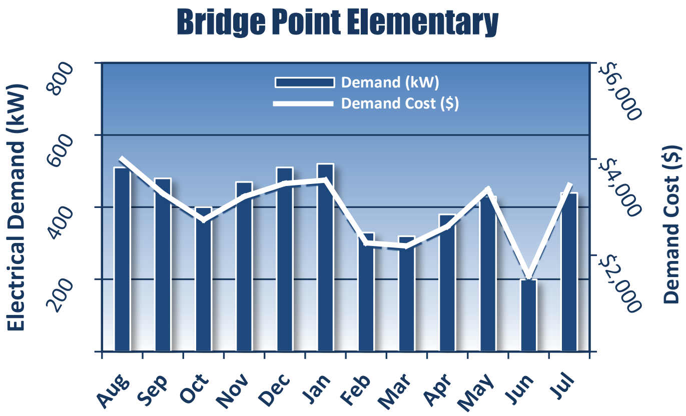


Figure 36. Bridge Point Elementary School baseline kW demand data.

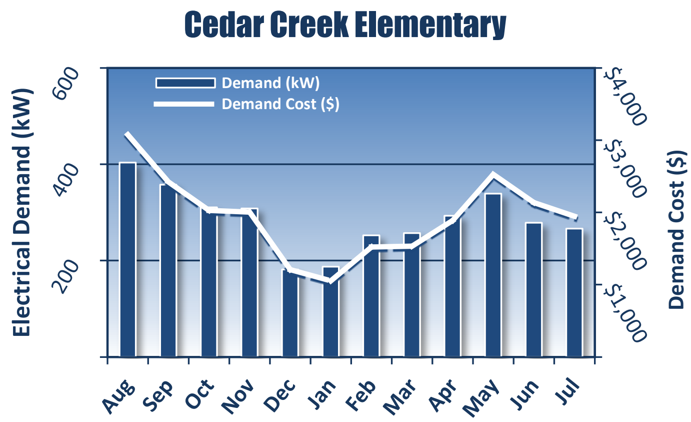


Figure 37. Cedar Creek Elementary School baseline kW demand data.

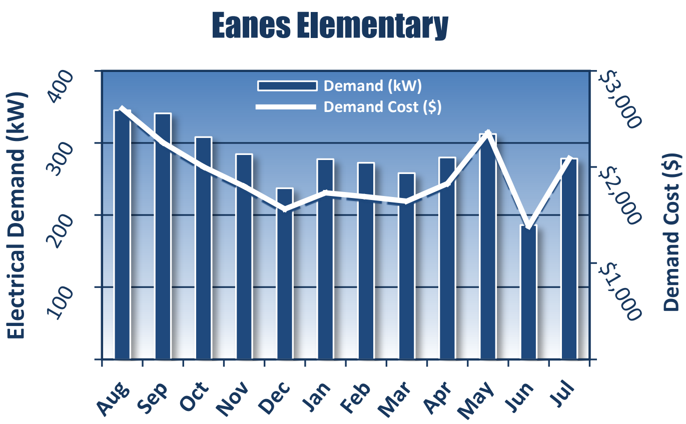


Figure 38. Eanes Elementary School baseline kW demand data.

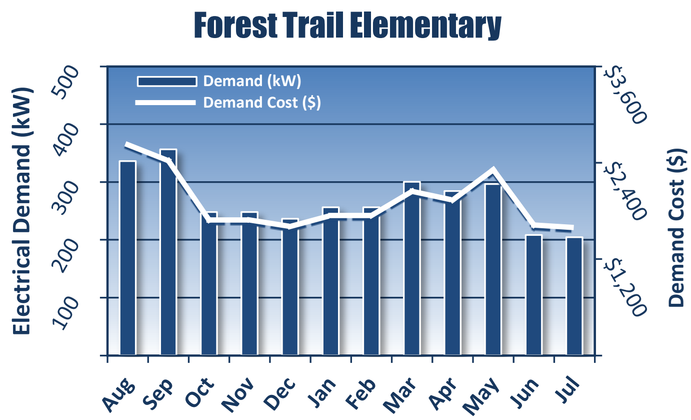


Figure 39. Forest Trail Elementary School baseline kW demand data.

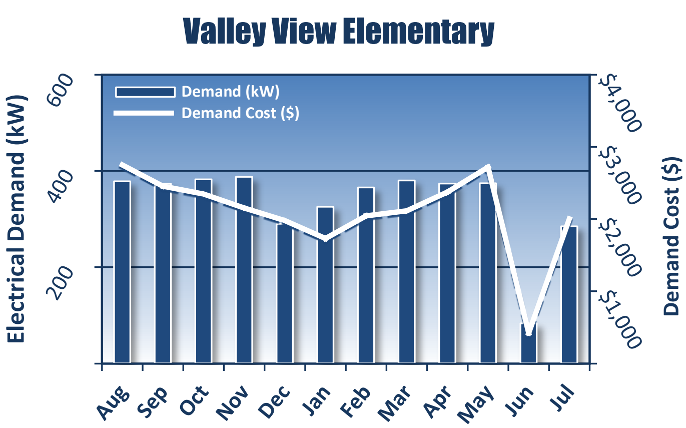


Figure 40. Valley View Elementary School baseline kW demand data.

Some general recommendations for reducing demand costs include:

- Staggering HVAC equipment start utilizing controls.
- Installing motion sensors for lighting control to prevent unnecessary lighting on at once (see Section IX).
- Increasing thermostat setpoints in the summer and decreasing them in the winter to reduce unit cycle times for DX units, chiller loads, and AHU fan speeds.
- During pre-year equipment startup and testing (note peak August and September demand data), be mindful of simultaneous equipment operation.

Billable Demand Adjustments

Note that the monthly demands shown in the previous charts are *metered* demand, whereas charges are often applied to a *billable* demand. The following describe typical electric rate provisions that affect billable demand, and thus total costs.

80% Ratchet

The 80% ratchet computes the larger of the metered kW in the billing period *or* 80% of the highest metered demand in the previous 11 months. This is essentially a penalty for the rest of the year when only one month experiences a "spike" in demand. It is therefore essential that the District try to manage demand peaks month to month to avoid penalties in the future.

Power Factor

The power factor is equal to the ratio of the actual power being used by a facility to the apparent power that the utility provider must make available. When the apparent power (kVA) demand from the provider is significantly greater than what is actually necessary, the power factor is low and a penalty is incurred.

Austin Energy customers with a power factor below 90% will have an adjustment to the demand kW that is charged. **For discussion of power factor *correction* as a potential Utility Cost Reduction Measure, reference Section IX.**

Load Factor

For analyzing a facility's electrical demand from month to month, it is useful to calculate the load factor. The load factor is equal to the average demand divided by the peak demand for a given period, and represents the consistency of a facility's energy usage. That is,

$$\text{Average kW in billing period} = \frac{\text{Total kWh in billing period}}{\text{Hours in billing period}}$$

$$\text{Load Factor} = \frac{\text{Average kW in billing period}}{\text{Peak kW in billing period}}$$

Typical load factors vary depending on facility type and operating hours, as well as season and building efficiency. An average value for a single-shift building is around 30%. In general, an excessively low load factor means higher demand peaks than total consumption would indicate, and thus higher than necessary demand charges. Excessively high load factors indicate more constant energy usage, suggesting equipment is not being shut down when it could be. The following plots show the monthly load factors at each applicable District campus.

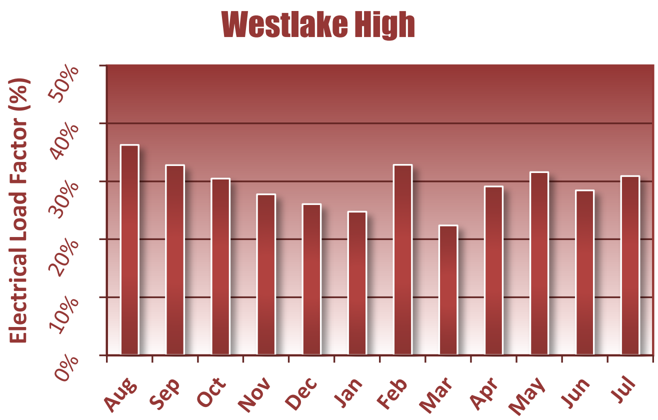


Figure 41. Westlake High School baseline electrical load factor data.

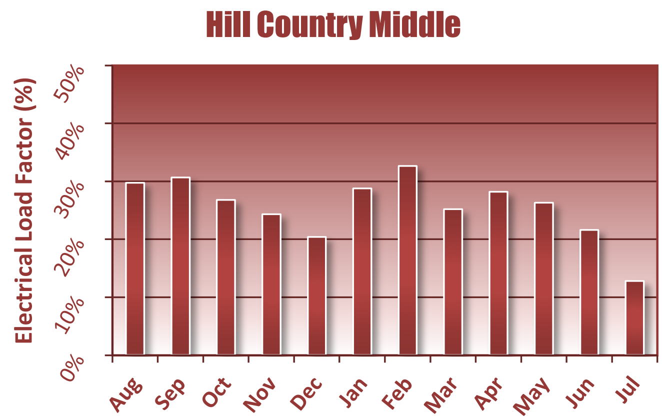


Figure 42. Hill Country Middle School baseline electrical load factor data.

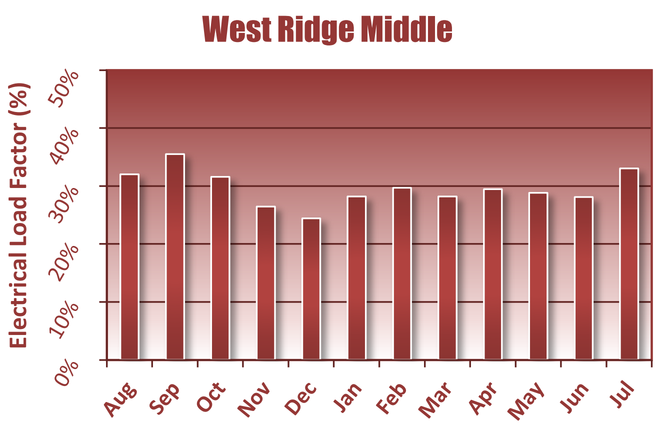


Figure 43. West Ridge Middle School baseline electrical load factor data.

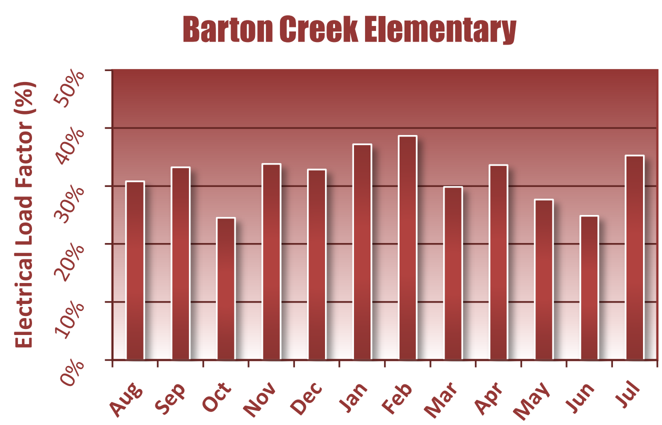


Figure 44. Barton Creek Elementary School baseline electrical load factor data.

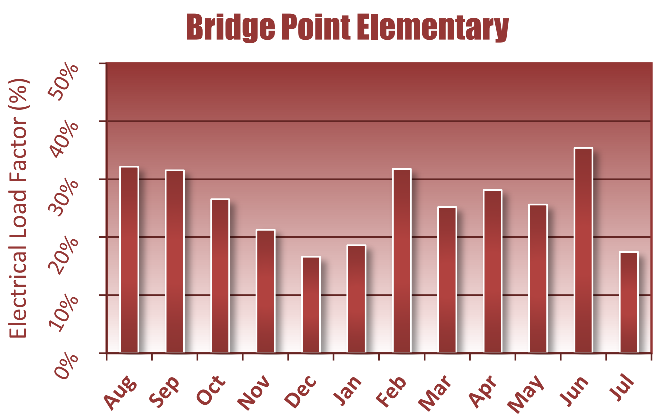


Figure 45. Bridge Point Elementary School baseline electrical load factor data.

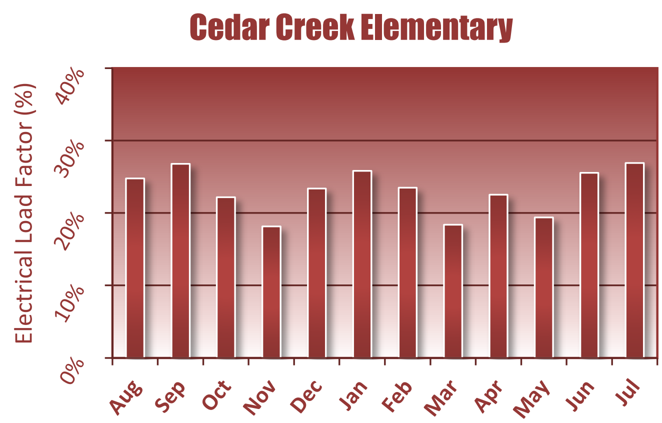


Figure 46. Cedar Creek Elementary School baseline electrical load factor data.

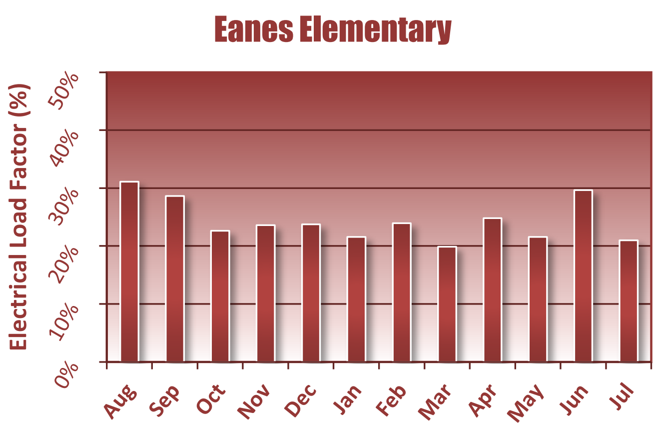


Figure 47. Eanes Elementary School baseline electrical load factor data.

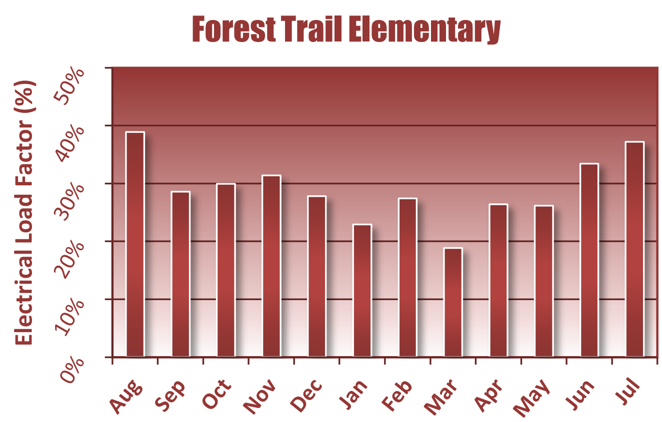


Figure 48. Forest Trail Elementary School baseline electrical load factor data.

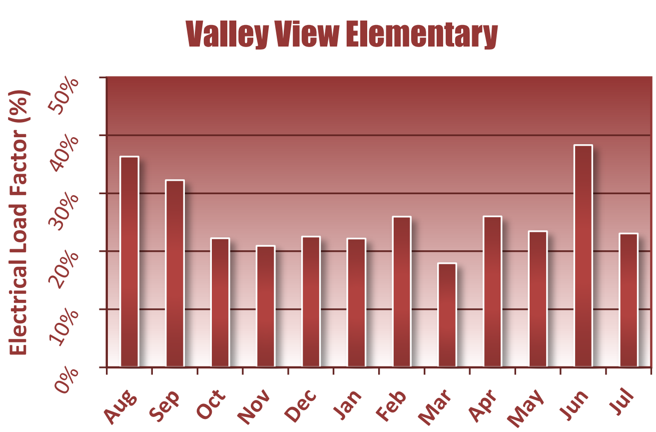


Figure 49. Valley View Elementary School baseline electrical load factor data.

Note that if the load factor is high (above 40%), it may be indicative of significant afterhours operation, and an opportunity for energy savings through more optimized equipment scheduling. Conversely, facilities with low load factors (below 20%) could indicate a demand “spike” occurred which is uncharacteristic of normal usage, and that could potentially be avoided through demand management strategies.

These are just two examples of how a load factor analysis can be used to assess energy and demand utilization. While not a direct indicator of operational and energy management issues, the load factor can still be used as another tool for energy management personnel.

VII. Energy Legislation Overview

In 2011, the 82nd Texas Legislature passes Senate Bill 898 (**SB898**) which, among other things extended the timeline set by Senate Bill 12 (**SB12**) and its predecessor Senate Bill 5 (**SB5**). SB5, commonly referred to as the Texas Emissions Reduction Plan, was adopted in 2001 by the 77th Texas Legislature to comply with the federal Clean Air Act standards. Also in 2011, the 82nd Texas Legislature passed Senate Bill 924 (**SB924**), which continued House Bill 3693 (**HB3693**) amending provisions of several codes relating primarily to energy efficiency.

In 2009, the 81st Texas Legislature passed Senate Bill 300 (**SB300**). This bill specifically addressed the requirement for Texas Schools. This bill repealed the requirement in HB3693 that school districts must establish a goal of reducing electric consumption by 5% each year for six years starting Fiscal Year (FY) 2007. SB300 instead requires that school districts establish a long-range energy plan to reduce the overall electricity use by 5% beginning FY 2008. Besides this change, other requirements set forth in SB898 and SB924 applicable to schools still apply.

Following are key requirements established by the above energy legislation:

- Establish a Long-Range Energy Plan (SB300) to reduce the District's electric consumption by five percent (5%) beginning with the 2008 state fiscal year and to consume electricity in subsequent fiscal years in accordance with the plan. The Long-Range Energy Plan should include strategies in the plan for achieving energy efficiency that result in net savings or that can be achieved without financial cost to the district. The Plan should account for the initial, short-term capital costs and lifetime costs and savings that may occur from implementation of the strategy. Each strategy should be evaluated based on the total net costs and savings that may occur over a seven-year period following implementation of the strategy.
- Record electric, water, and natural gas utility services (consumption and cost) in an electronic repository. The recorded information shall be on a publicly accessible Internet Web site with an interface designed for ease of navigation if available, or at another publicly accessible location. **Reporting to the State not currently required of School Districts, but energy accounting nonetheless still highly recommended.**
- Purchase commercially available light bulbs using the lowest wattages for the required illumination levels.
- Install energy saving devices in Vending Machines with non-perishable food products. **Not required of School Districts, but highly recommended.**

Summary descriptions of SB898, SB924, and SB300 are available in **Appendix A.**

VIII. Recommended Maintenance & Operation Procedures

Good Maintenance and Operation procedures significantly improve operating economy, equipment life, and occupant comfort. Generally, maintenance and operation procedural improvements can be made with existing staff and budgetary levels. Below are typical maintenance and operation procedures that have energy savings benefits. The District may already be following some of the recommendations noted below. The following maintenance and operation procedures should be encouraged and continued to ensure sustainable energy savings.

Conduct a nighttime audit

Conduct a nighttime audit to see what is left on afterhours that should not be.

Establish HVAC Unit Service Schedules

Document schedules and review requirements for replacing filters, cleaning condensers, and cleaning evaporators. Include particulars such as filter sizes, crew scheduling, contract availability if needed, etc. Replace filters with standard efficiency pleated units. Generally, appropriate service frequencies are as follows -- filters: monthly; condensers: annually; evaporators: 5 years.

Schedule HVAC Equipment Operation Based on Building Occupancy

Several of the District’s campuses are operated outside of typical school hours regardless of whether the building is occupied. This was confirmed through looking at equipment time schedules in the EMS during Summer break, and is demonstrated in the load factor analysis charts in Section VI. It is highly recommended to implement start/stop schedules on all HVAC equipment based on actual building occupancy. Optimization and implementation of equipment time schedules could be performed as part of an **Existing Building Enhanced Commissioning program**, a savings measure discussed further in **Section IX**.

Visual Inspections

Visually inspect insulation on all piping, ductwork and equipment for damage.

Energy Star Power Management

ENERGY STAR Power Management Program promotes placing monitors and computers (CPU, hard drive, etc.) into a low-power “sleep mode” after a period of inactivity. ENERGY STAR estimates an annual savings of $50 per computer. Simply touching the mouse or keyboard “wakes” the computer and monitor in seconds. ENERGY STAR recommends setting computers to enter system standby or hibernate after 30 to 60 minutes of inactivity. Simply touching the mouse or keyboard “wakes” the computer and monitor in seconds. Activating sleep features saves energy, money, and helps protect the environment. Visit www.energystar.gov/powermanagement to learn more about the ENERGY STAR Power Management Program.

Food Service Equipment

Purchase ENERGY STAR certified commercial food service equipment. Certified refrigerators and freezers use up to 45% less energy than conventional models, resulting in annual savings of $140 and $100 for refrigerators and freezers, respectfully. Using other ENERGY STAR certified appliances also result in significant annual savings such as: up to $60-180 for deep fryers, $280 for hot food holding cabinets, $450-$820 for steam cookers. For existing refrigerators, clean refrigerant coils twice per year and replace door gaskets if any sign of wear is visible. Have walk in refrigeration systems serviced at least annually. This includes cleaning, refrigerant top-off, lubrication of moving parts, and belt adjustments. This will ensure efficient operation and longer equipment life. Consider retrofitting existing refrigerators and display cases with anti-sweat door heater controls.

