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Facility Preliminary Energy Assessments and Recommendations

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SECO
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Table of Contents

1.0 EXECUTIVE SUMMARY: 3
2.0 ENERGY ASSESSMENT PROCEDURE: 5
3.0 ENERGY PERFORMANCE INDICATORS: 6
4.0 RATE SCHEDULE ANALYSIS: 9
ELECTRICITY PROVIDER: 9
NATURAL GAS PROVIDER: 10
5.0 CAMPUS DESCRIPTIONS: 11
6.0 RECOMMENDATIONS 16
A. MAINTENANCE AND OPERATIONS PROCEDURES 16
B. CAPITAL EXPENSE PROJECTS 18
7.0 FINANCIAL EVALUATION 20
8.0 GENERAL COMMENTS 21
APPENDICES 22
APPENDIX I - SUMMARY OF FUNDING AND PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS 23
SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS 24
SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS 25
APPENDIX II - ELECTRIC UTILITY RATE SCHEDULES 30
APPENDIX III - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT 34
APPENDIX IV - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA) 36
APPENDIX V - UTILITY CHARTS ON CD 38

1.0 EXECUTIVE SUMMARY:

This **Energy Efficient Partnership Service** is provided to public school districts and hospitals as a portion of the state's ***Schools/ Local Government Energy Management Program***; a program sponsored by the **State Energy Conservation Office (SECO)**, a division of the **State of Texas Comptroller of Public Accounts**.

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The service assists these public, non-profit institutions to take basic steps towards energy efficient facility operation. Active involvement in the partnership from the entire administration and staff within the agencies and institutions is critical in developing a customized blueprint for energy efficiency for their facilities.

In January 2010, **SECO** received a request for technical assistance from Larry Nichols, Superintendent for Calhoun County I.S.D. **SECO** responded by sending ESA **Energy Systems Associates, Inc.**, a registered professional engineering firm, to prepare this preliminary report for the school district. This report is intended to provide support for the district as it determines the most appropriate path for facility renovation, especially as it pertains to the energy consuming systems around the facility. It is our opinion that significant decreases in annual energy costs, as well as major maintenance cost reductions, can be achieved through the efficiency recommendations provided herein.

This study has focused on energy efficiency and systems operations. To that end, an analysis of the utility usage and costs for **Calhoun County ISD,** (hereafter known as CCISD) was completed by ESA **Energy Systems Associates, Inc**., (hereafter known as *Engineer*) to determine the annual energy cost index (ECI) and energy use index (EUI) for each campus or facility. A complete listing of the Base Year Utility Costs and Consumption is provided in Section 3.0 of this report.

Following the utility analysis and a preliminary consultation with *Mr. Nichols,* a walk-through energy analysis was conducted throughout the campus with Mr. Hernandez and Mr. Smith, both from CCISD Maintenance. Specific findings of this survey and the resulting recommendations for both operation and maintenance procedures and cost-effective energy retrofit installations are identified in Section 6.0 of this report.

We estimate that as much as **$90,950** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$890,850**, yielding an average simple payback of **9-3/4 years**.

SUMMARY: CCISD High School	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1* (See Note Below)	$2,300,000	n/a	n/a
HVAC ECRM #2	$285,600	$19,000	15
Lighting ECRM #3	$166,250	$30,000	5-1/2
Lighting ECRM #4	$40,000	$6,950	5-1/4
Controls ECRM #5	$399,000	$35,000	11-1/2
TOTAL PROJECTS	**$890,850**	**$90,950**	**9-3/4**

*Note: The HVAC ECRM #1 project involves replacing the entire HVAC system at the High School with a new and larger central system. The project will require increasing the capacity of the system to incorporate code required levels of outside air that the current system does not currently provide. The project will also require the abatement of asbestos suspicious materials, the restoration of egress corridor integrity, and the installation of an addressable fire alarm system. Many of the components in this project do not save energy, or may actually require an increase in energy consumption, in order to satisfy code compliance. Therefore, there has been no calculation of anticipated savings or overall project payback for this measure and its cost has not been included in the overall project summary.

The total utility cost for Calhoun High School in 2009 was $394,759. The projected savings of $90,950 would represent a decrease in utility expenditures for the district of 23%. Although additional savings from reduced maintenance expenses are anticipated, these savings projections are not included in the estimates provided above. As a result, the actual Return of Investment (ROI), for this retrofit program has been calculated and shown in Section 7.0 of this report.

Our final "summary" comment is that **SECO** views the completion and presentation of this report as a beginning, rather than an end, of our relationship with **CCISD**. We hope to be ongoing partners in assisting you to implement the recommendations listed in this report. Please call us if you have further questions or comments regarding your Energy Management Issues.

*ESA Energy Systems Associates, Inc. James W. Brown (512) 258-0547

2.0 ENERGY ASSESSMENT PROCEDURE:

Involvement in this on-site analysis program was initiated through completion of a Preliminary Energy Assessment Service Agreement. This PEASA serves as the agreement to form a "partnership" between the client and the State Energy Conservation Office (SECO) for the purposes of energy costs and consumption reduction within owned and operated facilities. After receipt of the PEASA, an initial visit was conducted by the professional engineering firm contracted by SECO to provide service within that area of the state to review the program elements that SECO provides to school districts and determine which elements could best benefit the district. A summary of the *Partner's* most recent twelve months of utility bills was provided to the engineer for the preliminary assessment of the Energy Performance Indicators. After reviewing the utility bill data analysis and consultation with SECO to determine the program elements to be provided to CCISD, ESA returned to the facilities to perform the following tasks:

1. Design and monitor customized procedures to control run times of energy consuming systems.
2. Develop an accurate definition of system and equipment replacement projects along with installation cost estimates, estimated energy and cost savings and analyses for each recommended project.
3. Develop a prioritized schedule for replacement projects.
4. Assist in the development of guidelines for efficiency levels of future equipment purchases.

3.0 ENERGY PERFORMANCE INDICATORS:

In order to easily assess the *Partner's* energy utilization and current level of efficiency, there are two key "Energy Performance Indicators" calculated within this report.

1. Energy Utilization Index

The Energy Utilization Index (EUI) depicts the total annual energy consumption per square foot of building space, and is expressed in "British Thermal Units" (BTUs).

To calculate the EUI, the consumption of electricity and gas are first converted to equivalent BTU consumption via the following formulas:

ELECTRICITY Usage

[Total KWH /yr] x [3413 BTUs/KWH] = _____ BTUs / yr

NATURAL GAS Usage

[Total MCF/yr] x [1,030,000 BTUs/MCF] = _____ BTUs / yr

After adding the BTU consumption of each fuel, the total BTUs are then divided

by the building area.

EUI = [Electricity BTUs + Gas BTUs] divided by [Total square feet]

2. Energy Cost Index

The Energy Cost Index (ECI) depicts the total annual energy cost per square foot of building space.

