Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Prepared by:

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Italy Independent School District

August 30, 2011

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Energy Systems Associates, Inc.
A Terracon COMPANY

SECO
State Energy Conservation Office

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1.0 EXECUTIVE SUMMARY:

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

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 Mr. Barry Bassett, Superintendent for **Italy 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 **Italy ISD,** (hereafter known as IISD) 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. Hamby,* a walk-through energy analysis was conducted throughout the campus. Specific findings of this survey and the resulting recommendations for both operation and maintenance procedures and cost-effective energy retrofit installations are identified in Section 7.0 of this report.

We estimate that as much as **$5,920** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$54,640**, yielding an average simple payback of **12-1/2** years.

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

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
CONTROLS ECRM #1	$4360	$1745	2-1/2 Years
CONTROLS ECRM #2	$180	$225	Less than 1 Year
LIGHTING ECRM #3	$9100	$1215	7-1/2 Years
HVAC ECRM #1	$41,000	$2,735	15 Years
TOTAL PROJECTS	**$ 54,640**	**$5,920**	**12-1/2 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 IISD. 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 IISD, 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 IISD ENERGY PERFORMANCE INDICATORS:

OWNER:	Italy ISD				BUILDING:	Italy HS		
MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
MONTH	YEAR	CONSUMPTION KWH	METERED KW/KVA	CHARGED KW/KVA	COST OF DEMAND	TOTAL ALL ELECTRICAL COSTS $	CONSUMPTION MCF	COSTS $
JANUARY	2011	34,875	131	131	1,439	3,824	322	2,150
FEBRUARY	2011	35,223	123	123	1,444	3,999	361	2,233
MARCH	2011	39,022	154	154	1,536	4,209	80	549
APRIL	2011	37,487	229	229	1,572	4,128	39	305
MAY	2011	49,270	243	243	1,704	5,066	29	251
JUNE	2011	67,084	268	268	1,724	5,701	27	248
JULY	2010	60,707	246	246	1,671	5,516	21	214
AUGUST	2010	54,328	222	222	1,615	5,330	16	180
SEPTEMBER	2010	63,300	237	237	1,831	6,159	23	240
OCTOBER	2010	77,804	309	309	2,169	7,486	24	308
NOVEMBER	2010	49,517	218	218	1,598	4,986	41	307
DECEMBER	2010	37,180	161	161	1,479	4,190	152	1,234
TOTAL		605,797	2541	2541	$19,782	$60,594	1,136	$8,219
					Energy Use Index:			
Annual Total Energy Cost =		$68,813	Per Year		Total Site BTU's/yr		46,248	BTU/s.f.yr
					Total Area (sq.ft.)			
Total KWH x 0.003413 =		2,067.59	x 106					
Total MCF x 1.03 =		1,169.77	x 106		Energy Cost Index:			
Total Other x ____			x 106		Total Energy Cost/yr		$0.98	$/s.f. yr
Total Site BTU's/yr		3,237.36	x 106		Total Area (sq.ft.)			
Floor area:		70,000	s.f.					
Electric Utility		ESID #			Gas Utility	Meter #		
Direct Energy		3714			Atmos	8257-8		
		4489				8256-0		
		6571				8258-6		
		2288						
		7399						

Note: Utility data for the month of July is an average of June and August.

OWNER:	Italy ISD				BUILDING:	Athletic Dome		
MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
MONTH	YEAR	CONSUMPTION KWH	METERED KW/KVA	CHARGED KW/KVA	COST OF DEMAND	TOTAL ALL ELECTRICAL COSTS $	CONSUMPTION MCF	COSTS $
JANUARY	2011	11,784	66	66	445	1,250	Electric-only Facility	
FEBRUARY	2011	12,630	59	59	403	1,318		
MARCH	2011	11,226	59	59	408	1,178		
APRIL	2011	11,953	54	54	386	1,203		
MAY	2011	12,680	48	48	363	1,228		
JUNE	2011	15,320	59	59	412	1,321		
JULY	2010	15,538	55	55	380	1,373		
AUGUST	2010	15,756	50	50	348	1,424		
SEPTEMBER	2010	20,598	58	58	403	1,810		
OCTOBER	2010	16,296	61	61	419	1,530		
NOVEMBER	2010	14,334	53	53	369	1,348		
DECEMBER	2010	13,218	57	57	392	1,296		
TOTAL		171,333	679	679	$4,728	$16,279	0	$0

