Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Prepared by:

ESA ENERGY SYSTEMS ASSOCIATES, Inc

A TERRACON COMPANY

100 East Main Street

Round Rock, Texas 78664

(512) 258-0547

Matagorda County

June 7, 2011

ESA Energy Systems Associates, Inc.
A Terracon COMPANY

SECO
State Energy Conservation Office

Table of Contents

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**.

SECO
State Energy Conservation Office

Program Administrator:	Stephen Ross
Phone:	512-463-1770
Address:	State Energy Conservation Office LBJ State Office Building 111 E. 17th Street Austin. Texas 78774

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 Nate McDonald, County Judge for **Matagorda County.** **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 **Matagorda County,** 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 *Judge McDonald*, 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.

<u>We estimate that as much as **$20,700** may be saved annually if all recommended projects are implemented</u>. The estimated installed cost of these projects should total approximately **$306,575**, yielding an average simple payback of **15** years.

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

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1	$192,000	$8,000	24 Years
Lighting ECRM #1	$975	$3,100	4 Months
Lighting ECRM #2	$350	$1,200	3-1/2 Months
Lighting ECRM #3	$950	$150	6 Years
Envelope ECRM #1	$12,300	$1,500	8 Years
Envelope ECRM #2	$100,000	$6,750	15 Years
TOTAL PROJECTS	**$ 306,575**	**$20,700**	**15 Years**

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 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 MATAGORDA COUNTY. 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
A Terracon Company

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. The purpose of this visit is 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 requested for the engineer's preliminary assessment of the Energy Performance Indicators. After consultation with SECO to determine the program elements to be provided to MATAGORDA COUNTY, 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 MATAGORDA COUNTY ENERGY PERFORMANCE INDICATORS:

CAMPUS	ENERGY UTILIZATION INDEX (EUI) BTUs/sf-year	COMPARISON TO DISTRICT AVERAGE	ENERGY COST INDEX (ECI) $/sf-year	COMPARISON TO DISTRICT AVERAGE
Courthouse	37,386	20%	$2.52	24%
Office Building	24,696	-20%	$1.53	-24%
Average Value:	31,041		$2.03	

Matagorda County purchases electricity for all facilities from GDF Suez. The transmission and distribution utility is AEP Central Company. The utility data worksheets are shown on page 8.

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

Copies of the rate schedules are included in Appendix I.

OWNER: Matagorda County BUILDING: Courthouse

MONTH / YEAR		ELECTRIC	DEMAND				NAT'L GAS / FUEL	
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2011	66,432		0	0	7,768	0	13
FEBRUARY	2010	60,672		0	0	7,266	0	13
MARCH	2010	57,792		0	0	6,864	0	13
APRIL	2010	64,704		0	0	7,841	0	13
MAY	2010	74,496		0	0	8,347	0	13
JUNE	2010	87,168		0	0	9,418	0	13
JULY	2010	80,640		0	0	8,838	0	13
AUGUST	2010	83,136		0	0	7,859	0	13
SEPTEMBER	2010	92,736		0	0	8,702	0	13
OCTOBER	2010	73,536		0	0	7,143	0	13
NOVEMBER	2010	75,648		0	0	7,230	0	13
DECEMBER	2010	68,160		0	0	6,757	0	13
TOTAL		**885,120**	**0**	**0**	**0**	**$94,033**	**0**	**$156**

Annual Total Energy Cost = $94,189 Per Year

Total KWH x 0.003413 = 3,020.91 x 106
Total MCF x 1.03 = 0.00 x 106
Total Other x ____ x 106
Total Site BTU's/yr 3,020.91 x 106

Floor area: 37,386 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 80,803 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $2.52 $/s.f. yr

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Gexa	8881	0	Bay City Gas	2-53-09800-00
GDF Suez				

OWNER: Matagorda BUILDING: Office Building

MONTH / YEAR		ELECTRIC	DEMAND				NAT'L GAS / FUEL	
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2011	24,565		0	0	2,950	50	532
FEBRUARY	2010	24,005		0	0	2,953	42	428
MARCH	2010	23,725		0	0	2,871	9	92
APRIL	2010	21,085		0	0	2,640	2	29
MAY	2010	24,525		0	0	2,956	3	35
JUNE	2010	37,165		0	0	4,136	5	53
JULY	2010	25,125		0	0	2,440	2	33
AUGUST	2010	44,365		0	0	4,194	0	13
SEPTEMBER	2010	37,525		0	0	3,778	0	14
OCTOBER	2010	27,845		0	0	2,876	0	13
NOVEMBER	2010	19,245		0	0	2,239	10	84
DECEMBER	2010	20,605		0	0	2,313	23	206
TOTAL		**329,780**	**0**	**0**	**0**	**$36,346**	**146**	**$1,532**

