Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Comfort ISD

327 High Street
Comfort, Texas 78013

Prepared by:

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APRIL 2010

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SECO
State Energy Conservation Office

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APPENDICES

Schools & Hospitals Energy Management Program
Comfort ISD
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Comfort, TX 78013
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1.0 EXECUTIVE SUMMARY

Comfort Independent School District, 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 Energy Management and Technical Assistance 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 saving measures, which will ultimately reduce the District's annual energy costs.

The annual cost savings, implementation cost estimate and simple payback for all building energy retrofit projects identified in this preliminary analysis are summarized below. Individual building projects are summarized in Section 7.0 of this report.

Implementation Cost Estimate:	$666,500
Annual Energy Cost Savings:	$70,300
Simple Payback:	9.5

Recommendations and information of interest to the District is provided in this report regarding Energy Consumption and Performance (Section 3.0), Energy Accounting (Section 4.0), Energy Legislation Overview (Section 5.0), Recommended Maintenance & Operation Procedures (Section 6.0), Retrofit Opportunities (Section 7.0), Capital Improvement Projects (Section 8.0), Energy Management Policy (Section 9.0), and Funding Options for Capital Energy Projects (Section 10.0). 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 / Ms. Juline Ferris	TEESI / Saleem Khan
(512) 936-9283	(512) 328-2533

2.0 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 Equipment). A description of each facility is provided below. Please reference **Appendix C-1** for building grouping.

Group 1: High School Complex

Buildings:	Main Campus, Ag. Barn, Bldg. Trades, Field House 1 & 2, and Weight Room
Stories:	Single story buildings
Area (estimated):	155,918 SF
Bldg. Components:	Ag. Barn, Bldg. Trades, Field House 1 & 2, and Weight Room – Metal building, pitched metal roof, slab on grade Main Campus – Stone building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	Combination of T12 fluorescent fixtures with magnetic ballasts and T8 fluorescent fixtures with electronic ballasts (T12 being the majority) High Intensity Discharge (HID) fixtures in gym
HVAC:	Split-DX units
Controls:	Standard thermostats with digital time clocks

Group 2: Middle School

Buildings:	Original Campus and Gym, Sands Bldg., PE Lockers, New Classroom and Gym, Fine Arts, Library, and Science
Stories:	All buildings are single story buildings except for the Technology Building, which is a two-story building
Area:	82,120 SF
Bldg. Components:	Original Campus and Gym, Technology – Stone building, flat built-up roof, slab on grade New Classroom Buildings – Stone façade building, pitched metal roof, slab on grade Fine Arts and Science – Metal building with partial stone facade, pitched metal roof, slab on grade Sands Building – Stone Brick building, pitched built-up roof, slab on grade Library – Stone and wood facade building, pitched asphalt shingle roof, slab on grade
Typical Lighting Fixtures:	Combination of T12 fluorescent fixtures with magnetic ballasts and T8 fluorescent fixtures with electronic ballasts (T12 being the majority) High Intensity Discharge (HID) fixtures in Original Gym T5 fluorescent fixture in New Middle School Gym
HVAC:	Majority of Campus buildings – Split-DX units Sands Building – Window units with Gas Space Heaters
Controls:	Standard thermostats with digital time clocks

Group 3: Elementary School

Buildings:	Wing A, C, D, E, Cafeteria and Gym
Stories:	Single story buildings
Area:	91,000 SF
Bldg. Components:	Wing A – Brick building, flat built-up roof, slab on grade Wing C, D, and Cafeteria – Concrete masonry unit (CMU) building, pitched metal roof, slab on grade Wing E – Brick building, pitched metal roof, slab on grade Gym – Metal building, pitched metal roof, slab on grade
Typical Lighting Fixtures:	Combination of T12 fluorescent fixtures with magnetic ballasts and T8 fluorescent fixtures with electronic ballasts (T12 being the majority) Gym – High Intensity Discharge (HID) fixtures
HVAC:	Split-DX systems and packaged units
Controls:	Standard thermostats with digital time clocks

Group 4: Administration Building

Stories:	Single story building
Area:	3,444 SF
Bldg. Components:	Pitched metal roof, exterior siding, pier and beam
Typical Lighting Fixtures:	T12 fluorescent fixtures with magnetic ballasts
HVAC:	Split-DX systems
Controls:	Standard thermostats

Group 5: Maintenance/Bus

Stories:	Single story buildings
Area:	8,625 SF
Bldg. Components:	Pitched metal roof, metal exterior, slab on grade
Typical Lighting Fixtures:	T12 fluorescent fixtures with magnetic ballasts
HVAC:	Window units
Controls:	Standard thermostats

3.0 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 341,107 square feet.

Annual electric and natural gas invoices for the buildings surveyed were $316,948 for the 12-month period ending March 2010. A summary of annual utility costs is provided in **Appendix C**, 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 as thousand BTU's per square foot per year (kBTU/SF/Year). Similarly, ECI is measured as cost per square foot per year ($/SF/Year). The EUI and ECI performance for selected facilities are listed below:

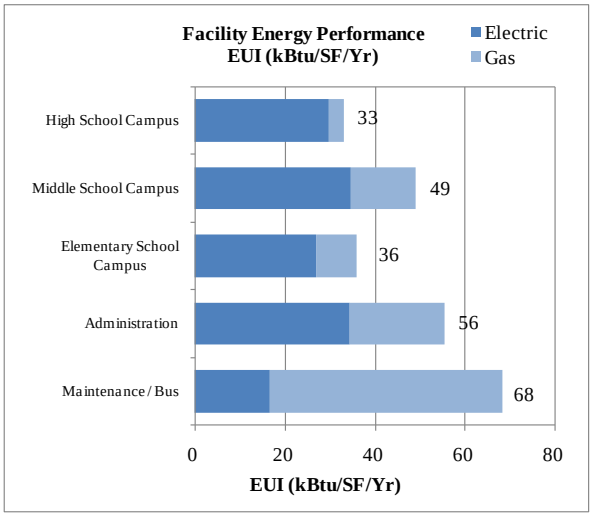
Energy Cost and Consumption Benchmarks

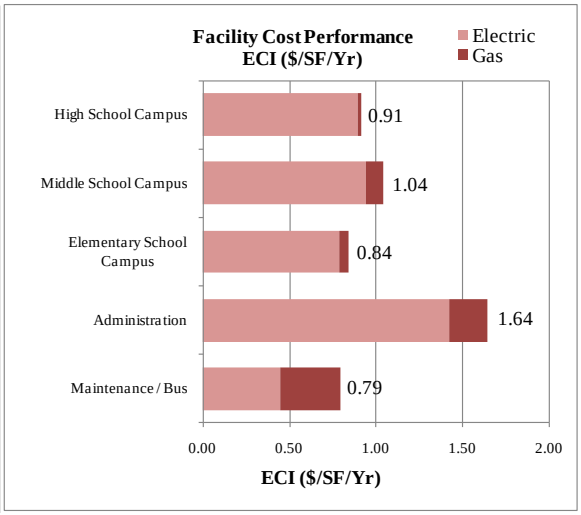
		Electric			Natural Gas			Total	Total	EUI	ECI	
	Building	KWH/Yr	MMBTU/Yr	$Cost/Yr	MCF/Yr	MMBTU/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF*
1	High School Campus	1,365,073	4,659	138,844	507	522	3,744	142,588	5,181	33	0.91	155,918
2	Middle School Campus	836,520	2,855	77,409	1,149	1,183	7,875	85,285	4,038	49	1.04	82,120
3	Elementary School Campus	717,360	2,448	71,438	799	823	5,158	76,596	3,272	36	0.84	91,000
4	Administration	34,809	119	4,899	71	73	743	5,642	192	56	1.64	3,444
5	Maintenance / Bus	42,283	144	3,867	432	445	2,970	6,837	589	68	0.79	8,625
		KWH/Yr	MMBTU/Yr	$Cost/Yr	MCF/Yr	MMBTU/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF
		2,996,045	10,226	296,457	2,957	3,046	20,490	316,948	13,271	39	0.93	341,107

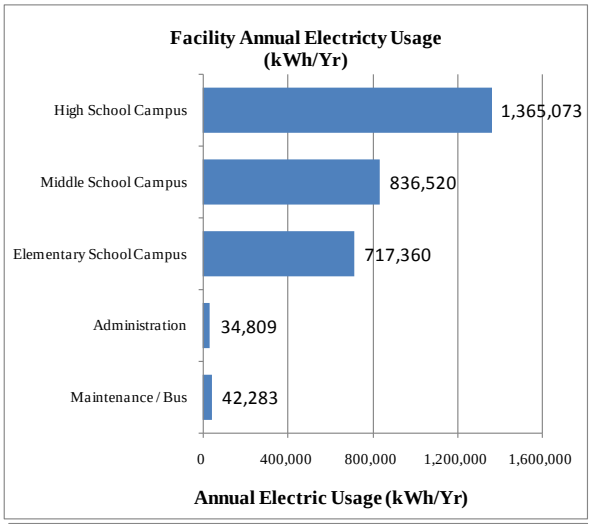
* Facility Square footages are based on estimates.

