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Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

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Buckholts Independent School District

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ESA-Energy Systems Associates, Inc.
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SECO
State Energy Conservation Office

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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 *Kent Dutton*, Superintendent for **Buckholts** 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 **Buckholts ISD,** (hereafter known as BISD) 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. Tommy Vaculin*, Maintenance Director for BISD, a walk-through energy analysis was conducted throughout the campus. 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 **$11,725** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$59,800**, yielding an average simple payback of **5-1/4** years.

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1	$12,300	$1,025	12 Years
Lighting ECRM #1	$ 15,000	$ 3,300	4-1/2 Years
Lighting ECRM #2	$ 17,500	$ 2,900	6 Years
Controls ECRM #1	$ 15,000	$ 4,500	3-1/3 Years
TOTAL PROJECTS	$ 59,800	$ 11,725	5-1/4 Years

The total utility cost for BISD in 2009 was $61,948. The projected savings of $11,725 would represent a decrease in utility expenditures for the district of 18.9%. 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 **BISD**. 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 BISD, 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. Develop and draft an overall energy management policy.

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" (BTU's).

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 BTU's are then divided

by the building area.

EUI = [Electricity BTU's + Gas BTU's] 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 :

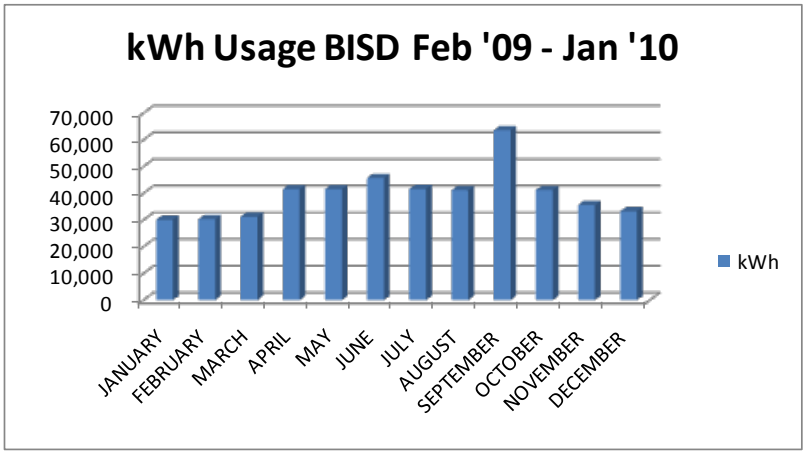
BUCKHOLTS ISD

CAMPUS	ENERGY UTILIZATION INDEX (EUI) (Btu/sf-year)	ENERGY COST INDEX (ECI) ($/sf-year)
2009 Buckholts K-12	**38,055**	**$1.14**

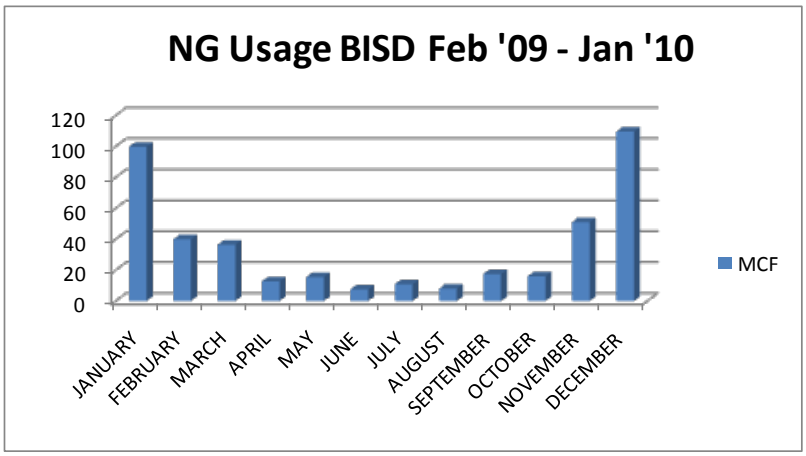
MONTH / YEAR		ELECTRIC				NAT'L GAS / FUEL		
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	30,090	272	272	n/a	4,129	100	$664
FEBRUARY	2009	30,276	201	201	n/a	4,666	40	$277
MARCH	2009	31,212	201	201	n/a	4,651	36	$194
APRIL	2009	41,554	213	213	n/a	5,466	13	$92
MAY	2009	41,554	213	213	n/a	5,466	16	$104
JUNE	2009	45,728	214	214	n/a	5,007	8	$73
JULY	2009	41,579	213	213	n/a	4,726	11	$108
AUGUST	2009	41,147	221	221	n/a	4,642	8	$87
SEPTEMBER	2009	63,587	301	301	n/a	6,694	17	$153
OCTOBER	2009	41,209	253	253	n/a	4,791	16	$160
NOVEMBER	2009	35,617	366	366	n/a	4,424	51	$398
DECEMBER	2009	33,283	238	238	n/a	4,182	110	$794
TOTAL		**476,836**	**2,906**	**2,906**		**$58,844**	**425**	**$3,104**

