Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Prepared by:

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Latexo Independent School District

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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 February 2010, **SECO** received a request for technical assistance from Don Elsom, Superintendent for **Latexo 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 **Latexo ISD,** (hereafter known as LISD) 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 *Greg Kennedy, Elementary Principal,* 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 7.0 of this report.

We estimate that as much as **$17,075** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$38,200**, yielding an average simple payback of **2-1/4** years.

Table 1: Summary of Recommended Energy Cost Reduction Measures (ECRMs)

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1	$2,050/ton	undefined	undefined
HVAC ECRM #2	$30,000	$15,000	6 Years
Lighting ECRM #1	$4,800	$800	6 Years
Lighting ECRM #2	$3,000	$1,000	3 Years
Lighting ECRM #3	$400	$275	1-1/2 Years
TOTAL PROJECTS	**$ 38,200**	**$17,075**	**2-1/4 Years**

Although additional savings from reduced maintenance expenses are anticipated, these savings projections are not included in the estimates provided above. The district is replacing the aged HVAC equipment through a process of planned obsolescence, a process in which a few of the oldest and most maintenance intensive units are replaced each year until all of the equipment has been replaced. Each budget year may include a different group of units scheduled to be replaced, therefore we have not projected estimated savings or payback for this group of projects. As a result, the actual Internal Rate of Return (IRR), for this retrofit program has been calculated and shown in Section 8.0 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 LISD. 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 LISD, ESA returned to the facilities to perform the following tasks:

1. Designing and monitoring customized procedures to control the run times of energy consuming systems.
2. Analyze systems for code and standard compliance in areas such as cooling system refrigerants used, outside air quantity, and lighting illumination levels.
3. 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.
4. Develop a prioritized schedule for replacement projects.
5. Developing and drafting an overall Energy Management Policy.
6. 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 LISD ENERGY PERFORMANCE INDICATORS:

Latexo ISD

CAMPUS	ENERGY UTILIZATION INDEX (EUI) BTUs/sf-year	ENERGY COST INDEX (ECI) $/sf-year
K-12 Campus	55,158	$1.20

Latexo ISD purchases electricity from Suez Energy. The transmission and distribution utility is Oncor. The energy history spreadsheets are shown below.

The rate schedule analysis for the district is shown in Section 4.0.

A copy of the rate schedule is included in Appendix I

OWNER: **Latexo ISD** **BUILDING:** **ES, JH, HS, Portables**

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
MONTH	YEAR	CONSUMPTION KWH	METERED KW/KVA	CHARGED KW/KVA	COST OF DEMAND	TOTAL ALL ELECTRICAL COSTS $	CONSUMPTION MCF	COSTS $
JANUARY	2010	91,923	301	301	2,132	8,853	512	$4,145
FEBRUARY	2010	78,494	301	306	2,133	7,874	406	$3,263
MARCH	2010	72,390	306	305	2,133	7,427	314	$2,524
APRIL	2010	77,507	305	309	2,158	7,826	119	$977
MAY	2010	54,476	309	224	2,149	8,249	30	$251
JUNE	2009	107,153	224	276	1,875	9,709	17	$152
JULY	2009	93,957	276	378	1,955	8,824	12	$113
AUGUST	2009	124,800	378	358	2,582	11,708	38	$321
SEPTEMBER	2009	101,964	358	306	2,445	9,899	24	$185
OCTOBER	2009	79,526	306	271	2,134	7,950	23	$185
NOVEMBER	2009	78,636	271	318	2,099	7,856	97	$743
DECEMBER	2009	100,014	318	0	2,197	9,854	305	$2,169
TOTAL		**1,060,840**	**3,653**	**3,352**	**25,992**	**$106,029**	**1,896**	**$15,028**

Annual Total Energy Cost =	$121,057	Per Year	**Energy Use Index:** Total Site BTU's/yr / Total Area (sq.ft.)	55,158 BTU/s.f.yr
Total KWH x 0.003413 =	3,620.65	x 106		
Total MCF x 1.03 =	1,952.88	x 106	**Energy Cost Index:**	
Total Other x ____		x 106	Total Energy Cost/yr / Total Area (sq.ft.)	$1.20 $/s.f. yr
Total Site BTU's/yr	5,573.53	x 106		
Floor area:	101,046	s.f.		

