Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Prepared by:

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Forney Independent School District

October 5, 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**.

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 June 2011, **SECO** received a request for technical assistance from Gregory Buchanan, Director of Maintenance and Energy Management for **Forney 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 **Forney ISD,** (hereafter known as FISD) was completed by ESA **Energy Systems Associates, Inc**., (hereafter known as *Engineer*) to determine the annual energy cost index (ECI) and energy use index (EUI) for each campus or facility. A complete listing of the Base Year Utility Costs and Consumption is provided in Section 3.0 of this report.

Following the utility analysis and a preliminary consultation with *Mr. Gregory Buchanan*, Energy Manager, 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 **$21,225** may be saved annually if all recommended projects are implemented</u>. The estimated installed cost of these projects should total approximately **$297,000**, yielding an average simple payback of **14** years.

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

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1	$297,000	$21,225	14 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 FISD. 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 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 FISD, ESA returned to the facilities to perform the following tasks:

1. Design and monitor 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. Develop and draft 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 FISD 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
Brown MS	63,972	16%	$1.65	13%
Warren MS	60,101	9%	$1.54	5%
Claybon ES	41,988	-24%	$1.21	-18%
Average Value:	55,354		$1.47	

Forney ISD purchases electricity from TXU Energy and Farmer's Electric Cooperative. The energy history spreadsheets are shown on the next few pages.

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: Forney ISD **BUILDING:** Brown MS

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	170,750		509	0	14,997	231	1,621
FEBRUARY	2010	152,250		464	0	13,120	293	2,300
MARCH	2010	163,850		530	0	15,229	140	1,068
APRIL	2010	175,100		530	0	15,898	53	433
MAY	2010	193,450		680	0	20,632	32	264
JUNE	2010	135,600		402	0	14,024	22	196
JULY	2010	147,200		475	0	14,886	19	187
AUGUST	2010	231,000		350	0	22,234	16	163
SEPTEMBER	2010	200,000		708	0	20,355	25	238
OCTOBER	2010	179,450		652	0	18,439	25	220
NOVEMBER	2010	172,050		518	0	16,920	44	353
DECEMBER	2010	163,400		582	0	15,986	144	1,083
TOTAL		**2,084,100**	**6,400**	**6,400**	**0**	**$202,720**	**1,044**	**$8,126**

Annual Total Energy Cost =	$210,846	Per Year	**Energy Use Index:**	
			Total Site BTU's/yr / Total Area (sq.ft.)	63,972 BTU/s.f.yr
Total KWH x 0.003413 =	7,113.03	x 106		
Total MCF x 1.03 =	1,075.32	x 106	**Energy Cost Index:**	
Total Other x ____		x 106	Total Energy Cost/yr / Total Area (sq.ft.)	$1.65 $/s.f. yr
Total Site BTU's/yr	8,188.35	x 106		
Floor area:	128,000	s.f.		

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Farmer's Electric Coop/TXU Electric	E3351465500	0	COSERV/Atmos Gas S	G0000163185
	E3351465600			

OWNER: Forney ISD **BUILDING:** Warren MS

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	108,062		334	0	13,360	560	3,855
FEBRUARY	2010	100,816		383	0	12,672	640	3,963
MARCH	2010	112,831		450	0	13,876	300	1,849
APRIL	2010	121,829		488	0	14,826	100	612
MAY	2010	161,549		578	0	18,918	50	292
JUNE	2010	142,061		405	0	16,455	10	74
JULY	2010	121,799		488	0	14,866	10	104
AUGUST	2010	180,292		683	0	21,467	20	138
SEPTEMBER	2010	187,061		660	0	21,863	60	438
OCTOBER	2010	133,064		660	0	16,932	140	1,063
NOVEMBER	2010	103,807		473	0	13,352	320	2,345
DECEMBER	2010	91,809		368	0	12,073	540	3,405
TOTAL		**1,564,980**	**0**	**5,970**	**0**	**$190,660**	**2,750**	**$18,138**

Annual Total Energy Cost =	$208,798	Per Year	**Energy Use Index:**	
			Total Site BTU's/yr / Total Area (sq.ft.)	60,101 BTU/s.f.yr
Total KWH x 0.003413 =	5,341.28	x 106		
Total MCF x 1.03 =	2,832.50	x 106	**Energy Cost Index:**	
Total Other x ____		x 106	Total Energy Cost/yr / Total Area (sq.ft.)	$1.54 $/s.f. yr
Total Site BTU's/yr	8,173.78	x 106		
Floor area:	136,000	s.f.		