Annual Total Energy Cost =	$61,948	Per Year	**Energy Use Index:** Total Site BTU's/yr / Total Area (sf)	38,055	BTU/s.f.yr
Total KWH x 0.003413 =	1,627.44	x 1,000,000			
Total MCF x 1.03 =	437.24	x 1,000,000	**Energy Cost Index:**		
Total Other x ____		x 1,000,000	Total Energy Cost/yr / Total Area (sf)	$1.14	$/s.f. yr
Total Site BTU's/yr	2,064.68	x 1,000,000			
Floor area:	54,255	s.f.			

Charting the annual electricity consumption reveals that the district does not experience a significant decrease in consumption for June and July as would be expected for periods of vacationing students. While it is acknowledged that summer months do represent custodial and administrative occupancy periods, the lack of a decrease in consumption for these months may indicate an opportunity for improved coordination and zoning of June and July Administrative and Custodial activities in order to reduce consumption during these time periods. The district conditions their spaces with individual split systems and rooftop units; control is provided with a combination of programmable and conventional thermostats. The lack of a decrease in consumption during summer months implies that more units than necessary are being operated for floor maintenance activities or possibly that thermostat programs are not being adjusted to the summer occupancy schedules.



The chart for natural gas consumption, on the other hand, shows an ideal inverted bell curve that demonstrates excellent control of natural gas use for space heating in a public school facility in Texas. The baseline readings in summer months likely represent the consumption for natural gas water heaters that are not disconnected during the summer.



As Buckholts 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 Energy for Schools and their Transmission and Distribution (T&D) Provider is Oncor. 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): Energy for Schools [$0.06960 per kWh]

TRANSMISSION AND DISTRIBUTION (T&D): Oncor

Electric Rate: Secondary Service > 10 kW

I.	TRANSMISSION AND DISTRIBUTION CHARGES:		
	Customer Charge	=	$3.50 per meter
	Metering Charge	=	$18.41 per meter
	Transmission System Charge (Non-IDR Meter)	=	$1.99 per NCP kW
	Distribution System Charge	=	$3.97 per DS Billing kW
II.	SYSTEM BENEFIT FUND	=	$0.000655 per kWh
III.	TRANSITION CHARGES		
	Transition Charge 1	=	$0.161/kW
	Transition Charge 2	=	$0.397/kW
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	$0.044 per DS Billing kW
V.	TRANSMISSION COST RECOVERY FACTOR	=	$0.125668/NCP kW
VI.	ENERGY EFFICIENCY COST RECOVERY	=	$9.66/billing period
VII.	COMPETITIVE METERING CREDIT	=	$5.47 per month

Average Savings for consumption = $0.06960/kWh + $0.000655/kWh = $0.070255/kWh

Average Savings for demand = $1.99 + $3.97 + $0.161 + $0.397 + $0.044 + $0.125668 = $6.69/kW**

** This number is a generalization of average cost per kW because the rate schedule from Oncor 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 kW

NATURAL GAS PROVIDER:

Atmos

Rate Schedule Unavailable: Average cost per MCF determined from utility billings.

Total Cost of Natural Gas purchased for Buckholts ISD:	$3,104
Total Quantity of Natural Gas purchased for Buckholts ISD:	425 MCF

Cost / Quantity = Average Unit Cost

$ 3,104 / 425 mcf = **$7.30 per mcf of natural gas**

5.0 CAMPUS DESCRIPTIONS:

Buckholts **ISD** consists of four educational buildings which are located on one K-12 campus at 203 South 10th Street in Buckholts, Texas. The Elementary School occupies the northwest corner of the property, the Middle School/Administration building and Weight Room/Art Room building is central to the campus and the High School, also known as the Aycock-Brady Building, is located southeast of the other buildings. The facilities are occupied from mid- August through late May on a weekday schedule of 7:15 A.M. to 4:30 P.M. The Administrative area is open all year, and portions of the facility are occupied by the maintenance/custodial staff throughout the summer. Insurance records indicate the district contains 54,255 square feet of classroom and student occupied space.