Publicize Energy Conservation

Promote energy awareness at regular staff meetings, on bulletin boards, and through organizational publications. Publicize energy cost reports showing uptrends and downtrends. Such publicity has been shown to effect behavioral changes in organization staff, ultimately conserving even more energy. A sample study by the US Green Building Council (USGBC) profiled five school districts across the US that reduced electricity use by over 20 percent through behavior-based strategies and energy conservation publicity alone.

Manage Small Electrical Equipment Loads

Small electrical equipment loads consists of small appliances/devices such as portable heaters, microwaves, small refrigerators, coffee makers, stereos, cell phone chargers, desk lamps, etc. The District should establish a goal to reduce the number of small appliances and to limit their usage. For example, the use of small space heaters should be discouraged; all space heating should be accomplished by the District's main heating system. In addition, many small devices such as radios, printers, and phone chargers can consume energy while not in use. To limit this "stand-by" power usage these devices should be unplugged or plugged into a power strip that can act as a central "turn off" point while not in use. With an effective energy awareness campaign to encourage participation, managing small electrical loads can achieve considerable energy savings.

Pre-Identify Premium Efficiency Motor (PEM) Replacements

Pre-identify supply sources and PEM stock numbers for all HVAC fan and pump motors so that as failures occur, replacement with PEM units can take place on a routine basis. As funding allows, pre-stock PEM replacements according to anticipated demand, i.e., motors in service more than 10 years, motors in stressful service, and at least one motor of each size and type that is in service at numerous locations.

For small single phase motors (less than 1 HP) such as on small split-unit indoor blowers, condenser fans, and restroom exhaust fans, many manufacturers are beginning to offer Electrically Commutated (EC) motors for the application. EC motors are brushless Direct Current (DC) motors that offer around 30% efficiency improvement over Permanent Split Capacitor (PSC) motors and up to 60% improvement over shaded pole motors. When replacing existing failed motors of these types, it is recommended to consider EC motor replacement, which has a typical payback of 3-6 years over PSC alternatives.

Improve Control of Interior and Exterior Lighting

Establish procedures to monitor use of lighting at times and places of possible/probable unnecessary use: Offices and classes at lunchtime, maintenance shops, closets, exterior, and parking lots during daylight hours, etc. Encouraging staff (i.e. Teacher, Custodial, maintenance, and students) to participate in the District's efforts to limit unnecessary lighting use would help improve this effort. It is recommended to turn these lights on only as needed when occupants actually arrive, so that electricity is not used to light a mostly unoccupied building. Turning many lights on at once also increases electric demand and costs. Using motion sensors to control building lighting is an optimum solution, and is discussed further in **Section IX Utility Cost Reduction Measures**.

The District has been replacing High Intensity Discharge (HID) exterior lighting with LED lighting, and it is recommended that the District continue until all of the exterior HID lights have been retrofitted. Exterior lighting is typically controlled using light sensing photocells, timeclocks, or manual switching. Photocells tend to fail in the "On" state, so someone should check regularly to see that the lights are not on during the day. Photocells can also drift out of calibration, causing exterior lighting to be left on in only slightly overcast conditions, as shown in Timeclocks are more reliable, and those with astronomical control or that operate in series with photocells also provide dusk-to-dawn operation that is seasonally corrected. Timeclocks also offer the option of turning off the lights in the middle of the night. Manual control is limited to when someone is present and remembers to actuate the switch.

Avoid Manual Operation of Equipment

For EMS occupancy schedules to function as intended, equipment Hand-Off-Auto (HOA) switches must be set to "Auto." Often these switches are placed in hand mode for temporary override or servicing, and then possibly forgotten to be returned to auto afterward.

It should be noted that new DDC controls are being installed at Whispering Pines Elementary during the summer of 2016. Also, note that an HOA switch in the hand position does not necessarily mean the equipment is overridden. Original motor starters may have been bypassed to retrofit with Variable Frequency Drives (VFDs), in which case the old HOA switch has no effect on operation. In some cases, the starter is left in place in the circuit and kept in hand to maintain power to the drive. Returning to auto in these cases would actually disconnect the equipment (retaining starters during VFD retrofits is not recommended).

Separately Schedule Temperature Control and Ventilation

It is typically necessary to start equipment and establish temperature control an hour or more before occupancy. Except perhaps in very mild weather, however, fresh air intake should not begin until the occupants are due to arrive. Otherwise, fresh air is heated or cooled needlessly. In hot, humid weather, the outside air also raises the indoor humidity at a time when the cooling load is too low to produce sufficient dehumidifying effect from the cooling system.

Maintain Optimum Cooling, Heating, and Setback Setpoints

The District currently maintains cooling setpoints for most zones at around 73°F, with heating setpoints from 68 to 72°F. It is recommended that these setpoints be standardized to allow a sufficient deadband between heating and cooling modes. An occupied cooling setpoint of 74°F and heating setpoint of 68°F are typically recommended by most energy codes, with unoccupied setback to 85°F in cooling and 55°F in heating. Optimization of these and other HVAC setpoints, as well as of control logic and programming for equipment in the EMS, could be part of a comprehensive Enhanced Commissioning program, a savings measure discussed further in **Section IX**. Standardization of thermostat setpoints as a District-wide energy conservation policy is discussed in **Section XI.**

Typical Equipment Maintenance Checklists

Effective operation and maintenance of equipment is one of the most cost effective ways to achieve reliability, safety, and efficiency. Failing to maintain equipment can cause significant energy waste and severely decrease the life of equipment. Substantial savings can result from good operation and maintenance procedures. In addition, such procedures require little time and cost to implement. Examples of typical maintenance checklists for common equipment including boilers, chillers, etc. are provided in **Appendix D**. These checklists from the Federal Energy Management Program (FEMP), a branch of the Department of Energy (DOE), are based on industry standards and should supplement, not replace those provided by the manufacturer.

Control Outside Air Infiltration

Conduct periodic inspections of door and window weather-stripping, as well as other building envelope penetrations, and schedule repairs when needed. Additionally, make sure doors and windows are closed during operation of HVAC systems (heating or cooling). Unintended outside air contributes to higher energy consumption and increases occupant discomfort.

Replace Incandescent Lamps with LEDs

Replace existing incandescent lamps with LED bulbs as they burn out. LED bulbs use 75 to 90% less wattage for the same light output, with more than ten times the operating life of incandescent bulbs. Look for personal lamps, desk lamps, task lamps, floor lamps, mood lighting and rope lights and ensure LED lights are being used.

Install LED Exit Signs

Exit signs operate 24/7, 365 days per year. LED exit signs use around 2-5 Watts per fixture and replacing the older, existing signs will have immediate energy savings of around 90% per sign.

Repair Leaking Faucets and Equipment

Repair leaking faucets to reduce unnecessary water consumption and natural gas consumption. A dripping hot water faucet can leak hundreds of gallons of water per year as well as natural gas being unnecessarily consumed.

Install Energy Saving Devices on Vending Machines

Install energy saving devices on vending machines with non-perishable food items to reduce the equipment power usage. These devices shut the vending machines down during unoccupied periods. There are several commercially available devices that can be easily installed on existing vending machines. These devices typically have a motion sensor which powers down the equipment after periods of inactivity. For example if the motion sensor does not sense activity within 15 minutes the device will shut down the vending machine and turn on once motion is sensed. These devices range in price from $100 to $250 and have a typical annual savings of $20 to $150 per vending machine.

Hail Guards on Condensing Coils

When an HVAC unit is replaced the District should ensure the new unit be specified with hail guards. The hail guards protect the condensing unit’s heat exchanger coils from hail damage. Damage to the condensing unit heat exchangers reduces the efficiency of the units. If any existing unit(s) have damaged condensing coil fins, the fins should be straightened using a fin comb.

Figure 50. Damaged heat-exchanging fins on unit at Cedar Creek Elementary School.

MERV Ratings for Air Filters

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has developed a measurement scale for air filters. This rating is called the Minimum Efficiency Reporting Value, or MERV rating. MERV ratings range from 1 to 16 for most applications. The lower MERV ratings will allow larger particles to pass through the air filter, whereas the higher MERV ratings will only allow much smaller particles to pass through. Air filters with higher MERV ratings will cost more but will also offer greater protection for the occupants, which can be very important for attendance levels at schools, as well as protection for HVAC equipment from excessive dust/particulate build up. Also, the higher the MERV rating, the greater the pressure drop will be from added resistance of the air filter. It is important that the District consider pressure drop if switching to air filters with a higher MERV rating. MERV ratings and applications summarized in the following table.

Table 5. Minimum Efficiency Reporting Value (MERV) Ratings (*)

MERV Std 52.2	Average Arrestance	Particle Size Ranges	Typical Applications
1 - 4	60 - 80%	> 10 µm	- Minimum filtration - Residential window units
5 - 8	80 - 95%	3.0 - 10 µm	- Better Residential - Commercial buildings
9 - 12	>90 - 98%	1.0 - 3.0 µm	- Superior residential - Better commercial buildings - Hospital laboratories
13 - 16	>95 - 99%	0.3 - 1.0 µm	- Superior commercial buildings - Hospital inpatient care - General Surgery

(*) Source: Understanding MERV NAFA User's Guide for ANSI/ASHRAE Standard 52.2-2012 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size – November 2014)

The District should consider air filters with MERV ratings between 8 and 13 to remove dust particles and molecular contaminants in an effort to improve indoor air quality. As a summary, the following metrics should be considered when investing in new air filters:

1. Compare allowed pressure drop with manufacturer's designed pressure drop

2. Life cycle cost analysis

3. Removal of dust and airborne microbial contamination

Water Conservation Measures: Low Flow Plumbing Fixture Retrofits

During the site walk-throughs, TEESI performed spot checks of select restroom faucets and toilets. Many fixtures were found to have flow rates in excess of water-efficient "low flow" fixtures currently on the market, which meet standards for high-performance green buildings. These include restroom faucets using 0.5 gallons per minute or less, urinals using 0.5 gallons per flush or less, and showerheads using 1.5 gallons per minute or less. It is recommended to retrofit those existing District plumbing fixtures with flows above these standards with water-efficient fixtures suited to the application. This would reduce not only facility water consumption and cost, but also sewer costs where applicable. A detailed assessment will be required to determine exact cost, quantities and configuration to maximize the water savings.

Replace HVAC Systems

Replacement of aging HVAC systems typically does not yield a high return on investment based on energy savings alone. Savings can be significant, especially if upgrading from extremely old or inefficient equipment types. However, the high cost of replacement equipment is often such that HVAC retrofit projects alone will not pay back until around the time replacement is required once again. The exact return on investment can be more or less favorable based on existing unit condition and maintenance requirements/costs, proposed equipment efficiency, climate conditions, operating hours, and utility rates, among other factors. Still, HVAC replacement by itself is very rarely a “slam dunk” in energy terms. However, it is still recommended to replace aging HVAC equipment (generally over 15 years old) or any equipment that requires frequent service. Replacing older, or troublesome, HVAC equipment will save on operating costs as well as maintenance costs. It is understood that some of the HVAC systems around the District are to be replaced in an upcoming bond.

Gym Lighting Level Requirements

During the site walk-through at Hill County Middle School, the gym light levels were spot measured around 20 foot-candles (FC). The recommended levels for gym lighting according to the Illuminating Engineering Society of North America (IESNA) is 30-50 FC for recreational gyms and 50-100 FC for competition gyms. Figure 51 shows an example of a 6-lamp high bay T5-high output fixture observed at Hill Country Middle School. During the site visit it was noted that there are two inoperable lamps in each fixture. A gym coach indicated the gym was intended to have two light level settings, one lower light used for practice and a brighter setting used for competitions. During the site visit it was not immediately apparent where another switch was located to turn on all 6 lamps for each fixture. If there is another switch, the coaches need to be made aware of its location. If there is not another switch, the District should take the appropriate measures to ensure appropriate lighting levels can be met for competitions.

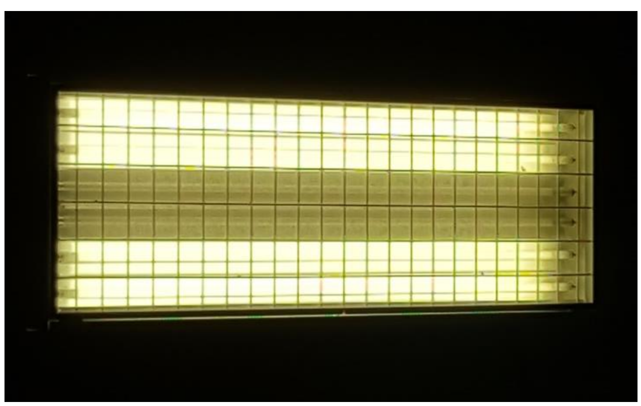


Figure 51. High Bay T5HO fixture at Hill Country Middle School

IX. Utility Cost Reduction Measures

Utility Cost Reduction Measures (UCRMs) projects identified during the preliminary analysis are detailed below. Project cost estimates include complete design and construction management services. *Note, HVAC measures are not included in the following UCRMs as District staff indicated that they are being addressed with Bond funds.*

Replace Existing T8 Fluorescent Lamps with Lower Wattage Lamps

The District uses primarily 32 Watt (W) T8 linear fluorescent lamps. These lamps can be retrofitted with high efficiency alternatives for energy and cost savings. Options for replacement include lower wattage 28W or 25W T8 fluorescents or, more recently, "plug-and-play" LED tube retrofits using between 15-18W. These LED lamps match standard T8 linear fluorescent dimensions and, if existing electronic ballasts are in good shape, can be installed in existing fluorescent fixtures with no rewiring required.

Until recently, interior LED lighting technology was, in general, prohibitively expensive from an energy savings retrofit perspective. In the case of plug-and-play LED tubes in particular, performance had also not yet evolved to match standard fluorescents. These barriers have since steadily come down. Light output is now highly competitive with typical fluorescents. Costs have decreased to the point where, when considering their greater energy savings potential, LED payback periods are relatively equal or superior to fluorescents. These costs are expected to decrease further in the future.

Both fluorescent and LED options are effective energy retrofit projects. Retrofitting with low wattage fluorescents will have a lower first cost, while retrofitting with LEDs will have a greater overall savings. LED retrofits are also an option with significant energy savings even where existing fluorescent lamps are already low wattage 25W or 28W varieties. With either option, the post retrofit fixtures may produce slightly less light. It is important to verify that recommended lighting levels will be maintained. Lighting levels should be measured prior to and after lamp replacement. In addition, compatibility with existing ballasts, local codes, and other requirements must be verified prior to retrofitting.

The estimated costs and savings in Table 6 (Option A) are based on replacement of existing 32W T8 lamps with 16W LED retrofit tubes, including a portion of the funds allocated to potential replacements of incompatible ballasts. Lamp recycling is included in the cost estimates. Estimates are based on a preliminary walkthrough of the facilities. A detailed lighting analysis will be required to determine exact cost, quantities and configuration to maximize the energy savings and lighting performance.

Table 6. T8 to LED Lamp Retrofit with Ballast Replacement (Option A)

Facility	Estimated Implementation Cost ($)	Estimated Annual Savings ($/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
Westlake High	$711,500	$86,800	3,363	8.2
Hill Country Middle	$181,400	$27,100	787	6.7
West Ridge Middle	$210,300	$27,300	766	7.7
Barton Creek Elementary	$103,800	$12,100	353	8.6
Bridge Point Elementary	$116,800	$16,200	454	7.2
Cedar Creek Elementary	$94,200	$13,100	373	7.2
Eanes Elementary	$91,600	$12,500	364	7.3
Forest Trail Elementary	$98,500	$12,000	388	8.2
Valley View Elementary	$89,000	$11,700	368	7.6
T8 TO LED RETROFIT W/BALLASTS SUMMARY	*$1,697,100 Est. Cost*	*$218,800 Est. Savings*	*7,217 MMBTU*	*7.8 Year Payback*

An alternative option would be to install all-new LED lay-in fixtures. This option costs considerably more than those discussed previously. However, some LED fixture models also offer greater lamp life than fluorescents or plug-and-play LEDs and thus potential maintenance savings. Improved continuous dimming and individual fixture controls possible with LED fixtures or dedicated LED drivers are another potential advantage. The estimated cost and savings estimates for new LED lay-in fixtures are shown in Table 7 (Option B). Previously mentioned notes on ballast, de-lamping, and lamp recycling costs also apply.

Table 7. LED Fixture Retrofit (Option B)

Facility	Estimated Implementation Cost ($)	Estimated Annual Savings ($/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
Westlake High	$1,170,600	$94,400	3,658	12.4
Hill Country Middle	$298,500	$29,900	869	10.0
West Ridge Middle	$346,000	$30,100	844	11.5
Barton Creek Elementary	$170,700	$13,400	391	12.7
Bridge Point Elementary	$192,200	$17,800	499	10.8
Cedar Creek Elementary	$155,000	$14,500	413	10.7
Eanes Elementary	$150,800	$13,700	399	11.0
Forest Trail Elementary	$162,000	$13,000	421	12.5
Valley View Elementary	$146,500	$12,700	400	11.5
T8 TO LED FIXTURE RETROFIT SUMMARY	*$2,792,300 Est. Cost*	*$239,500 Est. Savings*	*7,893 MMBTU*	*11.7 Year Payback*

Additional alternative retrofit for interior lighting include LED tube full retrofit kits (installing dedicated driver and removing the fluorescent ballast).

Install Classroom Occupancy Sensors

The District should consider installing occupancy sensors to improve control of interior lighting. Occupancy sensors will help ensure lights are only on when the space is occupied. Ideally, dual output sensors should be used, which dim or turn off lights when no motion is detected, while also sending an "unoccupied" signal for the space to the Building Automation System (BAS). This signal can then be used to set back thermostat setpoints, reduce VAV box minimum flows, and enhance demand controlled ventilation. Table 8 provides estimated costs and energy savings for the installation of occupancy sensors. Please note these estimates are based on a preliminary assessment. Exact sensor locations, technology (Infrared, Ultrasonic, etc.) and quantity can be determined during a detailed energy assessment or design phase. In general, enclosed areas with intermittent use are typically good candidates (e.g. classrooms, offices, break rooms and conference rooms). The costs and savings in Table 8 reflect ceiling mounted dual output occupancy sensors with signal integrated into HVAC controls.

Table 8. Lighting Occupancy Sensors

Facility	Estimated Implementation Cost ($)	Estimated Annual Savings ($/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
Westlake High	$130,400	$16,300	632	8.0
Hill Country Middle	$52,300	$6,500	189	8.0
West Ridge Middle	$64,400	$8,100	227	8.0
Barton Creek Elementary	$47,900	$6,000	175	8.0
Bridge Point Elementary	$45,100	$5,600	157	8.1
Cedar Creek Elementary	$30,800	$3,900	111	7.9
Eanes Elementary	$33,000	$4,100	119	8.0
Forest Trail Elementary	$35,800	$4,500	146	8.0
Valley View Elementary	$38,500	$4,800	151	8.0
LIGHTING OCCUPANCY SENSORS SUMMARY	***$478,200 Est. Cost***	***$59,800 Est. Savings***	***1,907 MMBTU***	***8.0 Year Payback***

Power Factor Correction Capacitor Installation

Westlake High School is billed for electricity under a rate structure which applies a power factor penalty each month the power factor is below 95% (reference Section VI for rate analysis and discussion). The average monthly power factor for Westlake High School over the period studied was 83%, resulting in over $9,500 of power factor penalties.

The power factor at Westlake High School can be corrected by installing capacitors to condition the power and reduce additional costs. Capacitor banks vary in cost with the size required, which is dependent on the facility's electrical demand and the amount of power factor correction elected. If the source of low power factor is a few large motors that always have the same low power factors, it may be most cost effective to connect the capacitors to the system between the motor starter and the load, so that the correction is only applied to the system while the offending motors are enabled. The estimated implementation costs and savings in Table 9 refer to installing capacitors at the electrical service entrances, and are based off preliminary utility data review. Detailed analysis would determine actual size of capacitors needed.

Table 9. Power Factor Correction Capacitor Installation

Facility	Estimated Implementation Cost ($)	Estimated Annual Savings ($/Yr)	Simple Payback (Yrs)
Westlake High	$39,800	$9,500	4.2
POWER FACTOR CORRECTION SUMMARY	*$39,800 Est. Cost*	*$9,500 Est. Savings*	*4.2 Year Payback*

UCRM Project Summary

Table 10 and Table 11 summarize the implementation costs, annual savings, and simple payback for the preceding projects. The projects' implementation costs and annual savings are estimated based on a preliminary examination of the facilities. Cost estimates for a *detailed* investment-grade assessment, as well as construction contingency funds for the projects identified, are included as separate items in Table 10 and Table 11 for reference. Final project costs will be determined from detailed building assessments, engineering calculations, and contractor estimates. Potential rebate money from utility-sponsored efficiency programs would also be identified where applicable in the detailed assessment phase. Project design (drawings and specifications), if authorized, would normally be accomplished by professional engineers. Project acquisition (competitive bidding) would be in accordance with District requirements, and construction management would be provided by the engineering group who prepared the drawings and specifications.

Table 10. Utility Cost Reduction Measure Summary (Option A)

Project Description	Estimated Implementation Cost ($)	Estimated Annual Savings ($/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
T8 to LED Retrofit w/Ballasts	$1,697,100	$218,800	7,217	7.8
Lighting Occupancy Sensors	$478,200	$59,800	1,907	8.0
Power Factor Correction	$39,800	$9,500	-	4.2
Detailed Assessment	$68,000	-	-	-
Contingency	$200,000	-	-	-
PROJECT TOTAL	*$2,483,100*	*$288,100*	*9,124*	*8.6*
SUMMARY	*Est. Cost*	*Est. Savings*	*Est. MMBTU*	*Year Payback*

The executive summary as shown in Figure 1 is based on Table 10. An alternative project summary that includes installing all new LED fixtures is shown in Table 11 below.