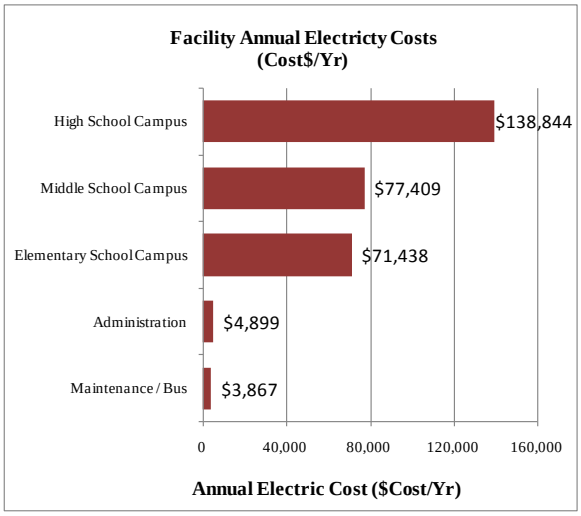
Knowing the EUI and ECI of each facility is useful to help determine the District's overall energy performance. In addition, the District's EUI was compared to TEESI's database of Texas schools. See **Appendix D** to determine how these facilities' EUI compared to other schools in Texas.

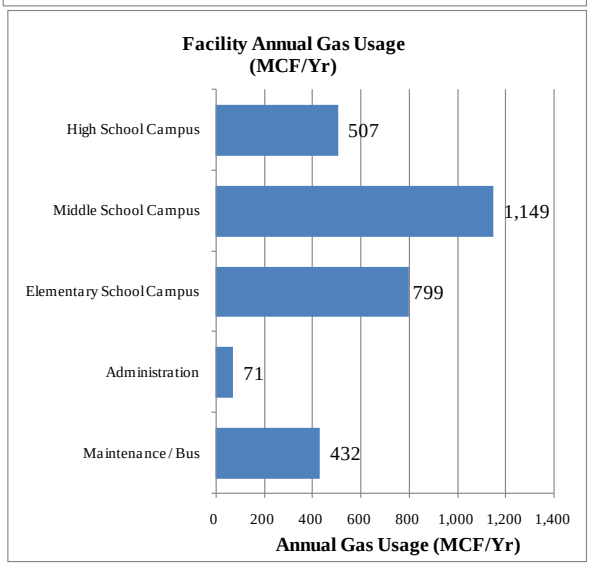
The following charts summarize the data presented in the previous table. See **Appendix C** for further detail.

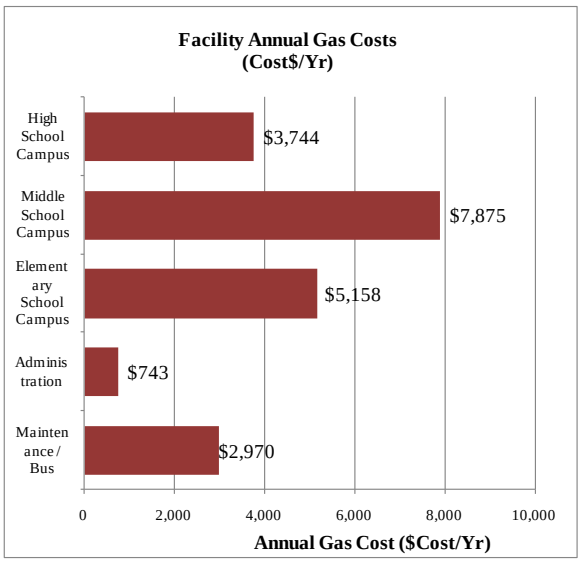




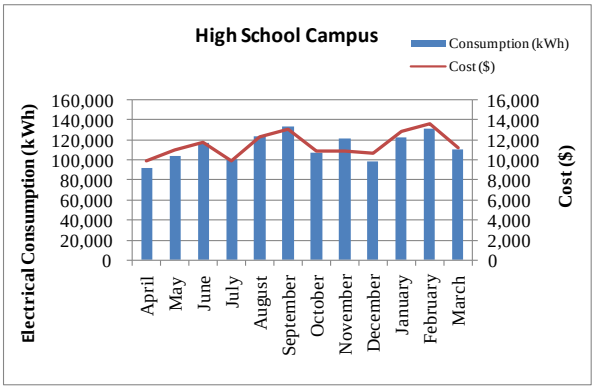


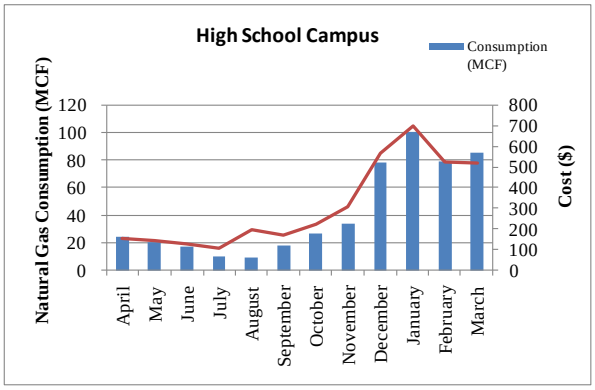


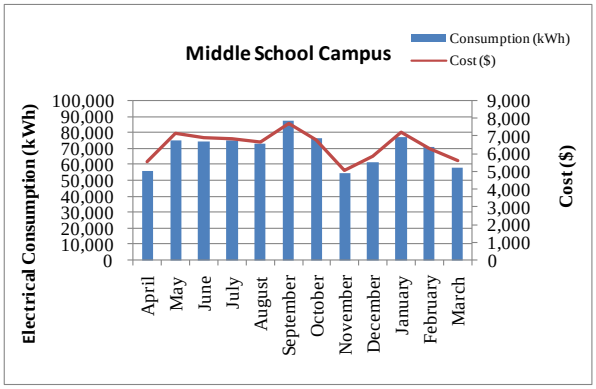


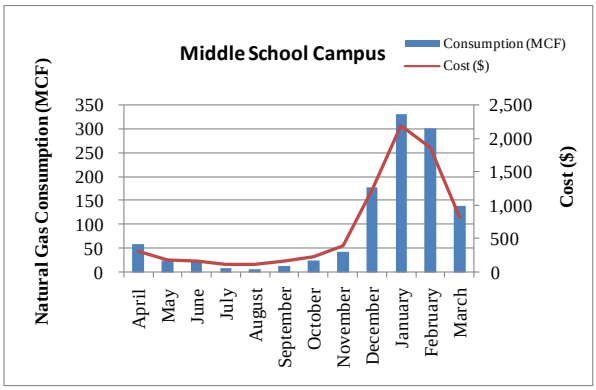


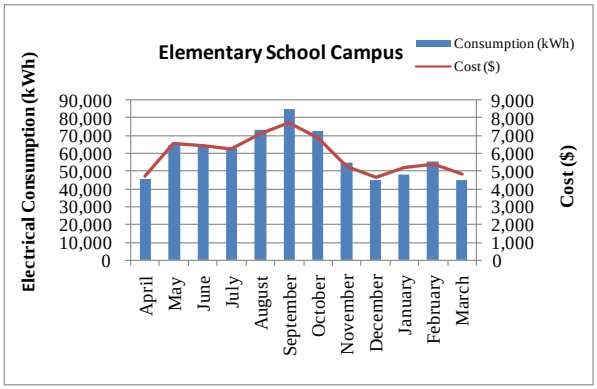
The following charts summarize the each campus monthly utility data. See **Appendix C** for further detail.

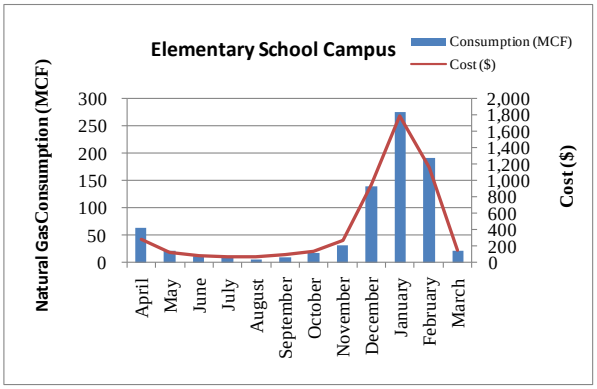


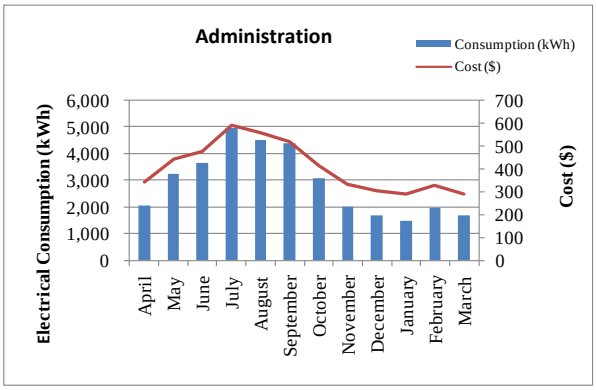


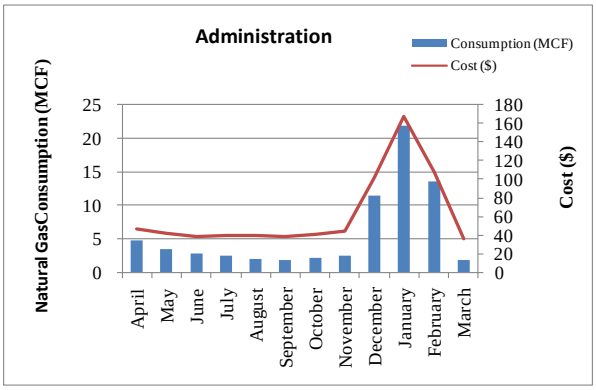












4.0 ENERGY ACCOUNTING

UTILITY PROVIDERS

The Bandera Electric and Central Texas Electric Coop (CTEC) provide electric service to the District. Atmos Energy provides natural gas service to the District.