Figure 1 High School Building

HVAC System Description:

The Middle School has a flat built-up gravel roof while all other buildings have low-sloping metal roofs. As a result, there are rooftop units serving the Middle School classrooms and all other classroom HVAC equipment is split systems. Two exceptions are the Gymnasium platform mounted horizontal discharge packaged units (Figure 2) and the Weight Room/Art Room portable building which utilizes two older window units that have sustained significant coil fin damage (Figure 3). The damage appears to be caused by student vandalism and not hail; coil guards would have limited, but not likely prevented, this damage. Damage to just 10% of the coil fins on condensers can result in as much as a 30% loss of operating efficiency for the unit. As per the picture, these units have sustained damage to more than 50% of the coil fins which has severely inhibited the unit's ability to reject heat to the atmosphere. These spaces are reported to only be used once or twice a week, but the condition of the units, along with the fact that some of the windows have been broken and covered with scrap pieces of ceiling tile suggests that there is considerable wasted energy when the spaces are in use. *We recommend that the windows be repaired and the two window units replaced with one split system to serve both spaces.*

Figure 2 Gymnasium Packaged Units

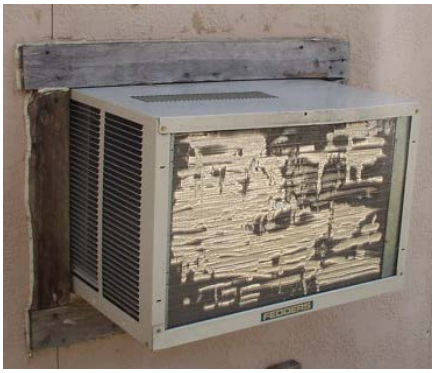


Figure 3 Art Room Window Unit

The rooftop units (RTUs) at the Middle School (Carrier Weathermaker models, 3-4 tons cooling capacity per unit, gas-fired heating coils) are in reasonable condition. Most of the units each serve two classrooms, therefore temperature disputes between occupants of shared classrooms do occur.

The split systems at the Elementary School and the High School utilize gas-fired furnaces. The units at the Elementary School and High School are all York models, typically ranging in size from 3 to 4 tons each. The High School units are all 2000 models original to the construction of the building, except for one unit that was recently replaced. The Elementary School units are all 1996 models original to its building construction. At 14 years old, the units are approaching the end of their 15-20 year life expectancy. *The district should begin to plan for their replacement within the next 5-6 years.* The Middle School has rooftop units installed in 2006 that remain in excellent condition.

Figure 4 Elementary School Condensing Units

The refrigerant line insulation was notably damaged or missing from several units around the district. As shown in Figure 5, this damage to the insulation allows the refrigerant to absorb heat from the ambient air and limits its ability to absorb heat from the interior space as intended. We recommend the district examine the condition of the refrigerant piping insulation at all buildings and repair or replace missing and damaged sections.

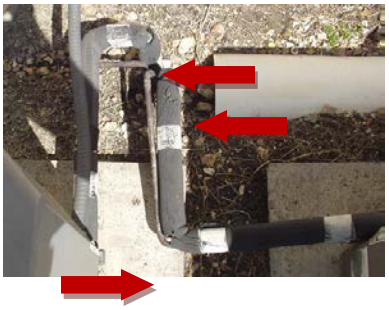


Figure 5 Deteriorated Refrigerant Insulation

It was also noted during the survey that there is some minor coil fin damage at rooftop units and condensing units. This damage again appears to be non-weather related (Figure 6 to the right). *We recommend that the unit fins be combed straight and coil guards be installed to prevent this damage from occurring in the future.*

Figure 6 Coil Fin Damage

The Kitchen staff noted during the survey that the Kitchen HVAC unit has to be programmed to cool with a 70°F setpoint and run 24/7 or the refrigeration/freezer units will not cool sufficiently to keep food at appropriate temperatures. There were two conditions noted during the survey that may be contributing to this issue: a lack of make-up air on the Kitchen exhaust hood and the fact that the freezer/cooler condensers are located inside the Kitchen below the units. The lack of make-up air suggests that much of the conditioned air from the HVAC unit is being exhausted from the Kitchen during food preparation hours and the presence of the condensers inside the Kitchen implies that all heat evacuated from the freezer/cooler is rejected to the Kitchen itself, raising the temperature in the Kitchen space. We recommend the district consider replacing the Kitchen hood with a new unit incorporating make-up air in the system and replacing the freezer cooler with models that incorporate remote condensers located exterior to the building. There is an ARRA (American Recovery and Reinvestment Act) grants available through the USDA for energy efficiency improvements in Kitchen equipment that could potentially assist with funding the projects.

