

SCHOOLS/LOCAL GOVERNMENT ENERGY MANAGEMENT PROGRAM

For

**ANDREWS
INDEPENDENT SCHOOL DISTRICT
Andrews, Texas**

An Energy Efficient Partnership Service
of
**COMPTROLLER of the STATE of TEXAS
STATE ENERGY CONSERVATION OFFICE
111 E. 17th Street
Austin, Texas 78774**

Professional Engineering Services By:

**ESA ENERGY SYSTEMS ASSOCIATES, Inc
100 East Main Street, Suite 201
Round Rock, Texas 78664
(512) 258-0547**

May 6, 2009

James W. Brown, P.E.
Texas Registration # 51926

ESA-Energy Systems Associates, Inc.
F-4882

Table of Contents

	<u>Page Number</u>
1.0 Executive Summary	1-2
2.0 Energy Assessment Procedure	3
3.0 Campus Description	3-6
4.0 Energy Performance Indicators	7-8
5.0 Utilities Rate Schedule Analysis	9-10
6.0 Recommendations	
A. Maintenance and Operations Projects	11
B. Capital Expense Projects	11-12
 APPENDICES:	
I. Summary of Funding and Procurement Options	13-21
II. Electric Utility Rate Schedule	22-24
III. Utilities Consumption History	25-28
IV. Energy Policy	29-30
V. Preliminary Energy Assessment Service Agreement	31-32
VI. Amortization Schedule	33-35
VII. SECO Program Contacts Watt Watchers of Texas	36-42
VIII. Texas Energy Managers Association (TEMA)	43-44
IX. Utility Charts on Diskette	45

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: Glenda Baldwin
Phone: 512-463-1731
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 April 2009, **SECO** received a request for technical assistance from *Dan Webb*, Assistant Superintendent for Andrews 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 heating and cooling 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 **Andrews ISD**, (hereafter known as AISD) 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 Appendix IV of this report.

Following the utility analysis and a preliminary consultation with Mr. Rios, a walk-through energy analysis was conducted throughout the campus. Specific findings of this survey and the resulting recommendations for both operation and maintenance procedures and cost-effective energy retrofit installations are identified in Section 6.0 of this report.

We estimate that as much as \$22,600 may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **\$135,000**, yielding an average simple payback of **6** years.

SUMMARY TABLE:

Recommended Project	Estimated Annual Energy Cost Avoidance	Estimated Installation Cost	Predicted Simple Payback Period (Years)
<i>Irrigation Systems</i>	\$-	\$-	-
<i>Lighting</i>	\$22,600	\$ 135,000	6 Years
Total:	\$22,600	\$135,000	6

(See Section 6.0 for a detailed description of each recommended project.)

Although additional savings from reduced maintenance expenses are anticipated, these savings projections are not included in the estimates provided above. As a result, the actual Return of Investment (ROI), for this retrofit program should be even faster than noted within these calculations.

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 **AIISD**. We hope to be ongoing partners in assisting you to implement the recommendations listed in this report. Please call us if you have further questions or comments regarding your Energy Management Issues.

*ESA Energy Systems Associates, Inc. James W. Brown (512) 258-0547

2.0 ENERGY ASSESSMENT PROCEDURE:

Involvement in this on-site analysis program was initiated through completion of a Preliminary Energy Assessment Service Agreement. This PEASA serves as the agreement to form a "partnership" between the client and the State Energy Conservation Office (SECO) for the purposes of energy costs and consumption reduction within owned and operated facilities. After receipt of the PEASA, an on-site visit was conducted by the professional engineering firm contracted by SECO to provide service within that area of the state. 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. ESA then toured the facilities to evaluate changes in maintenance, operations and/or equipment which would produce potential savings in energy consumption and cost.

SECO assisted Andrews ISD by providing an Energy Partnership Survey in 1998. At the time, most of Andrews's facilities were above regional averages for both energy consumption and energy cost per square foot. Recommendations included a lighting renovation from T12 to T8 fluorescent lamps and electronic ballasts, and the replacement of some HVAC units. We also recommended the installation of an energy management control system.

3.0 CAMPUS DESCRIPTIONS:

Andrews ISD consists of five campuses. There are two new elementary schools, Devonian and Underwood, along with the original elementary, junior high, and high school.

Elementary School

Originally built in 1982-1983, the school only serves kindergarten through second grade. Two years ago the school replaced the entire HVAC system. Currently the school has double paned windows and is carpeted throughout.

District staff estimates that 75% of the campus still utilizes T12 lamps and magnetic ballasts in the lighting system. The district currently renovates fixtures to T8 lamps with electronic ballasts as the fixtures require re-lamping. *We recommend the district complete the renovation to T8 lamps and electronic ballasts throughout the lighting system.* This recommendation will also assist the district in meeting lighting renovation directives of House Bill HB3693 passed in June 2007.