					Energy Use Index:			
Annual Total Energy Cost =		$16,279	Per Year		Total Site BTU's/yr		33,202	BTU/s.f.yr
					Total Area (sq.ft.)			
Total KWH x 0.003413 =		584.76	x 106					
Total MCF x 1.03 =		0.00	x 106		Energy Cost Index:			
Total Other x ____			x 106		Total Energy Cost/yr		$0.92	$/s.f. yr
Total Site BTU's/yr		584.76	x 106		Total Area (sq.ft.)			
Floor area:		17,612	s.f.					
Electric Utility		ESID #						
Direct Energy		3473						

Italy ISD purchases electricity from Direct Energy. The transmission and distribution utility is Oncor.

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

A copy of the rate schedule is included in Appendix I

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Direct Energy Contract price: $0.06 per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: Oncor

Electric Rate: Secondary Service > 10 kW

I. TRANSMISSION AND DISTRIBUTION CHARGES:

Customer Charge	=	$6.78 per meter
Metering Charge	=	$22.18 per IDR meter
Transmission System Charge	=	$0 per 4CP kW
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 FUND	=	$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	=	$0.044 per Billing kW
V.	TRANSMISSION COST RECOVERY FACTOR	=	$2.059691/4CP kW
VI.	ENERGY EFFICIENCY COST RECOVERY FACTOR	=	$8.14 per month
VII.	COMPETITIVE METERING CREDIT	=	- $1.82 per month
VIII.	ADVANCED METERING COST RECOVERY FACTOR	=	$ 3.98 per month
IX.	RATE CASE EXPENSE SURCHARGE	=	$0.007944 per kWh

Average Savings for consumption = $0.0775/kWh + $0.000654/kWh + $0.007944/kWh
= $0.086098/kWh

Average Minimum Savings for demand, $4.24 + $.188 + $0.265 +$0.044 + $2.059691 = $ 6.80/kVA**

Average Maximum Savings for demand, $5.30 + $.188 + $0.265 +$0.044 + $2.059691 = $ 7.86/kVA**

** This number is a generalization of average cost per kW because the rate schedule from Oncor utilizes three (3) different types of demand for the calculation of the utility bill and a calculation of the previous calendar year's Load Factor as calculated below:

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. Load Factor: kWh used previous calendar year / (Maximum NCP kW * Days in Billing Period * 24)

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: $8,219

Total quantity purchased during the analyzed billing cycle: 1,136 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = $8,219 / 1,136 MCF

Average cost per MCF = $7.23

5.0 CAMPUS DESCRIPTIONS:

Italy ISD consists of 2 educational campuses, Stafford Elementary and Italy High School. The facilities analyzed for this report are the high school and the high school athletic dome, which is located next to the high school.

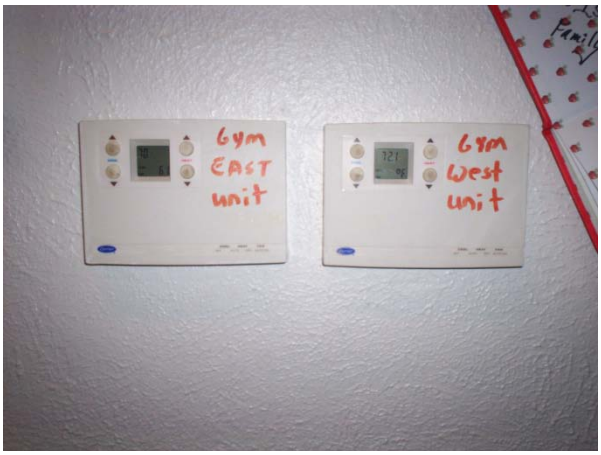
Table 2: School Facilities Analyzed For This Report