MONITORING AND TRACKING

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.

The District should consider consolidating the tracking and recording of all the Districts utility accounts (i.e., Electricity, Natural Gas, Propane, Water, etc.) into an electronic spreadsheet similar to the chart shown on the following page. Along with total utility costs ($), utility consumption should be recorded as well (i.e., kWh, MCF, gallons, etc.). The District can use this data to track utility consumption patterns and budget utility expenses. 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 **House** and **Senate Bill(s)** reporting requirements. Please see Section 5.0 for additional information regarding these requirements.

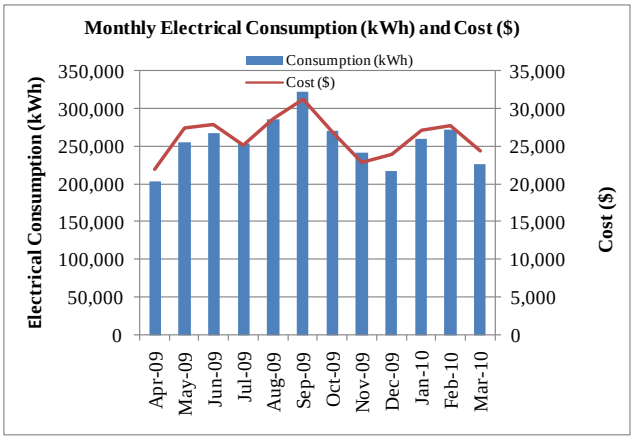
Furthermore, below is a sample format the District can customize to help summarize their overall utility usage and costs.

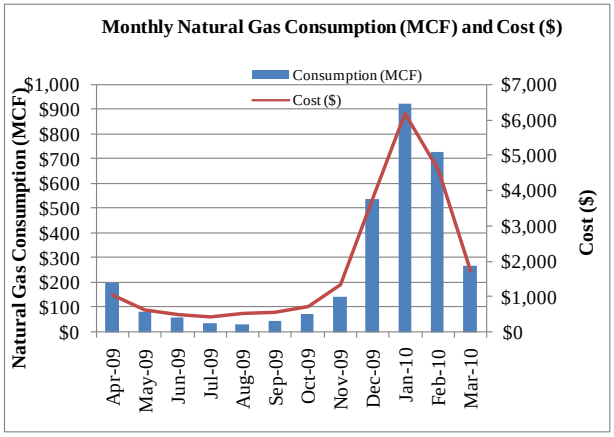
The data presented below is a summation of the data provided by the District. This data below includes only selected utility accounts and is for reference purposes only and does not represent the District's total utility data. See **Appendix C** for further detail regarding each utility account represented in the table below.

Comfort ISD - Sample Utility Input Form

MONTH	ELECTRICITY			NATURAL GAS		
	KWH	COST $	Avg. Rate $/KWH	MCF	COST $	Avg. Rate $/MCF
Apr-09	203,842	21,894	$0.1074	$200	$1,044	$5.2
May-09	256,218	27,341	$0.1067	$84	$604	$7.2
Jun-09	267,787	27,777	$0.1037	$62	$502	$8.1
Jul-09	254,108	25,111	$0.0988	$35	$422	$12.1
Aug-09	286,626	28,671	$0.1000	$31	$525	$16.9
Sep-09	322,141	31,212	$0.0969	$48	$550	$11.5
Oct-09	270,536	26,871	$0.0993	$76	$724	$9.5
Nov-09	241,733	22,830	$0.0944	$145	$1,321	$9.1
Dec-09	217,427	23,907	$0.1100	$537	$3,754	$7.0
Jan-10	260,646	27,076	$0.1039	$924	$6,171	$6.7
Feb-10	272,346	27,774	$0.1020	$729	$4,594	$6.3
Mar-10	226,589	24,381	$0.1076	$271	$1,713	$6.3
Total	3,079,999	$314,846	$0.1022	3,142	$21,923	$7.0

Gross Building Area:	341,107	SF





5.0 ENERGY LEGISLATION OVERVIEW

In 2001, the 77th Texas Legislature passed Senate Bill 5 (SB5), also known as the Texas Emissions Reduction Plan, to amend the Texas Health and Safety Code. The legislation required ambitious, fundamental changes in energy use to help the state comply with the federal Clean Air Act standards. It applied to all political subdivisions within 38 designated counties, later expanded to 41 counties.

In 2007, the 80th Texas Legislature passed Senate Bill 12 (**SB12**) which among other things extended the timeline set in SB5 for emission reductions. In the same period, the 80th Texas Legislature passed House Bill 3693 (**HB3693**) which amended 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 SB12 and HB3693 applicable to schools still apply.

Following are key requirements established by the above energy legislation:

Per SB300 a district should establish a Long-Range Energy Plan 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. To help with the utility reporting process a sample input form can be found in **Appendix B** of this report.

Energy-efficient light bulbs for buildings, requires an institution to purchase commercially available light bulbs using the lowest wattages for the required illumination levels.

Installation of energy saving devices in Vending Machines with non-perishable food products. **Not required by School Districts but highly recommended.**

A summary description of SB12, HB3693, and SB300 are available in **Appendix A.**

6.0 RECOMMENDED MAINTENANCE & OPERATION PROCEDURES

Sound Maintenance and Operation procedures significantly improve annual utility costs, 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 operations procedures that have energy savings benefits. Please note that some of the recommendations noted below are currently being practiced by the District. With this in mind, the following maintenance and operation procedures should be encouraged/continued to ensure sustainable energy savings.

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.

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 small space heaters should be discouraged; hence, 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.

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.

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 particular motor types that are in service at several locations.

IMPROVE CONTROL OF INTERIOR & 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.

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, fans, and electric motors, are provided in **Appendix E**. 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, 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 COMPACT FLUORESCENTS

Replace existing incandescent lamps with compact fluorescent lamps as they burn out. Compact fluorescents use 50 to 75 percent less wattage for the same light output, with ten times the operating life of incandescents.

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. The estimated annual savings can range from $25 to $75 per computer. 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.

INSTALL ENERGY SAVING DEVICES ON VENDING MACHINE

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 typical 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 shutdown 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 AND PACKAGED ROOFTOP UNITS

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. It is recommended if any existing unit(s) have damaged condensing coil fins the condensing fins should be straightened using a fin comb.

7.0 RETROFIT OPPORTUNITIES

Energy retrofit projects identified during the preliminary analysis are detailed below. Project cost estimates include complete design and construction management services.

T12 TO T8 FLUORESCENT LIGHTING RETROFIT

The District has a combination of T8 and T12 Fluorescent fixtures. It is recommended the District replace the existing T12 fluorescent lamps and magnetic ballasts with high efficiency T-8 fluorescent lamps and electronic ballasts. Typical four-foot, two-lamp magnetic ballast fixtures require 80 watts, while electronic ballasts and T-8 lamps in the same fixture configuration require only 50 watts. The table below indicates the facilities where T-12 fluorescent lamps were observed during the preliminary walkthrough. The cost and savings noted below are based on preliminary observations of the facilities. Exact cost, quantities, and lamp types can be identified through a detailed energy audit. In addition, a detailed lighting design calculation will help ensure the appropriate lighting replacement is selected. For example, a detailed design calculation may identify areas that could operate with fewer lamps per fixtures or with low-wattage T8 lamps while still maintaining adequate lighting levels.

T12 TO T8 FLUORESCENT LIGHTING RETROFIT			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
High School Campus	$79,100	$15,200	5.2
Middle School Campus	$32,000	$5,800	5.5
Elementary School Campus	$44,400	$6,800	6.5
Administration	$2,200	$500	4.4
Maintenance / Bus	$4,200	$900	4.7
TOTAL	**$161,900**	**$29,200**	**5.5**

REPLACE EXISTING T8 FLUORESCENT LAMPS WITH LOWER WATTAGE LAMPS

Low-wattage T8 fluorescent lamps are available in 30, 28 and 25-watt versions. It is recommended replacing existing 32-watt T8 Fluorescent lamps with lower wattage lamps (where applicable). Changing to a lower wattage T8 Lamp is a relatively straightforward process however, lower wattage T8 lamps do have limitations and are only suitable for certain applications. Lower wattage T8 lamps have reduced lighting levels therefore, it is important to ensure recommended lighting levels are maintained. Lighting levels should be verified prior to and after lamp replacement. In addition, compatibility with existing ballasts, local codes and other requirements must be verified prior to retrofitting. Nevertheless, if suitable for the application, switching to lower wattage T8 lamps will have sustainable energy savings with minimal impact. For example, replacing a 32-watt T8 lamp with a 28-watt T8 lamp will approximately have a 12% lighting energy reduction with only a lighting level drop near 4%.

The estimated costs and savings noted below are based on replacement of existing 32-watt T8 lamps and does not account for ballast replacements (if existing are incompatible) or reduced lamps (if existing lighting levels are above recommended levels). 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.