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Farmer's Electric Coop/TXU Electric	E104437200049596(	0	COSERV/Atmos Gas S	00178716-0162

OWNER: Forney ISD **BUILDING:** Clayborn ES

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	54,860		187	0	6,922	210	1,485
FEBRUARY	2010	48,000		188	0	6,292	200	1,254
MARCH	2010	46,400		224	0	6,226	80	530
APRIL	2010	52,400		252	0	6,829	20	155
MAY	2010	70,800		308	0	8,695	20	108
JUNE	2010	36,000		192	0	5,199	10	105
JULY	2010	46,000		316	0	6,558	10	99
AUGUST	2010	74,400		376	0	9,500	20	136
SEPTEMBER	2010	76,000		332	0	9,350	20	155
OCTOBER	2010	54,800		260	0	7,113	30	230
NOVEMBER	2010	46,400		220	0	6,270	100	739
DECEMBER	2010	42,000		188	0	5,782	190	1,227
TOTAL		648,060	0	3,043	0	$84,736	910	$6,223

Annual Total Energy Cost = $90,959 Per Year

Total KWH x 0.003413 = 2,211.83 x 106
Total MCF x 1.03 = 937.30 x 106
Total Other x ____ x 106
Total Site BTU's/yr 3,149.13 x 106

Floor area: 75,000 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 41,988 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.21 $/s.f. yr

Electric Utility	Account #	Meter#
Farmer's Electric Coop/TXU Electric	E104437200082560	0

Gas Utility	Meter #
COSERV/Atmos Gas S	00178716-115

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Energy CAP

TRANSMISSION AND DISTRIBUTION UTILITY: Oncor

Electric Rate: Secondary Service > 10 kVA

I. TRANSMISSION AND DISTRIBUTION CHARGES:

a.	Customer Charge	=	$6.78 per meter
b.	Metering Charge	=	$22.18 per IDR meter
c.	Transmission System Charge	=	$0 per 4CP kW
d.	Distribution System Charge	=	Varies per NCP kW by LF

NCP kW	Annual Load Factor	Per Distribution Billing kW
≤ 20 kW	ALL	$4.24
> 20 kW	0-10%	$4.24
	11-15%	$5.30
	16-20%	$5.00
	21-25%	$4.85
	>26%	$4.24

II.	System Benefit	=	$0.000654 per kWh
III.	TRANSITION CHARGES		
	Transition Charge 1	=	$0.188 per NCP kW
	Transition Charge 2	=	$0.265 per NCP kW
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	$0.0089154 per Billing kW
V.	TRANSMISSION COST RECOVERY FACTOR	=	$2.059691/4CP Kw
VI.	ENERGY EFFICIENCY COST RECOVERY FACTOR	=	$8.14 per Month
VII.	COMPETITIVE METER CREDIT	=	$-1.82 per Month
VIII.	ADVANCED METERING COST RECOVERY FACTOR	=	$3.98/Month
IX.	RATE CASE EXPENSE SURCHARGE	=	$0.007944/kWh

Average Savings per kWh (including demand charges) = $478,116 / 4,297,140/kWh = <u>$0.11126/kWh</u>
Average Minimum Savings for demand, $4.24 + $.188 + $0.265 +$0.044 + $2.059691 = <u>$6.80/kVA**</u>
Average Maximum Savings for demand, $5.30 + $.188 + $0.265 +$0.044 + $2.059691 = <u>$7.86/kVA**</u>

** 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
4. The DSC is a reflection of the previous year's Load Factor (see rate schedule definition above).