Control System Description:

The district utilizes a combination of timeclock and programmable thermostats to ensure the district's HVAC equipment does not run during unoccupied hours. The timeclock system interacts with conventional thermostats at the Elementary School and limits operation of the units to 0715 to 1630 hours; temperature control, however, resides totally with the building occupants. The other buildings utilize programmable thermostats for most units; the maintenance and custodial staff are jointly responsible for programming of the units. As stated in Section 3.0, the lack of a decrease in energy consumption during the summer months may be attributable to personnel not modifying the occupancy schedule in the programmable thermostats during the summer. We recommend the district examine its summer thermostat re-programming plan and investigate opportunities to reduce consumption during the summer vacation. We also recommend the district consider replacing the existing thermostats with IP-addressable programmable thermostats. These units are connected to a Local Area Network (LAN) connection which allows them to be monitored and programmed over the district's local network. Software is available to allow global changes to all thermostats on the network which would greatly simplify making changes to the occupied schedules.

Lighting System Description:

The district has a combination of T8 fluorescent fixtures and older, less efficient T12 fluorescent fixtures in the majority of the campus. *The T12 lamps and magnetic ballasts will no longer be manufactured after 2010 and in combination with the energy saving opportunities available and the fact that Senate Bill 300 mandates that all public schools install the most efficient lamps and ballasts possible in their existing lighting system, we recommend the district retrofit the remaining T12 system fixtures with T8 lamps and electronic ballasts.* The current lighting system, when renovated with T8 components, will produce 20% more light while consuming 18% less energy and will eliminate the flicker and hum associated with the current older technology. Oncor, the district's T&D electric utility, offers energy efficiency rebates for this type of renovation.

The gymnasiums currently utilize metal halide fixtures for the majority of the illumination in the space. These fixtures are relatively efficient fixtures by themselves, but their long re-strike issue discourages personnel from turning them off during periods of inactivity because they do not want to wait the 5-10 minutes required to re-start the fixtures when gym activities resume. Therefore, the fixtures typically operate 11-12 hours per day. We recommend the district consider renovating the gymnasium fixtures with new T5HO or T8 fluorescent high bay fixtures. These fixtures do offer energy reductions from comparable metal halide fixtures, but more importantly, they do not have the re-strike issue inherent to metal halides and therefore may be turned off during inactive times of the day.

The old gym also has five each 500 watt incandescent fixtures over the bleachers. Incandescent fixtures are the least efficient fixtures available and should also be replaced with the new T5 or T8 fluorescent high bay fixtures.

Exit signs are a mixture of LED and incandescent type fixtures. *We recommend the incandescent fixtures be renovated with new LED lamps if they are in sufficient condition to be in service. Exit fixtures that are not illuminated, or in too poor of condition to be re-used, should be replaced with new LED or LEC units.*

It was noted during the survey (Figure 7) that two areas of exterior fixtures remain operating throughout daytime hours: the canopy lights at the Administration Office and the exterior lights at the High School. We recommend these fixtures be placed on a photocell so that they will not operate during daytime hours.

Figure 7 HS Exterior Lights On During Day

General District Observations:

In general, the district's HVAC equipment is relatively modern and in good shape. The oldest units in the district are the 14 year old split systems at the Elementary School and RTUs at the Middle School. The district has no immediate need for a capital investment for this system, but should plan for replacement of these older units about the 2015-2016 school year. The system has several Maintenance and Operation procedural opportunities that will offer significant energy savings and improve the likelihood that these units will survive their 20 year life expectancy.

The control systems are likely controlling unit operation outside of the current 0715 to 1630 hour program. It is likely that this program is not updated for holiday or vacation time periods and therefore may be allowing units to operate more hours than necessary, especially in the summer months. A strategic plan to update the programmable thermostat and timeclock settings, or a renovation to IP addressable programmable thermostats, would define and simplify this procedure.