Facility	Year originally Constructed	Approximate Square Footage	Basic HVAC Cool/Heat	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Italy High School	1961/1985	70,000	RTUs / Split Systems	SZAHU	T8 / T12 in trophy cases	Conventional Thermostats
Athletic Dome	2002	17,612	Split Systems	SZAHU	T8 and Metal Halides	See Note Below

Note: SZAHU = Single-Zone Air Handling Unit; MZAHU = Multi-Zone Air Handling Unit

Note: The athletic dome is controlled by programmable thermostats and remote sensors which tie into an electronic timeclock system previously manufactured by Carrier. The district states many of the problems encountered with the existing system are a result of failed communication between the separate components that control the HVAC for this area. Our recommendation for this problem can be found below within Controls ECRM #1.

CONTROLS ECRM 1: REPLACE EXISTING THERMOSTATS



The HVAC systems that serve the athletic dome are controlled by eight programmable thermostats with two remote sensors located in the main arena. Since the control of the HVAC units is accomplished by the building occupants, the units are frequently left operating past normal occupancy hours and at temperatures below setback setpoint. *We recommend replacing the existing thermostat with IP-addressable units that can be programmed to only run when needed and turn off once the programmed setpoint is reached. We also recommend the district select IP-addressable thermostats with the capability of being connected to a humidistat that will allow the unit to monitor the humidity levels in the main arena to protect the wood gymnasium floor from high humidity levels.*

This price estimate is to replace the eight thermostats in the athletic dome. To extrapolate this recommendation to other areas of the district, please allocate approximately $545 per IP-addressable thermostat installed.

Estimated Cost: $4,360 Estimated Savings: $1,745 Estimated Payback: 2-1/2 Years

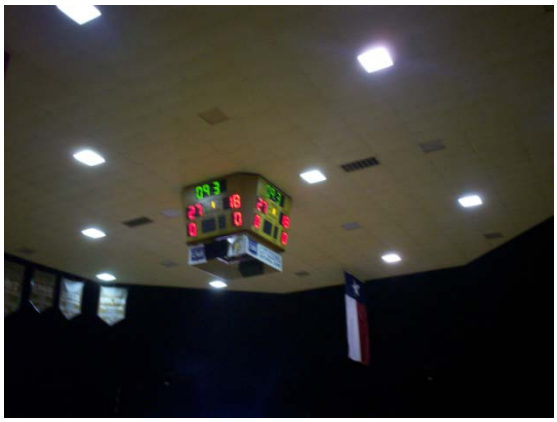
CONTROLS ECRM 2: INSTALL VENDING MACHINE CONTROLS

At the High School it was noted that there are several vending machines that are not currently under energy management control. *We recommend the district install vending machine controls on these units.* These controls have an occupancy sensor that operates the advertising lighting and compressor while the space is occupied, but turns the lighting off and cycles the compressor when the space is unoccupied. The compressor will operate and maintain a programmed maximum temperature for the vending product during the unoccupied periods in order to keep the product from getting too hot. The estimate below is for a single unit.