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Farmer Electric Cooperative

Electric Rate: Large Power >50 kW peak demand

I.	BASE CHARGE	=	$125.00/Meter
II.	DEMAND CHARGE	=	$5.60/Billing kW
	First 300 kWh	=	$0.083957/Billing kWh
	Over 300 kWh	=	$0.066295/Billing kWh

Average Savings for consumption = $0.0.066295/kWh = $0.066295/kWh

Average Minimum Savings for demand = **$5.60**/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: $32,487

Total quantity purchased during the analyzed billing cycle: 4,704 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = $32,487 / 4,704 MCF

Average cost per MCF = $6.91 per MCF

5.0 CAMPUS DESCRIPTIONS:

Note: CVAHU = Constant Volume Air Handling Unit; MZAHU = Multi-Zone Air Handling Unit,

FCU = Fan coil Unit, VAVAHU = variable air volume air handling unit

The selection of campuses represented a mix of older and newer campuses which allows for comparison of energy strategies between older and newer designs as well as the ability to extrapolate recommendations for these facilities to other facilities in the district.

Facility	Year originally Constructed	Approximate Square Footage	Basic HVAC Cool/Heat	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Forney HS North	2010	370,838	Air-cooled Chiller/ HW Boiler	AHU with hot water reheat	T8 MH(gym)	DDC Johnson
Clayborn ES	2000	75,000	RTUs with Economizers	RTUs	T8 MH Gym	DDC - Johnson

6.0 ENERGY RECOMMENDATIONS:

HVAC ECRM 1: REPLACE ONE EXISTING CHILLER WITH STAGEABLE UNIT

At Forney High School North, the chillers are identical 400-ton McQuay AGS-450 air-cooled units. This particular model of chiller shares oil between three of the six compressors, therefore it only stages for longer periods of time down to about 200 tons. It will stage down to 100 tons, but only for less than 10 minutes or so before it starts to lose oil. Unfortunately, there are many times that the district would like to condition only the Auditorium afterhours, which is just an 87 ton load. Consequently, the system must operate about ½ of the school instead of just the area occupied at the time. A new unit that can operate at lower part-load conditions would allow the district to only condition the area needed at any particular time. The cost below does not include any potential re-sale value that the existing chiller offers FISD; the payback is extraordinarily long due to the age of the existing chiller and the fact that the unit does operate efficiently at higher load conditions.

Estimated Cost: $297,000   Estimated Savings: $21,225   Estimated Payback: 14 Years

HVAC ECRM 2: ISOLATE CAFETERIA DX SYSTEM SERVICE AREA FROM THE CENTRAL PLANT SYSTEM SERVICE AREA

The HVAC system at the cafeteria is Rooftop Units (RTUs). There times that the district would like to operate just the DX system and leave the central system that serves the area surrounding the cafeteria off. This has not worked in the past as the cafeteria is not architecturally separated from the adjacent corridor areas; therefore the DX conditioned air migrates and out of the cafeteria space and the RTU receives very little return air. The result is that the central system must be turned on to retain the RTU supplied air. Architectural partitions would isolate the cafeteria and allow only the DX system to operate.

Estimated Cost: Beyond the scope of this report

HVAC ECRM 3: ISOLATE FRONT LOBBY FROM CORRIDORS

The staff at FISD described a situation at Clayborn Elementary, as well as the 4 other facilities all constructed with the same architectural design, in which cool and humid mornings lead to problematic humidity conditions within the building that can last all day long. *The scenario was described as follows:*

1. As students arrive in the morning, doors to the lobby, the classroom corridor and the doors to the back exit are all opened so that students do not have to open doors to head towards class.
2. Cool humid air is brought into the building at the lobby which flows into the common ceiling plenum by two return air grills located immediately in front of the doors in the lobby. Humidity levels are reported to reach 90% inside the school.
3. All of the doors are closed within 15-20 minutes but the humid conditions in the school are reported to last for most of the day until the RTUs catch up with dehumidification.
4. The district has verified that the rooftop unit economizers are not operating in free-cooling mode at these times which would contribute significantly to the substantial and

rapid build-up of humidity in the building. It was stated that the humidistat is correctly locking out the economizers, which would normally operate with an outside temperature less than 62 degrees.