T8 LAMPS TO LOW-WATTAGE T8 LAMPS			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
High School Gym	$7,000	$2,000	3.5
Middle School Orignial Gym	$7,200	$2,100	3.4
Elementary School Campus	$4,600	$1,200	3.8
TOTAL	**$18,800**	**$5,300**	**3.5**

GYMNASIUM HID TO FLUORESCENT FIXTURE LIGHTING RETROFIT

The High School Gym and the Middle School's "original" Gym utilize High Intensity Discharge (HID) fixtures to light the Gym. It is recommended that the District replace the existing HID fixtures with fluorescent fixtures suitable for gym applications. Fluorescent fixtures offer improved control, reduce energy consumption and improve lighting levels. In addition, due to the long re-strike times associated with HID fixtures, they cannot be effectively switched on/off during unoccupied periods. This causes the HID lamps to operate longer, which both consumes more energy and affects lamp life. The cost and savings estimates below are based on preliminary observations and analysis.

GYM LIGHTING RETROFIT - HID TO FLUORESCENT FIXTURES			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
High School Gym	$10,500	$2,100	5.0
Middle School Orignial Gym	$7,000	$1,200	5.8
TOTAL	**$17,500**	**$3,300**	**5.3**

INSTALLATION OF OCCUPANCY SENSORS FOR INDOOR LIGHTING CONTROL

It is recommended the District consider installing occupancy sensors to improve control of interior lighting. Occupancy sensors will help ensure lights are only on when the space is occupied. The following table below provides an estimated cost and energy savings for the installation of these types of sensors. Please note this estimation is based on a preliminary assessment exact sensor location, technology (Infrared, Ultrasonic, and Dual Technology) and quantity can be determined during a detailed energy assessment or design phase. In general, enclosed areas with intermittent use, are typically good candidates for occupancy sensors (i.e. hallways, specific classrooms, administration office, break rooms, etc.).

MOTION SENSOR INSTALLATION			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
High School Campus	$14,000	$2,000	7.0
Middle School Campus	$12,100	$1,800	6.7
Elementary School Campus	$18,200	$2,600	7.0
TOTAL	**$44,300**	**$6,400**	**6.9**

REPLACE HVAC SYSTEMS

Replace existing HVAC units with new high efficiency units at the facilities indicated in the table below. The existing systems are inefficient and are beyond their useful life. Units to be replaced at the Middle School consist of 12 Split-DX systems totaling approximately 50 tons (average age is 18 years). Units to be replaced at the Elementary School consist of 23 Split-DX systems totaling approximately 100 tons (average age is 19 years). The table below summarizes the estimated cost and savings for replacing the units indentified in each school.

HVAC REPLACEMENT			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
Middle School Campus	$78,400	$4,300	18.2
Elementary School Campus	$148,800	$6,500	22.9
TOTAL	**$227,200**	**$10,800**	**21.0**

INSTALL ENERGY MANAGEMENT SYSTEM (EMS)

Install Direct Digital Control (DDC) Energy Management System (EMS) to provide optimum scheduling and precise temperature supervision for the HVAC systems throughout each facility. The EMS will minimize the run time of the units while maintaining comfort throughout the facility. Additionally, EMS can remotely diagnose and document HVAC maintenance problems. Presently the District's HVAC systems are controlled using standard thermostats with digital time-clocks, installing an EMS will improve control and performance. The EMS systems proposed in the estimation below will have basic functions such as remote access capabilities, multiple scheduling, space temperature reset, optimum start/stop features. The table below summarizes the estimated cost and saving for these projects.

EMS INSTALLATION			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
High School Campus	$107,000	$8,900	12.0
Middle School Campus	$89,800	$6,400	14.0
TOTAL	**$196,800**	**$15,300**	**12.9**

The following table summarizes the implementation costs, annual savings and simple payback for the above projects:

SUMMARY OF ENERGY COST REDUCTION MEASURES			
Building	**Estimated Implementation Cost**	**Estimated Annual Savings ($/yr)**	**Simple Payback (years)**
T12 TO T8 FLUORESCENT LIGHTING RETROFIT	$161,900	$29,200	5.5
T8 LAMPS TO LOW-WATTAGE T8 LAMPS	$18,800	$5,300	3.5
GYM LIGHTING RETROFIT - HID TO FLUORESCENT FIXTURES	$17,500	$3,300	5.3
MOTION SENSOR INSTALLATION	$44,300	$6,400	6.9
HVAC REPLACEMENT	$227,200	$10,800	21.0
EMS INSTALLATION	$196,800	$15,300	12.9
TOTAL:	**$666,500**	**$70,300**	**9.5**

The above projects implementation costs and annual savings are estimated based on a preliminary examination of the facilities. Furthermore, maintenance cost savings are not included in this preliminary energy assessment. Final costs will be determined from detailed building assessments, engineering calculations, and contractor estimates

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.

8.0 CAPITAL IMPROVEMENT PROJECTS

This section is intended to describe the capital improvement projects that have energy savings opportunities but cannot be justified solely based on the potential energy savings alone. The following are the capital improvement projects recommended for the District.

REPLACE SINGLE PANE WINDOWS WITH NEW ENERGY EFFICIENT WINDOWS

Replace existing single pane windows enclosing the Middle Schools "Original" Gym with new energy efficient windows. The existing single pane windows are energy inefficient and are susceptible to unnecessary air infiltration due to degradation of the weather seals. Replacing these windows with new energy efficient windows will help improve the building envelope's thermal performance, reduce sound transmission and enhance occupant comfort. The new energy efficient windows shall meet ENERGY STAR qualifications.

CAPITAL RETROFIT - WINDOW REPLACEMENT	
Project Description	**Estimated Implementation Cost**
Middle School Orignial Gym	$26,000
TOTAL	**$26,000**

REPLACE HVAC SYSTEMS NEARING END OF USEFUL LIFE

The High Schools have several Split-DX air-conditioning units nearing the end of their useful life. The average age of these systems are thirteen (13) years. The District should budget and plan to replace these units in the next two (2) to four (4) years. Replace these systems with new high efficiency units will have energy savings and help reduce maintenance costs. The HVAC systems nearing the end of their useful life consist of 26 Split-DX systems totaling approximately 170 tons. The table below summarizes the estimated cost for replacing the units indentified at the High School.

CAPITAL RETROFIT - HVAC REPLACEMENT	
Project Description	**Estimated Implementation Cost**
High School Gym	$310,000
TOTAL	**$310,000**

INSTALL ENERGY MANAGEMENT SYSTEM (EMS)

Install Direct Digital Control (DDC) Energy Management System (EMS) to provide optimum scheduling and precise temperature supervision for the HVAC systems at the Elementary School Campus. The EMS can remotely diagnose and document HVAC maintenance problems. Presently the Elementary School's HVAC systems are controlled using standard thermostats with digital time-clocks, installing an EMS will improve control and performance. The EMS system proposed in the estimation below will have basic functions such as remote access capabilities, multiple scheduling, space temperature reset, optimum start/stop features. The table below summarizes estimated cost.

CAPITAL RETROFIT - EMS INSTALLATION	
Project Description	**Estimated Implementation Cost**
Elementary School Campus	$133,800
TOTAL	**$133,800**

9.0 ENERGY MANAGEMENT POLICY

By requesting this study, the District has demonstrated interest in taking a more aggressive approach to energy management. In order to establish an effective Energy Management Program it should have support from top management. An Energy Management Policy adopted by the school board sends a strong signal that energy management is an institutional priority. A formal Energy Management Policy can be as simple as a two-page document that clearly states the District's energy management objectives. The policy should cover items such as:

- who is accountable for energy management
- what your energy savings targets are
- how you will monitor, review and report on progress
- staffing and training to support the policy
- criteria for energy management investment
- working energy efficiency into new capital investments

Along with a clear energy **policy** an energy management **plan** should be developed to ensure sustained energy savings. The energy management plan is a document that details roles, responsibilities, and objectives. Following are key items that should be included in an energy management plan:

1. ESTABLISH ROUTINE ENERGY TRACKING AND REPORTING PROCEDURES Establishing a procedure to monitor energy usage and cost will help identify energy use patterns. The data will also help determine the effectiveness of the Energy Management Program.

2. ESTABLISH AN ENERGY MANAGEMENT STEERING COMMITTEE The Energy Management Steering Committee will include representatives from a cross section of the District. The steering committee will serve as a review board to evaluate all energy management recommendations before adoption and implementation. The steering committee will meet **quarterly or semiannually** to review the District's energy cost and consumption. Regular meetings will ensure the Districts goals are being met prior to the end of the year.

3. PROMOTE ENERGY AWARENESS The energy management steering committee members shall establish a program to publicize the District's energy goals and progress on a **quarterly or semiannually** basis. For example, student drawn posters of the District's energy savings can be placed in hallways. This will encourage student involvement and act as an educational tool. Continuous promotion of the District's goals will ensure the sustainability of the energy management program and help achieve further energy savings.

4. ESTABLISH ACCEPTABLE EQUIPMENT PARAMETERS Establish a District-wide uniform temperature set point for all HVAC units. Having a standard setpoint will help keep HVAC runtimes to a minimum. The following are some suggested temperature settings, however, the district will need to monitor and ensure that other building parameters (humidity levels etc.) are within acceptable limits. Also, areas with special equipment (MDF/IDF, server rooms, etc.) or materials (wood flooring, paper storage, etc.) shall be maintained at the equipment supplier's recommended settings and settings appropriate to the material.