To calculate the ECI, the annual costs of electricity and gas are totaled and divided by the total square footage of the facility:

ECI = [Electricity Cost + Gas Cost] divided by [Total square feet]

These indicators may be used to compare the facility's current cost and usage to past years, or to other similar facilities in the area. Although the comparisons will not provide specific reasons for unusual operation, they serve as indicators that problems may exist within the energy consuming systems.

THE CURRENT ENERGY PERFORMANCE INDICATORS FOR :

Calhoun County ISD

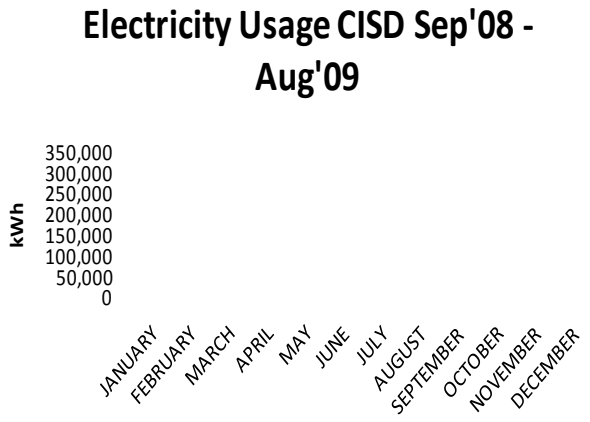
CAMPUS	ENERGY UTILIZATION INDEX (EUI) (Btu/sf-year)	ENERGY COST INDEX (ECI) ($/sf-year)
2009 Calhoun High School:	**39,844**	**$1.33**

The electricity and gas consumption charts for all of Calhoun County facilities area as follows:

OWNER:	Calhoun County ISD				**BUILDING:**	Calhoun High School		
MONTH / YEAR		**ELECTRIC**					**NAT'L GAS / FUEL**	
			DEMAND					
		CONSUMPTION	**METERED**	**CHARGED**	**COST OF**	**TOTAL ALL ELECTRICAL**	**CONSUMPTION**	**$**
MONTH	**YEAR**	**KWH**	**KW/KVA**	**KW/KVA**	**DEMAND**	**COSTS $**	**MCF**	**COSTS**
JANUARY	2009	193,841	1,026	1,026	Unavailable from currentBilling Format	$36,613.00	267	3,463
FEBRUARY	2009	198,379	1,100	1,100		$34,709.00	222	2,033
MARCH	2009	199,337	1,051	1,051		$30,148.00	102	943
APRIL	2009	261,684	1,205	1,205		$25,711.00	118	1,089
MAY	2009	266,232	1,198	1,198		$27,810.00	104	961
JUNE	2009	197,632	824	824		$29,080.00	380	361
JULY	2009	204,440	790	790		$29,001.00	110	116
AUGUST	2009	308,230	1,188	1,188		$35,355.00	52	399
SEPTEMBER	2008	278,959	1,167	1,167		$34,904.00	99	745
OCTOBER	2008	260,221	1,128	1,128		$27,884.00	116	871
NOVEMBER	2008	218,478	1,061	1,061		$28,221.00	216	1,608
DECEMBER	2008	175,716	966	966		$38,893.00	519	3,841
TOTAL		**2,763,149**	**12,704**	**12,704**	**0**	**$378,329**	**2,305**	**$16,430**

				Energy Use Index:			
Annual Total Energy Cost =	$394,759	Per Year		Total Site BTU's/yr		39,844	BTU/s.f.yr
				Total Area (sq.ft.)			
Total KWH x 0.003413 =	9,430.63	x 106					
Total MCF x 1.03 =	2,374.15	x 106		**Energy Cost Index:**			
Total Other x ____		x 106		Total Energy Cost/yr		$1.33	$/s.f. yr
Total Site BTU's/yr	11,804.78	x 106		Total Area (sq.ft.)			
Floor area:	296,276	s.f.					

Charting the annual electricity consumption, see Figure to right, reveals that the campus demonstrates a drop in consumption during the summer months, demonstrating that the district is adjusting equipment schedules during unoccupied summer months. The profile remains fairly flat throughout the year, evidence of the use of electric heat in the winter.



As Calhoun County is located in a deregulated energy market area of the State, the district is free to negotiate electricity contracts within State mandated procurement processes. The district's current Retail Electric Provider (REP) is Direct Energy and their Transmission and Distribution (T&D) Provider is AEP Central. The rate schedule applicable to most of the district's meters is Secondary Service Greater than 10 kW. A copy of the schedule and applicable riders is included in Appendix II.

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER (REP): Direct Energy

TRANSMISSION AND DISTRIBUTION (T&D): AEP

Electric Rate: Secondary Service > 10 kW

I.	TRANSMISSION AND DISTRIBUTION CHARGES:		
	Customer Charge	=	$26.52 per meter
	Metering Charge	=	$15.81 per meter
	Transmission System Charge (Non-IDR Meter)	=	$1.793 per NCP kW
	Distribution System Charge	=	$3.314 per Billing kW
II.	SYSTEM BENEFIT FUND	=	$0.000662 per kWh
III.	TRANSITION CHARGES		
	Transition Charge 1	=	$1.035407/kW
	Transition Charge 2	=	$2.464918/kW
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	$0.037224 per Billing kVA
V.	TRANSMISSION COST RECOVERY FACTOR	=	$0.335686/4CP kVA
VI.	COMPETITIVE METERING CREDIT	=	$2.17 per month
VII.	RATE CASE SURCHARGE RIDER #1	=	$0.000047 per kWh
VIII.	RATE CASE SURCHARGE RIDER #2	=	$0.000065 per kWh
IX.	TRUE-UP CASE SURCHARGE RIDER	=	$0.041116 per kW
X.	ENERGY EFFICIENCY RIDER	=	$0.000288 per kWh
XI.	ADVANCED METERING SYSTEM RIDER	=	$2.05 per month

Average Savings for consumption (from billings) = $263,739 / 2,763,149kWh = $0.09544 / kWh

Average Savings for demand = $1.793 + $3.314 + $1.035407 + $2.464918 + + 0.037224 + $0.335686 + $0.041116 = $9.02 / kW**

** This number is a generalization of average cost per kW because the rate schedule from AEP utilizes three (3) different types of demand for the calculation of the utility bill:

1. NCP kW: Peak demand during 15 minute interval of current billing cycle
2. 4CP kW: Average demands of June, July, August and September of previous calendar year; usually only applied to IDR metered accounts
3. DS (Distribution System) Billing kW: Ratchet demand representing higher of two calculations: 80% of peak demand in last 11 months or current NCP DS kW (Distribution System) Billing kW: Ratchet demand representing higher of two calculations: 80% of peak demand in last 11 months or current NCP kW

NATURAL GAS PROVIDER:

Rate Schedule Unavailable, average cost savings per MCF saved determined from billings:

Total Quantity of Natural Gas Purchased during analyzed Billing Cycle:	2,305 MCF
Total Cost of natural gas during analyzed Billing Cycle:	$16,430
Average Cost = Cost for Natural gas / Quantity Purchased	= $16,430 / 2,305mcf
	= $7.13 per MCF

5.0 CAMPUS DESCRIPTIONS:

Calhoun County ISD consists of seven campuses located throughout Calhoun County, Texas. The district requested the SECO Energy partnership Service with just the High School campus in mind. They requested the study focus on that campus alone.