Table 11. Utility Cost Reduction Measure Summary (Option B)

Project Description	Estimated Implementation Cost ($)	Estimated Annual Savings ($/Yr)	Estimated Annual MMBTU Savings	Simple Payback (Yrs)
T8 to LED Fixture Retrofit	$2,792,300	$239,500	7,893	11.7
Lighting Occupancy Sensors	$478,200	$59,800	1,907	8.0
Power Factor Correction	$39,800	$9,500	-	4.2
Detailed Assessment	$68,000	-	-	-
Contingency	$200,000	-	-	-
PROJECT TOTAL	*$3,578,300*	*$308,800*	*9,800*	*11.6*
SUMMARY	*Est. Cost*	*Est. Savings*	*Est. MMBTU*	*Year Payback*

X. Technical Assistance

TEESI was requested by the District to perform technical assistance in assessing a refrigerant additive product marketed to improve the cooling efficiency of HVAC units (DX and chillers). Estimated savings calculations from the additive product's manufacturer were provided to the District and, in turn, to TEESI for the analysis. This section presents a brief summary of the underlying theory of the product, as well as cursory analysis of its potential efficacy at the District.

Theory

DX HVAC equipment and chillers operate via the refrigeration cycle. The "work" (electrical energy) needed to produce a given amount of cooling effect (tons) is relatively proportional to high and low temperature limits of the refrigerant in the cycle, known as the "lift." These limits are in turn governed by the temperatures of the heat sinks involved (ambient air and AHU supply air for DX units; condenser water and chilled water for chillers) and the effectiveness of the heat exchangers to reject or absorb energy from and to these sinks. This effectiveness is manifested in the "approach" of the refrigerant temperature limits to their respective sink temperature limits. As fouling (deposits or buildup increasing resistance to heat transfer) of the heat exchanger surfaces occurs, their effectiveness decreases, and refrigerant approaches increase. This in turn increases the lift and decreases efficiency. Fouling can occur on the air side (dirty evaporator or condenser coils) in DX units, the water side (mineral or other deposits in evaporator or condenser tubes) in chillers, or the refrigerant side (oil or other contaminant fouling) on all equipment. It is this refrigerant-side fouling that the additive product in question is reported to reverse and prevent, thereby restoring efficiency to its original design levels and theoretically achieving energy savings.

Analysis

The estimated savings from this product as calculated by the additive manufacturer, and provided by the District to TEESI, are based on a number of assumptions. Primary among these is the assumed efficiency degradation over time due to refrigerant oil fouling. This baseline degradation is assumed to be between approximately 6% and 22% as the equipment ages from 2 years old to more than 14 years old. Proposed adding of the product is assumed to correct the degradation, and the savings calculated are the difference from operation at the degraded and the design efficiency.

The calculations do not appear to be based on any measured data, either for the baseline conditions of the equipment or the performance of the product in completely restoring the efficiency to design levels. The latter cannot be analyzed without actual before and after test data, but it should be noted that the underlying theory of the product as described above is sound, assuming appreciable refrigerant-side fouling has occurred. It is that assumption, however, that can and should be "sanity checked" in most cases before agreeing to (and paying for) a District-wide blanket application of the product.

The baseline efficiency of Eanes ISD equipment assumed in the manufacturer's calculations is 1.7 kW/ton (7 EER) for DX units, and 1.03 kW/ton (11.7) for (predominately water cooled) chillers. Verifying these values with long term kW and BTU meeting is beyond the scope of this TA. However, the baseline degradation claims can also be assessed by way of the refrigerant approach temperatures, particularly for chillers where their values are typically available at the unit's control panel. Note that typical approach temperatures for new chillers as designed is between 3°F and 5°F. TEESI was unable to perform a preliminary test due to the unfavorable weather conditions. The most accurate test data would need to be gathered during the hot season to measure baseline degradation while HVAC equipment is running at full load.

For a water cooled chiller, an efficiency degradation of 20% due to fouling (average assumed in the manufacturer's baseline calculations) would suggest an increase of approximately 10°F-12°F in the lift, or an average increase in approach (both evaporators and condensers) of 5°F-6°F from design levels. Similar checks of DX equipment approaches could also be performed by taking the differences between refrigerant saturated suction temperature and AHU supply air temperature, between refrigerant saturated condensing temperature and condenser leaving air temperature, and comparing to the equipment's design approach values.

If the District were to further pursue the refrigerant additive, it is recommended the vendor have a reputable independent third party perform actual tests per AHRI standard practices to verify that significant fouling has occurred in the aforementioned HVAC equipment at Eanes ISD. It is also recommended that these tests be witnessed and approved by major HVAC equipment manufacturers. In summary, although the conceptual theory behind the product is reasonable, it is intended to solve a baseline problem that may be insignificant or nonexistent. Prior quantitative vetting of target equipment is therefore strongly advised.

XI. Energy Management Policy

By requesting this study, the District has demonstrated interest in taking a more aggressive approach to energy management. The District already has a comprehensive Energy Management Plan, and has been proactively implementing several energy saving practices such as exterior LED light retrofits. Ideally, the Energy Management Plan should be reviewed and updated periodically. The District should also consider including the following subsections in their Energy Management Plan:

After hours Events Approval Process

Any event to take place after normal operating hours of a District facility must be requested at least 2 weeks before the event and approved by energy department. When applicable, the event should be strategically scheduled for locations where an entire central plant is not required to come online to accommodate a single space.

New Building and Construction

Energy efficiency considerations should be integrated in the design phase for new construction projects, where return on investment over code-required minimums is most advantageous. Energy savings potential can also be maximized in this phase with better integration of building systems, infrastructure, and controls that comes with the "blank canvas" of a new design. Energy efficiency design alternatives should be considered including, but not limited to: LED indoor and outdoor lighting, dimmable daylighting and occupancy controls for interior lighting, premium efficiency cooling equipment, variable volume pumping and air systems, separate treatment of outside air for ventilation with energy recovery, chilled water thermal storage, and high efficiency plumbing fixtures for additional water savings.

Alternative Energy Sources

Pursue cost effective applications of alternative energy sources including, but not limited to, PV Solar Arrays, Solar Water Reheat, and alternative fuels.

Establish a Water Management Program

The District should also establish a program to reduce water consumption. The following conservation measures should be employed:

1. Investigate the use of water conserving faucets, showerheads, and toilets in all new and existing facilities.
2. Utilize water-pervious materials such as gravel, crushed stone, open paving blocks or previous paving blocks for walkways and patios to minimize runoff and increase infiltration.
3. Employ Xeriscaping, using native plants that are well suited to the local climate, that are drought-tolerant and do not require supplemental irrigation.
4. Utilize drip irrigation systems for watering plants in beds and gardens.
5. Install controls to prevent irrigation when the soil is wet from rainfall.
6. Establish a routine check of water consuming equipment for leaks and repair equipment immediately.

XII. LoanSTAR Funding for Utility Cost Reduction Measures

Institutional organizations have traditionally tapped bond money, maintenance dollars, or federal grants to fund energy-efficient equipment change-outs or additions such as energy-efficient lighting systems, high efficiency air conditioning units, and computerized energy management control systems. The LoanSTAR (Saving Taxes and Resources) Program, which is administered by the State Energy Conservation Office (SECO), is an excellent alternative funding option for these projects.

LoanSTAR finances energy-efficient building retrofits at a low interest rate (typically 2-3 percent). The program's revolving loan mechanism allows borrowers to repay loans through the stream of cost savings realized from the projects. Projects financed by LoanSTAR must have an average simple payback of ten years or less and must be analyzed in an Energy Assessment Report by a Professional Engineer. Upon final loan execution, the School District proceeds to implement funded projects through the traditional bid/specification process. Background information for a previous LoanSTAR program Notice of Loan Fund Availability (NOLFA) is provided in **Appendix E** for reference. LoanSTAR NOLFAs are typically released twice per year, with similar timelines to that referenced in the Appendix.

Should the District decide to pursue LoanSTAR funding for implementation of any of the project recommendations in this report, Appendix E may also assist in that regard. A sample LoanSTAR application from a recent NOLFA is provided with some tips on completing it using the information from this preliminary assessment. **Note that the example form provided is for reference only from a previous round of funding, and certain fields, requirements, and point criteria are subject to change**. The District is encouraged to use this general guide along with information from SECO on the specific NOLFA in question. Updated application materials and information for the latest NOLFA are posted on the SECO website as they are released at http://www.seco.cpa.state.tx.us/funding/. Orientation webinars are typically also provided by SECO at this address to review the process and field any NOLFA-specific questions.

For additional information regarding the
LoanSTAR program, please contact:

Eddy Trevino
SECO, LoanSTAR Program Manager
(512) 463-1876

XIII. Additional UCRM Funding Options

Internal Financing

Improvements can be paid for by direct allocations of revenues from an organization's currently available operating or capital funds (bond programs). The use of internal financing normally requires the inclusion and approval of energy-efficiency projects within an organization's annual operating and capital budget-setting process. Often, small projects with high rate of return can be scheduled for implementation during the budget year for which they are approved. Large projects can be scheduled for implementation over the full time period during which the capital budget is in place. Budget constraints, competition among alternative investments, and the need for higher rates of return can significantly limit the number of internally financed energy-efficiency improvements.

Private Lending Institutions or Leasing Corporations

Banks, leasing corporations, and other private lenders have become increasingly interested in the energy efficiency market. The financing vehicle frequently used by these entities is a municipal lease. Structured like a simple loan, a municipal leasing agreement is usually a lease-purchase arrangement. Ownership of the financed equipment passes to the School District at the beginning of the lease, and the lessor retains a security interest in the purchase until the loan is paid off. A typical lease covers the total cost of the equipment and may include installation costs. At the end of the contract period the lessee pays a nominal amount, usually a dollar, for title to the equipment.

Performance Contracting with an Energy Service Company

Through this arrangement, an energy service company (ESCO) uses third party financing to implement a comprehensive package of energy management retrofits for a facility. This turnkey service includes an initial assessment by the contractor to determine the energy-saving potential for a facility, design work for identified projects, purchase and installation of equipment, and overall project management. The ESCO guarantees that the cost savings generated by the projects will, at a minimum, cover the annual payment due to the ESCO over the term of the contract.

Utility Sponsored Energy Efficiency Incentive Programs

Many utilities in Texas offer energy efficiency incentive programs to offset a portion of the upfront cost associated with energy efficiency measures. The program requirements and incentives range from utility to utility. For example, CenterPoint Energy provides incentives for efficiency measures such as installation of high efficiency equipment, lighting upgrades, and building commissioning. These energy efficiency programs' incentives typically cover $0.06/kWh and $175/kW of verifiable energy and demand reductions, respectively. For further information, contact your utility provider to determine what programs are available in your area.

Qualified School Construction Bond (QSCB)

The federal government authorizes tax-free bonds (QSCBs) through the American Recovery and Reinvestment Act (ARRA), which help school districts fund new construction and major renovation projects as well as land acquisition. In total, schools will save an estimated $10 billion in taxes using these bonds. They will also help reduce the cost of borrowing for use in construction projects for public schools. For more information, please visit http://www.qscb.us .

Energy Efficiency and Conservation Block Grant (EECBG)

The Office of Weatherization and Intergovernmental Programs (WIP) has administered the EECBG, which provides funding to state and local governments for the purpose of improving energy usage and efficiency, as well as improving environmental effects. It is being funded under the ARRA, and can include building retrofits and audits, which aim to reduce energy use in buildings and transportation. The State Energy Conservation Office receives a portion of these funds to distribute to cities and counties interested in these projects. Further information can be found by visiting:

http://www1.eere.energy.gov/wip/eecbg.html

Qualified Energy Conservation Bonds (QECB)

Energy projects can be eligible for QECBs, which are tax credit bonds that serve to assist with energy efficient capital projects, renewable energy usage, and reductions in energy consumption. The federal government has issued this loan program, which assists with funding of the interest costs for the bonds. These energy conservation bonds are different from tax-exempt bonds traditionally used because they can be regarded as taxable income. For more information on QECBs, please visit http://www.dsireusa.org.

Qualified Zone Academy Bond (QZAB)

QZABs are available for school districts that can utilize the bonds form the federal government for repair and rehabilitation projects. Tax credits are provided to bondholders nearly equal to the interest that the state or community would normally be expected to pay. It can be utilized for projects that qualify for the program. More information can be found by visiting http://www2.ed.gov/programs/qualifiedzone .

APPENDICES

APPENDIX A

ENERGY LEGISLATION
(SB898, SB924, AND SB300)

How to comply with SB898 & SB924

What you need to know about Texas Senate Bill 898

The passage of Senate Bill 898 (SB898) by the 82nd Texas Legislature signified the continuance of Senate Bill 5 (SB5) and SB12, the Texas Legislature's sweeping approach since 2001 to clean air and encourage energy efficiency in Texas. SB898 was enacted on September 1, 2012 and was crafted to continue to assist the state and its political jurisdictions to conform to the standards set forth in the Federal Clean Air Act. The bill contains energy-efficiency strategies intended to decrease energy consumption while improving air quality.

All political subdivisions, institutes of higher education, and state agencies in the 41 non-attainment or near non-attainment counties in Texas are required to:

1) Adopt a goal to reduce electric consumption by 5 percent each year for ten years, beginning September 1, 2011.

2) Implement all cost-effective energy-efficiency measures to reduce electric consumption by existing facilities. (Cost effectiveness is interpreted by this legislation to provide a 20 year return on investment.)

3) Report annually to the State Energy Conservation Office (SECO) on the entity's progress, efforts and consumption data.

What you need to know about Texas Senate Bill 924

The passage of Senate Bill 924 by the 82nd Texas Legislature signified the continuance of House Bill 3693 (HB3693), intended to provide additional provisions for energy-efficiency in Texas. HB 3693 is an additional mechanism by which the state encourages energy-efficiency for School Districts, State Entities, and Political Jurisdictions in Texas. HB 3693 includes the following state-wide mandates that apply differently according to the nature and origin of the entity:

Record, Report and Display Consumption Data
All Political Subdivisions, State Agencies, and State-Funded Institutes of Higher Education, are mandated to record and report the entity's metered resource consumption usage data for electricity, natural gas and water on a publically accessible internet page.
Note: *The format, content and display of this information are determined by the entity or subdivision providing this information.*

Energy Efficient Light Bulbs
All School Districts and State-Funded Institutes of Higher Education shall purchase and use energy-efficient light bulbs in education and housing facilities.

Additional SB924 Mandates
In addition to the mandates of HB3693 noted above, SB924 requires municipally owned utilities and electric cooperatives to report annually to SECO on energy efficiency goals and initiatives.

What you need to know about Texas Senate Bill 300

In 2009, the Texas 81st Legislative Session passed Senate Bill 300 amending the Education Code §311.1513 to require schools to develop a long-range energy plan. See the following pages of this section for bill analysis.

SB300 Mandates
Texas school districts must establish a long-range energy plan to reduce the district's annual electric consumption by five percent beginning with the 2008 state fiscal year and consume electricity in subsequent fiscal years in accordance with the district's energy plan

The plan shall include strategies for achieving energy efficiency that result in net savings to the district; or that can be achieved without financial cost to the district, and the initial short-term capital cost and lifetime cost and savings that may result from implementation of the strategy.

SB300 Reporting
Districts may submit their long-range energy plans to SECO for the purposes of determining whether funds available through loan programs administered by SECO are available to the district. However, plans and reports are not required to be submitted at this time.

How do you define energy-efficiency measures?

Energy-efficiency measures are defined as any facility modifications or changes in operations that reduce energy consumption. Energy-efficiency is a strategy that has the potential to conserve resources, save money** and better the quality of our air. They provide immediate savings and add minimal costs to your project budget.

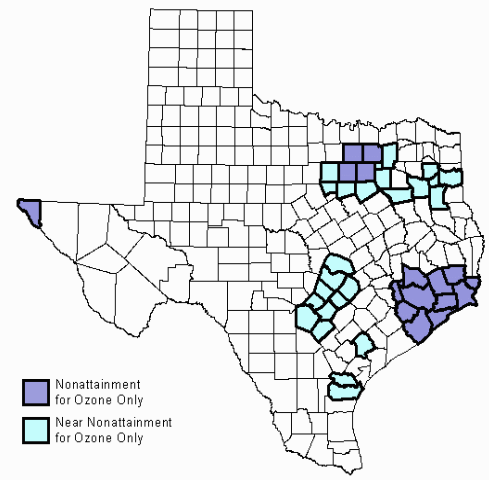
Examples of energy-efficiency measures include:
• installation of insulation and high-efficiency windows and doors • modifications or replacement of HVAC systems, lighting fixtures and electrical systems • installation of automatic energy control systems • installation of energy recovery systems or renewable energy generation equipment • building commissioning • development of energy efficient procurement specifications • employee awareness campaigns

***SECO's Preliminary Energy Assessment (PEA) program is an excellent resource for uncovering those energy-efficiency measures that can benefit your organization.*

What counties are affected?

All political jurisdictions located in the following Non-attainment and affected counties:

Bastrop Bexar Brazoria Caldwell Chambers Collin
Comal Dallas Denton El Paso Ellis Fort Bend
Galveston Gregg Guadalupe Hardin Harris Harrison
Hays Henderson Hood Hunt Jefferson Johnson
Kaufman Liberty Montgomery Nueces Orange Parker
Rockwall Rusk San Patricio Smith Tarrant Travis
Upshur Victoria Waller Williamson Wilson



What assistance is available for affected areas?

The Texas Energy Partnership is a partner with ENERGY STAR©, who partners across the nation with the goal of improving building performance, reducing air emissions through reduced energy demand, and enhancing the quality of life through energy-efficiency and renewable energy technologies.

To assist jurisdictions, the Texas Energy Partnership will:

- Present workshops and training seminars in partnership with private industry on a range of topics that include energy services, financing, building technologies and energy performance rating and benchmarking

- Prepare information packages – containing flyers, documents and national lab reports about energy services, management tools and national, state and industry resources that will help communities throughout the region

- Launch an electronic newsletter to provide continuous updates and develop additional information packages as needed

Please contact Stephen Ross at 512-463-1770 for more information.

SECO Program Contact Information

LoanSTAR;
Preliminary Energy Assessments:
Eddy Trevino – 512-463-1876
Eddy.Trevino@cpa.state.tx.us

Schools & Local Govt. Partnership Program:
Stephen Ross – 512-463-1770
Stephen.Ross@cpa.state.tx.us

Engineering (Codes / Standards):
Felix Lopez - 512-463-1080
Felix.Lopez@cpa.state.tx.us

Innovative / Renewable Energy:
Pamela Groce - 512-463-1889
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Energy / Housing
Partnership Programs:
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Alternate Fuels / Transportation:
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BILL ANALYSIS

Senate Research Center

S.B. 300
By: Patrick, Dan
Education
7/1/2009
Enrolled

AUTHOR'S / SPONSOR'S STATEMENT OF INTENT

Many independent school districts across Texas are reporting severe financial difficulties due to several factors, including the requirement to fulfill unfunded mandates. These mandates are particularly burdensome to fast-growth school districts. In a difficult economic climate and with dwindling resources, districts are forced to fulfill unnecessary mandates rather than focus on their basic mission, which is to educate students.

S.B. 300 amends current law relating to eliminating or modifying certain mandates on school districts.

RULEMAKING AUTHORITY

This bill does not expressly grant any additional rulemaking authority to a state officer, institution, or agency.

SECTION BY SECTION ANALYSIS

SECTION 1. Amends Section 11.1513(d), Education Code, as follows:

(d) Requires that the employment policy provide that not later than the 10th school day before the date on which a district fills a vacant position for which a certificate or license is required as provided by Section 21.003, other than a position that affects the safety and security of students as determined by the board of trustees, the district is required to provide to each current district employee notice of the position by posting the position on a bulletin board at certain locations or, rather than and, the district's Internet website, if the district has a website, and a reasonable opportunity to apply for the position.

SECTION 2. Amends Section 25.112, Education Code, by amending Subsection (d) and adding Subsections (e)-(g), as follows:

(d) Authorizes the commissioner of education (commissioner), on application of a school district (district), to except the district from the limit in Subsection (a) (relating to the prohibition of more than 22 students enrolled in an elementary school class) if the commissioner finds the limit works an undue hardship on the district. Provides that an exception expires at the end of the school year for which it is granted. Deletes existing text providing that an exception expires at the end of the semester for which it is granted, and prohibiting the commissioner from granting an exception for more than one semester at a time.

(e) Requires a district seeking an exception under Subsection (d) to notify the commissioner and apply for the exception not later than the later of October 1 or the 30th day after the first school day the district exceeds the limit in Subsection (a).

(f) Authorizes the commissioner, if a district repeatedly fails to comply with this section, to take any appropriate action authorized to be taken by the commissioner under Section 39.131 (Sanctions for Districts).

(g) Requires the Texas Education Agency, not later than January 1, 2011, to report to the legislature the number of applications for exceptions under Subsection (d) submitted by each district and for each application indicate whether the application was granted or denied. Provides that this subsection expires February 1, 2011.

SECTION 3. Amends Section 34.0021, Education Code, by amending Subsections (a) and (b) and adding Subsection (c-1), as follows:

(a) Authorizes, rather than requires, each school district, pursuant to the safety standards established by the Department of Public Safety under Section 34.002, to conduct a training session for students and teachers concerning procedures for evacuating a school bus during an emergency.