Annual Total Energy Cost = $37,878 Per Year

Total KWH x 0.003413 = 1,125.54 x 106
Total MCF x 1.03 = 150.38 x 106
Total Other x ____ x 106
Total Site BTU's/yr 1,275.92 x 106

Floor area: 24,696 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 51,665 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.53 $/s.f. yr

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Gexa	6070	0	Bay City Gas	1-01-01600-01
GDF Suez	6071			
	6072			

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: GDF Suez Contract price: $0.0897 per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: AEP Central Company

Electric Rate: Secondary Service > 10 kVA

I.	TRANSMISSION AND DISTRIBUTION CHARGES:		
	Customer Charge	=	$26.52 per Retail Customer
	Metering Charge	=	$15.81 per Retail Customer
	Transmission System Charge	=	$1.793 per 4CP kW Billing Demand
	Distribution System Charge	=	$3.314 per NCP kW Billing Demand
II.	SYSTEM BENEFIT FUND	=	$0.000662 per kWh
III.	TRANSITION CHARGES		
	Transition Charge 1	=	$1.040549 per kW
	Transition Charge 2	=	$2.28464916 per kW
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	$0.037224 per kW
V.	TRANSMISSION COST RECOVERY FACTOR	=	$0.456384 per kW
VI.	COMPETITIVE METER CREDIT	=	$2.17/Month
VII.	RATE CASE SURCHARGE	=	$0.000047/kWh
VIII.	TRUE UP CASE SURCHARGE RIDER	=	$0.041116 per kW or kVA
IX.	ENERGY EFFICIENCY COST RECOVERY FACTOR	=	$.000311/kWh
X.	ADVANCED METERING COST RECOVERY FACTOR	=	$2.05/Month
XI.	TAXES		
	General Local Taxes		

Average Savings for consumption = $0.0897/kWh + $0.000662/kWh + $0.000047/kWh + $.000311/kWh = $0.09072/kWh

Average Savings for demand = $1.793 + $3.314 + $1.040549 + $2.28464918 + $0.037224 + $0.456384+ $0.04116 = $ 8.967009/kW**

NATURAL GAS PROVIDER:

The rate schedule for Natural gas is unavailable, but we have calculated the average cost per MCF of purchased natural gas in the district by analyzing the utility histories for the schools surveyed in this report.

Total cost for natural gas at the eight facilities in the analyzed billing cycle: $1,688

> Note: The courthouse gas meter did not record any consumption for the entire cycle of analyzed utility bills. *Therefore, we recommend the County disconnect this meter until such time that natural gas consumption is anticipated or required.* This will save the County $156 per year. The customer charges for the Courthouse meter and the Office meter were removed from the total cost for natural gas in this calculation to accurately determine the cost for the commodity alone.

Total cost less customer charges: $1,688 - $13/month for 24 months = $1,376

Total quantity purchased during the analyzed billing cycle: 146 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = $1,376 / 146 MCF

Average Cost per MCF = $9.42

5.0 CAMPUS DESCRIPTIONS:

Matagorda County operates five campuses which are all located in and throughout the City of Bay City. The energy survey focused on two of the facilities:

Table 2: School Facilities Analyzed For This Report

Facility	Year originally Constructed	Approximate Square Footage	Basic HVAC Cool/Heat	Basic Lighting System Description	Basic Control System Description
Courthouse	1965	37,386	Water cooled chillers / gas fired boiler	T8/ Incandescent	CSI DDC (JACE) and pneumatic actuators at MZAHUs
Office Building	1981	24,696	Packaged DX FCUs with condenser water heat rejection/boiler heat	T8/Metal Halide	Conventional Thermostats

6.0 ENERGY RECOMMENDATIONS:

HVAC ECRM 1: RENOVATION OF AGED HVAC EQUIPMENT

It was noted during the survey that several pieces of equipment have reached the end of their useful life expectancy. *We recommend this equipment be included in subsequent maintenance budgets to be replaced as planned equipment upgrades in order to avoid the higher cost of emergency replacement when they inevitably fail.*

Each floor of the four story **Office Building** at 2200 7th Street has four McQuay packaged DX fan coil units located in the ceiling plenum space. During the heating season, the exterior Laars Pennant boiler (pictured to the right) provides hot water for heating with a 3 hp hot water pump. During the cooling season, a 15hp condenser water pump circulates water through a BAC cooling tower and the 2-pipe system to serve as the condenser for the building and reject the heat from the packaged units.