The High School campus was constructed in 1966. The original building totaled 197,474 square feet. In 1978, there was an addition of Vocational and PE Buildings totaling 67,010 square feet. In 2008, a 22,752 square foot Freshman Wing was added bringing the total campus square footage (including portable buildings) to 296,276.

The buildings have a brick façade and flat built-up roofs. The windows are single pane, but remain in fairly good condition.

HVAC System Description:

The HVAC system is predominantly a centralized system with boilers, chillers and a cooling tower supplying hot and chilled water to single and multi-zone air handlers distributed throughout the building. The multi-zone air handlers are dual deck units with return air bypass at the hot deck.

Space Heat Boilers:

There are four Lochinvar PowerFin PBN1000 boilers (1,000,000 BTUH input each) equipped with ½ hp circulation pumps. The system has two 3hp primary hot water loop pumps for the boilers themselves, plus 2-1/2 and 7-1/2 hp secondary loop pumps for the building loops.

Domestic hot water:

There are five (75,000 to 199,900 BTUH input) water heaters to supply domestic hot water to the building. Pictured to the right, the units range in age from 1997 to 2004. It was noted during the survey that much of this system had damaged or missing insulation from the hot water piping. The majority of energy losses in a hot water system occur in the hot water distribution piping. *We recommend replacing all damaged or missing hot water pipe insulation.*

Chilled Water Plant:

The existing chillers are two 1995 Carrier 23XL212 units with 250 tons cooling capacity each. There are two 1995 chilled water pumps (25hp each) that distribute 599 gpm at 107 feet of head and two 15hp condenser water pumps that distribute 712 gpm at 47 feet of head. The cooling tower, a single cell Marley unit, is older than 1995, but the staff was not able to identify the exact age. The tower was slightly scaled, but otherwise appeared to be in good condition. The staff reported that the tower would be cleaned over the summer break.

Air Handlers

The air handler inventory for the facility is as follows:

AHU	SIZE (Carrier)	TYPE / ZONES	TOTAL CFM	COOL GPM	HEAT GPM	MOTOR HP
FC-A-1	39C130	MZ/8	24,720	120.4	12.2	15
FC-A-2	39C120	MZ/4	15,375	78.3	7.5	7.5
FC-B-1	30C130	MZ/6	12,170	96.7	12	10
FC-C-1	30C100	MZ/7	11,210	47.4	6.6	5
FC-C-2	39C120	MZ/6	19,090	94.6	11.2	15
FC-D-1	39C120	MZ/6	19,275	103.2	9.7	10
FC-E-1	39B110	SZ	13,175	108	10	7.5
FC-F-1	39C120	MZ/6	16,455	76.2	8.5	10
FC-G-1	39C105	MZ/3	11,520	56	6.2	5
FC-H-1	39C130	MZ/4	21,685	144.8	13.1	15
FC-H-2	39C130	MZ/4	21,910	146	13.2	15
FC-J-1	39C70	MZ/3	3,425	17.8	1.5	1.5
FC-J-2	39B80	SZ	4,750	35.3	3.9	1.5
FC-J-3	39B70	SZ	3,250	28	3.2	1
FC-M-1	42H6	SZ	425	1.4	1	.5
FC-M-2	1,785	SZ	1,785	9	1.3	.5
FC-M-3	425	SZ	425	1.4	1	.5
HV-E-2	10,500	SZ	10,500	N/A	15.2	5

The air handlers are original 1966 equipment for the facility. The exposed piping and valves are corroded and rusty. The original return air ductwork was under the floor; that system has collapsed and forced the maintenance staff to create sidewall return air grills in the walls of the mechanical rooms. Many of the return air grills do not have fire-smoke dampers as required by the Life Safety code and therefore are not compliant with the code. It was also noted that many of the return air grilles are dirty (see picture to the right) and the dirt is restricting air flow into the mechanical rooms.

The doors into the large mechanical rooms are typically single 3’-0” doors. The district has requested that the renovation project include double 3’-0” doors. The walls in many of the mechanical rooms are lined with asbestos suspicious material wall panels. These materials may have to be abated before any work in the mechanical rooms can commence.

It was noted during the survey that many of the existing outside air intakes in the mechanical rooms have been sealed with sheet metal. In order to satisfy ASHRAE 62 requirements in the new system, the cooling capacity in the new chilled water coils will have to be increased in order to compensate for the increased humidity the system will encounter when the outside air intakes are opened back up.

The vocational building has four multi-zone rooftop units (RTUs) that require frequent work orders and high maintenance costs. The roof has a history as a source of water leaks. *We recommend the district replace the multi-zone RTUs with variable flow refrigerant split systems or with an expansion of the central plant to serve this building.* The variable flow refrigerant units have the ability to vary the flow of refrigerant to match load conditions in different spaces and even heat one space and cool another at the same time. The air handler in this system is a ceiling cassette that is mounted recessed to the acoustical ceiling in the space. Several cassettes are served by a single condensing unit and can be ground-mounted so that equipment is no longer required to be on the roof. The expansion of the central system would require installation of terminal boxes at the zoned spaces and chilled and hot water distribution piping.

Water Heaters

In addition to the domestic water heaters at the main mechanical room, the district has a 4500 watt electric water heater at the Vocational Building. *We recommend the district put this unit under R-lead control of the ALC energy management system (EMS).* This will limit the operation of the water heater to the occupancy schedule of the campus.

Control System Description:

The existing control system is a combination of a computer based energy management system (EMS) that regulates scheduling and a pneumatic system that executes adjustments to dampers and valves within the system. Hot and cold deck temperatures are monitored by Barber-Coleman equipment. The programmed occupancy hours for the ALC system is generally 0715 to 1615 hours; the units are currently limited to operation times that closely match student occupancy hours.

It was noted during the survey that there have been several modifications made to the dampers and valves in the system that were necessary due to the inability of the existing control system to provide occupant comfort. For example, at one air handler unit, the pneumatic tubing had been intentionally cut so as to prevent the system from engaging the damper actuator. *We recommend replacing the pneumatic system with an electronic energy management system at the time the HVAC system is replaced.*

HVAC System Summary:

The existing HVAC system has served the facility well for its 44 years of service. The system does not comply with current ASHRAE, Life Safety or Building Codes. We recommend a complete renovation of the HVAC and control systems, as well as some structural and fire alarm system upgrades that will allow the building to comply with existing Life Safety codes. The renovation will require the replacement of the majority of the chilled water distribution system and air handlers. The chilled water plant capacity will have to be increased to approximately 750 tons in order handle the extra load generated by including current required levels of outside air.