The lighting system consists of large numbers of older T12 fluorescent technology in the teaching spaces and metal halide fixtures in the gymnasiums that are operated more hours than necessary due to the long re-strike issue inherent to HID fixtures. Renovation of the lighting system to T8 and T5 fluorescent fixtures offers significant energy and scheduling savings opportunities.

Discussions with maintenance and Administrative personnel suggested that a district Energy Policy might assist personnel in remaining aware and allowing enforcement of sound energy saving strategies. The district desires to provide all occupants with comfortable and well illuminated facilities for all occupied hours. It is the waste of energy during unoccupied hours that the district is targeting to eliminate. A sample energy policy has been prepared for Buckholts ISD and is offered in Appendix IV of this report.

6.0 RECOMMENDATIONS

A. MAINTENANCE AND OPERATIONS PROCEDURES

HVAC	•Comb fins on damaged condensing units •Install hail guards to protect fins in future •Replace damaged refrigerant line insulation
Lighting	•Install photocell or timeclock for Administration exterior lights •Install photocell or timeclock for HS exterior lights
Controls	•Program all facility computer monitors to "sleep" during inactive periods •Adjust holiday/vacation programs at timeclocks and programmable thermostats
Building Envelope	•Check weatherstrip at all exterior doors, replace as needed

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 always less than one year. The difficulties with payback calculation 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 weatherstripping so that exact air losses may be determined, is prohibitive when the benefits of renovating door and weather weatherstripping are well documented and universally accepted.

HVAC M&O

At BISD, the HVAC M&O opportunities revolve around combing the condenser fins [combs available for less than $10] and replacement of refrigerant line insulation. The installation of coil guards prevents future fin combing, which is ultimately a combination of deferred labor savings for eliminating the need for maintenance personnel to perform the task and energy savings resulting from the units maintaining optimum operating efficiency.

Lighting System M&O

The low cost lighting system opportunities involve eliminating daylight operation of existing exterior fixtures. The Administration canopy has six 23 watt compact fluorescent fixtures and the High School has six exterior fixtures which were operating during daytime hours. Assuming this is a common occurrence and not coincidental to the days of the surveys, this represents approximately 0.65 kW worth of light fixtures. The installation of a photocell would likely disable operation of these fixtures for up to 12 hours per day. Savings can be calculated by the following formulae:

0.65kW * 12 hours * 365 days = 2,847 kWh per year

0.65kW/month * 12 months/year * $6.69 (average demand savings, Section 4.0) +
2,847 kWh * $0.070255 (average consumption savings, Section 4.0) = $ 200 per year

Photocontrols are available for less than $15 dollars per unit. One unit will likely be required for each exterior lighting circuit involved, but should not number more than three or four.

Assume four units are required: materials (labor could be calculated with in-house staff rates) would total $60; payback is project cost / savings [$60/$200] = 4 months

Controls M&O

There are two apparent M&O opportunities in the controls arena. As discussed previously, adjusting holiday and vacation schedules in the timeclocks and programmable thermostats will eliminate HVAC systems from operating during special unoccupied occasions. The only cost associated with this practice is the staff time spent making changes to the systems. There are commercially available products that will eliminate much of the labor associated with the schedule adjustment, but that requires a capital investment and is discussed in Section 6.0.B. Otherwise, the payback for this measure will result in the first holiday or vacation when the task is performed.

The second control opportunity exists with the operation of the computer monitors around the district. Many systems were noted operating screensavers when the systems had obviously had no student interaction for quite some time. There are simple and free (or inexpensive) programs that allow a system to put the monitors to “sleep” during periods of inactivity. One promoter of these strategies, Wattwatchers, has demonstrated that each computer system will result in $15 to $25 saved per computer per year with the implementation of this practice.

Envelope M&O

As discussed previously, calculating paybacks for missing or damaged weatherstripping is tedious and serves little purpose. It was noted there were several exterior doors around the district that suffered from missing or absent weatherstripping and we recommend that these situations be addressed as the opportunity arises.