The Fan Coil Units (FCUs) have reached the end of their useful life expectancy. The County has received a replacement cost estimate of $8,000 for each unit which would total $128,000 for the building.

An alternative system that allows for heating and cooling processes within the spaces that would not require a changeover is a Variable Refrigerant Flow (VRF) system. This type of heat pump system consists of an exterior condensing unit connected to a refrigerant controller which circulates refrigerant individually to indoor units (wall hung units or ceiling cassettes) which allows an indoor unit to be heating or cooling a space independent of the other units' operation within a building. The systems are ideal for multiple-story office structures and operate efficiently. The cost for these systems is higher, approximately $2,400 per ton at the current time, so a renovation to the building with this system would cost approximately $192,000. The flexibility of the system to simultaneously heat one space and cool another provides maximum occupant comfort as heating and cooling loads modulate between areas of the building at different times of the day.

For the purposes of this energy assessment report, the cost for the VRF system will be used since this system will save energy for the County. A 1:1 replacement of the fan coil units in the existing system will not generate significant energy savings. The substantial first cost for installation of the new system makes the project have a larger than normal simple payback, which the County may find more tolerable with the ability to improve occupant comfort.

Estimated Cost: $192,000 *Estimated Savings: $8,000* *Estimated Payback: 24 Years*

Lighting ECRM 1: REPLACE INCANDESCENT EXTERIOR LAMPS WITH CFL

The Courthouse has approximately 150 90-watt incandescent can fixtures surrounding the perimeter of the building. Incandescent lamps consume 75% more energy and last 1/8 as long as compact fluorescent lamps (CFLs). *We recommend the incandescent lamps be replaced with 23-watt compact fluorescent lamps.*

Estimated Cost: $975 *Estimated Savings: $3,100* *Estimated Payback: 4 Months*

Lighting ECRM 2: REPLACE INCANDESCENT RESTROOM LAMPS WITH CFL

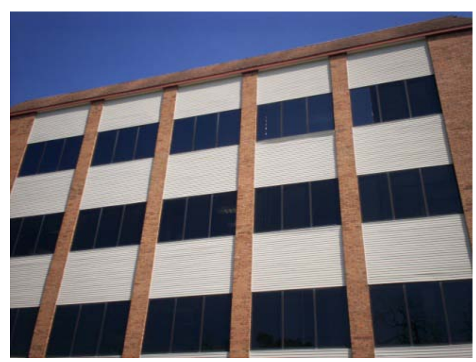
The Courthouse has approximately 50 incandescent fixtures in the restrooms. *We recommend the incandescent lamps be replaced with 23-watt compact fluorescent lamps.*

Estimated Cost: $350 *Estimated Savings: $1,200* *Estimated Payback: 3-1/2 Months*

Lighting ECRM 3: RETROFIT T12 FIXTURES WITH T8 LAMPS AND ELECTRONIC BALLASTS

The Courthouse has approximately nineteen (19) 4-lamp T12 fixtures that *we recommend be retrofit with T8 lamps and electronic ballasts.*

Estimated Cost: $950 *Estimated Savings: $150* *Estimated Payback: 6 years*



Envelope ECRM 1: INSTALLATION OF WINDOW TINT

The Office Building has approximately 138 three feet by six feet (3’x6’) single pane windows on the perimeter of the building. Only the windows on the South side, 4th floor (15 windows total) have been tinted to resist solar heat gain in the space. *We recommend the other 123 windows also be tinted.*

Estimated Cost: $12,300 *Estimated Savings: $1,500* *Estimated Payback: 8 Years*

Envelope ECRM 2: RENOVATE THE ROOF OF THE OFFICE BUILDING

The Maintenance staff reports the existing roof is nearing the end of its useful life and will need to be replaced in the near future. At the appropriate time, this project can include a replacement of the tar and gravel roof system to a white-colored single ply roofing system that will minimize the heat gain into the building. Additional insulation can be added at the same time for increased energy savings.