Estimated Cost: $180 per unit
Estimated Savings: $225 per year
Estimated Payback: Less than 1 year

LIGHTING ECRM 1: REPLACE METAL HALIDE FIXTURES WITH T5 LINEAR FLUORESCENT

The athletic dome has 26 each 400-watt metal halide fixtures lighting the central arena. One characteristic of metal halide fixtures is their inherently long re-strike. This means that if the fixtures are ever turned off, it can take up to 15 minutes for them to come back on. This long re-strike encourages staff to leave the lights on throughout the day, even if the space is not occupied. *We recommend replacing the metal halides with 6-lamp T5 high-bay fluorescent fixtures to improve overall light levels in the space and to allow the fixtures to be turned off during unoccupied periods of the day.*



Estimated Cost: $9,100 Estimated Savings: $1,215 Estimated Payback: 7-1/2 Years

HVAC ECRM 1: REPLACE BOTH 10-TON CONDENSING UNITS AT ATHLETIC DOME

At the athletic dome, the main arena is conditioned by two, 2001, 10-ton Carrier units. One of these units was not working on the day of our visit and district personnel voiced a desire to replace both of these units due to the numerous problems they have been having. Due to the high amount of maintenance these units are constantly requiring, *we recommend the district plan on replacing these two units as soon as funds become available to do so.*

Estimated Cost: $41,000 Estimated Savings: $2,735 Estimated Payback: 15 years

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

HVAC	•Comb coil fins •Replace refrigerant insulation •Insulate hot water piping
Lighting	•De-lamp cooridor light fixtures •Retrofit lighting in trophy display cases • Turn off lights in unoccupied spaces
Controls	•Use setback temperatures in unoccupied spaces
Building Envelope	•Replace weather stripping at exterior doors •Reseal caulk around windows
Safety	•Keep all cleaning equipment off electrical panels

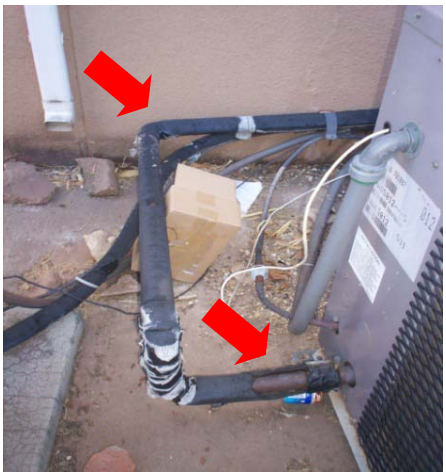
Maintenance and Operation procedures are strategies that can offer significant energy savings potential, yet require little or no capital investment by the district to implement. Exact paybacks are at times difficult to calculate, but are typically always less than one year. The difficulties with payback 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

At IISD, the HVAC M&O opportunities revolve around combing the condenser fins [combs available for less than $10]. Damage to just 10% of the coil fins on an HVAC unit can result in up to a 30% loss of efficiency for the unit. *We recommend making this a part of IISD's summer maintenance schedule to ensure it is done once per year.*

HVAC M&O - #2

Upon inspection of the athletic dome HVAC equipment, we found that multiple condenser units' refrigerant piping insulation was damaged or missing. This condition minimizes the ability of the refrigerant to absorb heat from the conditioned space as it instead absorbs heat from the outdoors. *We recommend the district replace damaged or missing refrigerant piping insulation on all condensing units.*



HVAC M&O #3

It was noted during the survey that the hot water piping at the old gym 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.*

Lighting M&O #1

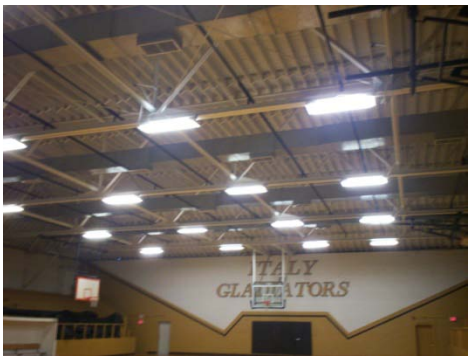
The corridor light fixtures at the high school are currently utilizing three T8 lamps per fixture. *We recommend de-lamping each hall lighting fixture from three lamps per fixture down to two lamps per fixture*. Two lamps per fixture along with the natural entering the building through various windows and doors will provide adequate light for the corridors.