(b) Provides that a school district that chooses to conduct a training session under Subsection (a) is encouraged to conduct the school bus emergency evacuation training session in the fall of the school year. Provides that the school district is also encouraged to structure the training session so that the session applies to school bus passengers, a portion of the session occurs on a school bus, and the session lasts for at least one hour. Deletes existing text requiring a school district to conduct the school bus emergency evacuation training at least twice each school year, with one training session occurring in the fall and one training session occurring in the spring. Deletes existing text requiring that a portion of the training session occur on a school bus and requiring the training session to last for at least one hour.

(c-1) Provides that a school district, immediately before each field trip involving transportation by school bus, is encouraged to review school bus emergency evacuation procedures with the school bus passengers, including a demonstration of the school bus emergency exits and the safe manner to exit.

SECTION 4. Amends Section 44.902, Education Code, as follows:

Sec. 44.902. New heading: LONG-RANGE ENERGY PLAN TO REDUCE CONSUMPTION OF ELECTRIC ENERGY. (a) Creates this subsection from existing text. Requires the board of trustees of a district to establish a long-range energy plan to reduce the district's annual electric consumption by five percent beginning with the 2008 state fiscal year and consume electricity in subsequent fiscal years in accordance with the district's energy plan. Deletes existing text requiring the board of trustees of a district to establish a goal to reduce the school district's annual electric consumption by five percent each state fiscal year for six years beginning September 1, 2007.

(b) Requires that the plan required under Subsection (a) include strategies for achieving energy efficiency that result in net savings for the district or can be achieved without financial cost to the district and for each strategy identified under Subdivision (1), the initial, short-term capital costs and lifetime costs and savings that may result from implementation of the strategy.

(c) Requires the board of trustees, in determining under Subsection (b) whether a strategy may result in financial cost to the district, to consider the total net costs and savings that may occur over the seven-year period following implementation of the strategy.

(d) Authorizes the board of trustees to submit the plan required under Subsection (a) to the State Energy Conservation Office for the purposes of determining whether funds available through loan programs administered by the office are available to the district.

SECTION 5. Repealer: Section 44.901(b) (regarding the requirement that the board of trustees establish a goal to reduce electric consumption by five percent each year for six years), Education Code.

SECTION 6. Provides that this Act applies beginning with the 2009-2010 school year.

SECTION 7. Effective date: upon passage or September 1, 2009.

APPENDIX B

BASE YEAR CONSUMPTION HISTORY

Facility Name	Approx. ft^2	Electric kWh/Yr	Electric kWh/ft^2/Yr	Electric $Cost/Yr	Heat'g Fuel [1] MMBTU/Yr	Heat'g Fuel[1] kBTU/ft^2/Yr	Heat'g Fuel $Cost/Yr	Total MMBTU/Yr	Total $Cost/Yr	EUI kBTU/ft^2/Yr	ECI $/$ft^2$/Yr
Westlake High	573,800	5,669,240	**9.9**	$605,717	4,949	**8.6**	$21,264	24,292	$626,981	**42.3**	**$1.09**
Hill Country Middle	146,300	1,163,490	**8.0**	$151,043	452	**3.1**	$1,174	4,422	$152,217	**30.2**	**$1.04**
West Ridge Middle *	169,600	1,331,359	**7.8**	$151,129	892	**5.3**	$10,824	5,435	$161,953	**32.0**	**$0.95**
Barton Creek Elementary *	83,700	881,000	**10.5**	$96,836	286	**3.4**	$6,072	3,292	$102,908	**39.3**	**$1.23**
Bridge Point Elementary	94,200	917,000	**9.7**	$121,514	305	**3.2**	$1,004	3,434	$122,519	**36.5**	**$1.30**
Cedar Creek Elementary	76,000	580,318	**7.6**	$76,295	218	**2.9**	$904	2,198	$77,198	**28.9**	**$1.02**
Eanes Elementary	73,900	604,639	**8.2**	$78,397	273	**3.7**	$1,804	2,336	$80,200	**31.6**	**$1.09**
Forest Trail Elementary	79,400	682,800	**8.6**	$79,462	276	**3.5**	$1,020	2,605	$80,482	**32.8**	**$1.01**
Valley View Elementary	71,800	736,124	**10.3**	$92,622	481	**6.7**	$2,462	2,992	$95,083	**41.7**	**$1.32**
TOTAL	**1,368,700 ft^2**	**12,565,970 kWh/Yr**	**9.2 kWh/ft^2/Yr**	**$1,453,014 Electricity**	**8,131 MMBTU/Yr**	**5.9 kBTU/ft^2/Yr**	**$46,527 Heating Fuel**	**51,006 MMBTU/Yr**	**$1,499,541 Energy**	**37.3 kBTU/ft^2/Yr**	**$1.10 per ft^2/Yr**

1) Campuses with diesel heating denoted with *, remainder use natural gas. All heating fuel consumption converted to MMBTU heat input using factors 1 MCF = 1.03 MMBTU for natural gas and 1 gallon = 0.319 MMBTU for diesel.

Facility Name	Approx. Bldg ft²	Approx. Number Stud'ts[1]	Domestic[2] Water kGal/Yr	Irrigation Water kGal/Yr	Total Water kGal/Yr	Total[3] Water $Cost/Yr	Domestic Water Gal/ft²/Yr	Domestic Water Gal/Stud't/Day
Westlake High	573,800	2,541	7,422	95	7,517	$40,687	12.9	8.0
Hill Country Middle	146,300	905	971	711	1,682	$9,666	6.6	2.9
West Ridge Middle	169,600	840	3,574	N/A	3,574	$13,393	21.1	11.7
Barton Creek Elementary	83,700	530	2,734	N/A	2,734	$11,327	32.7	14.1
Bridge Point Elementary	94,200	736	1,563	N/A	1,563	$52,564	16.6	5.8
Cedar Creek Elementary	76,000	476	1,553	N/A	1,553	$26,151	20.4	8.9
Eanes Elementary	73,900	686	1,168	626	1,793	$10,030	15.8	4.7
Forest Trail Elementary	79,400	605	1,591	N/A	1,591	$8,704	20.0	7.2
Valley View Elementary	71,800	502	1,927	N/A	1,927	$10,745	26.8	10.5
TOTAL	**1,368,700 ft²**	**7,821 Stud'ts**	**22,502 kGal/Yr**	**1,431 kGal/Yr**	**23,933 kGal/Yr**	**$183,266 Water**	**16.4 Gal/ft²/Yr**	**7.9 Gal/Stud't/Day**

(1) Student enrollement data dow nloaded from Texas Education Agency (TEA) database.

(2) Includes all accounts not specifically marked for irrigation. May include some irrigation consumption if not separated by the utility.

(3) Cost includes all w ater, irrigation, and sew er charges as applicable.

Entity Eanes ISD

FACILITY: Westlake High

FLOOR AREA (SF) 573,800 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	612,640	2,044	1,999	$18,880	$64,335	56	$343
September	2015	551,880	2,044	2,000	$16,878	$56,325	90	$508
October	2015	479,160	1,831	1,787	$15,590	$48,955	108	$567
November	2015	425,920	1,841	1,793	$15,278	$46,397	436	$2,041
December	2015	368,080	1,770	1,754	$14,665	$43,409	467	$1,568
January	2016	403,360	1,728	1,662	$13,857	$43,756	1,091	$4,844
February	2016	473,800	1,704	1,641	$13,997	$46,916	994	$4,408
March	2016	391,760	1,902	1,856	$15,463	$44,817	510	$2,283
April	2016	502,640	1,990	1,951	$16,529	$50,398	553	$2,365
May	2016	520,040	2,086	2,043	$19,281	$56,750	266	$1,195
June	2016	462,360	2,009	1,966	$17,964	$53,192	133	$585
July	2016	477,600	1,761	1,718	$15,506	$50,467	101	$556
TOTAL		5,669,240			$193,887	$605,717	4,804.8	$21,264

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
631,000.0	4,600.0	$3,495
824,100.0	0.0	$4,462
821,300.0	0.0	$4,447
861,800.0	18,600.0	$4,737
527,000.0	0.0	$2,954
369,000.0	0.0	$2,152
591,300.0	0.0	$3,280
566,000.0	3,800.0	$2,411
454,000.0	32,800.0	$2,740
621,400.0	26,800.0	$3,559
473,000.0	0.0	$2,680
681,800.0	8,300.0	$3,771
7,421,700	94,900	$40,687

Annual Total Energy Cost = 626,981 $/year

Energy Use Index:
Total site BTUs/Yr ÷ SF = 42 kBTU/SF/year

Water Utility : Crossroads US Water District 10

Total KWH/yr x 0.003413 = 19,349.12 MMBTU/year
Total MCF/yr x 1.03 = 4,948.90 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 24,298 MMBTU/year

Energy Cost Index:
Energy Cost/Yr ÷ SF = 1.09 $/SF/year

Electric Utility: City of Austin

Gas Utility: Texas Gas Service

Entity Eanes ISD

FACILITY: West Ridge Middle   FLOOR AREA (SF) 169,600 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	Diesel *	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	Gal	COSTS ($)
August	2015	134,410	564	564	$4,405	$15,599	475	$914
September	2015	176,411	690	690	$4,699	$18,254	475	$914
October	2015	144,620	615	615	$4,188	$15,460	475	$914
November	2015	101,723	534	534	$3,637	$12,331	475	$914
December	2015	84,022	462	462	$3,146	$10,494	583	$890
January	2016	91,827	438	438	$2,983	$10,516	583	$890
February	2016	108,023	522	522	$3,555	$12,452	583	$890
March	2016	90,024	429	429	$2,921	$10,017	583	$890
April	2016	111,925	528	528	$3,596	$12,359	583	$890
May	2016	111,323	519	519	$4,053	$13,171	583	$890
June	2016	81,928	405	405	$3,163	$10,060	*475*	$914
July	2016	95,123	387	387	$3,022	$10,416	*475*	$914
TOTAL		1,331,359			43,368	$151,129	6,348.0	$10,824

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
514,000.0	0.0	$1,648
494,000.0	0.0	$1,599
429,000.0	0.0	$1,439
284,000.0	0.0	$1,082
311,000.0	0.0	$1,148
60,000.0	0.0	$531
92,000.0	0.0	$610
255,000.0	0.0	$1,011
283,000.0	0.0	$1,080
322,000.0	0.0	$1,176
179,000.0	0.0	$824
351,000.0	0.0	$1,247
3,574,000	0	13,393.20

*June & July Diesel Consumption estimated from historical data as current data was not readily available.

Annual Total Energy Cost = 161,953 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 30 kBTU/SF/year

Water Utility: LCRA / WTCPUA

Total KWH/yr x 0.003413 = 4,543.93 MMBTU/year
Total Gal/yr x 0.139 = 581.48 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 5,125 MMBTU/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 0.95 $/SF/year

Electric Utility: City of Austin   Gas Utility: Tex-Con Oil

Entity Eanes ISD

FACILITY: Hill Country Middle FLOOR AREA (SF) 146,300 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	157,200	710	710	$5,545	$19,160	13	$69
September	2015	147,700	669	669	$4,556	$17,135	20	$78
October	2015	114,700	575	575	$3,916	$14,294	20	$78
November	2015	97,300	556	556	$3,786	$12,884	31	$91
December	2015	57,400	378	378	$2,574	$9,314	67	$134
January	2016	84,200	393	393	$2,676	$9,966	144	$226
February	2016	101,500	447	447	$3,044	$11,500	61	$127
March	2016	88,400	472	472	$3,214	$10,826	18	$77
April	2016	112,900	556	556	$3,786	$13,130	25	$84
May	2016	114,700	586	586	$4,577	$14,790	21	$80
June	2016	54,900	353	353	$2,757	$8,914	11	$67
July	2016	32,590	342	342	$2,671	$9,131	8	$64
TOTAL		1,163,490			$43,103	$151,043	438.8	$1,174

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
10,300.0	106,800.0	$688
66,500.0	118,500.0	$1,033
118,300.0	75,500.0	$1,078
105,800.0	76,400.0	$1,019
84,500.0	4,500.0	$546
58,000.0	19,300.0	$486
100,900.0	28,200.0	$749
97,500.0	42,800.0	$806
79,200.0	46,200.0	$731
117,000.0	46,900.0	$926
103,900.0	55,500.0	$903
29,000.0	90,400.0	$700
970,900	711,000	$9,666

Annual Total Energy Cost = 152,217 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 30 kBTU/SF/year

Water Utility: Crossroads US Water District 10

Total KWH/yr x 0.003413 = 3,970.99 MMBTU/year
Total MCF/yr x 1.03 = 451.96 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 4,423 MMBTU/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.04 $/SF/year

Electric Utility: City of Austin

Gas Utility: Texas Gas Service

Entity Eanes ISD

FACILITY: Barton Creek Elementary

FLOOR AREA (SF) 83,700 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	Diesel *	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	Gal	COSTS ($)
August	2015	94,000	410	410	$3,202	$11,126	63	$122
September	2015	91,000	380	380	$2,588	$9,737	63	$122
October	2015	73,000	400	400	$2,724	$9,090	63	$122
November	2015	73,000	300	300	$2,043	$7,677	63	$122
December	2015	66,000	270	270	$1,839	$6,929	583	$890
January	2016	72,000	260	260	$1,771	$7,065	583	$890
February	2016	78,000	290	290	$1,975	$7,766	583	$890
March	2016	60,000	270	270	$1,839	$6,459	583	$890
April	2016	75,000	310	310	$2,111	$7,670	583	$890
May	2016	72,000	350	350	$2,734	$8,744	583	$890
June	2016	43,000	240	240	$1,874	$5,711	63	$122
July	2016	84,000	320	320	$2,499	$8,863	63	$122
TOTAL		881,000			27,198	$96,836	3,874.0	$6,072

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
234,000.0	0.0	$959
483,000.0	0.0	$1,572
337,000.0	0.0	$1,212
255,000.0	0.0	$1,011
128,000.0	0.0	$698
94,000.0	0.0	$615
156,000.0	0.0	$767
207,000.0	0.0	$893
203,000.0	0.0	$883
238,000.0	0.0	$969
173,000.0	0.0	$809
226,000.0	0.0	$939
2,734,000	0	11,326.80

*June & July Diesel Consumption estimated from historical data as current data was not readily available.

Annual Total Energy Cost = 102,908 $/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = 42 kBTU/SF/year

Water Utility: LCRA / WTCPUA

Total KWH/yr x 0.003413 = 3,006.85 MMBTU/year

Total Gal/yr x 0.139 538.49 MMBTU/year

Total Other x________ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 3,545 MMBTU/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = 1.23 $/SF/year

Electric Utility: City of Austin

Gas Utility: Tex-Con Oil

Entity Eanes ISD

FACILITY: Bridge Point Elementary FLOOR AREA (SF) 94,200 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	122,000	510	510	$4,004	$14,656	5	$60
September	2015	109,000	480	480	$3,288	$12,576	19	$77
October	2015	79,000	400	400	$2,740	$9,928	17	$75
November	2015	72,000	470	470	$3,220	$10,114	18	$76
December	2015	63,000	510	510	$3,494	$10,530	43	$105
January	2016	72,000	520	520	$3,562	$10,824	70	$138
February	2016	73,000	330	330	$2,261	$8,507	49	$112
March	2016	60,000	320	320	$2,192	$7,733	19	$78
April	2016	77,000	380	380	$2,603	$9,279	21	$79
May	2016	82,000	430	430	$3,376	$11,056	18	$76
June	2016	51,000	200	200	$1,570	$5,834	9	$65
July	2016	57,000	440	440	$3,454	$10,476	8	$63
TOTAL		917,000			35,762	$121,514	296.1	$1,004

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
172,100.0	0.0	$4,552
255,900.0	0.0	$4,896
133,100.0	0.0	$4,392
190,600.0	0.0	$4,628
130,600.0	0.0	$4,382
77,500.0	0.0	$4,164
131,400.0	0.0	$4,385
101,100.0	0.0	$4,261
118,000.0	0.0	$4,330
103,600.0	0.0	$4,271
69,600.0	0.0	$4,132
79,200.0	0.0	$4,171
1,562,700	0	52,564.13

Annual Total Energy Cost = 122,519 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 36 kBTU/SF/year

Water Utility: AQUA

Total KWH/yr x 0.003413 = 3,129.72 MMBTU/year
Total MCF/yr x 1.03 = 304.97 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 3,435 MMBTU/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.30 $/SF/year

Electric Utility: City of Austin

Gas Utility: Texas Gas Service

Entity Eanes ISD

FACILITY: Cedar Creek Elementary FLOOR AREA (SF) 76,000 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	74,444	404	395	$3,080	$9,847	1	$56
September	2015	69,026	358	355	$2,425	$8,367	6	$61
October	2015	51,235	310	300	$2,028	$6,759	4	$59
November	2015	40,274	308	298	$2,006	$6,218	10	$66
December	2015	31,612	182	176	$1,206	$4,141	37	$98
January	2016	35,997	187	154	$1,055	$4,058	92	$164
February	2016	41,359	253	222	$1,521	$5,249	43	$105
March	2016	35,202	257	224	$1,534	$4,878	8	$65
April	2016	47,563	293	276	$1,891	$6,164	6	$62
May	2016	48,942	339	322	$2,528	$7,404	4	$59
June	2016	51,281	279	272	$2,135	$6,728	0	$54
July	2016	53,383	267	248	$1,947	$6,482	0	$55
TOTAL		580,318			23,355	$76,295	211.6	$904

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
204,100.0	0.0	$3,395
187,900.0	0.0	$3,143
136,800.0	0.0	$2,363
87,500.0	0.0	$1,610
71,600.0	0.0	$1,353
133,100.0	0.0	$2,293
129,700.0	0.0	$2,254
106,000.0	0.0	$1,892
91,500.0	0.0	$1,671
70,700.0	0.0	$1,380
123,800.0	0.0	$2,113
210,700.0	0.0	$2,685
1,553,400	0	26,150.80

Annual Total Energy Cost = 77,198 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 29 kBTU/SF/year

Water Utility: Crossroads US Water District 10

Total KWH/yr x 0.003413 = 1,980.63 MMBTU/year
Total MCF/yr x 1.03 = 217.96 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 2,199 MMBTU/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.02 $/SF/year

Electric Utility: City of Austin

Gas Utility: Texas Gas Service

Entity Eanes ISD

FACILITY: Eanes Elementary FLOOR AREA (SF) 73,900 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	79,989	346	337	$2,609	$9,540	3	$121
September	2015	70,373	341	333	$2,254	$8,211	7	$128
October	2015	51,970	308	300	$2,004	$6,841	13	$134
November	2015	48,423	285	272	$1,800	$6,285	14	$136
December	2015	42,034	238	238	$1,564	$5,577	61	$203
January	2016	44,574	278	261	$1,732	$5,954	89	$246
February	2016	45,435	272	255	$1,692	$5,885	47	$192
March	2016	38,232	258	247	$1,645	$5,324	13	$145
April	2016	50,102	280	272	$1,830	$6,211	9	$131
May	2016	50,198	313	305	$2,358	$7,172	8	$129
June	2016	39,827	186	180	$1,386	$4,902	1	$119
July	2016	43,482	279	271	$2,090	$6,495	1	$119
TOTAL		604,639			22,964	$78,397	265.3	$1,804

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
20,100.0	18,500.0	$272
55,400.0	97,300.0	$851
139,700.0	103,200.0	$1,309
227,500.0	34,500.0	$1,405
57,200.0	29,800.0	$517
35,100.0	4,500.0	$277
60,200.0	77,700.0	$776
55,400.0	121,800.0	$975
128,700.0	77,400.0	$1,122
166,800.0	60,800.0	$1,231
103,600.0	0.0	$612
117,900.0	0.0	$684
1,167,600	625,500	10,029.51

Annual Total Energy Cost = 80,200 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 32 kBTU/SF/year

Water Utility: Crossroads US Water District 10

Total KWH/yr x 0.003413 = 2,063.63 MMBTU/year
Total MCF/yr x 1.03 = 273.26 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 2,337 MMBTU/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.09 $/SF/year

Electric Utility: City of Austin

Gas Utility: Texas Gas Service

Entity Eanes ISD

FACILITY: Forest Trail Elementary FLOOR AREA (SF) 79,400 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	97,200	336	336	$2,624	$10,312	27	$91
September	2015	73,200	356	356	$2,424	$8,472	9	$68
October	2015	55,200	248	248	$1,689	$6,118	10	$69
November	2015	56,000	248	248	$1,689	$6,155	32	$97
December	2015	48,800	236	236	$1,607	$5,652	38	$105
January	2016	43,600	256	256	$1,743	$5,695	87	$167
February	2016	48,800	256	256	$1,743	$5,935	45	$113
March	2016	42,000	300	300	$2,043	$6,108	7	$67
April	2016	54,000	284	284	$1,934	$6,399	8	$68
May	2016	57,600	296	296	$2,312	$7,247	3	$61
June	2016	50,000	208	208	$1,624	$5,563	1	$58
July	2016	56,400	204	204	$1,593	$5,807	1	$57
TOTAL		682,800			23,027	$79,462	267.5	$1,020

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
142,800.0	0.0	$777
284,700.0	0.0	$1,497
195,000.0	0.0	$1,042
160,600.0	0.0	$868
105,400.0	0.0	$587
83,200.0	0.0	$475
78,700.0	0.0	$452
91,600.0	0.0	$517
87,100.0	0.0	$495
103,300.0	0.0	$577
106,400.0	0.0	$592
152,200.0	0.0	$825
1,591,000	0	8,704.27

Annual Total Energy Cost = 80,482 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 33 kBTU/SF/year

Water Utility: Crossroads US Water District 10

Total KWH/yr x 0.003413 = 2,330.40 MMBTU/year
Total MCF/yr x 1.03 = 275.53 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 2,606 MMBTU/year

Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.01 $/SF/year

Electric Utility: City of Austin

Gas Utility: Texas Gas Service

Entity Eanes ISD

FACILITY: Valley View Elementary FLOOR AREA (SF) 71,800 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL	NG	
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
August	2015	102,220	378	352	$2,749	$11,397	1	$158
September	2015	86,546	373	360	$2,452	$9,788	3	$160
October	2015	63,207	382	344	$2,343	$8,375	3	$160
November	2015	58,336	387	316	$2,152	$8,120	26	$189
December	2015	48,555	290	290	$1,975	$6,964	72	$246
January	2016	53,677	325	254	$1,730	$6,689	88	$266
February	2016	66,005	365	300	$2,043	$7,898	169	$366
March	2016	50,679	380	310	$2,111	$7,249	45	$214
April	2016	69,935	374	348	$2,370	$8,435	41	$208
May	2016	65,219	374	348	$2,718	$8,877	18	$179
June	2016	22,918	83	54	$422	$2,286	1	$158
July	2016	48,827	285	256	$1,999	$6,542	0	$157
TOTAL		736,124			25,063	$92,622	466.8	$2,462

WATER		
WATER	IRRIG'N	TOTAL
CONSUMPTION	CONSUMPTION	WTR/SWR
GAL	GAL	COSTS($)
211,400.0	0.0	$1,154
288,300.0	0.0	$1,544
209,400.0	0.0	$1,143
155,100.0	0.0	$868
127,200.0	0.0	$726
62,000.0	0.0	$395
132,000.0	0.0	$751
143,600.0	0.0	$809
114,000.0	0.0	$659
140,600.0	0.0	$794
175,300.0	0.0	$970
167,600.0	0.0	$931
1,926,500	0	10,744.70

Annual Total Energy Cost = 95,083 $/year

Energy Use Index:
Total site BTU's/Yr ÷ Total Area (SF) = 42 kBTU/SF/year

Water Utility: Crossroads US Water District 10

Total KWH/yr x 0.003413 = 2,512.39 MMBTU/year
Total MCF/yr x 1.03 = 480.78 MMBTU/year
Total Other x________ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 2,993 MMBTU/year

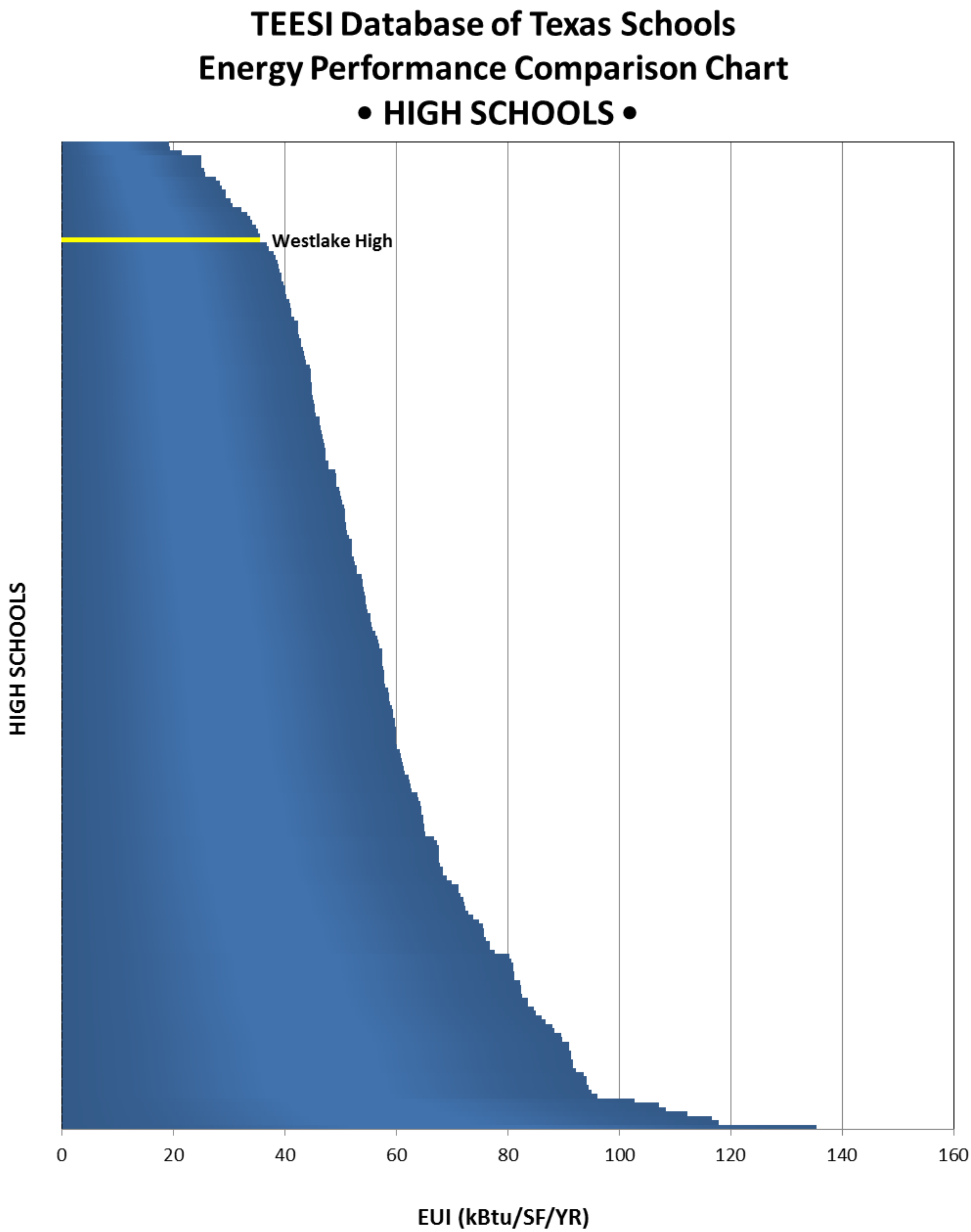
Energy Cost Index:
Total Energy Cost/Yr ÷ Total Area (SF) = 1.32 $/SF/year

Electric Utility: City of Austin

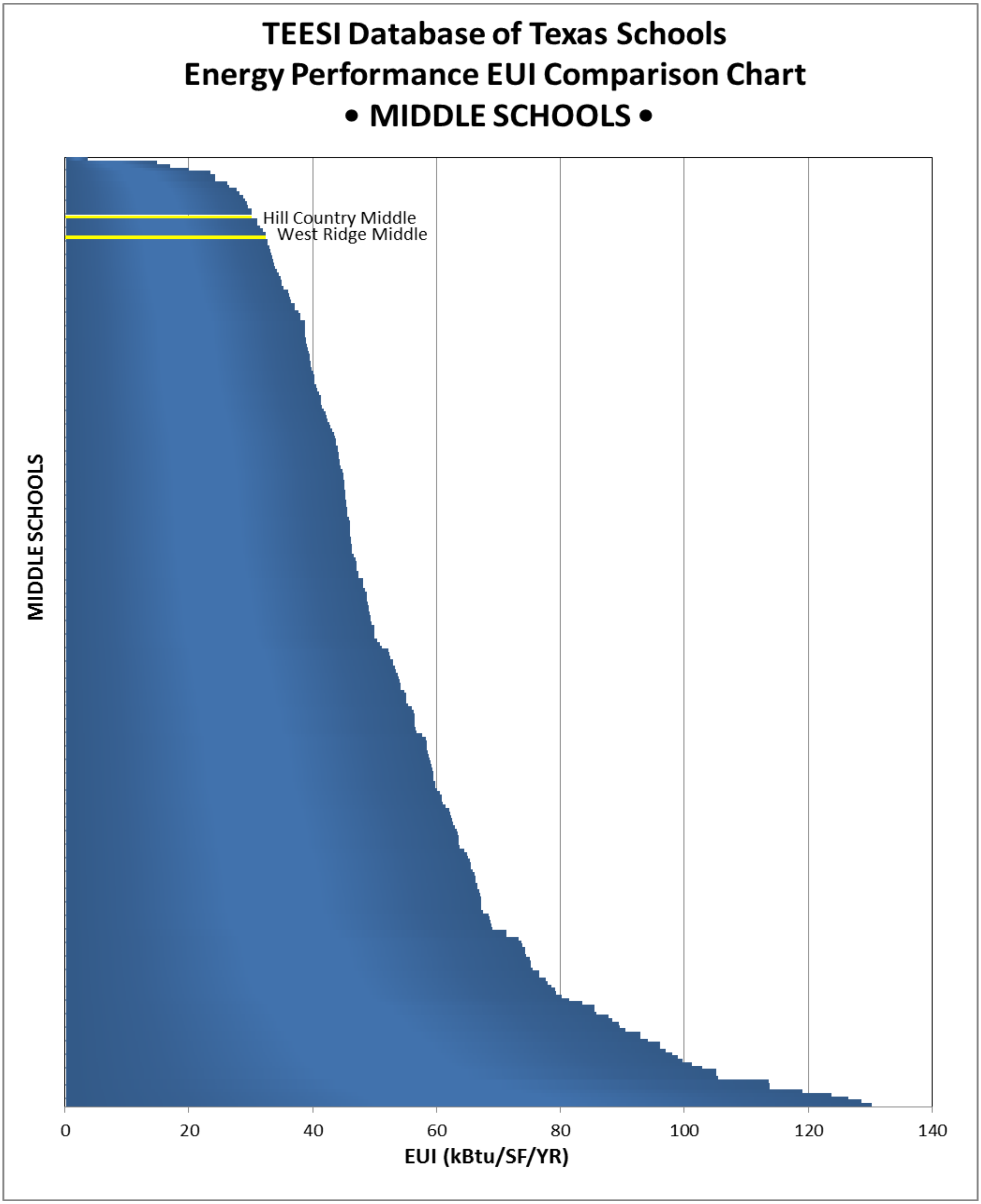
Gas Utility: Texas Gas Service

APPENDIX C

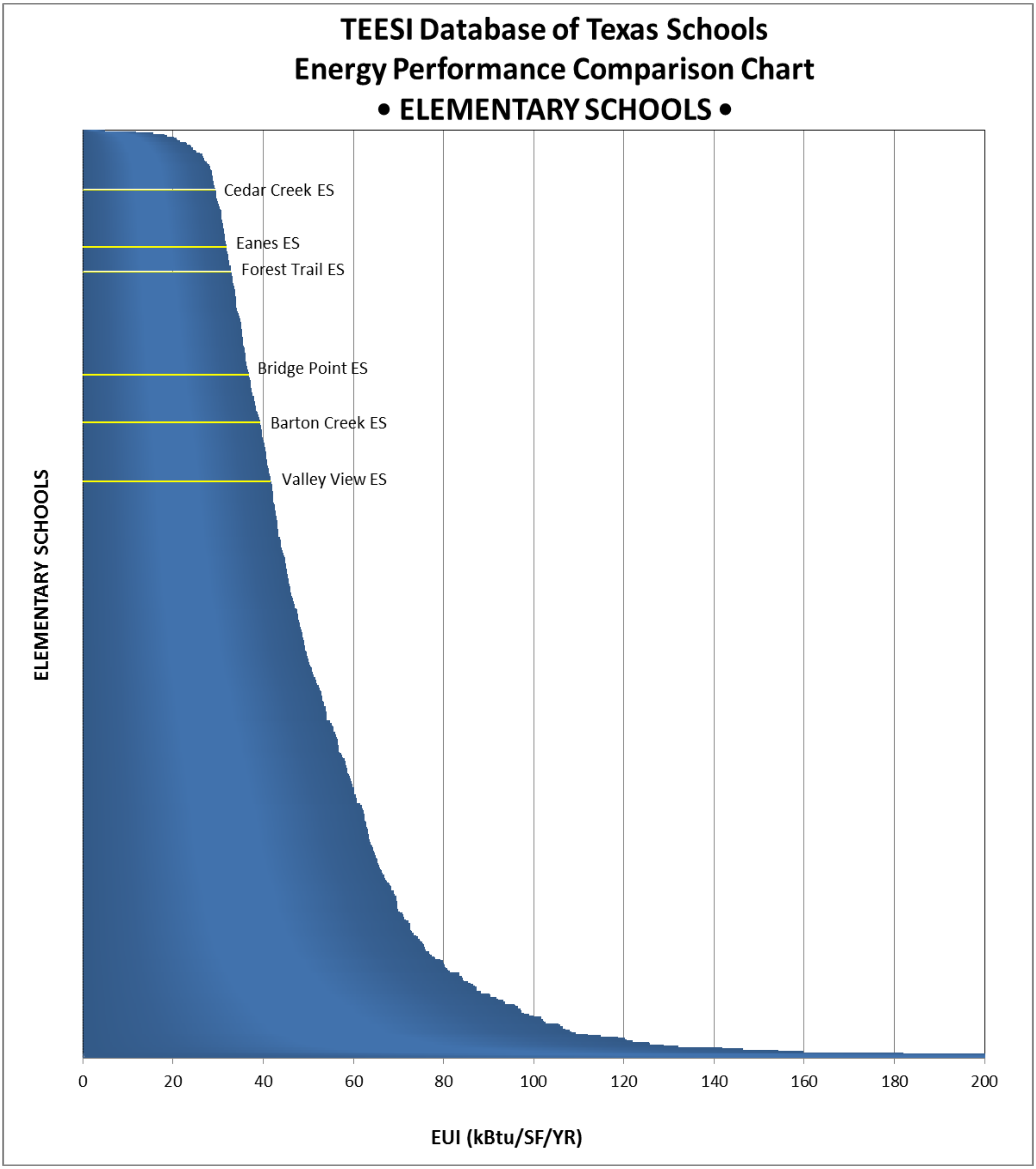
ENERGY PERFORMANCE COMPARISON CHARTS



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Schools)



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Schools)



(The chart above is a comparison of EUIs based on sample data from TEESI's database of Texas Schools)

APPENDIX D

TYPICAL EQUIPMENT MAINTENANCE CHECKLISTS

Boilers Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Boiler use/sequencing	Turn off/sequence unnecessary boilers	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Follow manufacturer's recommended procedures in lubricating all components	Compare temperatures with tests performed after annual cleaning	X			
Check steam pressure	Is variation in steam pressure as expected under different loads? Wet steam may be produced if the pressure drops too fast	X			
Check unstable water level	Unstable levels can be a sign of contaminates in feedwater, overloading of boiler, equipment malfunction	X			
Check burner	Check for proper control and cleanliness	X			
Check motor condition temperatures	Check for proper function	X			
Check air temperatures in boiler room	Temperatures should not exceed or drop below design limits	X			
Boiler blowdown	Verify the bottom, surface and water column blow downs are occurring and are effective	X			
Boiler logs	Keep daily logs on: • Type and amount of fuel used • Flue gas temperature • Makeup water volume • Steam pressure, temperature, and amount generated Look for variations as a method of fault detection	X			
Check oil filter assemblies	Check and clean/replace oil filters and strainers	X			
Inspect oil heaters	Check to ensure that oil is at proper temperature prior to burning	X			
Check boiler water treatment	Confirm water treatment system is functioning properly	X			
Check flue gas temperatures and composition	Measure flue gas composition and temperatures at selected firing positions - recommended O2% and CO2% Fuel / O2 % / CO2% Natural gas / 1.5 / 10 No. 2 fuel oil / 2.0 / 11.5 No. 6 fuel oil / 2.5 / 12.5 Note: percentages may vary due to fuel composition variations		X		

Boilers Checklist (contd)

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Check all relief valves	Check for leaks		X		
Check water level control	Stop feedwater pump and allow control to stop fuel flow to burner. Do not allow water level to drop below recommended level.		X		
Check pilot and burner assemblies	Clean pilot and burner following manu-facturer's guidelines. Examine for mineral or corrosion buildup.		X		
Check boiler operating characteristics	Stop fuel flow and observe flame failure. Start boiler and observe characteristics of flame.		X		
Inspect system for water/steam leaks and leakage opportunities	Look for: leaks, defective valves and traps, corroded piping, condition of insulation		X		
Inspect all linkages on combustion air dampers and fuel valves	Check for proper setting and tightness		X		
Inspect boiler for air leaks	Check damper seals		X		
Check blowdown and water treatment procedures	Determine if blowdown is adequate to prevent solids buildup			X	
Flue gases	Measure and compare last month's readings flue gas composition over entire firing range			X	
Combustion air supply	Check combustion air inlet to boiler room and boiler to make sure openings are adequate and clean			X	
Check fuel system	Check pressure gauge, pumps, filters and transfer lines. Clean filters as required.			X	
Check belts and packing glands	Check belts for proper tension. Check packing glands for compression leakage.			X	
Check for air leaks	Check for air leaks around access openings and flame scanner assembly.			X	
Check all blower belts	Check for tightness and minimum slippage.			X	
Check all gaskets	Check gaskets for tight sealing, replace if do not provide tight seal			X	
Inspect boiler insulation	Inspect all boiler insulation and casings for hot spots			X	
Steam control valves	Calibrate steam control valves as specified by manufacturer			X	
Pressure reducing/regulating valves	Check for proper operation			X	

Boilers Checklist (contd)

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Perform water quality test	Check water quality for proper chemical balance			X	
Clean waterside surfaces	Follow manufacturer's recommendation on cleaning and preparing waterside surfaces				X
Clean fireside	Follow manufacturer's recommendation on cleaning and preparing fireside surfaces				X
Inspect and repair refractories on fireside	Use recommended material and procedures				X
Relief valve	Remove and recondition or replace				X
Feedwater system	Clean and recondition feedwater pumps. Clean condensate receivers and deaeration system				X
Fuel system	Clean and recondition system pumps, filters, pilot, oil preheaters, oil storage tanks, etc.				X
Electrical systems	Clean all electrical terminals. Check electronic controls and replace any defective parts.				X
Hydraulic and pneumatic valves	Check operation and repair as necessary				X
Flue gases	Make adjustments to give optimal flue gas composition. Record composition, firing position, and temperature.				X
Eddy current test	As required, conduct eddy current test to assess tube wall thickness				X

Chillers Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Semi-Annually	Annually
Chiller use/sequencing	Turn off/sequence unnecessary chillers	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Check setpoints	Check all setpoints for proper setting and function	X			
Evaporator and condenser coil fouling	Assess evaporator and condenser coil fouling as required		X		
Compressor motor temperature	Check temperature per manufacturer's specifications		X		
Perform water quality test	Check water quality for proper chemical balance		X		
Leak testing	Conduct leak testing on all compressor fittings, oil pump joints and fittings, and relief valves		X		
Check all insulation	Check insulation for condition and appropriateness		X		
Control operation	Verify proper control function including: • Hot gas bypass • Liquid injection		X		
Check vane control settings	Check settings per manufacturer's specification			X	
Verify motor load limit control	Check settings per manufacturer's specification			X	
Verify load balance operation	Check settings per manufacturer's specification			X	
Check chilled water reset settings and function	Check settings per manufacturer's specification			X	
Check chiller lockout setpoint	Check settings per manufacturer's specification				X
Clean condenser tubes	Clean tubes at least annually as part of shutdown procedure				X

Building Controls Checklist

Description	Comments	Maintenance Frequency: Daily	Weekly	Semi-Annually	Annually
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Verify control schedules	Verify in control software that schedules are accurate for season, occupancy, etc.	X			
Verify setpoints	Verify in control software that setpoints are accurate for season, occupancy, etc.	X			
Time clocks	Reset after every power outage	X			
Check all gauges	Check all gauges to make sure readings are as expected		X		
Control tubing (pneumatic system)	Check all control tubing for leaks		X		
Check outside air volumes	Calculated the amount of outside air introduced and compare to requirements		X		
Check setpoints	Check setpoints and review rational for setting		X		
Check schedules	Check schedules and review rational for setting		X		
Check deadbands	Assure that all deadbands are accurate and the only simultaneous heating and cooling is by design		X		
Check sensors	Conduct thorough check of all sensors - temperature, pressure, humidity, flow, etc. - for expected values			X	
Time clocks	Check for accuracy and clean			X	
Calibrate sensors	Calibrate all sensors: temperature, pressure, humidity, flow, etc.				X

Pumps Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Pump use/sequencing	Turn off/sequence unnecessary pumps	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Check lubrication	Assure that all bearings are lubricated per the manufacture's recommendation			X	
Check packing	Check packing for wear and repack as necessary. Consider replacing packing with mechanical seals.			X	
Motor/pump alignment	Aligning the pump/motor coupling allows for efficient torque transfer to the pump			X	
Check mountings	Check and secure all pump mountings			X	
Check bearings	Inspect bearings and drive belts for wear. Adjust, repair, or replace as necessary.				X
Motor condition	Checking the condition of the motor through temperature or vibration analysis assures long life				X

Fans Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
System use/sequencing	Turn off/sequence unnecessary equipment	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Observe belts	Verify proper belt tension and alignment			X	
Inspect pulley wheels	Clean and lubricate where required			X	
Inspect dampers	Confirm proper and complete closure control; outside air dampers should be airtight when closed			X	
Observe actuator/linkage control	Verify operation, clean, lubricate, adjust as needed			X	
Check fan blades	Validate proper rotation and clean when necessary			X	
Filters	Check for gaps, replace when dirty - monthly			X	
Check for air quality anomalies	Inspect for moisture/growth on walls, ceilings, carpets, and in/outside of duct-work. Check for musty smells and listen to complaints.			X	
Check wiring	Verify all electrical connections are tight				X
Inspect ductwork	Check and refasten loose connections, repair all leaks				X
Coils	Confirm that filters have kept clean, clean as necessary				X
Insulation	Inspect, repair, replace all compromised duct insulation				X

APPENDIX E

LOANSTAR INFORMATION

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

LoanSTAR Revolving Loan Application Packet

RFA# BE-G14-2015

SECO
State Energy Conservation Office

Contents

Overview

Program Summary

The Texas Comptroller of Public Accounts ("Comptroller") and the State Energy Conservation Office ("SECO") administer the LoanSTAR (Saving Taxes and Resources) Revolving Loan Program. The program finances energy-related cost-reduction retrofits for state, public school district (excluding charter schools), public college, public university, and tax-district supported nonprofit hospital facilities. Low interest rate loans are provided to assist those institutions in financing their energy-related cost-reduction efforts. The program's revolving loan mechanism allows Applicants to repay loans through the stream of energy cost savings realized from the projects.