Occupied Cooling Temperature Setpoints:

Instructional Areas	73 F – 76 F
Admin Areas	72 F – 74 F

Unoccupied Cooling Temperature Setpoints:

Instructional Areas	85 F
Admin Areas	85 F

Occupied Heating Temperature Setpoints:

Instructional Areas	67 F – 69 F
Admin Areas	67 F – 69 F

Unoccupied Heating Temperature Setpoints:

Instructional Areas	55 F
Admin Areas	55 F

5. STAFF INCENTIVES AND RECOGNITION PROGRAM Establishing a student, staff, and campus incentive and recognition program would help promote and encourage support from staff and custodial members. The District may consider implementing a staff incentive and recognition program. Following are some program examples.

- ❖ The energy accounting system can be used to monitor cost savings and compare it to the base year consumption. An energy incentive plan consisting of a 50-50 sharing with the school campus and the Energy Management Program could be employed. The school would get 50% of the savings resulting from energy cost reduction. The school would be free to use the money for educational programs such as materials, supplies, etc. The other 50% would be used for continuing energy management efforts. The following is an example of the Building savings summary report.

EXAMPLE:

High School - Annual Total Electric Cost

Baseline (2006 - 07)	Current (2007 - 08)	Savings	50% Savings
$248,483	$240,483	$8,000	$4,000

In this example, the High School saved $8,000 where 50% ($4,000) will be assigned to the school. This money would be paid in October of the following fiscal year.

- ❖ An energy flag program should be implemented. There would be three energy flags, one flag per each grade level. An energy flag would be awarded to the schools exhibiting the greatest percentage reduction in energy costs. Energy flags would be awarded on a rotating basis each summer. In order to provide motivation, maintain enthusiasm, and recognize individuals doing their part to save the District taxpayers money through the Energy Management Program, the local media (including district newsletters) should be informed of the energy flag results. The energy flags would be awarded in January and August of each year based on the energy consumption of the previous four months.

- ❖ The successes of the program should also be communicated to the public through the media to show what the District is doing to reduce costs to taxpayers.

6. NEW BUILDING AND CONSTRUCTION Ensure proper maintenance and operation of energy using equipment in new buildings by required adequate documentation of all systems and control strategies, specifying minimum content of M&O manuals; specifying contractor requirements for cleaning and adjusting equipment prior to occupancy; specifying on-site vendor training for M&O staff; and requiring as-built drawings.

7. ESTABLISH A WATER MANAGEMENT PROGRAM Along with saving energy the District should establish a program to reduce water consumption. The following conservation measures should be employed.

   a. Investigate the use of water conserving faucets, showerheads, and toilets in all new and existing facilities.
   b. 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.
   c. Employ Xeriscaping, using native plants that are well suited to the local climate, that are drought-tolerant and do not require supplemental irrigation.
   d. Utilize drip irrigation systems for watering plants in beds and gardens.
   e. Install controls to prevent irrigation when the soil is wet from rainfall.
   f. Establish a routine check of water consuming equipment for leaks and repair equipment immediately.

10.0 FUNDING OPTIONS FOR CAPITAL ENERGY PROJECTS

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. Today, a broader range of funding options are available. A number of these are listed below.

Texas LoanSTAR Program

The LoanSTAR (Saving Taxes and Resources) Program, which is administered by the State Energy Conservation Office, finances energy-efficient building retrofits at a low interest rate (typically 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. Contact: Eddy Trevino (512/463-1080).

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 of the State's utilities 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.

APPENDICES

APPENDIX A

ENERGY LEGISLATION
(SB12, HB3693 AND SB300)

How to comply with SB12 & HB 3693

What you need to know about Texas Senate Bill 12

The passage of Senate Bill 12 (SB12) by the 80th Texas Legislature signified the continuance of Senate Bill 5 (SB5), the 77th Texas Legislature's sweeping approach in 2001 to clean air and encourage energy efficiency in Texas. SB12 was enacted on September 1, 2007 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 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 six years, beginning September 1, 2007**

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.

*Note: The recommended baseline data for those reporting entities will consist of the jurisdiction's 2006 energy consumption for its facilities and based on the State Fiscal Year (September 1, 2006 to August 31, 2007).

What you need to know about Texas House Bill 3693

The passage of House Bill 3693 (HB3693) by the 80th Texas Legislature is intended to provide additional provisions for energy-efficiency in Texas. Adopted with an effective date of September 1, 2007, HB 3693 is an additional mechanism by which the state can encourage energy-efficiency through various means for School Districts, State Facilities 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, School Districts 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.

Who must comply?

The provisions in this bill will apply to entities including: Cities and Counties; School Districts; Institutes of Higher Education; State Facilities and Buildings.

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:

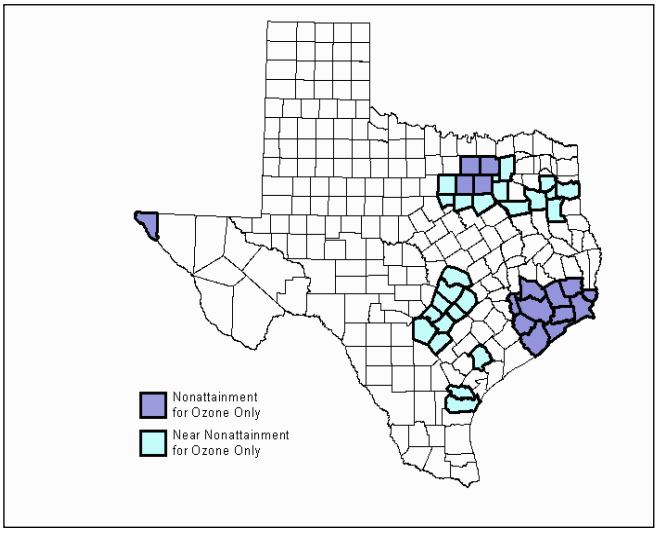
• installation of insulation and high-efficiency windows and doors • modifications or replacement of HVAC systems, lighting fixtures and electrical systems • installation of automatic energy control systems • installation of energy recovery systems or renewable energy generation equipment • building 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:
Theresa Sifuentes - 512-463-1896
Theresa.Sifuentes@cpa.state.tx.us

Schools Partnership Program:
Glenda Baldwin - 512-463-1731
Glenda.Baldwin@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
pam.groce@cpa.state.tx.us

Energy / Housing
Partnership Programs:
Stephen Ross - 512-463-1770
Stephen.Ross@cpa.state.tx.us

Alternate Fuels / Transportation:
Mary-Jo Rowan - 512-463-2637
Mary-Jo.Rowan@cpa.state.tx.us

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.

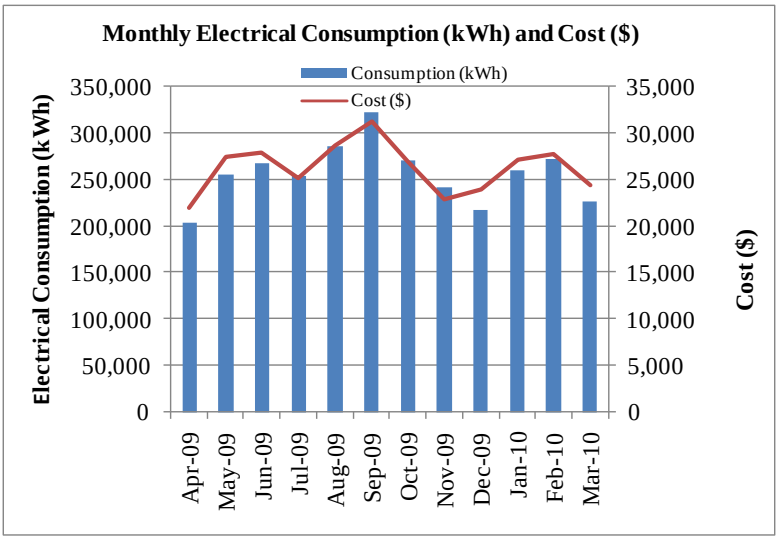
APPENDIX B

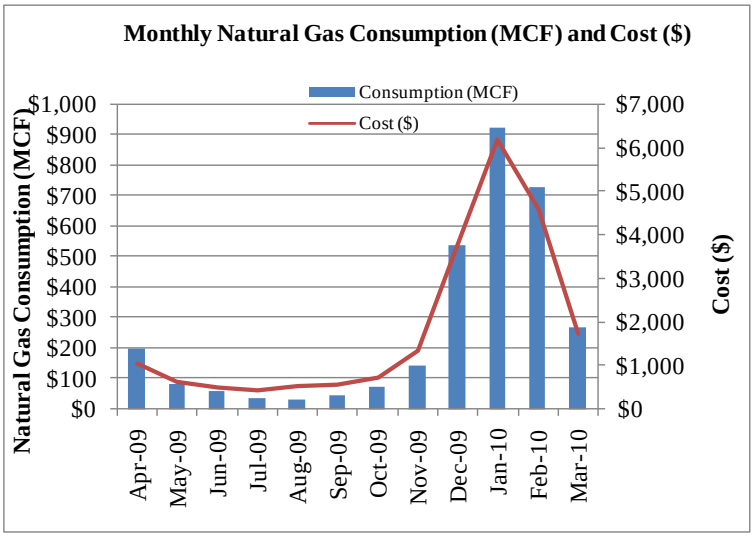
SAMPLE UTILITY DATA REPORTING FORM

Comfort ISD - Sample Utility Input Form

MONTH	ELECTRICITY			NATURAL GAS		
	KWH	COST $	Avg. Rate $/KWH	MCF	COST $	Avg. Rate $/MCF
Apr-09	203,842	21,894	$0.1074	$200	$1,044	$5.2
May-09	256,218	27,341	$0.1067	$84	$604	$7.2
Jun-09	267,787	27,777	$0.1037	$62	$502	$8.1
Jul-09	254,108	25,111	$0.0988	$35	$422	$12.1
Aug-09	286,626	28,671	$0.1000	$31	$525	$16.9
Sep-09	322,141	31,212	$0.0969	$48	$550	$11.5
Oct-09	270,536	26,871	$0.0993	$76	$724	$9.5
Nov-09	241,733	22,830	$0.0944	$145	$1,321	$9.1
Dec-09	217,427	23,907	$0.1100	$537	$3,754	$7.0
Jan-10	260,646	27,076	$0.1039	$924	$6,171	$6.7
Feb-10	272,346	27,774	$0.1020	$729	$4,594	$6.3
Mar-10	226,589	24,381	$0.1076	$271	$1,713	$6.3
Total	3,079,999	$314,846	$0.1022	3,142	$21,923	$7.0