B. CAPITAL EXPENSE PROJECTS

HVAC	•Replace Wt Rm/Art Rm window units with split system •Budget for HVAC replacement at ES in 5-6 years
Lighting	•Retrofit T12s with T8 lamps and ballsts •Renovate Gym metal halide fixtures with T5 fluorescent
Controls	•Install IP Addressable Programmable thermostats at all HVAC units
Infrastructure	•Repair damaged windows at Wt Rm/Art Room

HVAC and Infrastructure ECRMs

ECRM #1: HVAC Renovation at Weight Room / Art Room

At BISD, the Weight Room and Art Room are reported to have use as little as one or two times per week. Infrequent use is not prone to short paybacks in capital intensive projects, but if this building is expected to be used for the next 10 years or more, the project will provide improved occupant comfort and offer significant energy savings when it is being used. The recommendation involves replacing the broken windows to improve the envelope seal of the space, and replacement of the two damaged window units with one new split system. Using the split system to condition both spaces will require some ductwork installation.

Estimated Installed Cost	=	$12,300
Estimated Energy Cost Savings	=	$ 1,025
Simple Payback Period	=	12 years

ECRM #2: Begin to budget for Elementary Split System Renovation

The HVAC equipment for this facility is currently 14 years old. The life expectancy for this equipment is 15-20 years depending on the quality of maintenance performed during its life. The Elementary has eight split systems, totaling 29 tons of cooling capacity. If the units were replaced this year, the project budget should be the following:

Estimated Installed Cost	=	$ 59,450
Estimated Energy Cost Savings	=	$ 3,950
Simple Payback Period	=	15 years

The 15 year payback is due to the fact that the units still have functional life and are not operating as inefficiently as they will be when the appropriate time to replace the units arrives. Allowing for 4% inflation per year for the next 5 years, the budget may become the following:

Estimated Installed Cost	=	$ 72,330
Estimated Energy Cost Savings	=	$ 8,509
Simple Payback Period	=	8-1/2 years

<u>LIGHTING ECRMs</u>

ECRM #1: Retrofit Existing T12 Lighting with T8 Lamps and Electronic Ballasts

At BISD, there are approximately 400 T12 fixtures that we recommend be retrofit with T8 lamps and electronic ballasts. The new components produce approximately 18% more light while consuming about 20% less energy. Senate Bill 300 mandates school districts in Texas install the most energy efficient lamps and ballasts possible in their existing fixtures. T12 components will no longer be manufactured after 2010.

Estimated Installed Cost	=	$ 15,000
Estimated Energy Cost Savings	=	$ 3,300
Simple Payback Period	=	4-1/2 years

ECRM #2: Retrofit Existing Gymnasium Fixtures to T5HO or T8 High Bay Fluorescent

At BISD, there are approximately 24 400-watt metal halide fixtures and five (5) 500-watt incandescent fixtures we recommend be replaced with new T5HO or T8 high bay linear fluorescent fixtures. These fixtures will allow the lights to be turned off during inactive periods of the day, saving as much as 4-6 hours of operation per day.

Estimated Installed Cost	=	$ 17,500
Estimated Energy Cost Savings	=	$ 2,900
Simple Payback Period	=	6 years

<u>CONTROL ECRMs</u>

ECRM #1: Retrofit Existing Conventional and Programmable Thermostats with New IP Addressable Programmable Thermostats

The existing timeclock system and programmable thermostats are providing some level of control over the operation of the HVAC system outside normal occupancy hours. As stated several times in the report, it appears that the programs are not currently adjusted for holiday and vacation periods, which is allowing the systems to operate outside exception unoccupied periods. The task to manually update holiday and vacation programs can be tedious, new IP Addressable Programmable Thermostats may be monitored and programmed via the district's intranet and software available for the units makes updating all of the thermostat programming a five minute task. The programming may be monitored from any internet connection provided the user has the appropriate password and credentials, so the system may be monitored by the

Director of Maintenance or Superintendent from home, if desired. The units may be relocated to a different location or unit as necessary in the future.

Estimated Installed Cost	=	$ 15,000
Estimated Energy Cost Savings	=	$ 4,500
Simple Payback Period	=	3-1/3 years

SUMMARY TABLE:

Excluding HVAC ECRM #2, because it is a future consideration, not a current recommended measure, the projects we recommend BISD consider at the present time include HVAC ECRM #1 plus both lighting ECRMs as well as Controls ECRM #1:

Estimated Installed Cost	=	$ 59,830
Estimated Energy Cost Savings	=	$ 11,725
Simple Payback Period	=	5-1/4 years

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

1. Lighting ECRM #1 — Lighting is often considered one of the most economical projects a district may undertake. It is also a project mandated by Senate Bill 300. The cost savings generated by this project can be collected to fund the additional projects.