Lighting System Description:

The district utilizes T12 lighting almost exclusively throughout the campus, except where the ceiling had to be replaced after Hurricane Claudette blew off the second story roof in 2003. In these renovated areas, T8 fixtures have been installed. As can be seen in the picture to the right, the corridor fixtures are predominantly surface-mount, single lamp T8 fixtures. *We recommend the district retrofit the existing fixtures with new T8 lamps and electronic ballasts and replace the single lamp surface-mount corridor fixtures with new low-profile 2-lamp recessed fixtures.* This project will offer approximately 20% more light, while consuming about 18% less energy than the existing T12 system and could be easily accomplished when the ceiling work for the renovated HVAC system was in progress. The measure will also help the district to comply with Senate Bill 300, which has mandated that school districts install the most efficient lamps and ballasts as possible into their existing light fixtures.

The cafeteria has four each 1-lamp T12 fixtures within the skylight wells that do not offer significant light contribution during the daytime hours. *We recommend turning these skylight well fixtures off during the day; never turning them on until night time activities allow for student occupancy in the space.*

Many of the classrooms are currently illuminated with 24 each 4-lamp T12 fixtures. *We recommend the district replace these fixtures with 12 each 3-lamp T8 fixtures.*

The gymnasium utilizes thirty-two 400-watt metal halide fixtures (76 footcandles demonstrated at mid-court) and four each 2-lamp F96T12 fixtures over the bleachers. Metal halide fixtures have a prolonged re-strike with which they take 5-10 minutes to come back after they have been turned off or power to the fixtures has been disconnected. This condition encourages district personnel to leave them on all at all times, even if the space is unoccupied during the day. For this reason, w*e recommend replacing the metal halide fixtures with 6-lamp T5HO high-bay fluorescent fixtures and the F96T12 fixtures over the bleachers with 4-lamp T5HO fixtures.*

The high-bay fixtures do not have the re-strike issue inherent to the metal halide fixtures, and can therefore be turned off when the space is unoccupied.

Similarly, the practice Gymnasium and Trade Shops utilizes 68 additional 400-watt metal halide fixtures. *We recommend all of these fixtures be replaced with the more efficient high-bay fluorescent fixtures.*

At the Auditorium, the house lights are 150 and 500 watt dimmable incandescent fixtures. The stage lighting control system is working with the last available control board; the system is no longer produced so a replacement is unavailable. The district chooses to use the house lighting for non-performance activity stage lighting in an effort to prolong the life of the lighting control system. We recommend the stage control lighting system be upgraded to eliminate the requirement for operating the dimmable incandescent house lights for non-performance stage activities.

Exit signs in the High School building utilize incandescent lamps and are powered via a 12 volt DC circuit. *We recommend the incandescent fixtures be retrofit with new LEC exit fixtures. LEC fixtures are new technology that allows the unit to satisfy all egress requirements and consume just $0.25 worth of electricity per year.*

The various vending machines around the district do not currently have controls. *We recommend installing a vending miser for each machine to limit illumination of the advertisement lighting and cycle the compressor so that it does not run all of the time, based upon the sensor's detection of occupancy in the area. The compressor will operate only long enough to keep the food or beverages at the programmed temperature and not operate most of the time as they currently do.*

6.0 RECOMMENDATIONS

A. MAINTENANCE AND OPERATIONS PROCEDURES

HVAC	•insulate Water Heater piping as needed •Place Vocational Building electric water heater under R-lead control of EMS
Lighting	•Turn off skylight well fluorescent fixtures during the day
Controls	•Add zone sensor in Library to improve occupant comfort
Building Envelope	•Check weatherstrip at all exterior doors, replace as needed •Install vending power controls at vending machines within district

Maintenance and Operation procedures are strategies that can offer significant energy savings potential, yet require little or no capital investment by the district to implement. Exact paybacks are at times difficult to calculate, but are typically less than one year. The difficulties with payback calculations are often related to the fact that the investigation required to make the payback calculation, (for example measuring the air gap between exterior doors and missing or damaged weather-stripping so that exact air losses may be determined), is prohibitive when the benefits of renovating door and weather-stripping are well documented and universally accepted.

HVAC M&O #1

The space heat and domestic hot water systems have piping with damaged or missing hot water pipe insulation.

HVAC M&O #2

The current electric water heater at the Vocational Building is not under any operational control. We recommend using the energy management system to control the on/off scheduling of the water heater with programmed student occupancy hours by interrupting the electrical circuit (R-lead conductor) during non-occupied hours.

Lighting M&O #1

The skylight wells at the cafeteria have T12 fluorescent fixtures in the well itself. After renovating the fixtures with T8 lamps and electronic ballasts, we recommend the district install photocells in these fixtures, or this fixture circuit, to eliminate these fixtures from operating during the day.

Controls M&O #1

The existing space temperature sensor for the Library is located in the Librarian Office. The small volume of the office as compared to the Library itself, is limiting the HVAC system from fully conditioning the Library because the system turns off as soon as the small office is comfortable. Adding a zone sensor to the Library will ensure the humidity and temperature in the Library is fully controlled.

Envelope M&O #1

It was noted there were several exterior doors around the district that suffered from damaged or missing weather-stripping.

Envelope M&O #2

The vending machines at Calhoun High School do not currently have controls installed. Vending machine controllers use occupancy sensors to eliminate operation of the advertisement lighting and minimize the operation of the compressors when no local activity is detected.

B. CAPITAL EXPENSE PROJECTS

HVAC	•Replace existing 500 ton central system with new 750 ton central system •Replace Vocational Building rooftop multi-zone units with new central system expansion or variable flow refrigerant split systems.
Lighting	•Replace T12 lighting and ballasts •Replace gym/shop metal halide lighting
Controls	•Replace existing pneumatic controls with DDC energy management system

HVAC Project

Project #1: Replace existing 500 ton central system with new 750 ton central system

The existing chillers and cooling tower are 15 years old and undersized to handle the anticipated load when outside air is re-incorporated into the HVAC system. The existing air handlers and piping were installed in 1966 and need to be replaced. The mechanical rooms will require abatement of some asbestos suspicious materials (ASM) before the renovation can begin and the existing return air grills will require fire/smoke dampers. We recommend the new system consist of variable volume air handlers with hot water re-heat at the terminal boxes. The additional tonnage required to meet minimum outside air requirements will result in a longer than normal payback period for the project than if the system could have been replaced with the same size equipment, therefore no anticipated savings or payback calculation has been performed. The existing equipment will not last more than one or two years before expensive emergency replacement plans will have to be performed. The installation cost below also includes provision for an addressable fire alarm system to be installed throughout the facility.

Estimated Installed Cost	=	$ 2,300,000

ECRM #2: Replace Vocational Building Rooftop Multi-Zones

The existing multi-zones should be replaced with variable flow refrigerant split systems or an expansion of the central system.