Gross Building Area:	341,107	SF





APPENDIX C

BASE YEAR CONSUMPTION HISTORY

Energy Cost and Consumption Benchmarks

		Electric			Natural Gas			Total	Total	EUI	ECI	
	Building	KWH/Yr	MMBTU/Yr	$Cost/Yr	MCF/Yr	MMBTU/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF*
1	High School Campus	1,365,073	4,659	138,844	507	522	3,744	142,588	5,181	33	0.91	155,918
2	Middle School Campus	836,520	2,855	77,409	1,149	1,183	7,875	85,285	4,038	49	1.04	82,120
3	Elementary School Campus	717,360	2,448	71,438	799	823	5,158	76,596	3,272	36	0.84	91,000
4	Administration	34,809	119	4,899	71	73	743	5,642	192	56	1.64	3,444
5	Maintenance / Bus	42,283	144	3,867	432	445	2,970	6,837	589	68	0.79	8,625
		KWH/Yr	MMBTU/Yr	$Cost/Yr	MCF/Yr	MMBTU/Yr	$Cost/Yr	$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	$/SF/Yr	SF
		2,996,045	10,226	296,457	2,957	3,046	20,490	316,948	13,271	39	0.93	341,107

* Facility Square footages are based on estimates.

Version 1

ACCOUNT# 25775101 27823700 25931000 267535200 Electric
27836900 25967500 25950500
546959 546960 Gas

BUILDING: High School Campus

District: Comfort ISD

FLOOR AREA: 155,918 estimated

		Electrical				NATURAL GAS / FUEL		
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	92,163				10,008	25	154
May	2009	104,165				11,015	21	144
June	2009	116,939				11,798	18	128
July	2009	101,338				9,962	11	108
August	2009	123,613				12,378	10	198
September	2009	133,489				13,146	18	171
October	2009	106,988				10,982	27	224
November	2009	121,712				10,960	34	308
December	2009	98,752				10,742	79	566
January	2010	123,031				12,936	101	700
February	2010	132,054				13,688	79	525
March	2010	110,829				11,229	86	520
TOTAL		1,365,073				138,844	506.6	3,744

Energy Use Index:

Annual Total Energy Cost = 142,588 $/year

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

Total KWH/yr x 0.003413 = 4,658.99 MMBTU/year

Total MCF/yr x 1.03 = 521.80 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 5,181 MMBTU/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = 0.91 $/SF/year

Electric Utility: CTEC

Gas Utility: ATMOS

District: Comfort ISD

ACCOUNT# 35128/200007 35160/200008 Electric

906883-5 766884-3 1135503 Gas

BUILDING: Middle School Campus FLOOR AREA: 82,120 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	55,800				5,548	59	318
May	2009	74,640				7,116	24	184
June	2009	74,040				6,898	24	179
July	2009	74,640				6,836	8	124
August	2009	72,840				6,644	8	131
September	2009	86,880				7,695	13	166
October	2009	76,080				6,739	24	234
November	2009	54,360				5,038	44	407
December	2009	61,200				5,845	178	1,244
January	2010	77,040				7,180	329	2,191
February	2010	70,920				6,302	299	1,866
March	2010	58,080				5,568	138	831
TOTAL		836,520				77,409	1,148.5	7,875

* Natural Gas service not included in this summary.

Annual Total Energy Cost = 85,285 $/year

Total KWH/yr x 0.003413 = 2,855.04 MMBTU/year

Total MCF/yr x 1.03 = 1,182.96 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 4,038 MMBTU/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = 49 kBTU/SF/year

Energy Cost Index:

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

Electric Utility: Bandera

Gas Utility: ATMOS

District: Comfort ISD

ACCOUNT# 200118 35169/201084 35394/201037 200121 Electric
631405.-9 Gas

BUILDING: Elementary School Campus FLOOR AREA: 91,000 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	45,520				4,776	63	277
May	2009	64,960				6,592	23	125
June	2009	64,240				6,467	13	81
July	2009	62,880				6,305	9	74
August	2009	73,120				7,111	6	68
September	2009	85,120				7,753	11	96
October	2009	72,720				6,904	18	139
November	2009	54,880				5,303	33	270
December	2009	45,280				4,686	140	942
January	2010	48,080				5,237	273	1,781
February	2010	55,680				5,422	190	1,163
March	2010	44,880				4,882	21	142
TOTAL		717,360				71,438	799.4	5,158

Energy Use Index:

Annual Total Energy Cost = 76,596 $/year

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

Total KWH/yr x 0.003413 = 2,448.35 MMBTU/year
Total MCF/yr x 1.03 = 823.38 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 3,272 MMBTU/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = 0.84 $/SF/year

Electric Utility: Bandera

Gas Utility: ATMOS

District: Comfort ISD

ACCOUNT# 38962/123436 Electric
766883.-5 Gas

BUILDING: Administration FLOOR AREA: 3,444 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	2,067				344	5	46
May	2009	3,241				443	4	42
June	2009	3,667				477	3	39
July	2009	4,970				590	3	40
August	2009	4,538				558	2	40
September	2009	4,396				520	2	38
October	2009	3,081				415	2	41
November	2009	2,031				333	2	45
December	2009	1,684				305	12	102
January	2010	1,478				291	22	167
February	2010	1,979				330	14	108
March	2010	1,677				293	2	36
TOTAL		34,809				4,899	70.6	743

Energy Use Index:

Annual Total Energy Cost = 5,642 $/year

Total site BTU's/Yr ÷ Total Area (SF) = 56 kBTU/SF/year

Total KWH/yr x 0.003413 = 118.80 MMBTU/year
Total MCF/yr x 1.03 = 72.72 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 192 MMBTU/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = 1.64 $/SF/year

Electric Utility: Bandera

Gas Utility: ATMOS

District: Comfort ISD

ACCOUNT# 38997/123565 Electric
906894-2 Gas

BUILDING: Maintenance / Bus

FLOOR AREA: 8,625 estimated

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	2,411				234	31	152
May	2009	2,958				283	6	52
June	2009	3,270				311	3	38
July	2009	3,795				358	3	43
August	2009	4,059				381	3	45
September	2009	3,610				322	3	44
October	2009	3,171				286	3	45
November	2009	2,701				246	19	168
December	2009	4,001				355	98	666
January	2010	4,589				404	146	965
February	2010	4,282				379	106	661
March	2010	3,436				308	12	91
TOTAL		42,283				3,867	432.0	2,970

Annual Total Energy Cost = 6,837 $/year

Energy Use Index:

Total site BTU's/Yr ÷ Total Area (SF) = 68 kBTU/SF/year

Total KWH/yr x 0.003413 = 144.31 MMBTU/year
Total MCF/yr x 1.03 = 444.96 MMBTU/year
Total Other x _____ = 0.0 MMBTU/year
Total Site MMBTU's/yr = 589 MMBTU/year

Energy Cost Index:

Total Energy Cost/Yr ÷ Total Area (SF) = 0.79 $/SF/year

Electric Utility: Bandera

Gas Utility: ATMOS

District: Comfort ISD

ACCOUNT# 26003200 25747900 27523600 Electric

Gas

BUILDING: HS BB Field, Well, Tennis Courts, FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	3,742				653	0	0
May	2009	3,244				1,484	0	0
June	2009	3,187				1,469	0	0
July	2009	4,056				705	0	0
August	2009	5,003				1,150	0	0
September	2009	2,956				1,160	0	0
October	2009	2,831				931	0	0
November	2009	2,495				512	0	0
December	2009	3,561				1,587	0	0
January	2010	2,003				518	0	0
February	2010	2,809				1,126	0	0
March	2010	3,915				1,646	0	0
TOTAL		39,802				12,940	0.0	0

Energy Use Index:

Annual Total Energy Cost = 12,940 $/year

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

Total KWH/yr x 0.003413 = 135.84 MMBTU/year

Total MCF/yr x 1.03 = 0.00 MMBTU/year

Energy Cost Index:

Total Other x _____ = 0.0 MMBTU/year

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

Total Site MMBTU's/yr = 136 MMBTU/year

Electric Utility: CTEC

Gas Utility: ATMOS

ACCOUNT# 38961/123816 42852/123434 26936/123199 56988/117783 58510-122998 35709/200485 38999/123000 Electric
389879-1 Gas

District: Comfort ISD

BUILDING: AEP/GED, Book Store, Tennis Crts. N & S ALTGLET Field, Faltin & ALTGLET Field House

FLOOR AREA: N/A

		ELECTRICAL					NATURAL GAS / FUEL	
			DEMAND			TOTAL ALL		
		CONSUMPTION	METERED	CHARGED	COST OF	ELECTRIC	CONSUMPTION	TOTAL
MONTH	YEAR	KWH	KW	KW	DEMAND ($)	COSTS ($)	MCF	COSTS ($)
April	2009	2,139				330	18	98
May	2009	3,010				408	7	57
June	2009	2,444				357	3	38
July	2009	2,429				356	1	33
August	2009	3,453				447	2	42
September	2009	5,690				617	1	35
October	2009	5,665				615	2	42
November	2009	3,554				438	13	124
December	2009	2,949				387	32	234
January	2010	4,425				511	53	366
February	2010	4,622				527	41	272
March	2010	3,772				456	12	93
TOTAL		44,152				5,448	185.2	1,433

Annual Total Energy Cost = 6,881 $/year

Energy Use Index:

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

Total KWH/yr x 0.003413 = 150.69 MMBTU/year

Total MCF/yr x 1.03 = 190.76 MMBTU/year

Total Other x _____ = 0.0 MMBTU/year

Total Site MMBTU's/yr = 341 MMBTU/year

Energy Cost Index:

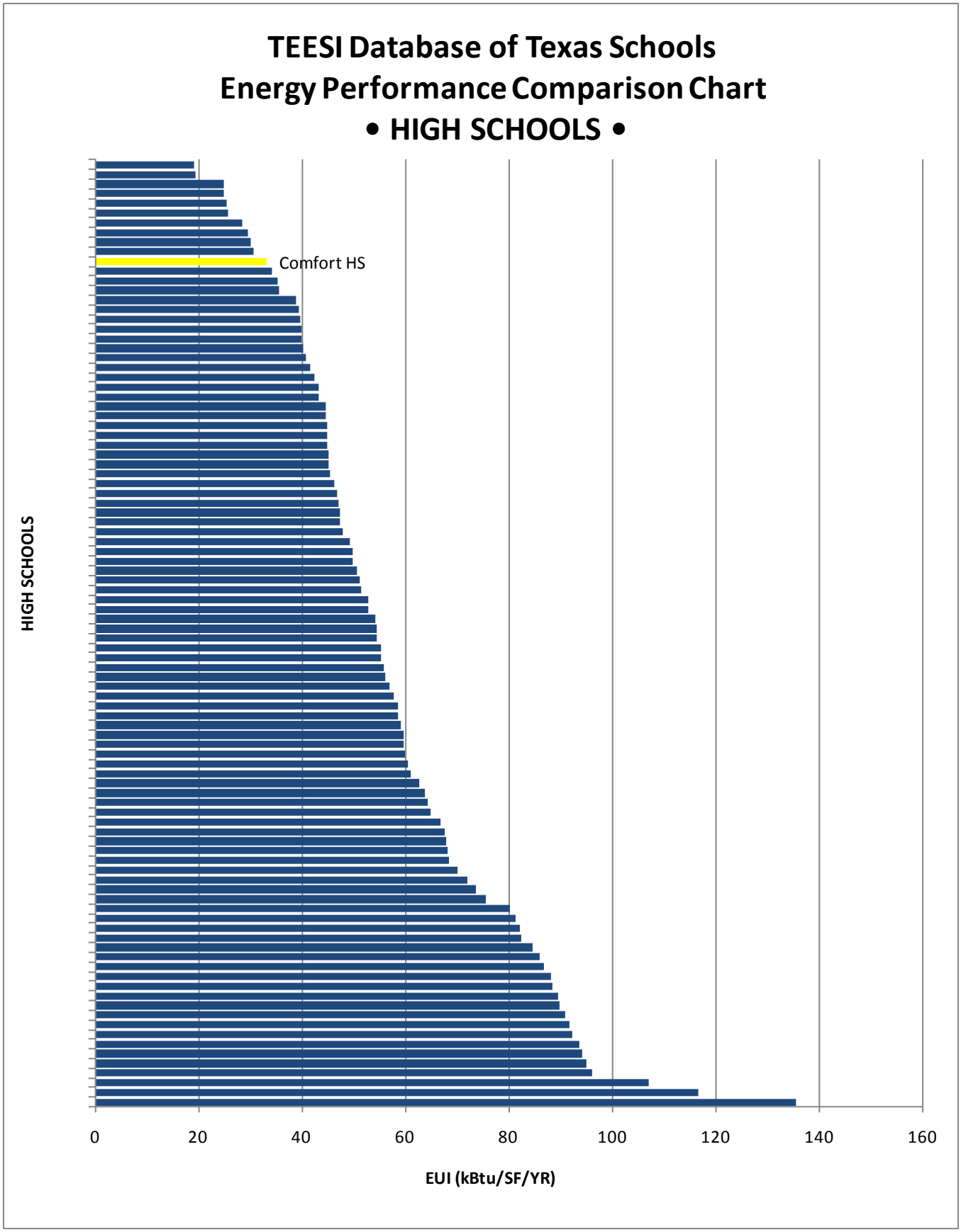
Total Energy Cost/Yr ÷ Total Area (SF) = N/A $/SF/year