2. Lighting ECRM #2 — Taking advantage of the ability to turn off the gymnasium fixtures during inactive periods of the day will generate energy savings and eliminate unnecessary heat generated in the gym which has to be overcome by the HVAC system.

3. HVAC ECRM #1 — While this project serves a smaller and lesser occupied area of the campus than Controls ECRM #1 will affect, consolidating the units in this area requires one less thermostat to be purchased in the controls measure and should therefore be installed before the controls measure is implemented.

4. Controls ECRM #1 — Prioritized last for the reasons stated above, but potentially the most effective of all of the recommended measures in generating energy savings for the district.

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 5% per year after year 5				
Cash Flow	**Project Cost**	**Project Savings**	**Maintenance Expense**	**Net Cash Flow**
Time 0	($59,830.00)		0	($59,830)
Year 1		$ 11,725.00	0	$11,725
Year 2		$ 11,725.00	0	$11,725
Year 3		$ 11,725.00	0	$11,725
Year 4		$ 11,725.00	0	$11,725
Year 5		$ 11,725.00	0	$11,725
Year 6		$ 11,138.75	($500)	$10,639
Year 7		$ 10,552.50	($500)	$10,053
Year 8		$ 9,966.25	($500)	$9,466
Year 9		$ 9,380.00	($500)	$8,880
Year 10		$ 8,793.75	($500)	$8,294
Year 11		$ 8,207.50	($1,000)	$7,208
Year 12		$ 7,621.25	($1,000)	$6,621
Year 13		$ 7,035.00	($1,000)	$6,035
Year 14		$ 6,448.75	($1,000)	$5,449
Year 15		$ 5,862.50	($1,000)	$4,863
			Internal Rate of Return	**15.26%**

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

APPENDIX I: SUMMARY OF FUNDING AND PROCUREMENT OPTIONS

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:

The 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 Theresa Sifuentes of State Energy Conservation Office, (SECO), at 512-463-1896 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

Tariff for Retail Delivery Service
Oncor Electric Delivery Company LLC

6.1.1 Delivery System Charges | Sheet: 1.3
Applicable: Entire Certified Service Area | Page 1 of 2
Effective Date: December 30, 2009 | Revision: Three

6.1.1.1.3 Secondary Service Greater Than 10 kW

AVAILABILITY

This schedule is applicable to Delivery Service 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 or three-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, unless Retail Customer is eligible for and chooses a competitive meter provider. Any meter other than the standard meter provided by Company 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 contract arrangements may be required prior to Delivery Service being furnished, pursuant to Section 6.1.2.2 of this Tariff.

MONTHLY RATE

I. Transmission and Distribution Charges:		
Customer Charge	$3.50	per Retail Customer
Metering Charge	$18.41	per Retail Customer
Transmission System Charge		
Non-IDR Metered	$1.48	per NCP kW
IDR Metered	$1.99	per 4CP kW
Distribution System Charge	$3.97	per Distribution System billing kW
II. System Benefit Fund:	$0.000655	per kWh, See Rider SBF
III. Transition Charge:	See Riders TC1 and TC2	per Distribution System billing kW
IV. Nuclear Decommissioning Charge:	$0.044	per Distribution System billing kW, See Rider NDC
V. Transmission Cost Recovery Factor:	See Rider TCRF	
VI. Energy Efficiency Cost Recovery Factor:	See Rider EECRF	
VII. Competitive Meter Credit:	See Rider CMC	
VIII. Advanced Metering Cost Recovery Factor:	See Rider AMCRF	
Other Charges or Credits		
IX. Rate Case Expense Surcharge:	See Rider RCE	per Distribution System billing kW

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COMPANY SPECIFIC APPLICATIONS

At Company's option, locations where the electrical installation has multiple connections to Company's conductors, due to Company facilities limitations or design criteria, may be considered one Point of Delivery for billing purposes.

DETERMINATION OF BILLING DEMAND FOR TRANSMISSION SYSTEM CHARGES

DETERMINATION OF NCP kW

The NCP kW applicable under the Monthly Rate section shall be the kW supplied during the 15 minute period of maximum use during the billing month.

DETERMINATION OF 4 CP kW

The 4 CP kW applicable under the Monthly Rate section shall be the average 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 4CP 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 will be billed at the applicable NCP rate under the "Transmission System Charge" using the Retail Customer's NCP kW.