Estimated Installed Cost	=	$ 285,600
Estimated Energy Cost Savings	=	$ 17,850
Simple Payback Period	=	16 years

<u>LIGHTING ECRMs</u>
ECRM #3: Replace T12 lighting and ballasts with T8 lighting

The existing fixtures primarily utilize T12 lamps and magnetic ballasts. We recommend retrofitting the fixtures with T8 lamps and electronic ballasts. This measure will provide approximately 18% more light while consuming about 20% less energy. The measure will assist the district to comply with Senate Bill 300, in which school districts are required to install the most efficient lamps and ballasts as possible in their existing fixtures.

Estimated Installed Cost	=	$ 166,250
Estimated Energy Cost Savings	=	$ 27,700
Simple Payback Period	=	6 years

ECRM #4: Replace gymnasium and shop metal halide fixtures

The gymnasiums and shops are currently lit with one hundred 400-watt metal halide fixtures. We recommend replacing these fixtures with high output T5 high-bay linear fluorescent fixtures

Estimated Installed Cost	=	$ 40,000
Estimated Energy Cost Savings	=	$ 6,950
Simple Payback Period	=	5-3/4 years

<u>CONTROL ECRMs</u>
ECRM #5: Replace the existing pneumatic controls with new DDC controls.

Estimated Installed Cost	=	$ 399,000
Estimated Energy Cost Savings	=	$ 33,250
Simple Payback Period	=	12 years

SUMMARY TABLE:
If the district elected to install all of the ECRMs described above, <u>excluding HVAC Project #1</u> because of its exceptionally long overall payback, that financial summary would be:

Estimated Installed Cost	=	$ 890,850
Estimated Energy Cost Savings	=	$ 90,950
Simple Payback Period	=	9-3/4 years

Should the district desire to implement these projects in stages and not all at once, we recommend the following implementation schedule:

7.0 FINANCIAL EVALUATION

Financing of these projects may be provided using a variety of methods as Bond Programs, municipal leases, or state financing programs like the SECO LoanSTAR Program.

If the project was financed with in-house funds, the internal rate of return for the investment would be as follows:

Proposal:	Perform recommended ECRMs			
Assumptions:				
1. Equipment will last at least 15 years prior to next renovation				
2. No maintenance expenses for first five years (warranty period)				
3. $500 maintenance expense next 5 years				
4. $1000 maintenance expense last 5 years				
5. Savings decreases 2% per year after year 5				
Cash Flow	**Project Cost**	**Project Savings**	**Maintenance Expense**	**Net Cash Flow**
Time 0	($863,650)		0	($863,650)
Year 1		$ 86,500	0	$86,500
Year 2		$ 86,500	0	$86,500
Year 3		$ 86,500	0	$86,500
Year 4		$ 86,500	0	$86,500
Year 5		$ 86,500	0	$86,500
Year 6		$ 84,770	($500)	$84,270
Year 7		$ 83,040	($500)	$82,540
Year 8		$ 81,310	($500)	$80,810
Year 9		$ 79,580	($500)	$79,080
Year 10		$ 77,850	($500)	$77,350
Year 11		$ 76,120	($1,000)	$75,120
Year 12		$ 74,390	($1,000)	$73,390
Year 13		$ 72,660	($1,000)	$71,660
Year 14		$ 70,930	($1,000)	$69,930
Year 15		$ 69,200	($1,000)	$68,200
			Internal Rate of Return	**4.58%**

More information regarding financial programs available to CCISD can be found in:

APPENDIX I: SUMMARY OF FUNDING AND PROCUREMENT OPTIONS

8.0 GENERAL COMMENTS

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted engineering practices. All estimations provided in this report were based upon information provided to ESA by the District and their respective utility providers. While cost saving estimates have been provided, they are not intended to be considered a guarantee of cost savings. No guarantees or warranties, expressed or implied, are intended or made. Changes in energy usage or utility pricing from those provided will impact the overall calculations of estimated savings and could result in different or longer payback periods.

APPENDICES

APPENDIX I - SUMMARY OF FUNDING AND PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

Several options are available for funding retrofit measures which require capital expenditures.

LoanSTAR Program:

The Texas LoanSTAR program is administered by the State Energy Conservation Office (SECO). It is a revolving loan program available to all public school districts in the state as well as other institutional facilities. SECO loans money at 3% interest for the implementation of energy conservation measures which have a combined payback of eight years or less. The amount of money available varies, depending upon repayment schedules of other facilities with outstanding loans, and legislative actions. Check with Eddy Trevino of SECO (512-463-1876) for an up-to-date evaluation of prospects for obtaining a loan in the amounts desired.

TASB (Texas Association Of School Boards) Capital Acquisition Program:

TASB makes loans to school districts for acquiring personal property for "maintenance purposes". Energy conservation measures are eligible for these loans. The smallest loan TASB will make is $100,000. Financing is at 4.4% to 5.3%, depending upon length of the loan and the school district's bond rating. Loans are made over a three year, four year, seven year, or ten year period. The application process involves filling out a one page application form, and submitting the school district's most recent budget and audit. Contact Cheryl Kepp at TASB (512-467-0222) for further information.

Loans On Commercial Market:

Local lending institutions are another source for the funding of desired energy conservation measures. Interest rates obtainable may not be as attractive as that offered by the LoanSTAR or TASB programs, but advantages include "unlimited" funds available for loan, and local administration of the loan.

Leasing Corporations:

Leasing corporations have become increasingly interested in the energy efficiency market. The financing vehicle frequently used is the municipal lease. Structured like a simple loan, a municipal leasing agreement is usually a lease-purchase agreement. Ownership of the financed equipment passes to the 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 a nominal amount, usually a dollar, is paid by the lessee for title to the equipment.

Bond Issue:

They may choose to have a bond election to provide funds for capital improvements. Because of its political nature, this funding method is entirely dependent upon the mood of the voters, and may require more time and effort to acquire the funds than the other alternatives.

SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

State Purchasing:

The General Services Commission has competitively bid contracts for numerous items which are available for direct purchase by school districts. Contracts for this GSC service may be obtained from Sue Jager at (512) 475-2351.

Design/Bid/Build (Competitive Bidding):

Plans and specifications are prepared for specific projects and competitive bids are received from installation contractors. This traditional approach provides the district with more control over each aspect of the project, and task items required by the contractors are presented in detail.

Design/Build:

These contracts are usually structured with the engineer and contractor combined under the same contract to the owner. This type team approach was developed for fast-track projects, and to allow the contractor a position in the decision making process. The disadvantage to the district is that the engineer is not totally independent and cannot be completely focused upon the interest of the district. The district has less control over selection of equipment and quality control.

Purchasing Standardization Method:

This method will result in significant dollar savings if integrated into planned facility improvements. For larger purchases which extend over a period of time, standardized purchasing can produce lower cost per item expense, and can reduce immediate up-front expenditures. This approach includes traditional competitive bidding with pricing structured for present and future phased purchases.