Electric Utility: Bandera

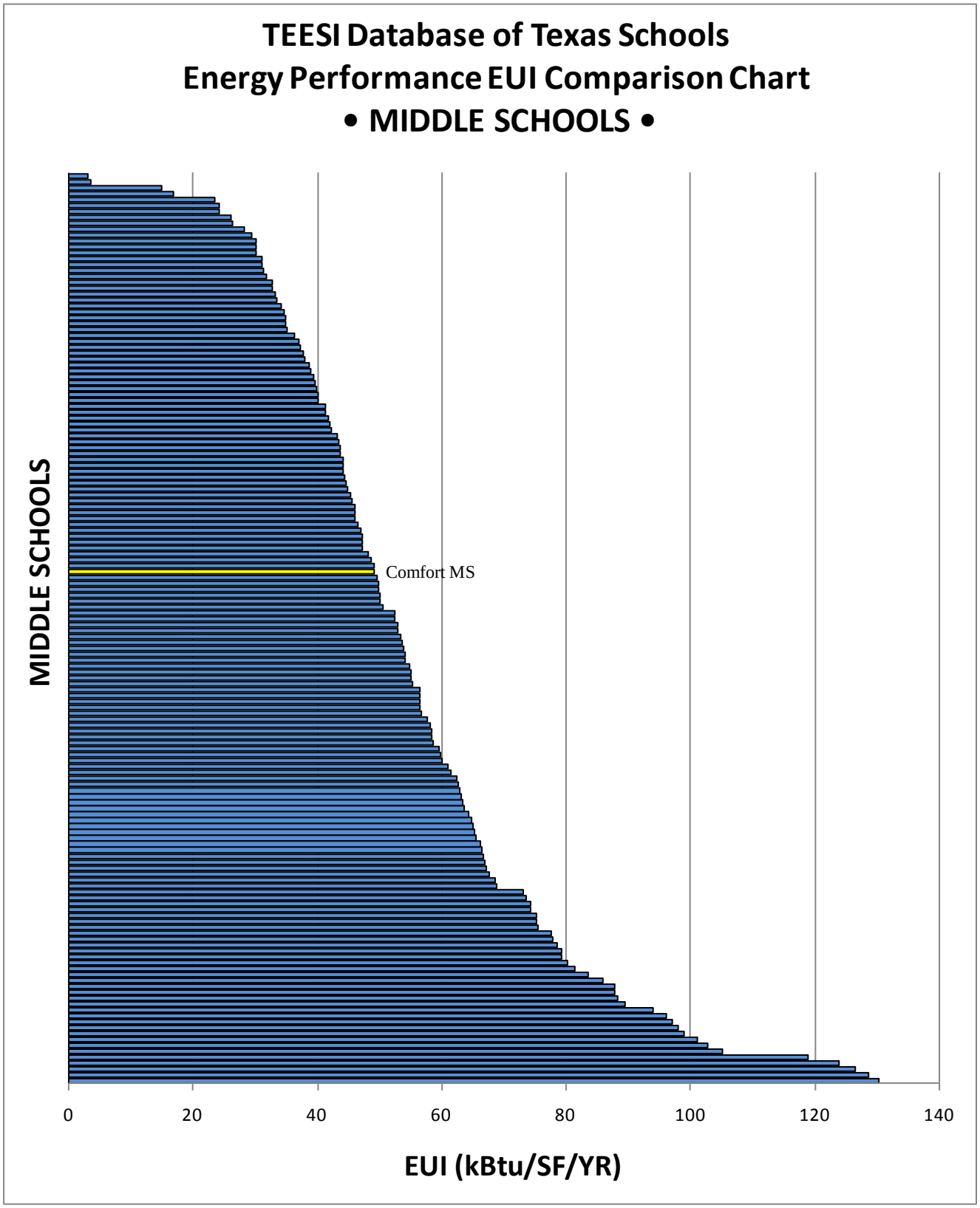
Gas Utility: ATMOS

APPENDIX D

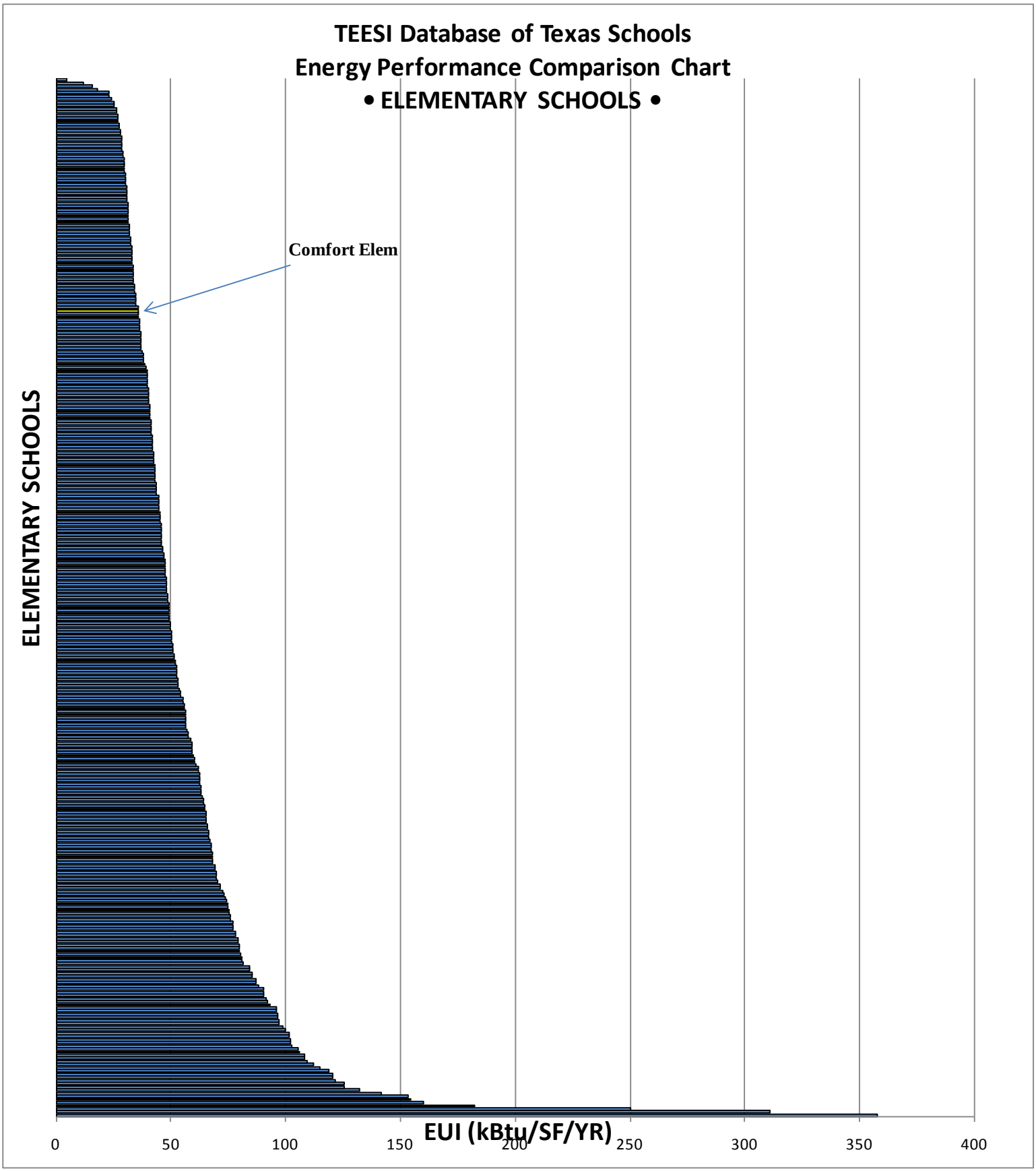
ENERGY PERFORMANCE COMPARISON CHARTS



(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 E

TYPICAL EQUIPMENT MAINTENANCE CHECKLISTS

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

Electric Motors Checklist

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Motor use/sequencing	Turn off/sequence unnecessary motors	X			
Overall visual inspection	Complete overall visual inspection to be sure all equipment is operating and safety systems are in place	X			
Motor condition	Check the condition of the motor through temperature or vibration analysis and compare to baseline values		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 alignment	Aligning the motor coupling allows for efficient torque transfer to the pump			X	
Check mountings	Check and secure all motor mountings			X	
Check terminal tightness	Tighten connection terminals as necessary			X	
Cleaning	Remove dust and dirt from motor to facilitate cooling			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
Check for balanced three-phase power	Unbalanced power can shorten the motor life through excessive heat build up				X
Check for over-voltage or under-voltage conditions	Over- or under-voltage situations can shorten the motor life through excessive heat build up				X

APPENDIX F

LOANSTAR INFORMATION

Texas LoanSTAR Program

FACTS ABOUT LoanSTAR

The State of Texas LoanSTAR (Saving Taxes and Resources) Program finances energy efficient facility up-grades for state agencies, public schools, institutions of higher education, local governments, municipalities, and hospitals. The program's revolving loan mechanism allows participants to borrow money and repay all project costs through the stream of **cost savings** produced.

ELIGIBLE PROJECTS

Up-grades financed through the program include, but are not limited to, (1) energy efficient lighting systems; (2) high efficiency heating, ventilation and air conditioning systems; (3) energy management systems; (4) boiler efficiency improvements; (5) energy recovery systems; (6) building shell improvements; and (7) load management projects. The prospective borrower hires a Professional Engineer to analyze the potential energy efficient projects that will be submitted for funding through the Loan STAR Program. All engineering costs are covered under the program.

PROGRAM REQUIREMENTS

Once the projects are analyzed and the prospective borrower agrees with the recommended projects, the engineer prepares an Energy Assessment Report (EAR) with the project descriptions and calculations. The EAR must be prepared according to the LoanSTAR Technical Guidelines. The EAR is reviewed and approved by the State Energy Conservation Office (SECO) technical staff before project financing is authorized. Projects financed by LoanSTAR must have an average simple payback of ten years or less. Borrowers do, however, have the option of buying down paybacks to meet the composite ten-year limit.

To ensure up-grade projects are designed and constructed according to the EAR, SECO performs a review of the design documents at the 50% and 100% completion phases. On-site construction monitoring is also performed at the 50% and 100% completion phases.

SAVINGS VERIFICATION

To ensure that the Borrower is achieving the estimated energy savings, monitoring and verification is required for all LoanSTAR funded projects. The level of monitoring and verifications may range from utility bill analysis to individual system or whole building metering depending on the size and type of retrofit projects. If whole building metering is required, metering and monitoring cost can be rolled into the loan.

For additional information regarding the
LoanSTAR program, please contact:

Eddy Trevino
SECO, LoanSTAR Program Manager
(512) 463-1080

APPENDIX G

REQUEST FOR ENERGY ASSISTANCE

SECO
State Energy Conservation Office

Public Schools, Colleges and Non-Profit Hospitals

Preliminary Energy Assessment
Service Agreement

Investing in our public schools, colleges and non-profit hospitals through improved energy efficiency in public buildings is a win-win opportunity for our communities and the state. Energy-efficient buildings reduce energy costs, increase available capital, spur economic growth, and improve working and living environments. The Preliminary Energy Assessment Service provides a viable strategy to achieve these goals.

Description of the Service

The State Energy Conservation Office (SECO) will analyze electric, gas and other utility data and work with _____, hereinafter referred to as Partner, to identify energy cost-savings potential. To achieve this potential, SECO and Partner have agreed to work together to complete an energy assessment of mutually selected facilities.

SECO agrees to provide this service at no cost to the Partner, with the ~~understanding that the Partner is ready and willing~~ to consider implementing the energy savings recommendations. NO Commitments (to Vague)

Principles of the Agreement

Specific responsibilities of the Partner and SECO in this agreement are listed below.

- ✓ Partner will select a contact person to work with SECO and its designated contractor to establish an Energy Policy and set realistic energy efficiency goals.
- ✓ SECO's contractor will go on site to provide walk through assessments of selected facilities. SECO will provide a report which identifies no cost/low cost recommendations, Capital Retrofit Projects, and potential sources of funding. Portions of this report may be posted on the SECO website.
- ✓ Partner will schedule a time for SECO's contractor to make a presentation of the assessment findings key decision makers.

Acceptance of Agreement

This agreement should be signed by your organization's chief executive officer or other upper management staff.

Signature: _____ Date: 2/18/10

Name (Mr./Ms./Dr.) John Clegg Title: Superintendent

Organization: ComFort ISD Phone: 830-995-6400

Street Address: 327 High St ComFort Tx 78013 Fax: 830-995-2236

Mailing Address: P.O. Box 398 E-Mail: _____

ComFort Tx 78013 County: Kendall

Contact Information:

Name (Mr./Ms./Dr.): Randy Hector Title: OPS Director

Phone: 830-398-0507 Fax: 830-995-2236

E-Mail: randy.hector@comfort.txed.net County: Kendall

Please sign and mail or fax to: Juline Ferris, Schools and Education Program Administrator, State Energy Conservation Office, 111 E. 17th Street, Austin, Texas 78774. Phone: 512-936-9283. Fax 512-475-2569.