Estimated Cost: $100,000 *Estimated Savings: $6,750* *Estimated Payback: 15 Years*

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

HVAC

- Install insulation on hot water piping at Office Building water heaters
- Clean scale from cooling tower

Controls

- Re-schedule weekend central system operation hours

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 #1

It was noted during the survey that the hot water piping at the Office Building water heater was not insulated. The majority of the energy losses in a hot water system occur in the hot water piping. *We recommend the district insulate the hot water piping to minimize energy losses in the hot water system.*

HVAC M&O #2

The cooling tower at the Courthouse (pictured to the right) has significant scaling that is reducing the ability for the tower to evaporate condenser water. *We recommend the County clean the media to improve the ability for the tower to cool the condenser water.*

Controls M&O

The current schedule for the building's central system is set so that units operate from 6am to 6pm on Monday through Friday, 6am to 5pm on the weekends. *We recommend the County analyze the actual occupancy experienced on weekends and consider consolidating the weekend occupancy to allow the central system operation to be adjusted to match. The system should not operate during periods that the facility is not unoccupied.*

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. $100 maintenance expense next 5 years				
4. $200 maintenance expense next 5 years				
5. Savings decreases 2% per year after year 5				
Cash Flow	**Project Cost**	**Project Savings**	**Maintenance Expense**	**Net Cash Flow**
Time 0	($306,575)		0	($306,575)
Year 1		$ 20,700.00	0	$20,700
Year 2		$ 20,700.00	0	$20,700
Year 3		$ 20,700.00	0	$20,700
Year 4		$ 20,700.00	0	$20,700
Year 5		$ 20,700.00	0	$20,700
Year 6		$ 20,286.00	($100)	$20,186
Year 7		$ 19,872.00	($100)	$19,772
Year 8		$ 19,458.00	($100)	$19,358
Year 9		$ 19,044.00	($100)	$18,944
Year 10		$ 18,630.00	($100)	$18,530
Year 11		$ 18,216.00	($200)	$18,016
Year 12		$ 17,802.00	($200)	$17,602
Year 13		$ 17,388.00	($200)	$17,188
Year 14		$ 16,974.00	($200)	$16,774
Year 15		$ 16,560.00	($200)	$16,360
			Internal Rate of Return	**-0.88%**

More information regarding financial programs available to MATAGORDA COUNTY 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

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

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

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

6.1.1.1.3 SECONDARY VOLTAGE SERVICE GREATER THAN 10 KW

AVAILABILITY

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

TYPE OF SERVICE

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

MONTHLY RATE

I. Transmission and Distribution Charges:

Customer Charge		
Non-IDR Metered	$3.26	per Retail Customer per Month
IDR Metered	$26.52	per Retail Customer per Month
Metering Charge	$15.81	per Retail Customer per Month
Transmission System Charge		
Non-IDR Metered	$1.286	per NCP kW Billing Demand
IDR Metered	$1.793	per 4CP kW Billing Demand
Distribution System Charge	$3.314	per NCP kW Billing Demand

II. System Benefit Fund: $0.000662 per kWh See SBF 6.1.1.4

III. Transition Charge: See Riders TC 6.1.1.2.1.1 and TC-2 6.1.1.2.2.1

IV. Nuclear Decommissioning Charge: See Rider NDC 6.1.1.5.1

V. Transmission Cost Recovery Factor: See Rider TCRF 6.1.1.6.2.1

119 16

PUBLIC UTILITY COMMISSION OF TEXAS
APPROVED

DEC 2 3 '09 DOCKET 36923

CONTROL # ___________

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

VI. Excess Mitigation Credit:	Not Applicable
VII. State Colleges and Universities Discount:	See Rider SCUD 6.1.1.6.1
VIII. Competitive Metering Credit:	See Rider CMC 6.1.1.6.6
IX. Other Charges or Credits:	
A. Rate Case Surcharge Rider	See Rider RCS-2 6.1.1.6.8
B. True-up Case Surcharge Rider	See Rider TCE 6.1.1.6.7
C. Energy Efficiency Rider	See Rider EECRF 6.1.1.6.4.1
D. Advanced Metering System Rider	See Rider AMSCRF 6.1.1.6.9

COMPANY-SPECIFIC APPLICATIONS

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

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

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

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

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

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

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

Determination of Billing Demand for Transmission System Charges

Determination of NCP kW

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

APPENDIX IV - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

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 Matagorda County, 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: Nate McDonald	Date: 3-14-11
Name (Mr./Ms./Dr.) Nate McDonald	Title: County Judge
Organization: Matagorda County	Phone: (979) 244-7605
Street Address: 1700 7th Street, Room 301	Fax: (979) 245-3697
Mailing Address: Bay City, Texas 77414	E-Mail: cojudge@co.matagorda.tx.us
	County: Matagorda County

Contact Information:

Name (Mr./Ms./Dr.):	Title:
Phone:	Fax:
E-Mail:	County:

Please sign and mail or fax to: Stephen Ross, 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**.

[redacted]

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