Solicitation Details

- Budget Allocation (Amount Available to Award): Approximately $18 million
    - Approximately $6 million of which is ARRA funds
- The maximum loan amount shall not exceed $7.5 million
- The interest rate is set at 2.0% (1% for ARRA funds)

Eligibility

Applicants must meet eligibility requirements before submitting a loan application.

Organization Eligibility

Qualifying public institutions include cities, counties, independent school districts, state agencies, public institutions of higher education, tax-district supported public hospitals, and other political subdivisions of the State of Texas. The public institutions must own and occupy the facilities where the retrofit projects will take place.

Project Eligibility

Projects funded under this Notice of Loan Fund Availability ("NOLFA") must have:

- A composite simple payback of ten years or less for Design-Build, Design-Bid-Build and Commissioning projects or a total project payback of ten years or less for Energy Savings Performance Contracts; and
- Each Utility Cost Reduction Measure ("UCRM") must have a simple payback that does not exceed the estimated useful life ("EUL") of the UCRM.

Utility dollar savings are the number one criterion for determination if the measure can be considered an eligible UCRM. UCRMs are not limited to those activities that save units of energy. A UCRM could conceivably call for actions which save no energy or consume additional BTUs, but save utility budget dollars. Examples of such UCRMs include: demand reduction, increased power factor, load shifting, switching utility rate structures, and thermal storage projects. All improvements must meet minimum efficiency standards as prescribed by applicable building energy codes.

Examples of projects that are acceptable may include:

- Building and mechanical system commissioning and optimization;

- Energy management systems and equipment control automation;
- High efficiency heating, ventilation and air conditioning systems, boilers, heat pumps and other heating and air conditioning projects;
- High efficiency lighting fixtures and lamps;
- Building shell improvements (insulation, adding reflective window film, radiant barriers, and cool roof);
- Load management projects;
- Energy recovery systems;
- Low flow plumbing fixtures, high efficiency pumps; and
- Retro- and re- commissioning.

Renewable energy efficiency projects are strongly encouraged wherever feasible, and may include:

- Installation of distributed technology such as rooftop solar water and space heating systems;
- Geothermal heat pumps (only closed loop systems with no greater than 10 ton capacity);
- Electric generation with photovoltaic; or
- Small wind and solar-thermal systems.

Applicants are responsible for compliance with all state and federal laws, rules, and requirements, including United States Department of Energy ("DOE") National Environmental Policy Act ("NEPA") review and State Historical Preservation Office ("SHPO") review, if applicable. Please refer to the requirements set forth in the sample loan agreement

Application Process

Schedule

Description	Date
Issuance of NOLFA	May 8, 2015- 10 a.m. CT
Submission of Questions	May 29, 2015- 2 p.m. CT
Official Response to Questions Posted	June 5, 2015, or as soon thereafter as practical
Application Deadline	June 22, 2015- 2 p.m. CT
Grant Award	As soon thereafter as practical

Questions

All written questions must be received by Jason C. Frizzell, Assistant General Counsel, Contracts, Texas Comptroller of Public Accounts, at 111 E. 17th St., Room 201, Austin, Texas 78774 (the "Issuing Office") not later than 2:00 p.m. CT on May 29, 2015. Prospective applicants are encouraged to send Questions via email to contracts@cpa.texas.gov or fax to (512) 463-3669 to ensure timely receipt. On or about Friday, June 5, 2015, or as soon thereafter as practical, responses to the questions received by the deadline will be posted on the Electronic State Business Daily ("ESBD") at http://esbd.cpa.state.tx.us and on the SECO website at http://www.seco.cpa.state.tx.us/funding/nolfa/050815/. **Late questions will not be considered under any circumstances.**

Application Submission

Applicants must submit one original, five bound copies, and one electronic copy on a CD (not a USB flash drive) of the loan application and all required documentation. Applications must be complete, signed by an authorized representative of the applicant, and meet all the requirements of the LoanSTAR Program.

Applications must be delivered to the Issuing Office no later than 2:00 p.m. CT, on Monday, June 22, 2015. **Late applications will not be considered under any circumstance. Applicants shall be solely responsible for verifying timely receipt of applications in the Issuing Office.**

Required Documentation

1. Application
2. Memorandum of Understanding
3. Project Assessment Commitment, Preliminary Energy Assessment or a Utility Assessment Report

   Applicants are required to submit a Utility Assessment Report (UAR) for Design-Bid-Build projects, Design-Build projects, Energy Savings Performance Contracts, and for Retro- or Re-commissioning projects. The UAR Engineers are selected by the applicant and must be licensed in the state of Texas. Documentation must comply with SECO guidebooks:

   - UAR for Design-Bid-Build Projects and Design-Build Projects Design: http://seco.cpa.state.tx.us/ls//guidelines/
   - UAR for Performance Contracts: http://seco.cpa.state.tx.us/perf-contract/
   - There is not a prescribed format for Retro- or Re- commissioning UARs.

All UAR reports will be reviewed by a SECO Professional Engineer. This Engineer is selected by SECO.

UARs and Commissioning Reports that do not contain a Texas Licensed Professional Engineering seal will receive the same score as a Project Assessment Commitment.

Application and Technical Review Process

Upon receipt of an application, the application and associated documents are reviewed by SECO's legal Counsel for eligibility and compliance. Applications that meet the minimum qualifications are then distributed to members of an Evaluation Committee for their independent review and score. The following chart follows the chart process for successful applicants:

Construction Review Process

Design-Bid-Build, Design-Build, and Commission Projects

After a Loan Agreement has been executed, the Applicant can begin the process of designing and implementing the projects identified in the report.

Energy Savings Performance Contract Projects

There is no design review process for Energy Savings Performance Contracts unless a system commissioning is a component of that program.

For Energy Savings Performance Contracts, a Measurement and Verification Plan must be developed and approved by SECO. Post construction measurement and verification costs must be included as part of the total project cost when calculating the payback.

Loan Repayment

After submittal of the Final Completion Report to SECO and the final voucher request, Successful Applicant will request a Loan Repayment Schedule from SECO. The Loan Repayment Schedule will contain the outstanding loan balance, the term of the loan, and the schedule of quarterly payments to SECO.

The outstanding loan balance consists of the borrowed dollars plus the interested accrued on the borrowed dollars. Interest begins accruing on the borrowed dollars when the applicant receives that money. The interest continues to accrue until the date of the first scheduled loan repayment.

The loan repayment term is equal to the Total Loan Payback for Design-Bid-Build and Design-Build projects and the Total Project Payback for Energy Savings Performance Contracts.

SECO forwards the Loan Repayment Schedule to the Applicant based on the incurred loan amount. Loan repayments will begin within sixty days of project completion. Payments are due quarterly.

Payments are due at the end of each fiscal quarter, using the State's fiscal calendar. The payments do not vary according to the actual energy savings. Payments are due regardless of whether the Applicant has achieved that level of energy savings.

Attachments

**NOTE: Application requirements and format is subject to change.
Check SECO website for most recent NOLFA application.**

Memorandum of Understanding

RFA# BE-G14-2015

Instructions:

- Completed Memorandum of Understanding (MOU) must be submitted with NOLFA application.
- MOU does not become effective until Applicant receives MOU with SECO signatures.

Subject to the conditions listed below, execution of this Memorandum of Understanding (MOU) reserves $____________ (Amount) of LoanSTAR Funding for __________________________ (Borrower).

The dollar amount listed above is the borrower's estimated cost based on the PEA or Project Assessment Commitment to analyze and implement energy efficiency projects which will be financed through the LoanSTAR Program.

The funds are reserved subject to the following conditions:

1. Upon written NOLFA selection, the borrower's CFO signs and inserts dates on this MOU, which certifies that the borrower has retained a Professional Engineer to prepare an Energy Assessment Report (EAR) or Utility Assessment Report (UAR). The UAR shall be prepared in accordance with the guidelines and formats provided in the Texas LoanSTAR Program Guidebook: Guidelines, Formats, Program Requirements and Documents (http://seco.cpa.state.tx.us/ls//guidelines/). The UAR shall be prepared in accordance with the SECO Performance Contracting Guidelines (http://seco.cpa.state.tx.us/perf-contract/docs/ESPC_Guidelines_Part5_UtilityAssessmentReport.pdf).
2. The applicant's CFO certifies by signature of this document that three (3) original hard copies and one (1) electronic copy (cd) of the completed reports referenced in item 1 will be delivered to the State Energy Conservation Office for review. **If the completed reports are not submitted by the "End Date for Commitment", the reserved funds will be released to other applicants.**
3. The sole purpose of this MOU is to reserve LoanSTAR funds for an applicant during the period that its EAR or UAR is being prepared. This document should not be construed as a loan agreement and does not authorize the expenditure of funds for LoanSTAR projects. LoanSTAR project expenditures cannot be incurred before the effective date cited in the fully executed loan agreement.

Applicant	**State Energy Conservation Office**
Applicant Name (printed)	SECO Program Manager Name (printed)
Title	SECO Program Manager Signature
Applicant Signature	Date
Date	End Date for Commitment

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

Project Assessment Commitment

RFA# BE-G14-2015

_________________________________(Applicant) requests that $__________ of LoanSTAR Funding be reserved for a proposed energy efficiency, commissioning project or energy savings performance contract (ESPC).

The Applicant certifies that the energy efficiency or commissioning project shall comply with LoanSTAR Technical Guidelines (http://seco.cpa.state.tx.us/ls//guidelines/) and that the ESPC shall comply with the Performance Contracting Guidelines (http://seco.cpa.state.tx.us/perf-contract/). The Applicant dollar amount listed above is the borrower's estimated cost to analyze and implement energy efficiency projects which will be financed through the LoanSTAR Program.

LoanSTAR funds, if reserved, will be subject to the following conditions:

(1) Applicant agrees to retain a Professional Engineer, licensed in the State of Texas, to prepare an Energy Assessment Report (EAR), a Commissioning Report, or an Utility Assessment Report (UAR) that complies with the LoanSTAR Technical Guidelines (http://seco.cpa.state.tx.us/ls//guidelines/) or with Performance Contracting Guidelines (http://seco.cpa.state.tx.us/perf-contract/). The Professional Engineer shall meet the technical analyst qualifications listed in Volume I, Section I, Paragraph C of the LoanSTAR Technical Guidebook.

(2) Applicant agrees to complete an EAR for design-bid-build or design-build contracts, a Commissioning Report for commissioning projects, or an UAR for ESPCs within Application calendar. On or before the date listed below the applicant agrees to submit three (3) original hard copies and one (1) electronic copy of the completed EAR, Commissioning Report, or UAR to the State Energy Conservation Office (SECO). If reports are not received by SECO by the date below, the funds may be released to other applicants.

Place "x" in the following box to show agreement to complete EAR/UAR/Commissioning Report within required time frame.

☐ EAR/UAR/Commissioning Report will be completed in less than 120 days after MOU execution.

(3) The sole function of a Project Assessment Commitment (PAC) is to request reservation of LoanSTAR funds for an applicant during the period that the EAR, Commissioning Report, UAR are being prepared. This document shall not be construed as a loan agreement and does not authorize the expenditure of funds for LoanSTAR projects. LoanSTAR project expenditures cannot be incurred before the effective date cited in the fully executed loan agreement.

(4) If the applicant is selected for funding, SECO will send the applicant a Memorandum of Understanding (MOU) to reserve the LoanSTAR funds. This reservation of funds will remain in place during the period that the EAR, Commissioning Report, UAR are being prepared. The EAR, Commissioning Report, UAR must be submitted within the time frame designated on the MOU.

Applicant

______________________________	______________________________
Applicant Name (printed)	Title
______________________________	______________________________
Applicant Signature	Date

Application

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

SECO LoanSTAR Application

RFA# BE-G14-2015

SECO State Energy Conservation Office

> **In addition to contact/administrative information on page 1, enter here the total loan amount requested from SECO. This amount includes all project implementation costs, plus escalation, M&V, detailed audit costs, etc. as allowed by the LoanSTAR guidelines, and less any buy down included from internal funds. It should not include financing costs or long-term M&V costs associated with energy savings performance contracts.**

PART 1: General Information

Applicant (Borrower)

Name of Eligible Public Entity | Federal Tax ID | Application Date

Mailing Address | City | State | Zip Code

County Name | $ Total Amount Requested

Applicant Signing Authority

First Name | Initial | Last Name | Title

Telephone | Email Address

Applicant Primary Contact (Project Director)

> **Select from the listed application information types, described below. Note that all options eventually require a detailed investment grade audit before funds can be awarded. This section only indicates the information being submitted in the application phase.**
>
> - **Energy Assessment Report – If a detailed investment grade audit is developed prior to applying for LoanSTAR, select this option and submit the EAR with the application.**
> - **Utility Assessment Report – If the project is to be delivered using an Energy Savings Performance Contract (ESPC), and an ESPC UAR has already been developed by the ESCO, select this option and submit the UAR with the application.**
> - **Commissioning Report – If the loan being requested is intended to fund facilities commissioning, and a Cx report has already been developed, select this option and submit the Cx report with the application**
> - **Preliminary Energy Assessment – Select this option if the detailed audit is to be performed after the application is selected, but the project scope and estimated cost have been identified in a PEA (such as this report). Submit PEA with application**
> - **Project Assessment Commitment – Select this option if the detailed audit is to be performed after the application is selected, and a PEA has not been performed, or the proposed scope differs from that in the PEA**

PART 2: Report Information

2A. Place a check next to the type of report that is submitted with the application. One (1) original and five (5) bound copies of the report are required.

- ○ Utility Assessment Report – for design-bid-build or design-build projects
- ○ Utility Assessment Report – for Energy Savings Performance Contracts
- ○ Commissioning Report
- ○ Preliminary Energy Assessment (PEA)
  Required: UAR to be completed in less than 120 days
- ○ Project Assessment Commitment
  Required: UAR to be completed in less than 120 days

If UAR cannot be completed in less than 120 days after notice is received that funding is committed to the project, do not proceed. The project is disqualified from loan consideration.

For more information visit: http://seco.cpa.state.tx.us/ls

50-831 (02-15/1)

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

SECO State Energy Conservation Office

PART 3: Project Information

Complete the following table listing all Utility Cost Reduction Measures (UCRMs). If any information changes in the table prior to loan document preparation, an update is required in order to complete the loan application. See Attachment B - Project Financial Worksheets to calculate energy savings. Attachment B is not required for application submittal.

Facility Name — *Address* — *City* — *State* — *ZIP Code*

Engineering Firm Name — *Address* — *ZIP Code*

Date of Audit Report

Enter facility name or District name if multiple buildings are to be included in the project.

Enter the engineering firm who developed the EAR/UAR/CxR/PEA (N/A if submitting project assessment commitment)

UCRM NO.	BUILDING	UCRM DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		

List the proposed UCRMs and affected facilities (i.e. "various campuses" if applying to multiple buildings). This information can be taken from Table 10 of this report if submitting a PEA with the application, or from various subsections of Section IX if submitting a Project Assessment Commitment using only select UCRMs.

How long will it take to complete the project? ________ (months)

Is the TOTAL LOAN simple payback for the UCRMs less than 10 years? ◯ Yes ◯ No

If No, then project is disqualified from further loan consideration.

Note that following SECO approval of the detailed audit and official award of the Loan, LoanSTAR requires construction to be completed typically within 12-18 months.

Is the simple payback for each UCRM less that the Estimated Useful Life of the UCRM? ◯ Yes ◯ No

If No, then project is disqualified from further loan consideration.

PART 4: Public Viewing

Describe where monthly energy savings information will be made available for public viewing.

Optional, but represents additional "points" in the application process. Options include publication on District website, posters, etc.

For more information visit: http://seco.cpa.state.tx.us/ls

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

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Optional, but represents additional "points" in the application process. Note that setup of the EnergyStar baseline and training in Portfolio Manager are included as part of the SECO schools and Local Governments Energy Program.

PART 5: Project Geographic Location and Population

Use the following link to determine the county population, http://quickfacts.census.gov/qfd/states/48000lk.html

County Name

County Population

PART 6: Measuring Savings

Will ENERGY STAR Portfolio Manager be used to track energy/water savings? ◯ Yes ◯ No

PART 7: Signature and Certification by Applicant Signing Authority or Chief Financial Officer

Do you agree to accept the terms and conditions of the sample contract? ◯ Yes ◯ No

I certify that I have reviewed this application, including commitment of "buy-down" funds. The information provided is accurate to the best of my knowledge and in my best professional judgment. If awarded, I will agree to abide by the terms of the contract.

Signature

Date

Printed Name

Title

For more information visit: http://seco.cpa.state.tx.us/ls

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

Attachment A – Evaluation Form (Required)

Applications will be evaluated under the general criteria outlined below. The Comptroller will make the final decision. The Comptroller reserves the right to accept or reject any or all applications submitted. The Comptroller is not obligated to execute a loan agreement on the basis of this NOLFA / RFA. The Comptroller shall not pay for any costs incurred by any entity in responding to this NOLFA / RFA. Comptroller and SECO may request additional information at any time if deemed necessary for further evaluation. General evaluation criteria are as follows and as set forth in the application instructions:

Qualification Requirements	
1. Has the applicant stated they agree to the terms and conditions of the sample contract?	◯ Yes ◯ No
2. This question relates only to Design-Build (DB) and Design-Bid-Build (DBB) projects: Is the Total Loan payback for the project Utility Cost Reduction Measures (UCRMs) less than ten years?	◯ Yes ◯ No ◯ Not a DB or DBB
3. This question relates only to Energy Savings Performance Contracts (ESPCs): Is the Total Project Payback less than ten years?	◯ Yes ◯ No ◯ Not an ESPC
4. Is the simple payback for each UCRM less than Estimated Useful Life (EUL) of that measure?	◯ Yes ◯ No
Do not proceed, if the answer to any of the questions is "No". Project is disqualified from further loan consideration. Either Question 2 or 3 must have a "Yes" response to be considered for loan consideration.	

Total project payback for ESPCs should include all financing and ongoing M&V costs associated with the contract.

Evaluation Criteria	Possible Base Points	Applicant Self-Score
5. Which of the following reports are submitted with this application? ◯ Utility Assessment Report for design-bid-build or design-build projects. Must be sealed by a Texas Professional Engineer. ***(45 points)*** ◯ Utility Assessment Report for Energy Savings Performance Contracts. Must be sealed by a Texas Professional Engineer. ***(45 points)*** ◯ Commissioning Report. Must be sealed by a Texas Professional Engineer. ***(45 points)*** ◯ Preliminary Energy Assessment (PEA) ***(35 points)*** UAR must be completed in less than 120 days after MOU execution ◯ Project Assessment Commitment (PAC) ***(30 points)*** UAR must be completed in less than120 days after MOU execution ***(30 points)***	45	
Do not proceed, if UAR cannot be completed in less than 120 days after notice is received that funding is committed to the project by way of the Memorandum of Understanding (MOU). The project is disqualified from further loan consideration. **Do not proceed**, if no UAR/PEA/PAC is submitted. The project is disqualified from further loan consideration.		
6. What is the name of the county and the county population (http://quickfacts.census.gov/qfd/states/48000lk.html) where project retrofit activities will take place? County Name: ______ County Population: ______ • County population less than 100,000 ***(1 points)*** • County population greater than 100,000 ***(0 points)***	1	

For more information visit: http://seco.cpa.state.tx.us/ls

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

Evaluation Criteria (continued)	Possible Base Points	Applicant Self-Score
7. Will the energy savings information be available for public viewing? • Yes. The information will be available for public viewing via an internet portal or via detailed signage at the facility entrance ***(1 point)*** • No. The information will not be made available for public viewing ***(0 points)***	1	
8. Will ENERGY STAR Portfolio Manager be used to track energy/water savings? • Yes ***(1 point)*** • No ***(0 points)***	1	
9. In the previous NOLFA/RFA, did you submit an application which was not funded due to lack of available funding? • Yes (Insert date of application ________) ***(2 points)*** • No ***(0 points)***	2	
Applicant Self-Score Total	**50 max**	0

For more information visit: http://seco.cpa.state.tx.us/ls

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

SECO
State Energy Conservation Office

Attachment B – Project Financial Calculation Worksheets (Not Required)

Attachment B1. Design-Bid-Build or Design-Build Project Calculation Worksheet

PROJECT INFORMATION

UCRM No.	Building	UCRM Description	Construction Time (Months)	Costs ($)			Estimated Annual Saving ($)	Payback*** (yrs)	UCRM Estimated Useful Life (yrs)
				Eng./Design	Construction	Total			
			Totals	0	0	0	0	0	
					EAR Cost*				
					Metering**				
					Monitoring**				
					Buy Down				
					Total Loan				

* Costs for the UAR, metering, and monitoring may be included in the loan at Borrower's option.
** Maximum metering cost is 3% of UCRM costs and monitoring cost is 7%. Contact SECO for additional information.
*** Individual energy efficiency measure payback must be less than or equal to the estimated useful life of the measure.

Use the information from Section IX and Table 10 of this report to complete this table (NOTE: for internal computation purposes only, not required for submission to SECO). Composite payback (including EAR cost, metering cost, and monitoring cost included as desired by the District) must be less than 10 years, and individual measures must have paybacks less than the estimated useful life. The District may elect to "buy down" individual measures or the project as a whole from their own funds to meet these criteria. Buy down

NOTE: Application requirements and format is subject to change. Check SECO website for most recent NOLFA application.