Lighting M&O #2

While surveying the High School, it was noted that many of the trophy case display lighting was on during the summer. This trophy case lighting is still utilizing magnetic ballasts with T12 lamps. *We recommend the district retrofit all trophy case lighting fixtures to electronic ballasts with T8 lamps, and turn these lights off whenever students are not occupying the building.*

Lighting M&O #3

It was noted that multiple areas of the high school had lights on in unoccupied spaces. *We recommend the district emphasize to the staff the immediate energy saving opportunities when keeping lights off in unoccupied spaces becomes a priority for every teacher and staff member.*



Controls M&O #1

During our survey it was noted that thermostats throughout the district had temperature setpoints that varied greatly from one another. *While replacing the existing thermostats with IP addressable thermostats is our first recommendation for this issue, implementing a strict energy management policy requiring all thermostats have an unoccupied setback temperature will provide immediate savings*. The thermostat pictured to the right was found to be set at 72°F in an unoccupied classroom during the summer break.

Envelope M&O #1

It was noted during the survey that some of the exterior doors had damaged or missing weatherstripping. This condition allows conditioned air to leak from the building and allows insects, humidity and non-conditioned air to infiltrate the building. *We recommend the district replace the damaged or missing weatherstripping at all exterior doors where necessary.*

Envelope M&O #2

Some of the seals around the windows next to the High School office are deteriorating and in need of repair. To avoid additional heat gain to the space along with insects and dust, *we recommend the district re-caulk all existing windows where the seal appears to be deteriorating and in need of repair*.

Safety M&O #1

In one of the custodial closets we noticed that the handles to the electrical breaker boxes were being used to hang umbrellas and plungers up to dry. Due to the impending hazard should water ever come in contact with the electrical components of the breaker boxes, *we recommend the district find another place to dry and store all janitorial equipment.*

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	($13,640)		0	($13,640)
Year 1		$ 3,185.00	0	$3,185
Year 2		$ 3,185.00	0	$3,185
Year 3		$ 3,185.00	0	$3,185
Year 4		$ 3,185.00	0	$3,185
Year 5		$ 3,185.00	0	$3,185
Year 6		$ 3,025.75	($250)	$2,776
Year 7		$ 2,866.50	($250)	$2,617
Year 8		$ 2,707.25	($250)	$2,457
Year 9		$ 2,548.00	($250)	$2,298
Year 10		$ 2,388.75	($250)	$2,139
Year 11		$ 2,229.50	($500)	$1,730
Year 12		$ 2,070.25	($500)	$1,570
Year 13		$ 1,911.00	($500)	$1,411
Year 14		$ 1,751.75	($500)	$1,252
Year 15		$ 1,592.50	($500)	$1,093
			Internal Rate of Return	**19.21%**

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

APPENDIX I: SUMMARY OF FUNDING AND PROCUREMENT OPTIONS

9.0 GENERAL COMMENTS

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

APPENDICES

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

SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

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

LoanSTAR Program:

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

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

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

Loans on Commercial Market:

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

Leasing Corporations:

Leasing corporations have become increasingly interested in the energy efficiency market. The financing vehicle frequently used is the municipal lease. Structured like a simple loan, a municipal leasing agreement is usually a lease-purchase agreement. Ownership of the financed equipment passes to the district at the beginning of the lease, and the lessor retains a security interest in the purchase until the loan is paid off. A typical lease covers the total cost of the equipment and may include installation costs. At the end of the contract period a nominal amount, usually a dollar, is paid by the lessee for title to the equipment.

Bond Issue:

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

SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

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

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

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

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

Performance Contracting:
Through this arrangement, an energy service company (ESCO) using in-house or third party financing to implement comprehensive packages of energy saving retrofit projects. Usually a turnkey service, this method includes an initial assessment of energy savings potential, design of the identified projects, purchase and installation of the equipment, and overall project management. The ESCO guarantees that the cost savings generated will, at a minimum, cover the annual payment due over the term of the contract. The laws governing Performance Contracting for school districts are detailed in the Texas Education Code, Subchapter Z, Section 44.901. Senate Bill SB 3035, passed by the seventy-fifth Texas Legislature, amends some of these conditions. Performance Contracting is a highly competitive field, and interested districts may wish to contact Eddy Trevino of State Energy Conservation Office, (SECO), at 512-463-1896 for assistance in preparing requests for proposals or requests for qualifications.