DETERMINATION OF BILLING DEMAND FOR DISTRIBUTION SYSTEM CHARGES

DETERMINATION OF BILLING kW

For loads whose maximum NCP kW established in the 11 months preceding the current billing month is less than or equal to 20 kW, the Billing kW applicable to the Distribution System Charge shall be the NCP kW for the current billing month.

For all other loads, the Billing kW applicable to the Distribution System Charge shall be the higher of the NCP kW for the current billing month or 80% of the highest monthly NCP kW established in the 11 months preceding the current billing month (80% ratchet).

The 80% ratchet shall not apply to Retail Seasonal Agricultural Customers.

NOTICE

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

APPENDIX III – SAMPLE ENERGY POLICY

ENERGY POLICY

Recognizing our responsibility as Trustees of **Buckholts** ISD, we believe that every effort should be made to conserve energy and natural resources. As a result, we are establishing this Energy Management Policy which shall be implemented within each of our facilities. We believe that this policy will be beneficial for taxpayers and community residents in the prudent management of our financial and energy resources.

The Board will designate an Energy Manager to coordinate and implement the overall Energy Policy. The Energy Manager will also maintain accurate records of energy consumption and cost on a monthly and annual basis. Energy audits will be conducted annually at each facility and recommendations will be made for updating and improving the energy program. Energy efficiency guidelines and procedures will be reviewed and accepted or rejected by the Board. In addition, the procedures required for implementation of the program, and the results achieved from its administration, will be published for administrative and staff information.

The Board shall sanction the Energy Manager with the authority to establish air conditioning heating and cooling setpoints, equipment operating schedules, and demand limiting strategies for the district's energy consuming equipment. The Energy Manager shall have authority to approve or reject requests for personal refrigerators, heaters, fans, light fixtures, and other energy consuming equipment in district facilities.

Energy management is not sacrificing comfort or productivity in exchange for reduced energy bills. Energy management is eliminating the wasteful energy consumption of having equipment operating inappropriately or outside normal occupancy hours. Lights should be turned off when no one occupies a room. Air conditioning equipment should not be left operating overnight. Custodial and Maintenance activities shall be zoned so lights and air conditioning systems will not be operated in unoccupied areas of the building.

The fulfillment of this policy shall be the joint responsibility of the trustees, administrators, staff and support personnel. The success of the policy is dependent upon total cooperation from all levels within the system.

Adopted this day of , 2010 .

By: _____ , President, Board of Trustees

Attest: _____ , Secretary, Board of Trustees

APPENDIX IV - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

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 Buckholts 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: Kent Dutton
Date: 01/20/2010
Name (Mr./Ms./Dr.) Kent Dutton
Title: Superintendent
Organization: Buckholts ISD
Phone: (254) 593-3011
Street Address: 203 S. 10th, Buckholts
Fax: (254) 593-2270
Mailing Address: PO Box 248
E-Mail: kdutton@buckholtsisd.net
Buckholts, TX 76518
County: Milam - ESA

Contact Information:

Name (Mr./Ms./Dr.): Susie Hubnik
Title: Business Manager
Phone: (254) 593-3011
Fax: (254) 593-2270
E-Mail: shubnik@buckholtsisd.net
County: Milam

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.

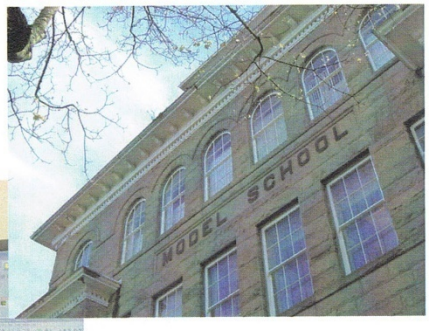
APPENDIX V - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

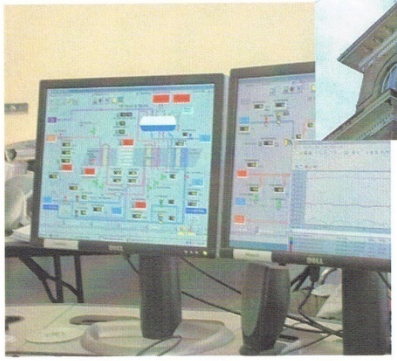
ANNOUNCING!

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.

Texas Energy Managers Association

SECO
State Energy Conservation Office

APPENDIX VI - UTILITY CHARTS ON CD