SECO State Energy Conservation Office

Attachment B2. Energy Savings Performance Projects Calculation Worksheet

UCRM No.	UCRM Title	Annual Savings: Electric Energy (kWh/yr)	Demand (kW/yr)	Electric ($/yr)	Natural Gas (Mcf/yr)	Natural Gas ($/yr)	Water (kGal/yr)	Water ($/yr)	Project Cost ($)	Payback* (yrs.)	Estimated Project Useful Life (yrs.)
1											
2											
3											
4											
5											
6											
7											
8											
Utility Assessment Report Cost		–	–	–	–	–	–	–		–	–
Initial Measurement & Verification Cost		–	–	–	–	–	–	–		–	–
Construction Bonding Cost		–	–	–	–	–	–	–		–	–
Owner's Administration, Management, Training & Other Costs		–	–	–	–	–	–	–		–	–
Buy Down		–	–	–	–	–	–	–		–	–
TOTAL LOAN AMOUNT (IMPLEMENTATION TOTAL) (Simple Payback)											
Required On-going Monitoring Service Cost		–	–	–	–	–	–	–		–	–
Guaranteed Rebate Savings		–	–	–	–	–	–	–		–	–
Financing Cost		–	–	–	–	–	–	–		–	–
TOTAL PROJECT PAYBACK (Project Payback)		–	–	–	–	–	–	–			–

* Individual energy efficiency measure payback must be less than or equal to the estimated useful life of the measure.

Use the information from Section IX and Table 10 of this report to complete this table if project is to be delivered using an ESPC (UAR to be developed by the ESCO following selection of the LoanSTAR application). Remember to include ongoing monitoring costs and financing costs in the total project payback. Note that LoanSTAR ESPCs must comply with additional ESPC guidelines from SECO that may be found online at http://www.seco.cpa.state.tx.us/perf-contract/

For more information visit: http://seco.cpa.state.tx.us/ls

APPENDIX F

ENERGY STAR PORTFOLIO MANAGER REFERENCE MATERIAL

INTRODUCTION TO ENERGY STAR PORTFOLIO MANAGER

An entity's energy baseline can be developed using ENERGY STAR's Portfolio Manager. One of the primary reasons for using ENERGY STAR Portfolio Manager is its ability to normalize the baseline according to several key factors (i.e. Weather, Square Feet, Hours of Operation, Number of Computers, etc.). It is also a free online resource available to all registered users, and is a user-friendly web-based tool.

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). ENERGY STAR has developed Portfolio Manager, an innovative online energy management tool, designed to help organizations track and assess energy and water consumption of their facilities. Portfolio Manager helps organizations set investment priorities, identify under-performing facilities, verify efficiency improvements, and receive EPA recognition for superior energy performance.

Portfolio Manager is also an energy performance benchmarking tool. Portfolio Manager rates a facility's energy performance on a scale of 1–100 relative to similar buildings and WWTPs nationwide. The rating system based on a statistically representative model utilizing a national survey conducted by the Department of Energy's Energy Information Administration. This national survey, known as the Commercial Building Energy Consumption Survey (CBECS), conducted every four years gathers data on building characteristics and energy use from thousands of buildings across the United States. A rating of 50 indicates that the facility, from an energy consumption standpoint, performs better than 50% of all similar facilities nationwide, while a rating of 75 indicates that the facility performs better than 75% of all similar facilities nationwide.

In addition, Portfolio Manager is used to generate a Statement of Energy Performance (SEP) for each facility, summarizing key energy information such as site and source energy intensity, greenhouse gas emission, energy reduction targets and energy cost. The Statement of Energy Performance is required for applying for ENERGY STAR Recognition from EPA/DOE. If ENERGY STAR recognition is pursued, the SEP will need to be verified and certified by a qualified professional.

Some facility types are not able to receive an ENERGY STAR rating. However, Portfolio Manager can still serve as a valuable tool for in tracking utility consumption and setting targets for performance of these facilities.

To develop an entity's baseline, 12 months of utility consumption, cost data, and Building Space Use information is required. The following is reference materials that explain how to input this information as well as perform other basic tasks within Portfolio Manager. For further information, please visit ENERGY STAR'S Portfolio Manager at:

http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

LOGGING IN TO PORTFOLIO MANAGER

Log in to Portfolio Manager with user name and password. This will bring the user to the My Portfolio page, which includes a summary of the user's facilities.

Website: https://portfoliomanager.energystar.gov/pm/login.html

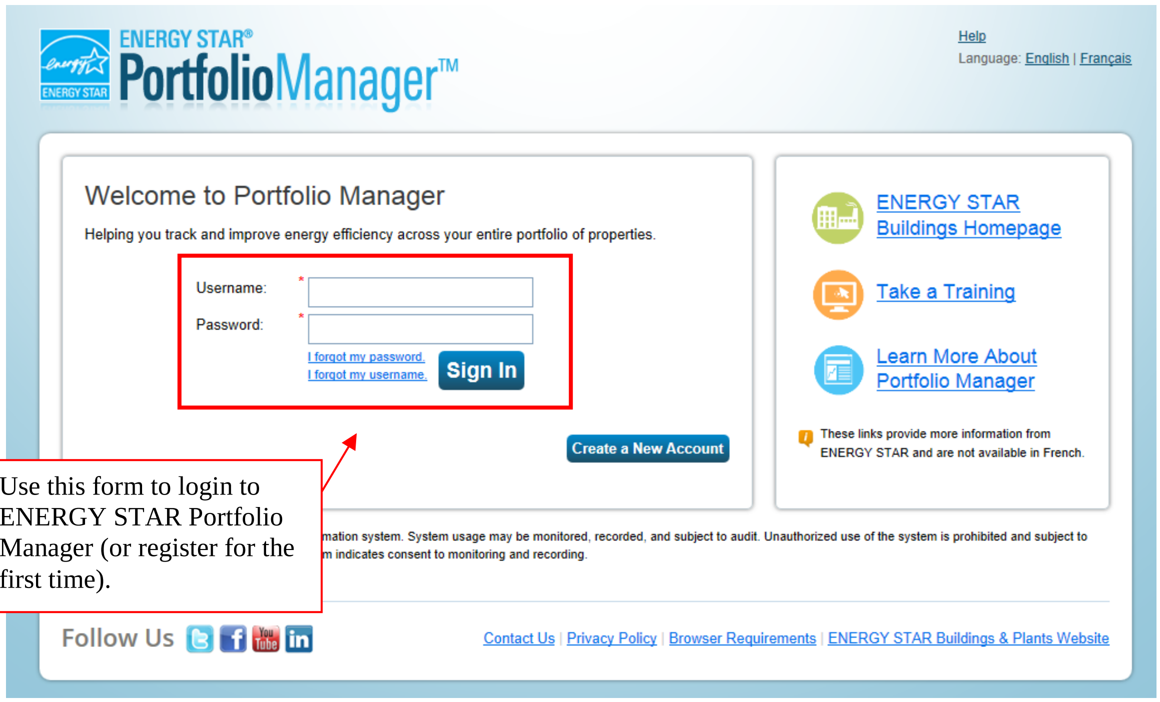


Figure 1: ENERGY STAR Portfolio Manager Homepage

ADDING A FACILITY/PROPERTY

If a facility does not already exist in Portfolio Manager, the user can use the 'Add a Property' link to create an entry in Portfolio Manager for that single facility.

Click the '*Add a Property*' selection located near the top of the main 'My Portfolio' page, as seen in Figure 2.

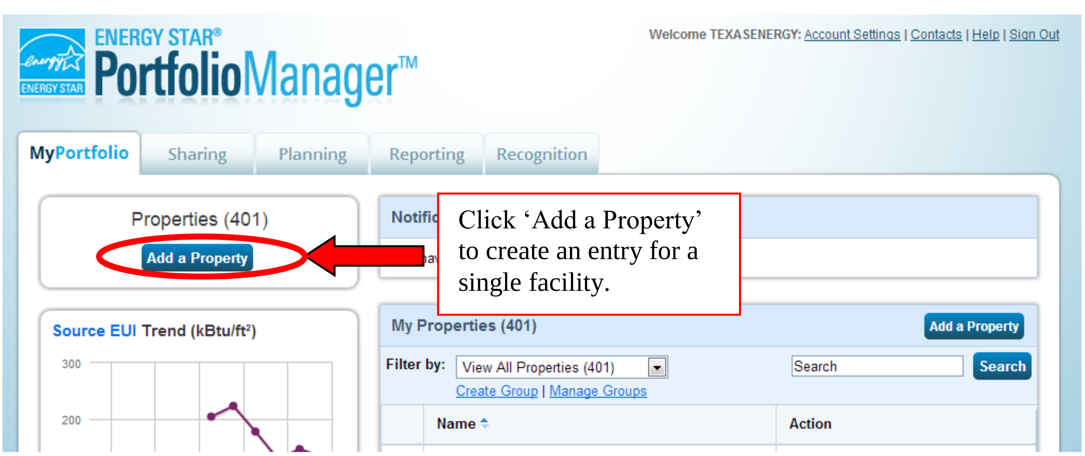


Figure 2: My Portfolio main page

In Figure 3 below, select the primary function of the property (i.e. office, K-12 school, wastewater treatment plant, etc.), whether the property is one or more buildings (i.e. a campus), and whether it is existing or a proposed design. Click **Get Started!** when completed.

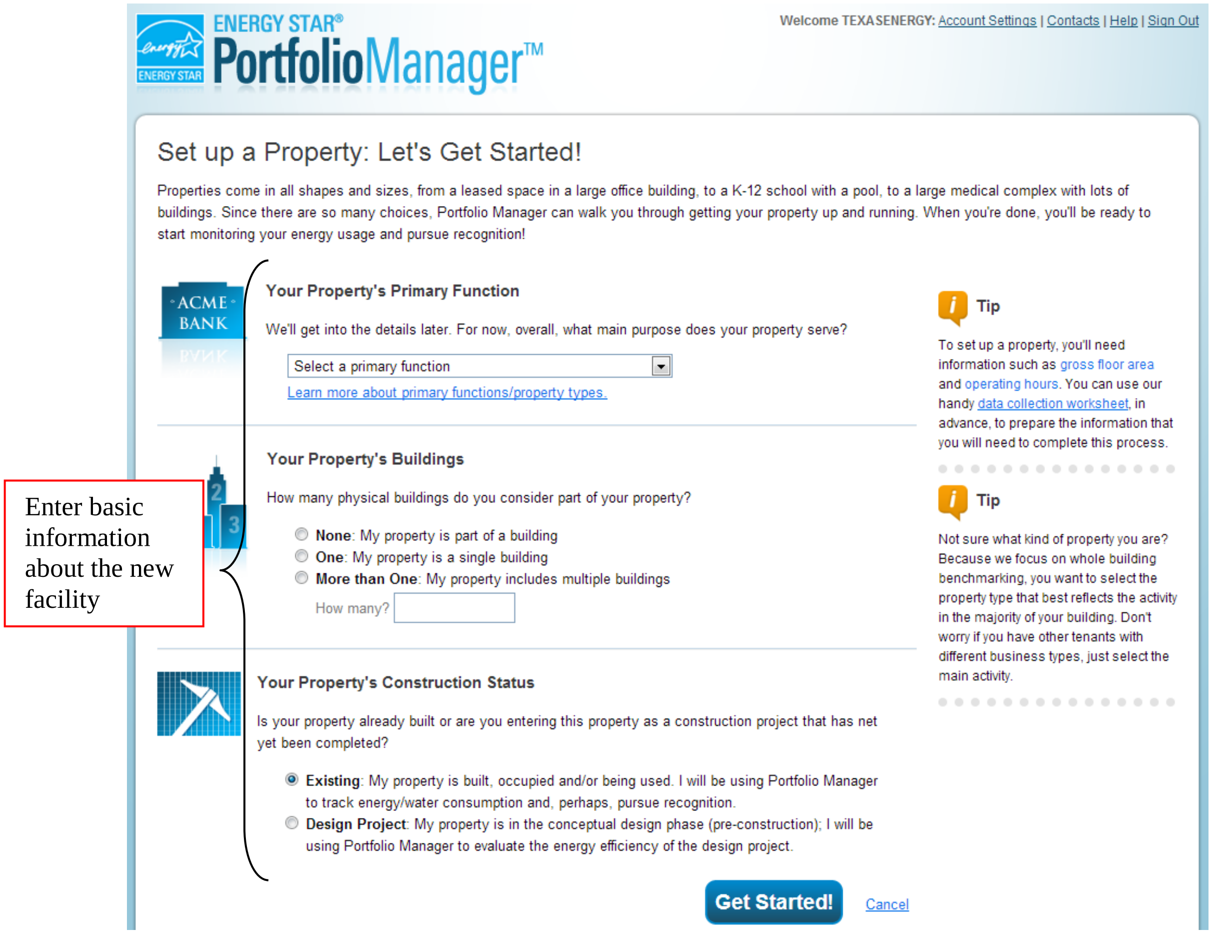


Figure 3: General Facility Information

After clicking **Get Started!**, enter basic property information. Here you can change the property's name, address, and gross floor area.

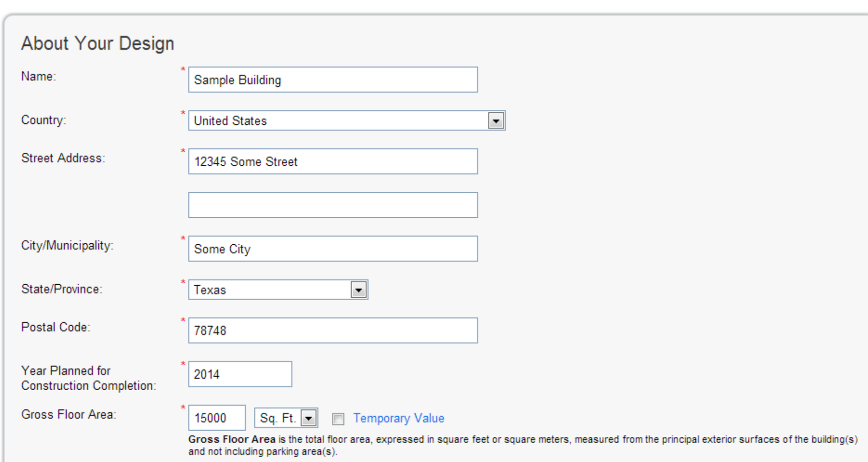


Figure 4: About Your Design Tab

Click **Continue** to enter property use details, as seen below in Figure 5 (specific details to be entered will vary depending on the space use selected previously). They must be entered in correctly and accurately in order to be eligible for ENERGY STAR recognition. If ENERGY STAR recognition is not a primary goal, or if precise attribute values are initially unknown, default values may be used temporarily.

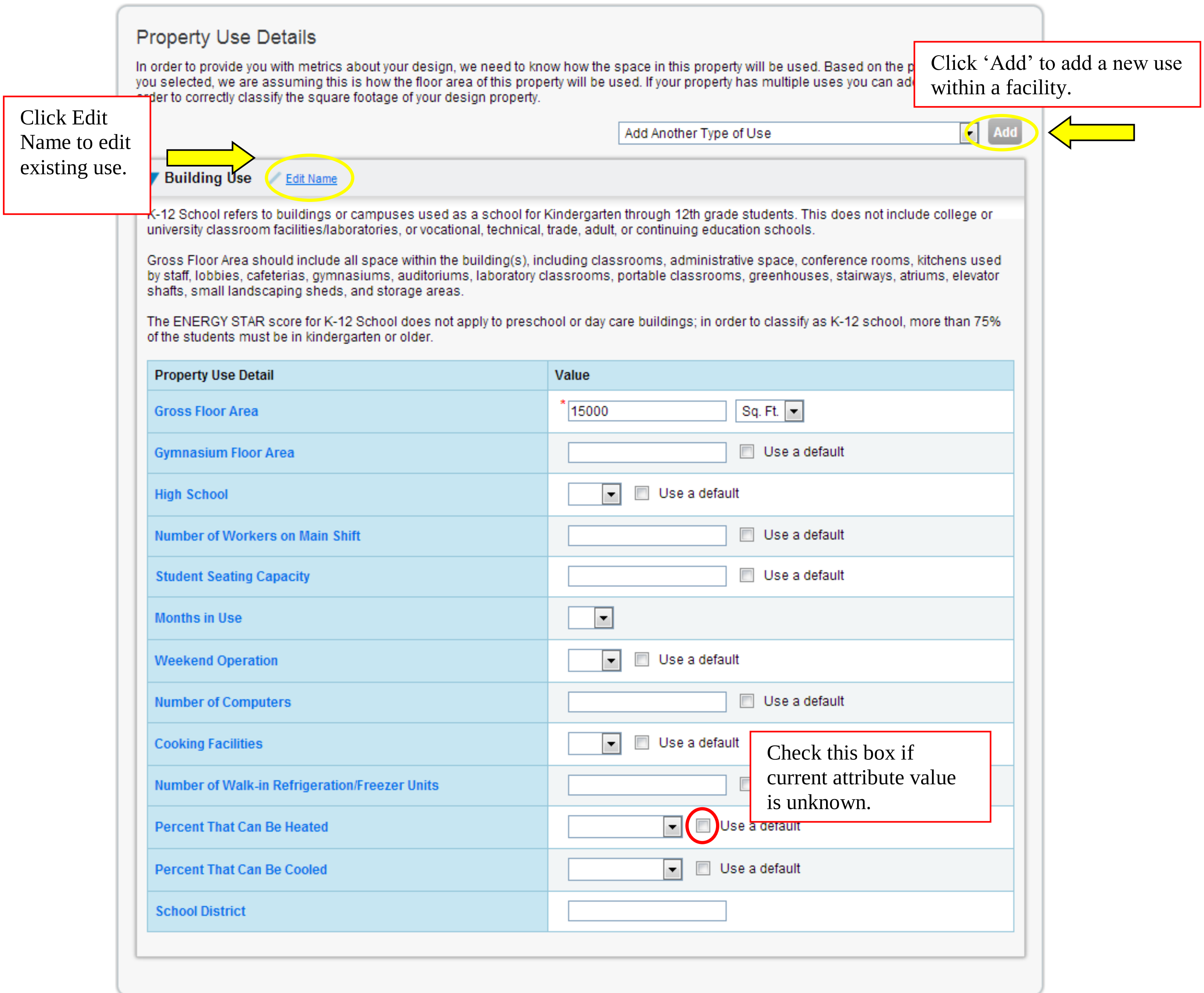


Figure 5: Property use details.

Click **ADD PROPERTY** to finish.

ADDING/EDITING ENERGY METERS

From the **My Portfolio** tab, scroll to the **My Properties** section and click on the property you want to add meters for. Click the **Meters** tab (as seen in Figure 6). To edit an existing meter, click the meter name, as shown below.

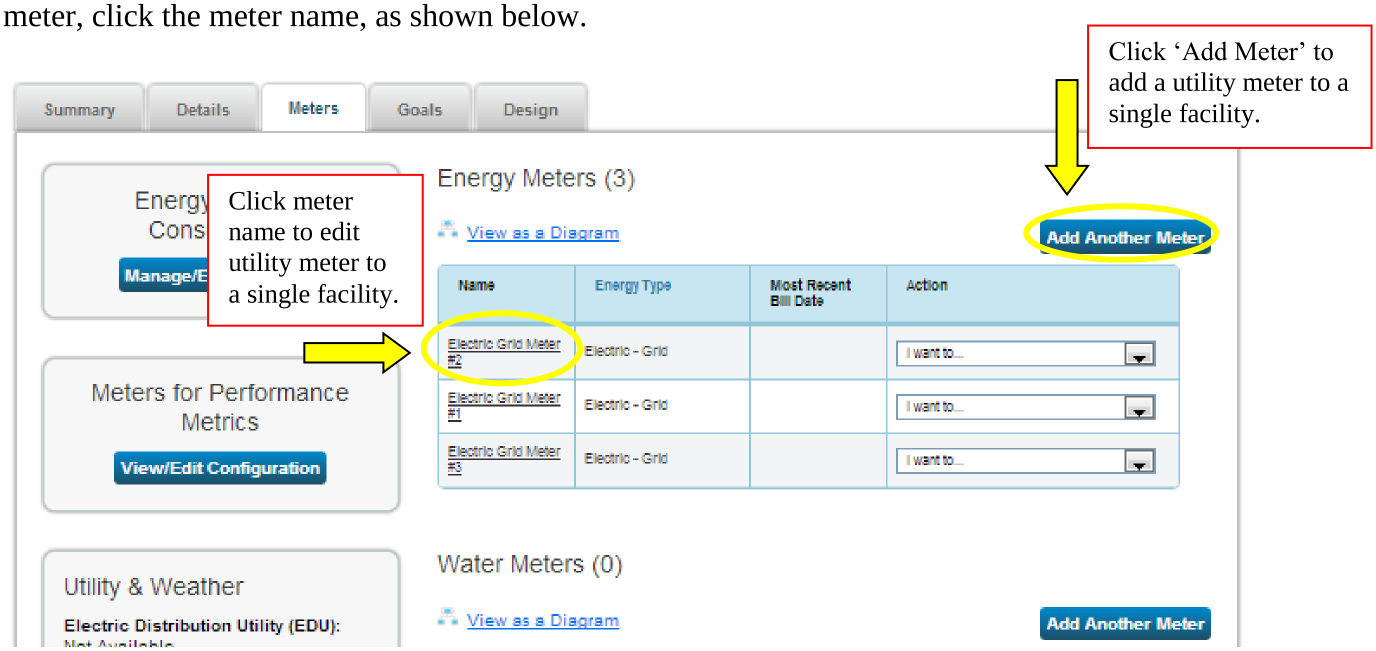


Figure 6: Adding an Energy Meter from the Meters Tab

Start setting up the meters, by choosing your energy sources and number of meters, then click on **Get Started!**

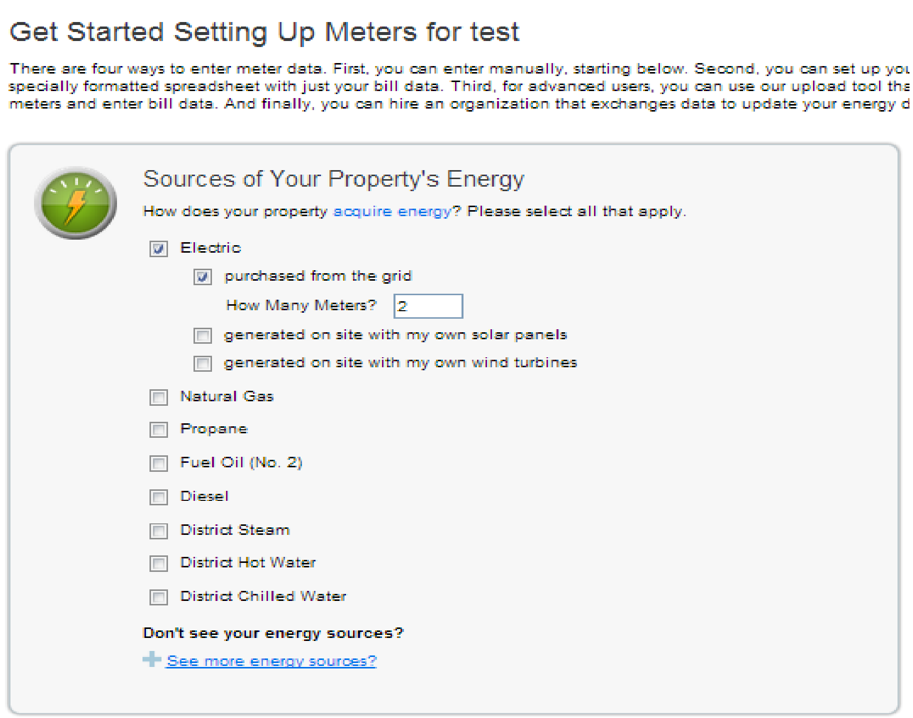


Figure 6: Select the types and numbers of meters to add.