Performance Contracting:

Through this arrangement, an energy service company (ESCO) using in-house or third party financing to implement comprehensive packages of energy saving retrofit projects. Usually a turnkey service, this method includes an initial assessment of energy savings potential, design of the identified projects, purchase and installation of the equipment, and overall project management. The ESCO guarantees that the cost savings generated will, at a minimum, cover the annual payment due over the term of the contract. The laws governing Performance Contracting for school districts are detailed in the Texas Education Code, Subchapter Z, Section 44.901. Senate Bill SB 3035, passed by the seventy-fifth Texas Legislature, amends some of these conditions. Performance Contracting is a highly competitive field, and interested districts may wish to contact Felix Lopez of State Energy Conservation Office, (SECO), at 512-463-1080 for assistance in preparing requests for proposals or requests for qualifications.

Solution Center

How to Finance Your Energy Program

Cost and financing issues are pivotal factors in determining which energy-efficiency measures will be included in your final energy management plan. Before examining financing options, you need to have a reasonably good idea of the measures that may be implemented. For this purpose, you will want to perform cost/benefit analyses on each candidate measure to identify those with the best investment potential. This document presents a brief introduction to cost/benefit methods and then suggests a variety of options for financing your program.

Selecting a Cost/Benefit Analysis Method

Cost/benefit analysis can determine if and when an improvement will pay for itself through energy savings and to help you set priorities among alternative improvement projects. Cost/benefit analysis may be either a simple payback analysis or the more sophisticated life cycle cost analysis. Since most electric utility rate schedules are based on both consumption and peak demand, your analyst should be skilled at assessing the effects of changes in both electricity use and demand on total cost savings, regardless of which type of analysis is used. Before beginning any cost/benefit analyses, you must first determine acceptable design alternatives that meet the heating, cooling, lighting, and control requirements of the building being evaluated. The criteria for determining whether a design alternative is "acceptable" includes reliability, safety, conformance with building codes, occupant comfort, noise levels, and space limitations. Since there will usually be a number of acceptable alternatives for any project, cost/benefit analysis allows you to select those that have the best savings potential.

Simple Payback Analysis

A highly simplified form of cost/benefit analysis is called simple payback. In this method, the total first cost of the improvement is divided by the first-year energy cost savings produced by the improvement. This method yields the number of years required for the improvement to pay for itself.

This kind of analysis assumes that the service life of the energy-efficiency measure will equal or exceed the simple payback time. Simple payback analysis provides a relatively easy way to examine the overall costs and savings potentials for a variety of project alternatives. However, it does not consider a number of factors that are difficult to predict, yet can have a significant impact on cost savings. These factors may be considered by performing a life-cycle cost (LCC) analysis.

Simple Payback

As an example of simple payback, consider the lighting retrofit of a 10,000-square-foot commercial office building. Relamping with T-8 lamps and electronic, high-efficiency ballasts may cost around $13,300 ($50 each for 266 fixtures) and produce annual savings of around $4,800 per year (80,000 kWh at $0.06/kWh). This simple payback for this improvement would be

$$\frac{\$13{,}300}{\$4{,}800/\text{year}} = 2.8 \text{ years}$$

That is, the improvement would pay for itself in 2.8 years, a 36% simple return on the investment (1/2.8 = 0.36).

Life-Cycle Cost Analysis

Life-cycle cost analysis (LCC) considers the total cost of a system, device, building, or other capital equipment or facility over its anticipated useful life. LCC analysis allows a comprehensive assessment of all anticipated costs associated with a design alternative. Factors commonly considered in LCC analyses include initial capital cost, operating costs, maintenance costs, financing costs, the expected useful life of equipment, and its future salvage values. The result of the LCC analysis is generally expressed as the value of initial and future costs in today's dollars, as reflected by an appropriate discount rate.

The first step in this type of analysis is to establish the general study parameters for the

continued

Financing Mechanisms

Capital for energy-efficiency improvements is available from a variety of public and private sources, and can be accessed through a wide and flexible range of financing instruments. While variations may occur, there are five general financing mechanisms available today for investing in energy-efficiency:

- **Internal Funds.** Energy-efficiency improvements are financed by direct allocations from an organization's own internal capital or operating budget.
- **Debt Financing.** Energy-efficiency improvements are financed with capital borrowed directly by an organization from private lenders.
- **Lease or Lease-Purchase Agreements.** Energy-efficient equipment is acquired through an operating or financing lease with no up-front costs, and payments are made over five to ten years.
- **Energy Performance Contracts.** Energy-efficiency measures are financed, installed, and maintained by a third party, which guarantees savings and payments based on those savings.
- **Utility Incentives.** Rebates, grants, or other financial assistance are offered by an energy utility for the design and purchase of certain energy-efficient systems and equipment.

These financing mechanisms are not mutually exclusive (i.e., an organization may use several of them in various combinations). The most appropriate set of options will depend on the size and complexity of a project, internal capital constraints, in-house expertise, and other factors. Each of these mechanisms is discussed briefly below, followed by some additional funding sources and considerations.

Internal Funds

The most direct way for the owner of a building or facility to pay for energy-efficiency improvements is to allocate funds from the internal capital or operating budget. Financing internally has two clear advantages over the other options discussed below – it retains internally all savings from increased energy-efficiency, and it is usually the simplest option administratively. The resulting savings may be used to decrease overall operating expenses in future years or retained within a revolving fund used to support additional efficiency investments. Many public and private organizations regularly finance some or all of their energy-efficiency improvements from internal funds.

In some instances, competition from alternative capital investment projects and the requirement for relatively high rates of return may limit the use of internal funds for major, standalone investments in energy-efficiency. In most organizations, for example, the highest priorities for internal funds are business or service expansion, critical health and safety needs, or productivity enhancements. In both the public and private sectors, capital that remains available after these priorities have been met will usually be invested in those areas that offer the highest rates of return. The criteria for such investments commonly include an annual return of 20 percent to 30 percent or a simple payback of three years or less.

Since comprehensive energy-efficiency improvements commonly have simple paybacks of five to six years, or about a 12 percent annual rate of return, internal funds often cannot serve as the sole source of financing for such improvements. Alternatively, however, internal funding can be used well and profitably to achieve more competitive rates of return when combined with one or more of the other options discussed below.

Debt Financing

Direct borrowing of capital from private lenders can be an attractive alternative to using internal funds for energy-efficiency investments. Financing costs can be repaid by the savings that accrue from increased energy-efficiency. Additionally, municipal governments can often issue bonds or other long-term debt instruments at substantially lower interest rates than can private corporate entities. As in the case of internal funding, all savings from efficiency improvements (less only the cost of financing) are retained internally.

Debt financing is administratively more complex than internal funding, and financing costs will vary according to the credit rating of the borrower. This approach may also be restricted by formal debt ceilings imposed by municipal

policy, accounting standards, and/or Federal or state legislation.

In general, debt financing should be considered for larger retrofit projects that involve multiple buildings or facilities. When considering debt financing, organizations should weigh the cost and complexity of this type of financing against the size and risk of the proposed projects.