Electric Utility	Account #	Meter#	Gas Utility	Account #
Suez Energy		092120007LG	Centerpoint	2667111-5
		092295583LG		7286580-1
		092295586LG		
		090854591LG		

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Suez Energy: $0.07312 per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: Oncor

Electric Rate: Secondary Service > 10 kW

I.	TRANSMISSION AND DISTRIBUTION CHARGES:		
	Customer Charge	=	$3.50 per meter
	Metering Charge	=	$18.41 per IDR meter
	Transmission System Charge	=	$1.99 per 4CP kW
	Distribution System Charge	=	$3.97 per Billing kW
II.	SYSTEM BENEFIT FUND	=	$0.000655 per kWh
III.	TRANSITION CHARGES		
	Transition Charge 1	=	$0.188/kW
	Transition Charge 2	=	$0.248/kW
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	$0.044 per Billing kW
V.	TRANSMISSION COST RECOVERY FACTOR	=	$0.233457/4CP kW
VI.	ENERGY EFFICIENCY COST RECOVERY FACTOR	=	$9.66
VII.	COMPETITIVE METER CREDIT	=	$-5.47
VIII.	ADVANCED METERING COST RECOVERY FACTOR	=	$3.98
IX.	RATE CASE EXPENSE SURCHARGE	=	.007944 per kWh

Average Savings for consumption = $0.07312/kWh + $0.000655/kWh + $0.007944/kWh = $0.081719/kWh

Average Savings for demand = $1.99 + $3.97 + $0.188 +$0.248 + $0.044 + $0.233457 = $ 6.67/kW**

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

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

NATURAL GAS PROVIDER:

The rate schedule for Natural gas as determined from the utility bills:

Customer Charge:	$16.25 per meter per month
Base Commodity Charge:	$0.0924/ccf
Gas Cost Adjustment Factor:	Varies per month; average for analyzed billing cycle: $0.652335
Local Franchise Fee Reimbursement:	Approximately 2% of Subtotal

Average cost per MCF of purchased natural gas in the district was determined by analyzing the utility histories for the schools surveyed in this report over 12 consecutive month period.

Total cost for natural gas at the eight facilities in the analyzed billing cycle: $15,028

Total quantity purchased during the analyzed billing cycle: 1,896 MCF

Average cost per MCF (Commodity Cost) = Cost of natural gas / quantity purchased

= $15,028 / 1,896 MCF

Average cost per MCF = $7.92

5.0 CAMPUS DESCRIPTIONS:

Latexo ISD consists of 2 educational campuses which are located in Houston County; in the City of Latexo.

Table 2: School Facilities Analyzed For This Report

Facility	Year originally Constructed	Approximate Square Footage	Basic HVAC Cool/Heat	Insulation Above ACT	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Elementary	1997	43,335	Heat Pump Split Systems	Yes	Natural Gas Emergency Heat Air Handlers	100% T8 / Exterior lights under timeclock control/Gym T5	Programmable Thermostat
Junior High / High School	1981	39,145	Heat Pump Split Systems	Yes	Natural Gas Emergency Heat Air Handlers	100% T8 / Exterior lights under timeclock control/Gym T5	Programmable Thermostat

The district had received assistance from SECO 2-3 years ago by participating in the Energy Partnership Program with Estes, McClure and Associates. The district is implementing or has implemented virtually all of the recommendations in that report. The report was the catalyst for the interior lighting retrofit from T12 to T8 in the teaching spaces and from metal halide to T5 linear fluorescent in the gymnasiums. The district replaced inefficient exterior light fixtures and installed insulation above the acoustical ceiling in both campuses. The majority of the individual heaters and small refrigerators have been eliminated from the spaces; food storage is now consolidated and limited to the Teacher's Lounge.

6.0 ENERGY RECOMMENDATIONS:

HVAC ECRM 1: RENOVATION OF AGED HVAC EQUIPMENT

The district has recognized the benefits of planned obsolescence (the practice of replacing a few units each year to avoid emergency replacement costs as units fail) and has replaced almost all of the High School condensing units. There is one 25-ton (Dining and Kitchen) and two 15-ton condensing units (Gymnasium) that have not been replaced at the High School. At the Elementary, there is a total nominal cooling load of 137-1/2 tons supplied by 28 heat pump split systems with natural gas supplemental heat. Of these, just one 4-ton unit has been replaced; all the other equipment was installed in 1997. The district plans to continue the planned obsolescence approach to HVAC replacement. The life expectancy for split systems is approximately 15-20 years; this equipment is only 14 years old, so the payback to replace all of the equipment now would be higher than typically expected for an HVAC retrofit project. The district should budget approximately $2,050 per ton of HVAC units scheduled to be replaced in the 2011-2012 year.