Select the type, units, the first bill date, and put a checkmark if the meter is still in use. Click **CONTINUE** to begin adding billing info.

Figure 7: Configuring meter entries

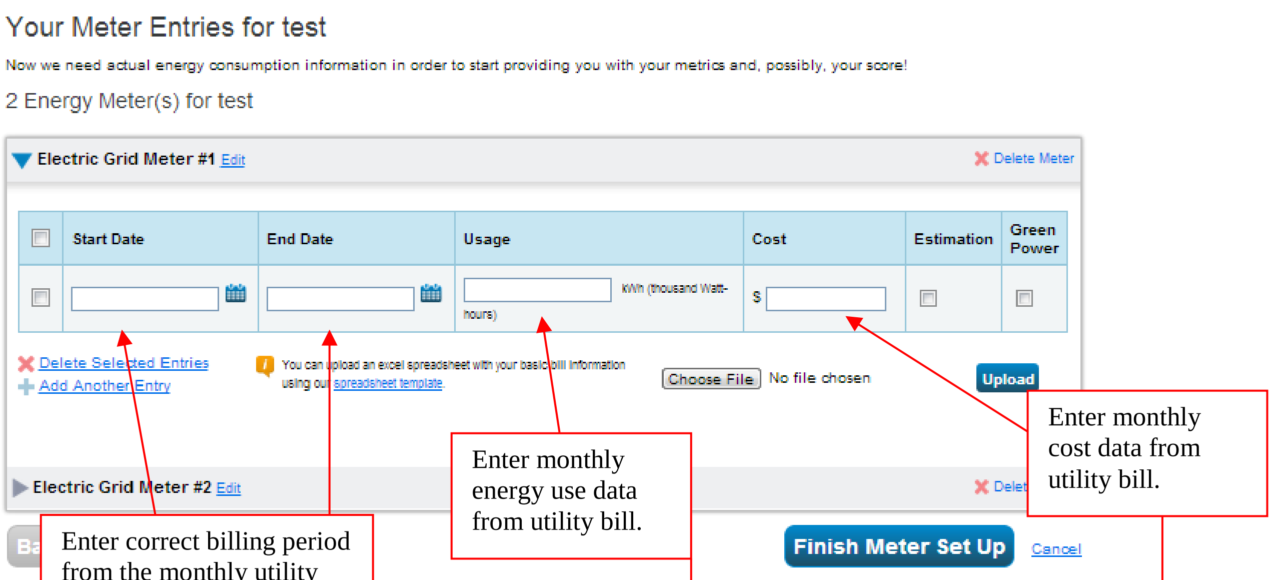


Figure 8: Entering energy data

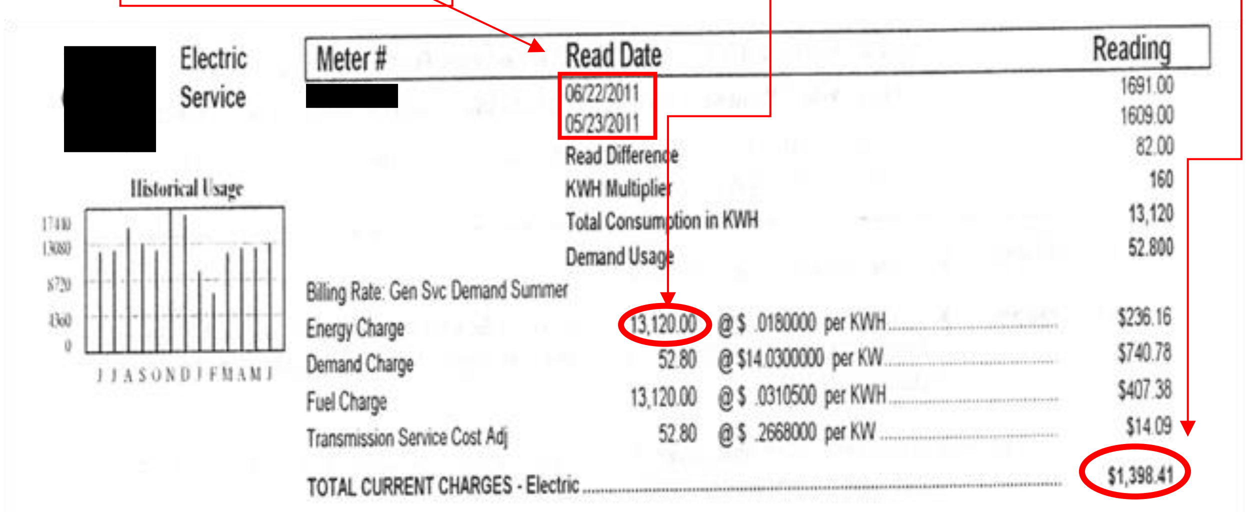


Figure 9: Sample facility utility bill

GENERATING A STATEMENT OF ENERGY PERFORMANCE

A Statement of Energy Performance (SEP) is a required document in applying for ENERGY STAR recognition. It can also be used for purposes other than applying for ENERGY STAR, such as formalizing information regarding a facility's energy performance or energy and environmental performance impacts.

On the home page, select the **MyPortfolio** tab and click on the property you want to generate a SEP for (You may already be in here). Now click on the **Goals** tab. To the left you will see a section named **Generate & Download Performance Reports for Property**.

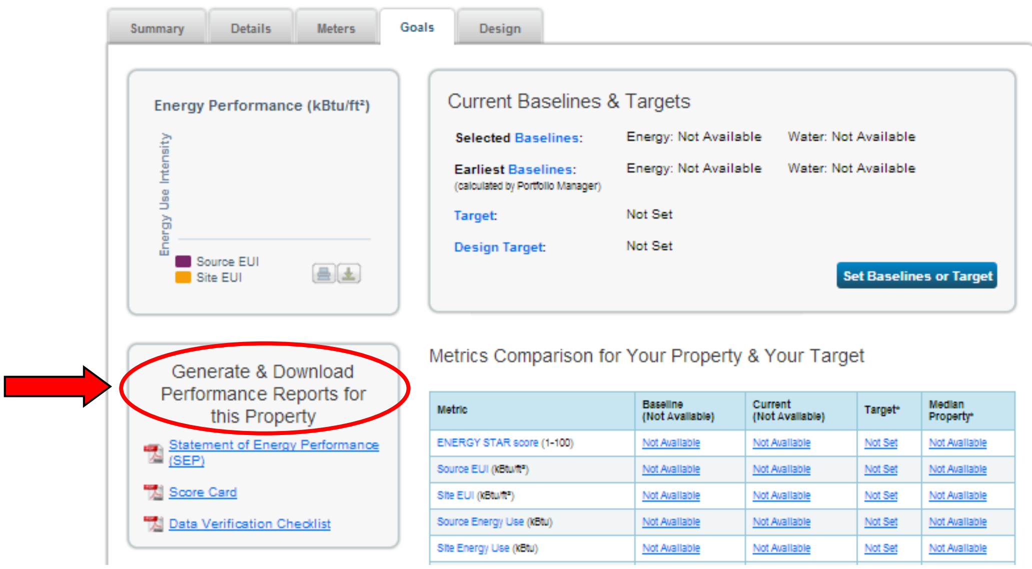


Figure 10: Generating a Statement of Energy Performance from the Facility page

Select Statement of Energy Performance (SEP). In the next page, select the reports to download, the property, the timeframe, and the contacts for the report. Click **Generate & Download Report(s)**

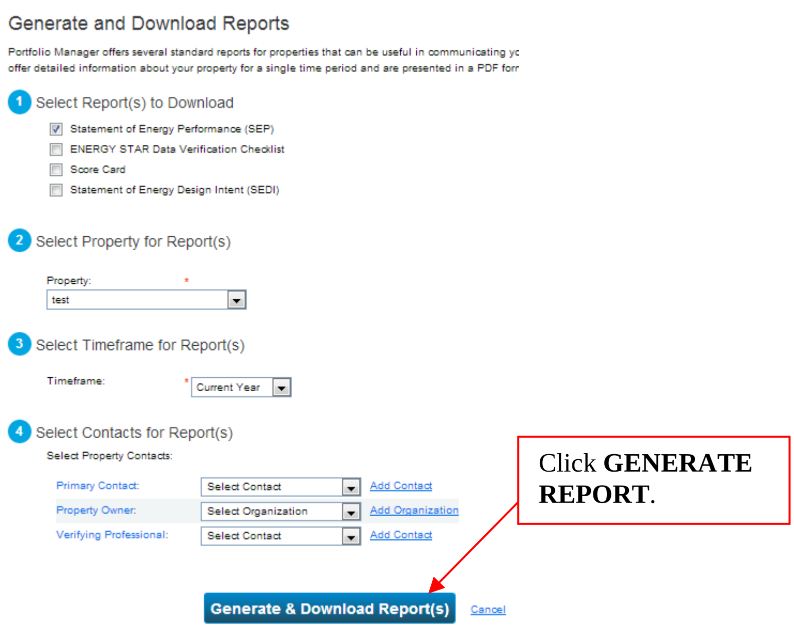


Figure 11: Setting up Statement of Energy Performance

SETTING ENERGY PERFORMANCE BASELINES AND TARGETS

An energy 'Baseline Period' for a facility is a 12-month period of complete energy data that can be compared to a facility's current energy performance or specified goal. To set a baseline period for a particular facility, click on the **Goals** Tab, scroll to the **Current Baselines & Targets** section, and click on **Set Baselines or Target**. 'Set Baseline Periods' on the main facility page (as shown below).

Figure 12: Use the goals tab to set goals and view progress from a baseline period.

In the new window, scroll to the **Baselines** section. Use the drop down menu to select an Energy Baseline Period from which to compare to current consumption and your goal metric.

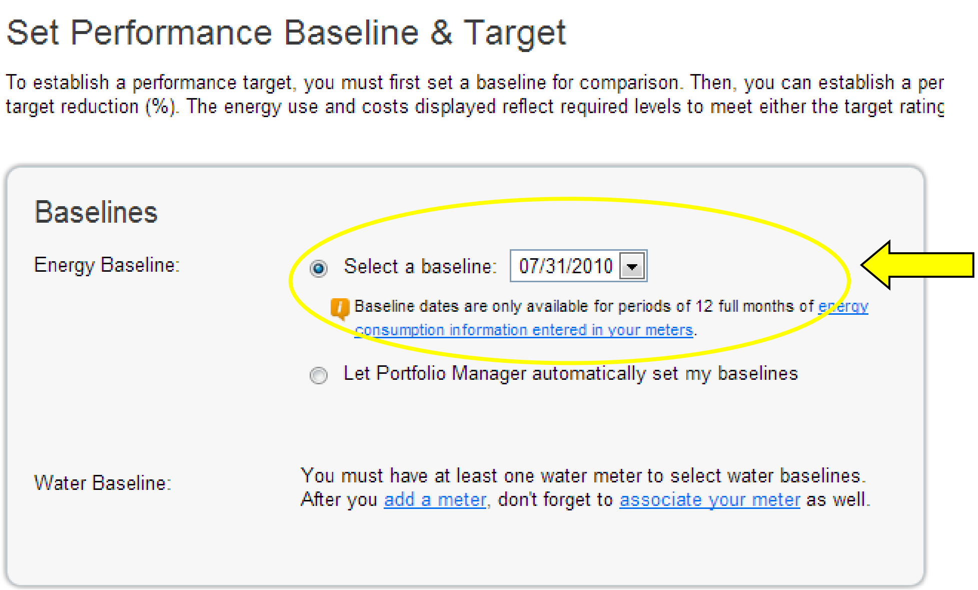
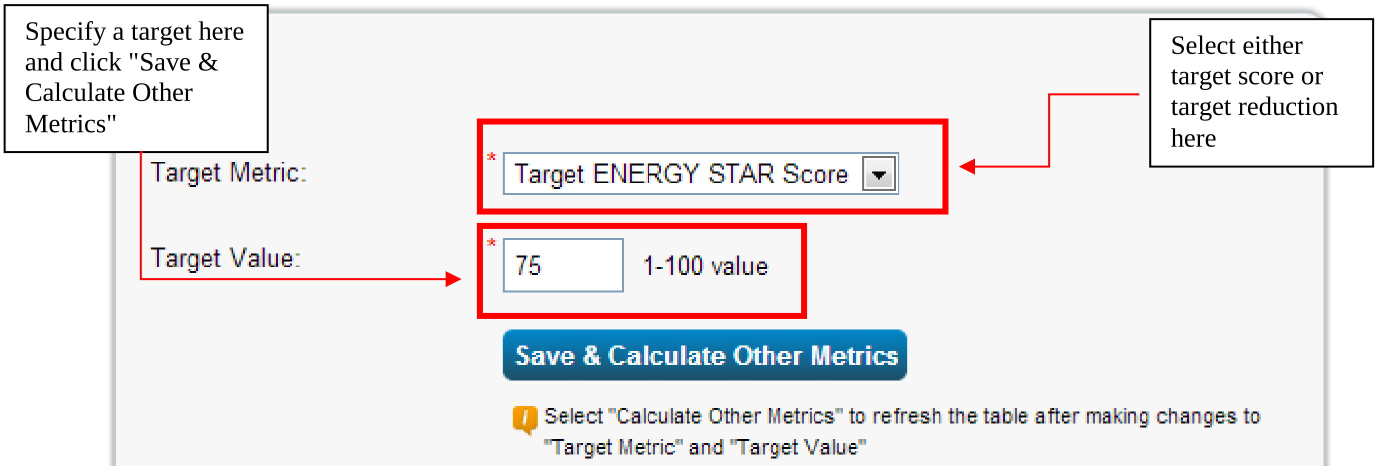


Figure 13: Setting a baseline period for a single facility from the Facility page

The user can choose one of two methods to set an energy performance target: by ENERGY STAR rating or target reduction (%). Click the desired method, and specify a desired target (as seen below). Click **Save & Calculate Other Metrics** to view the baseline, current, target, and median metrics such as EUI, energy star score, and greenhouse gas (GHG) emission statistics for your building type.



Metric	Baseline (Jul 2010)	Current (Jul 2010)	Target*	Median Property*
ENERGY STAR score (1-100)	55	55	75	50
Source EUI (kBtu/ft²)	173.6	173.6	143.2	183.1
Site EUI (kBtu/ft²)	55.3	55.3	45.6	58.3
Source Energy Use (kBtu)	34712323.8	34712323.8	28640000	36620000
Site Energy Use (kBtu)	11054880.2	11054880.2	9120000	11660000
Energy Cost ($)	323999.9905	323999.9905	267168.15656636556	341735.101979989
Total GHG Emissions (MtCO2e)	1743.1	1743.1	1437.34823261	1838.5138078

Figure 14: Setting an Energy Performance Target for a single facility

DELETING A FACILITY, SPACE, OR METER

Deleting a property from Portfolio Manager will delete *everything* associated with that particular property, including general information (address, year built, type of property), any spaces designated within the facility, and any Energy/Water meters. To delete a property, click on the property you want to delete, select the **Details** tab, and click on the **Delete this Property** button on the bottom left corner, as shown in Figure 15 below.

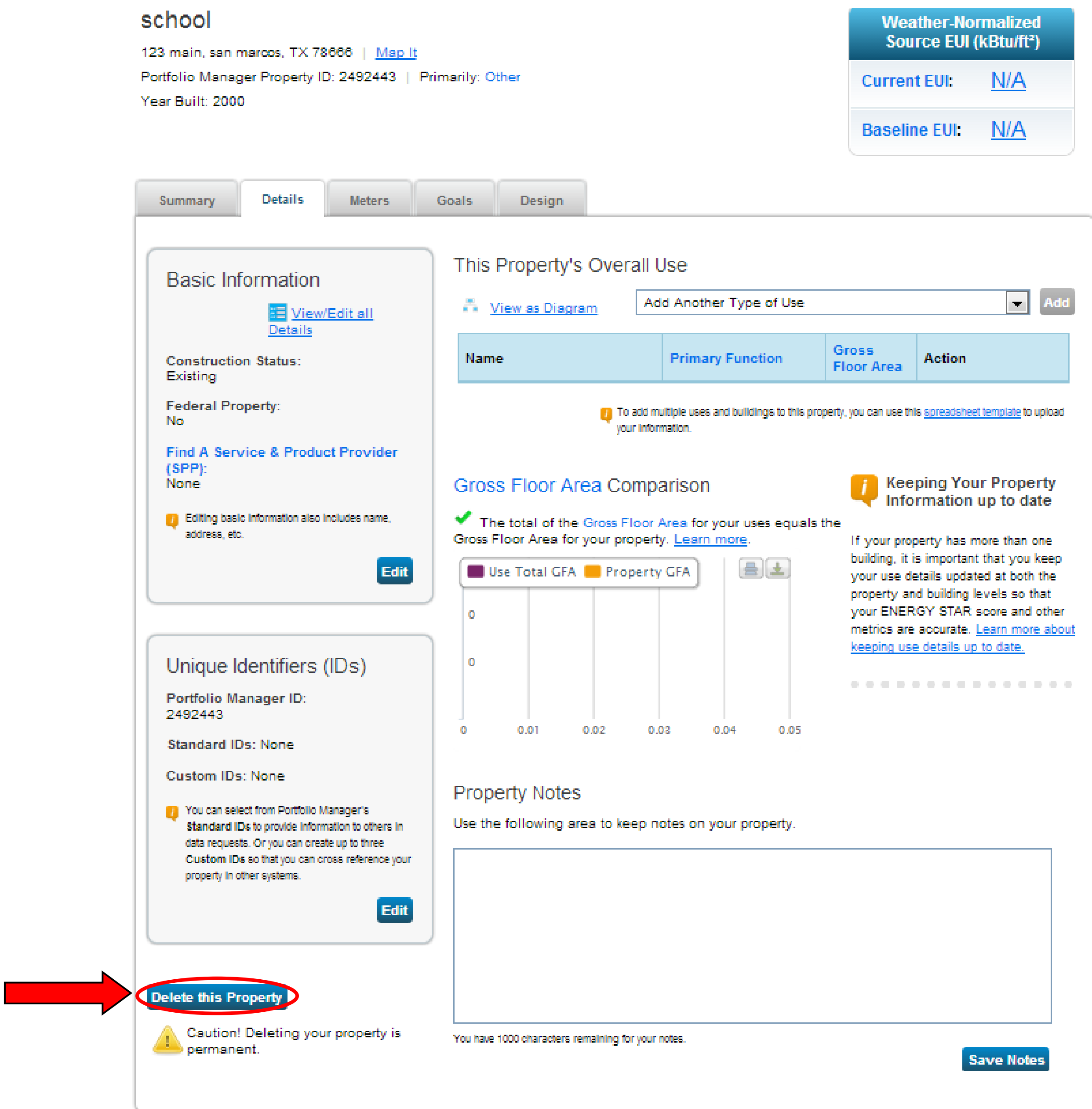


Figure 15: Deleting a facility from the Facility page

ONLINE HELP

ENERGY STAR provides a detailed ‘HELP’ section online, as seen in Figure 16.

Figure 16: ENERGY STAR Portfolio Manager Help Section

It can also be found at the following link:

https://www.energystar.gov/istar/pmpam/help/portfolio_manager_online_help.htm

The information found in this section provides a wealth of information regarding operation of Portfolio Manager, including a glossary of terms, step-by-step tutorials, instructions for applying for ENERGY STAR recognition, and managing user accounts. It also includes a ‘Search’ function, which allows the user to locate applicable Help topics.