Lease and Lease-Purchase Agreements

Leasing and lease-purchase agreements provide a means to reduce or avoid the high, up-front capital costs of new, energy-efficient equipment. These agreements may be offered by commercial leasing corporations, management and financing companies, banks, investment brokers, or equipment manufacturers. As with direct borrowing, the lease should be designed so that the energy savings are sufficient to pay for the financing charges. While the time period of a lease can vary significantly, leases in which the lessee assumes ownership of the equipment generally range from five to ten years. There are several different types of leasing agreements, as shown in the sidebar. Specific lease agreements will vary according to lessor policies, the complexity of the project, whether or not engineering and design services are included, and other factors.

Energy Performance Contracts

Energy performance contracts are generally financing or operating leases provided by an Energy Service Company (ESCo) or equipment manufacturer. The distinguishing features of these contracts are that they provide a guarantee on energy savings from the installed retrofit measures, and they provide payments to the ESCo from the savings, freeing the customer from any need of up-front payments to the ESCo. The contract period can range from five to 15 years, and the customer is required to have a certain minimum level of capital investment (generally $200,000 or more) before a contract will be considered.

Under an energy performance contract, the ESCo provides a service package that typically includes the design and engineering, financing, installation, and maintenance of retrofit measures to improve energy-efficiency. The scope of these improvements can range from measures that affect a single part of a building's energy-using

Types of Leasing Agreements

Operating Leases are usually for a short term, occasionally for periods of less than one year. At the end of the lease period, the lessee may either renegotiate the lease, buy the equipment for its fair market value, or acquire other equipment. The lessor is considered the owner of the leased equipment and can claim tax benefits for its depreciation.

Financing Leases are agreements in which the lessee essentially pays for the equipment in monthly installments. Although payments are generally higher than for an operating lease, the lessee may purchase the equipment at the end of the lease for a nominal amount (commonly $1). The lessee is considered the owner of the equipment and may claim certain tax benefits for its depreciation.

Municipal Leases are available only to tax-exempt entities such as school districts or municipalities. Under this type of lease, the lessor does not have to pay taxes on the interest portion of the lessee's payments, and can therefore offer an interest rate that is lower than the rate for usual financing leases. Because of restrictions against multi-year liabilities, the municipality specifies in the contract that the lease will be renewed year by year. This places a higher risk on the lessor, who must be prepared for the possibility that funding for the lease may not be appropriated. The lessor may therefore charge an interest rate that is as much as 2 percent above the tax-exempt bond rate, but still lower than rates for regular financing leases. Municipal leases nonetheless are generally faster and more flexible financing tools than tax-exempt bonds.

Guaranteed Savings Leases are the same as financing or operating leases but with the addition of a guaranteed savings clause. Under this type of lease, the lessee is guaranteed that the annual payments for leasing the energy-efficiency improvements will not exceed the energy savings generated by them. The owner pays the contractor a fixed payment per month. If actual energy savings are less than the fixed payment, however, the owner pays only the small amount saved and receives a credit for the difference.

How to Finance Your Energy Program *continued*

Bulk Purchasing. Large organizations generally have purchasing or materials procurement departments that often buy standard materials in bulk or receive purchasing discounts because of the volume of their purchases. Such organizations can help reduce the costs of energy-efficiency renovations if their bulk purchasing capabilities can be used to obtain discounts on the price of materials (e.g., lamps and ballasts). While some locales may have restrictions that limit the use of this option, some type of bulk purchasing can usually be negotiated to satisfy all parties involved.

Project Transaction Costs. Certain fixed costs are associated with analyzing and installing energy measures in each building included in a retrofit program. Each additional building, for example, could represent additional negotiations and transactions with building owners, building analysts, energy auditors, equipment installers, commissioning agents, and other contractors. Similarly, each additional building will add to the effort involved in initial data analysis as well as in tracking energy performance after the retrofit. For these reasons, it is often possible to achieve target energy savings at lower cost by focusing only on those buildings that are the largest energy users. One disadvantage with larger buildings is that the energy systems in the building can be more difficult to understand, but overall, focusing on the largest energy users is often the most efficient use of your financial resources.

Direct Value-Added Benefits. The primary value of retrofits to buildings and facilities lies in the reduction of operating costs through improved energy-efficiency and maintenance savings. Nevertheless, the retrofit may also directly help address a variety of related concerns, and these benefits (and avoided costs) should be considered in assessing the true value of an investment. A few examples of these benefits include the improvement of indoor air quality in office buildings and schools; easier disposal of toxic or hazardous materials found in energy-using equipment; and assistance in meeting increasingly stringent state or Federal mandates for water conservation. Effective energy management controls for buildings can also provide a strong electronic infrastructure for improving security systems and telecommunications.

Economic Development Benefits. In addition to direct savings on operating costs and the added-value benefits mentioned above, investments in energy-efficiency can also support a community's economic development and employment opportunities. Labor will typically constitute about 60 percent of a total energy investment, and about 50 percent of equipment can be expected to be purchased from local equipment suppliers; as a result, about 85 percent of the investment is retained within the local economy. Additionally, funds retained in urban areas will generally be re-spent in the local economy. The Department of Commerce estimates that each dollar retained in an urban area will be re-spent three times. This multiplier effect results in a three-fold increase in the economic benefits of funds invested in energy-efficiency, without even considering the savings from lower overall fuel costs.

For more information contact the Rebuild America Clearinghouse at 252-459-4664 or visit www.rebuild.gov

Rebuild America
U.S. Dept. of Energy

APPENDIX II - ELECTRIC UTILITY RATE SCHEDULES

PUBLIC UTILITY COMMISSION OF TEXAS
APPROVED
DEC 23 '09 DOCKET 36928
CONTROL #

AEP TEXAS CENTRAL COMPANY
TARIFF FOR ELECTRIC DELIVERY SERVICE
Applicable: Entire System
Chapter: 6 Section: 6.1.1
Section Title: Delivery System Charges
Revision: Sixth Effective Date: December 30, 2009

6.1.1.1.3 SECONDARY VOLTAGE SERVICE GREATER THAN 10 KW

AVAILABILITY

This schedule is applicable to Delivery Service for non-residential purposes at secondary voltage with demand greater than 10 kW when such Delivery Service is to one Point of Delivery and measured through one Meter.

TYPE OF SERVICE

Delivery Service will be single-phase 60 hertz, at a standard secondary voltage. Delivery Service will be metered using Company's standard meter provided for this type of Delivery Service. Any meter other than the standard meter will be provided at an additional charge. Where Delivery Service of the type desired is not available at the Point of Delivery, additional charges and special arrangements may be required prior to Delivery Service being furnished, pursuant to Section 5.7 and 6.1.2 of this Tariff.