Solution Center

How to Finance Your Energy Program

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

Selecting a Cost/Benefit Analysis Method

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

Simple Payback Analysis

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

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

Simple Payback

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

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

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

Life-Cycle Cost Analysis

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

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

continued

How to Finance Your Energy Program *continued*

Financing Mechanisms

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

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

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

Internal Funds

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

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

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

Debt Financing

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

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

How to Finance Your Energy Program *continued*

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

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

Lease and Lease-Purchase Agreements

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

Energy Performance Contracts

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

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

Types of Leasing Agreements

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

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

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

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

How to Finance Your Energy Program *continued*

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

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

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

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

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

Rebuild America
U.S. Dept. of Energy

APPENDIX II - ELECTRIC UTILITY RATE SCHEDULE

6.1.1.1.3 Secondary Service Greater Than 10 kW

AVAILABILITY

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

TYPE OF SERVICE

Delivery Service will be single or three-phase, 60 hertz, at a standard secondary voltage. Delivery Service will be metered using Company's standard meter provided for this type of Delivery Service, unless Retail Customer is eligible for and chooses a competitive meter provider. Any meter other than the standard meter provided by Company will be provided at an additional charge. Where Delivery Service of the type desired is not available at the Point of Delivery, additional charges and special contract arrangements may be required prior to Delivery Service being furnished, pursuant to Section 6.1.2.2 of this Tariff.

MONTHLY RATE

I. Transmission and Distribution Charges:

Customer Charge	$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:

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

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.

APPENDIX IV - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

SECO
State Energy Conservation Office

Local Governments and Municipalities

Preliminary Energy Assessment
Service Agreement

Investing in our communities 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 _____, 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: B. Basset — Date: 6/14/11

Name (Mr./Ms./Dr.) Barry Basset — Title: Superintendent

Organization: Italy I.S.D. — Phone (972) 483-1815

Street Address: 300 S College — Fax: (972) 483-6152

Mailing Address: Italy Tx — E-Mail: bbasset@italyisd.org

76651 — County: Ellis

Contact Information: Speed Hamby

Name (Mr./Ms./Dr.) ~~Barry Basset~~ — Title: Director Maintenance ~~Superintendent~~

Phone: ~~(972) 483-1815~~ 972-483-3200 — Fax: ~~(972) 483-6152~~ ~~3200~~ 6152

E-Mail: ~~bbasset@italyisd.org~~ Shamby — County: Ellis

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

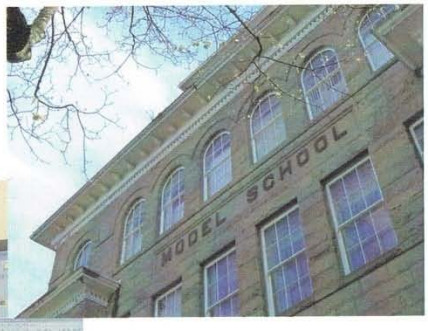
APPENDIX V - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

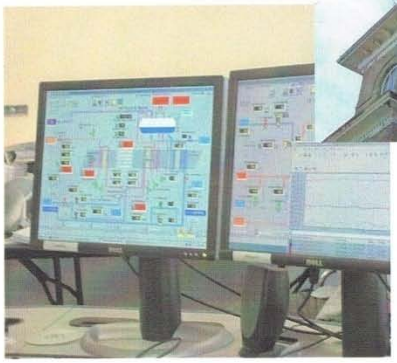
ANNOUNCING!

TEXAS ENERGY MANAGERS ASSOCIATION

TEMA

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