HVAC ECRM 2: INSTALLATION OF IP PROGRAMMABLE THERMOSTATS AT BOTH CAMPUSES

It was noted during the survey, that the conventional thermostats are not turned off each night after the occupants leave the building. Instead, the district implements a night setback procedure where thermostat cooling or heating setpoints are moved 10°F higher or lower, respectively, in each space. While this measure does offer some energy savings by reducing the runtime of the equipment after-hours, it does not offer as much energy savings as a practice of turning off the equipment. IP Addressable Programmable thermostats have the ability to provide the district remote management and surveillance of the HVAC systems. If the district has intranet access at each classroom, these devices simply connect into the network and software allows the system to operate similar to a computer-based energy management system. The units have night setback temperature operation during periods of extreme weather which offers protection against freezing interior pipes. The programming may be adjusted to allow startup an hour before occupants arrive so that the spaces have met setpoint in time for their arrival. Minimizing equipment runtimes after-hours will extend the overall life of the units.

Estimated Cost: $30,000 Estimated Savings: $15,000 Estimated Payback: 2 Years

Lighting ECRM 1: RETROFIT OF T12 LIGHTING TO T8:

The Ag Barn canopy lights were noted to utilize eight-foot T12 components in their linear fluorescent lighting fixtures. T12 components produce approximately 18% less light and consume about 20% more energy than the T8 lamps and electronic ballasts that may be retrofit into the existing linear fluorescent fixtures. Senate Bill 300 requires Texas school districts to install the most efficient lamps and ballasts possible in their existing fixtures. *Therefore we recommend the district retrofit the fixtures at this facility with T8 lamps and electronic ballasts.* In addition, these fixtures operate throughout the evening hours for security purposes. We recommend the district consider placing the operation of these fixtures under motion control so that they only operate during programmed periods when motion us detected in the Ag barn area.

Estimated Cost: $4800 Estimated Savings: $800 Estimated Payback: 6 years

Lighting ECRM 2: MINIMIZING NIGHT LIGHT USE:

The corridors at the High School utilize 2-lamp fixtures; the staff reports that about ½ of those fixtures are left operating throughout the night as night-lights. We recommend that the district reduce the number of night-light fixtures to one out of every 5 corridor fixtures. If the high number of fixtures are operating as a requirement to provide enough light for a video surveillance system, the existing night-light circuit could be placed under motion sensor control so fixtures would be operating if motion was detected, but remain off when there was no activity detected in the space.

Estimated Cost: $3,000 Estimated Savings: $1,000 Estimated Payback: 3 Years

Lighting ECRM 3: OCCUPANCY SENSOR INSTALLATION

There were several areas of the facilities that were noted to have artificial light fixtures operating during unoccupied periods. The first line of defense for the district to eliminate unnecessary fixture operation is to conduct staff training to turn lights off as the last occupant leaves the room. Studies have shown that linear fluorescent fixtures, the type of fixture most often found in classrooms, offers energy savings 23 seconds after they have been turned off when considering the startup current required to turn the fixtures back on when the occupants return. If the training is unsuccessful in changing the behavior of the occupants, then automatic means of turning off the lights, most commonly occupancy sensors, can be employed to perform the task. One such location that this strategy is available is the Cafeteria at the High School. There are 24 4-lamp T8 fluorescent light fixtures in this space that were noted to be on during unoccupied periods; we recommend installing occupancy sensors to ensure the lights are off when nobody is in the space.

Estimated Cost: $400 (Cafeteria Only) Estimated Savings: $275 Estimated Payback: 1-1/2 Years

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

HVAC	•Comb fins on damaged condensing units •Increase frequency of filter replacement; consider changing to pleated filter type
Lighting	•De-lamp areas with excessive illumination •Turn off lights in unoccupied spaces
Envelope	•Weatherstripping at exterior doors

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 time and cost prohibitive when the benefits of renovating door and weather weatherstripping are well documented and universally accepted.