MONTHLY RATE

I. Transmission and Distribution Charges:

Customer Charge		
Non-IDR Metered	$3.26	per Retail Customer per Month
IDR Metered	$26.52	per Retail Customer per Month
Metering Charge	$15.81	per Retail Customer per Month
Transmission System Charge		
Non-IDR Metered	$1.286	per NCP kW Billing Demand
IDR Metered	$1.793	per 4CP kW Billing Demand
Distribution System Charge	$3.314	per NCP kW Billing Demand
II. System Benefit Fund:	$0.000662	per kWh See SBF 6.1.1.4
III. Transition Charge:	See Riders TC 6.1.1.2.1.1 and TC-2 6.1.1.2.2.1	
IV. Nuclear Decommissioning Charge:	See Rider NDC 6.1.1.5.1	
V. Transmission Cost Recovery Factor:	See Rider TCRF 6.1.1.6.2.1	

119 16

VI. Excess Mitigation Credit: Not Applicable

VII. State Colleges and Universities Discount: See Rider SCUD 6.1.1.6.1

VIII. Competitive Metering Credit: See Rider CMC 6.1.1.6.6

IX. Other Charges or Credits:

A. Rate Case Surcharge Rider See Rider RCS-2 6.1.1.6.8

B. True-up Case Surcharge Rider See Rider TCE 6.1.1.6.7

C. Energy Efficiency Rider See Rider EECRF 6.1.1.6.4.1

D. Advanced Metering System Rider See Rider AMSCRF 6.1.1.6.9

COMPANY-SPECIFIC APPLICATIONS

Refer to Section 6.2.2 of the Tariff for additional voltage information.

Three-phase service may be provided if Retail Customer has permanently installed, and in regular use, motor(s) which qualify according to Section 6.2.3.4, or, at the Company's sole discretion, the load is sufficient to warrant three-phase service.

Service will normally be metered at the service voltage. For more information, refer to the Meter Installation and Meter Testing Policy, Section 6.2.3.3 of the Tariff.

Refer to Section 5.5.2 of the Tariff for additional information regarding highly fluctuating loads.

Refer to Section 5.5.4 of the Tariff for additional information regarding operational changes significantly affecting Demand.

Refer to Section 5.5.5 of the Tariff for additional information regarding Power Factor.

Transmission service will be furnished by the Transmission Service Providers (TSPs), and not the Company. The Company performs only the billing function for TSPs.

Determination of Billing Demand for Transmission System Charges

Determination of NCP kW

The NCP kW applicable under the Monthly Rate section for transmission system charges for non-IDR metered customers and IDR metered customers without sufficient 4CP kW

PUBLIC UTILITY COMMISSION OF TEXAS
APPROVED
DEC 2 3 '09 DOCKET 36928
CONTROL #

demand data shall be the kW supplied during the 15-minute period of maximum use during the billing month.

Determination of 4 CP kW For IDR Metered Customers

If the Billing Meter is an IDR Meter that was installed at the Retail Customer's request, or by Commission rule, the transmission system charges will be calculated using the 4CP billing kW demand as determined in this section. The 4 CP kW demand applicable under the Monthly Rate section shall be the average of the sum of the Retail Customer's integrated 15-minute demands at the time of the monthly ERCOT system 15-minute peak demand for the months of June, July, August and September of the previous calendar year. The Retail Customer's average 4 CP kW demand will be updated effective on January 1 of each calendar year and remain fixed throughout the calendar year. Retail Customers without previous history on which to determine their 4 CP kW demand will be billed at the applicable NCP kW demand rate under the "Transmission System Charge" using the Retail Customer's NCP kW demand.

All Retail Customers with IDR metering, except IDR meters installed by Company for load survey purposes, will be billed Transmission charges on their 4 CP kW demand pursuant to this schedule.

Determination of Billing Demand for Distribution System Charges

Determination of NCP kW Billing Demand

The NCP kW Billing Demand shall be the kW supplied during the 15-minute period of maximum use. The NCP kW Billing Demand applicable to the Distribution System Charge shall be the higher of the NCP kW demand for the current billing month or 80% of the highest monthly NCP kW demand established in the 11 months preceding the current billing month (80% ratchet). The 80% ratchet shall not apply to Retail Seasonal Agricultural Customers.

Determination Of Billing Demand When Meter Readings Cannot be Obtained

When meter readings cannot be obtained due to denial of access, weather, meter failure, tampering, or other event, the Retail Customer's demand will be estimated pursuant to Section 6.2.3.2.

NOTICE

This rate schedule is subject to the Company's Tariff and Applicable Legal Authorities.

APPENDIX III - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

OFFICE OF THE COMPTROLLER TEXAS

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 CALHOUN COUNTY ISD, 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.

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: Larry W. Nichols — Date: 4-9/10

Name (Mr./Ms./Dr.) MR. LARRY W. NICHOLS — Title: SUPERINTENDENT

Organization: CALHOUN COUNTY ISD — Phone: 361-552-9728

Street Address: 525 NORTH COMMERCE — Fax: 361-551-2648

Mailing Address: 525 NORTH COMMERCE PORT LAVACA, TEXAS 77979 — E-Mail: nichols@calcoisd.org

County: CALHOUN

Contact Information:

Name (Mr./Ms./Dr.): LARRY NICHOLS — Title: SUPT

Phone: 361-552-9728 — Fax: 361-551-2648

E-Mail: nichols@calcoisd.org — County: CALHOUN

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.

AND fax to the SECO Contractor for this service, Yvonne Huneycutt, ESA Energy Systems Associates, Inc. Phone: 512-258-0547, x124. Fax: 512-388-3312.

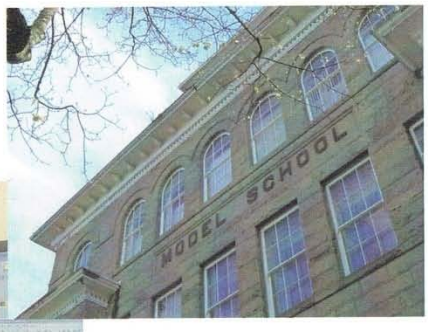
APPENDIX IV - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

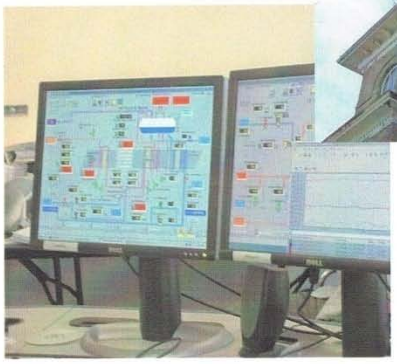
ANNOUNCING!

TEMA

TEXAS ENERGY MANAGERS ASSOCIATION

A PROFESSIONAL ASSOCIATION FOR THOSE RESPONSIBLE FOR ENERGY MANAGEMENT IN TEXAS PUBLIC FACILITIES





- Networking
- Sharing Knowledge and Resources
- Training Workshops
- Regional Meetings
- Annual Conference
- Certification
- Legislative Updates
- Money-Saving Opportunities

WWW.TEXASEMA.ORG

Check the website for Membership and Association information.

SECO
State Energy Conservation Office

APPENDIX V - UTILITY CHARTS ON CD