5. The practice of keeping the doors open as the students arrive in the morning was stated to be a district-wide policy and keeping them closed was not negotiable as a means of correcting the issue.

We recommend the issue be addressed within the lobby itself by having the open space above the interior corridor door sets be enclosed so that the lobby space is isolated from the corridors. Additionally, we recommend the return air grills in the lobby be relocated to the corridors just behind the new door partitions. With this setup, the cool humid air will not be drawn directly into the common return plenum and the humidity in the plenum should not offer a problem.

Estimated Cost: Beyond the scope of this report

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

HVAC

- Insure exhaust fans and outside air dampers are controlled and operating correctly.
- Turn system off during unoccupied 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 reported during the survey that the HVAC units are allowed to start operating at 3-4am in order to bring the classrooms to setpoint when school starts, despite the fact that the school operates with an 85°F night setback and the system is never truly off. This condition suggests that a source of humid air infiltration is present and significant energy savings will become available if this source of water infiltration can be found and stopped. The first items to check are the exhaust fans and outside air dampers. These should be turned off and closed as the students leave the building for the day as ASHRAE outside air requirements do not apply to unoccupied hours. Ensuring this equipment is controlled, the building will not become negatively pressurized overnight and draw in humid air.

The next items to investigate are the possibility of underground sources of water that could seep through concrete floors or basement walls. Significant quantities of water can infiltrate a building in this manner. Any vulnerable walls or floors can be sealed to prevent much of the water infiltration that may be causing the high humidity conditions.

Controlling the source of the moisture infiltration will eliminate temperature and humidity issues that currently require the system to operate more hours than should be necessary in the Dallas area. Additionally, the elimination of the problem will allow the district to turn the system completely off overnight instead of requiring the system to operate with an 85°F setback temperature.

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. $5,000 maintenance expense next 5 years				
4. $10,000 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	($297,000)		0	($297,000)
Year 1		$ 21,225.00	0	$21,225
Year 2		$ 21,225.00	0	$21,225
Year 3		$ 21,225.00	0	$21,225
Year 4		$ 21,225.00	0	$21,225
Year 5		$ 21,225.00	0	$21,225
Year 6		$ 20,163.75	($5,000)	$15,164
Year 7		$ 19,102.50	($5,000)	$14,103
Year 8		$ 18,041.25	($5,000)	$13,041
Year 9		$ 16,980.00	($5,000)	$11,980
Year 10		$ 15,918.75	($5,000)	$10,919
Year 11		$ 14,857.50	($10,000)	$4,858
Year 12		$ 13,796.25	($10,000)	$3,796
Year 13		$ 12,735.00	($10,000)	$2,735
Year 14		$ 11,673.75	($10,000)	$1,674
Year 15		$ 10,612.50	($10,000)	$613
			Internal Rate of Return	**-7.78%**

More information regarding financial programs available to Forney ISD 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

3

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	$6.78	per Retail Customer
Metering Charge	$22.18	per Retail Customer
Transmission System Charge		
Non-IDR Metered	$0.00	per NCP kW
IDR Metered	$0.00	per 4CP kW
Distribution System Charge	See Table Below	

NCP kW	Annual Load Factor	per Distribution Billing kW
Less than or equal to 20 kW	All	$4.24
Greater than 20 kW	0% - 10%	$5.91
	11% - 15%	$5.30
	16% - 20%	$5.00
	21% - 25%	$4.85
	26% and above	$4.24

II. System Benefit Fund:	$0.000654	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
X. State Colleges and Universities Discount:	See Rider SCUD	

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 ANNUAL LOAD FACTOR

The Annual Load Factor for each premise shall be calculated using the previous year's usage for that premise ending with the December Bill Cycle. The Annual Load Factor shall apply for the following 12 billing months.

The Annual Load Factor calculation is as follows:

$$\frac{\text{kWh Used in 12 Billing Months Ending December}}{\text{Maximum NCP kW for the 12 Billing Months Ending December * Days in Billing Periods * 24}}$$

For premises with less than 12 months usage history, the available billing history shall be used for determining the Annual Load Factor. However, if less than 90 days of billing history is available, the premise shall be assumed to have an Annual Load Factor greater than 25%.