HVAC M&O

At LISD, the HVAC M&O opportunities revolve around combing the condenser fins [combs available for less than $10]. The portable building window units (see picture to the right) were noted to have crushed coil fins. Damage to just 10% of the coil fins on an HVAC unit can result in up to a 30% loss of efficiency for the unit.

Envelope M&O

It was noted that some of the exterior doors had missing or damaged weatherstripping (see picture to the right). We recommend the district replace the weatherstripping to minimize the loss of conditioned air and the entrance of dust and contaminants.

8.0 FINANCIAL EVALUATION

Financing of these projects may be provided using a variety of methods such 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. $2,000 maintenance expense next 5 years				
4. $4,000 maintenance expense next 5 years				
5. Savings decreases 5% per year after year 5				
Cash Flow	**Project Cost**	**Project Savings**	**Maintenance Expense**	**Net Cash Flow**
Time 0	($38,200)		0	($38,200)
Year 1		$ 17,075.00	0	$17,075
Year 2		$ 17,075.00	0	$17,075
Year 3		$ 17,075.00	0	$17,075
Year 4		$ 17,075.00	0	$17,075
Year 5		$ 17,075.00	0	$17,075
Year 6		$ 16,733.50	($2,000)	$14,734
Year 7		$ 16,392.00	($2,000)	$14,392
Year 8		$ 16,050.50	($2,000)	$14,051
Year 9		$ 15,709.00	($2,000)	$13,709
Year 10		$ 15,367.50	($2,000)	$13,368
Year 11		$ 15,026.00	($4,000)	$11,026
Year 12		$ 14,684.50	($4,000)	$10,685
Year 13		$ 14,343.00	($4,000)	$10,343
Year 14		$ 14,001.50	($4,000)	$10,002
Year 15		$ 13,660.00	($4,000)	$9,660
			Internal Rate of Return	**43.08%**

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

APPENDIX I: SUMMARY OF FUNDING AND PROCUREMENT OPTIONS

9.0 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:

The Board 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 Eddy Trevino 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

How to Finance Your Energy Program *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

How to Finance Your Energy Program *continued*

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 SCHEDULE

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

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 IV - 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 Latexo 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: Don Elsom
Date: 2/18/11
Name (Mr./Ms./Dr.) Don Elsom
Title: Superintendent
Organization: Latexo ISD
Phone: 936-544-5664
Street Address: 298 FM 2663
Fax: 936-544-5332
Mailing Address: P.O. Box 975
E-Mail: delsom@latexoisd.net
Latexo, TX 75849
County: Houston

Contact Information:

Name (Mr./Ms./Dr.): Greg Kennedy
Title: Elementary Principal
Phone: 936-546-5630
Fax: 936-544-5332
E-Mail: gkennedy@latexoisd.[redacted]net
County: Houston

Please sign and mail or fax to: Stephen Rose, Schools and Education Program Administrator, State Energy Conservation Office, 111 E. 17th Street, Austin, Texas 78774. Phone: 512-463-1770. **Fax 512-475-2569.**

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

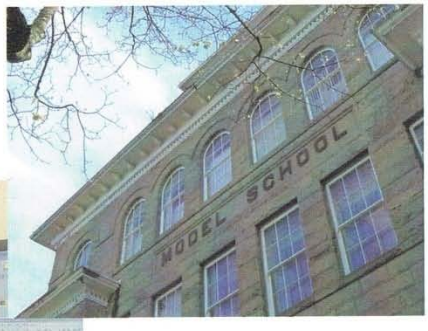
APPENDIX V - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

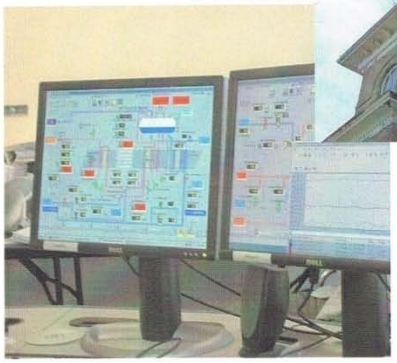
ANNOUNCING!

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.

SECO
State Energy Conservation Office

APPENDIX VI - UTILITY CHARTS ON CD