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 loads whose maximum NCP kW established in the 11 months preceding the current billing month is greater than 20 kW and their Annual Load Factor is less than or equal to 25%, the Billing kW applicable to the Distribution System Charge shall be the NCP kW for the current billing month. Billing kW applicable to Riders TC, NDC, RCE charges 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).

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 and the Annual Load Factor Provisions shall not apply to Retail Seasonal Agricultural Customers.

NOTICE

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

FARMERS ELECTRIC COOPERATIVE, INC. TARIFF FOR ELECTRIC SERVICE	Section: II	Tab – Page No. 2 – 2
Title: RATE SCHEDULES Part 1 – Billing Rates for Retail Service Applicable to All Service Areas	Approved: April 24, 2007 Amended: February 19, 2008 Effective: May 5, 2007	

202.1 General Service.

A. Availability.

Available in accordance with the Cooperative's Service Rules and Regulations to Members having a peak demand less than 50 kW for the twelve months ending with the current billing period.

If the Member's peak demand exceeds 50 kW, the Member will be reclassified to the Large Power rate for twelve months or until the Member's peak demand does not exceed 50 kW for twelve consecutive months ending with the current billing period.

B. Type of Service.

Single or three-phase service at the Cooperative's standard secondary distribution voltages, where available. The Cooperative shall determine when single-phase service is sufficient for the load to be connected and when three-phase service is required.

C. Monthly Rate.

	Power Supply	Distrib. Wires	Total
Base Charge Single-Phase Three-Phase	 $0.00 $0.00	 $15.00 $27.00	 $15.00 $27.00
All kWh, per kWh	$0.082592	$0.029998	$0.112590

Power Supply charges shall be adjusted by the power cost recovery factor

D. Minimum Charges.

1) Each billing period the single-phase Member shall be obligated to pay $20.00, whether or not any energy is actually used.

2) Each billing period the three-phase Member shall be obligated to pay $32.00, whether or not any energy is actually used.

E. Billing Adjustments.

This rate is subject to all billing adjustments.

Tab 02-Sec-II-Part-1 RETAIL RATES (9-22-09).doc

P. 002 2011/MAR/15/TUE 15:20

FARMERS ELECTRIC COOPERATIVE, INC. TARIFF FOR ELECTRIC SERVICE	Section: II	Tab – Page No. 2 – 4
Title: RATE SCHEDULES Part 1 – Billing Rates for Retail Service Applicable to All Service Areas	Approved: April 24, 2007 Amended: February 19, 2008 Effective: May 5, 2007	

E. Minimum Charge.

Each billing period the Member shall be obligated to pay the Base Charge and Demand Charge as a minimum, whether or not any Energy is actually used.

F. Primary Service Discount.

If Electric Service under this Rate Schedule is provided at primary distribution voltage, the monthly rate for Demand and Energy charges shall be reduced by 3%. The Cooperative may meter at secondary voltage and estimate transformation loss.

G. Billing Adjustments.

This rate is subject to all applicable billing adjustments.

Tab 02-Sec-II-Part-1 RETAIL RATES (9-22-09).doc

P. 004 2011/MAR/15/TUE 15:20

APPENDIX IV - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

SECO
State Energy Conservation Office

Public Schools, Colleges and Non-Profit Hospitals

Preliminary Energy Assessment Service Agreement

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

Description of the Service

The State Energy Conservation Office (SECO) will analyze electric, gas and other utility data and work with Forney 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: Gregory Buchanan — Date: 6-22-11

Name (Mr./Ms./Dr.): Gregory Buchanan — Title: Dir. of Maintenance & Energy Management

Organization: Forney ISD — Phone: 214-543-8116

Street Address: 402 North Elm — Fax:

Mailing Address: 402 North Elm — E-Mail: gregory.buchanan@forneyisd.net

County: Kaufman

Contact Information:

Name (Mr./Ms./Dr.): Same as above — 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, Eric Ryan, ESA Energy Systems Associates, Inc. Phone: 512-628-6828. Fax: 512-258-5638.

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