The gymnasium lobby currently has twelve, four-lamp lighting fixtures. *We recommend the current fixtures be retrofit to include six four-lamp T8 lighting fixtures.* The library has fourteen, sixty seven watt incandescent fixture without a dimming system and several storage and lobby areas also have incandescent lamps. Incandescent lamps are the least efficient lamp types to operate in a lighting system. *These should be replaced with compact fluorescent lamps (CFLs) or with new linear fluorescent fixtures.* CFL lamps consume 25% of the power requirements of the incandescent units and last approximately eight times longer. *We also recommend that the school initiate a program to encourage turning off the lights. Staff has reported that lights are frequently found left operating all night after the evening crew has been working.*

It was noted in the survey that the water heaters were missing the section of the hot water line insulation closest to the heater. This



is the source of most of the energy losses in a hot water system and the insulation should be installed at this location.

Junior High School

Water heater insulation missing

Originally built in 1974 and serving grades six through eight, the school received a complete HVAC renovation in 2004. In 1998 the choir and band halls were completely renovated. The brick building has tile floors throughout, double pane windows and a flat roof with metal soffit. There is insulation above the acoustic ceilings. All of the weather stripping is in good condition and does not need any repair.

Building Q1/AEP and all of the shops utilize T12 fixtures. *We recommend the district renovate these fixtures to T8 lamps and electronic ballasts.* The retrofit will also help AISD comply with the lighting renovation directives of House Bill HB3693 passed in June 2007. Also, there are several storage and lobby areas that have incandescent lamps. *These should be replaced with compact fluorescent lamps (CFLs) or with new linear fluorescent fixtures. In addition, we recommend that the district retrofit the existing incandescent exit fixtures with LED lamps or replace the exit fixtures with LED units altogether.* These new lamps/fixtures consume 10% of the power requirements of the incandescent units and last for up to 100,000 hours. *We also recommend that the school initiate a program to encourage turning off lights in unoccupied spaces.*

Exterior lighting is designed to be controlled with photocell(s), but as was observed during the survey, not all of the lights were effectively turned off by those devices. *We recommend that the district explore the nature of the failure for the current photocell to maintain control over the exterior lights and repair or replace any equipment necessary to correct the condition.*

High School

Originally built in 1960, the school serves grades ten through twelve. The campus has single pane windows and tile floors throughout. In 2007 the school renovated the HVAC system and installed an Energy Management Control System (EMCS). There is no override option at individual classrooms because the central plant HVAC system is not a system that should be allowed to be energized with a small occupancy load. Some of the campus is served with rooftop and split systems. Override functionality could be allowed in this area of the campus if the district desired.

It was noted during the survey that the cooling tower fill media was moderately scaled up, a condition which limits the efficiency of the cooling tower to cool the condenser



water. We recommend the tower be cleaned as soon as possible.

The campus needs to replace or repair the door and window weather-stripping throughout.

The campus is in the process of retrofitting to T8 lighting system. The staff renovates fixtures as the lamps and ballasts in the existing fixtures fail. The exact percentage of the ongoing retrofit is not known. *We recommend that the district complete the renovation.* The T8 lamps and electronic ballasts produce about 20% more light than the existing system while consuming approximately 18% less energy. The retrofit will also help AISD comply with the lighting renovation directives of House Bill HB3693 passed in June 2007. *We also recommend that the school initiate a program to encourage turning off the lights in unoccupied spaces.*

Cooling Tower



High School Domed Lobby

Exterior lights are two hundred watt incandescent and three hundred watt halogen fixtures controlled with a time clock. *We recommend getting the exterior lighting turned off during the day.* There are incandescent lights at the tunnel and in the girls' dance room. The cafeteria is all NG. Incandescent lamps are the least efficient lamp types to operate in a lighting system. *These should be replaced with compact fluorescent lamps (CFLs) or with new linear fluorescent fixtures.* These new fixtures consume 25% of the power requirements of the incandescent units and last up to eight times longer than incandescent lamps.

We recommend that the programming for the central system for the simultaneous heating and cooling.

As can be seen in the picture to the right, the weatherstripping on doors and windows is in poor condition. *We recommend it be replaced or repaired.*



Weatherstripping missing under door

All Campuses

One of the conservation projects that the district expressed interest in pursuing was an irrigation system at each campus. Examination of the water bills for the district shows no credit currently given to the district on sewer charges for water not dumped down the sewer, but rather used for

irrigation. Including a water meter in the installation of the irrigation system will allow the district to document the gallons of water that should not appear in the sewer charges.

One program that encourages turning off lights when in unoccupied spaces is called *Wattwatchers*. This is a program that involves the students in monitoring the lights around the school and having them encourage energy efficient practices.

The energy management system is currently programmed to operate in a demand limiting strategy called “staggered start”. This programming initiates the startup of HVAC units around a campus at 15 or 30 minutes stages in order to prevent multiple units from starting at the exact same time and resulting in excessive demand charges. While it is true that motors require a higher amperage to start than they do to run, demand measurements are taken as 15- minute average power draws and therefore the small 1-2 second startup current “surge” is minimized over that average time period. The consumption charges that are experienced by running some units for up to an hour and a half longer than necessary costs more than the demand charges saved through staggered start. Therefore, we recommend that the district re-program the EMS to limit operation of the HVAC to as close to student occupancy schedules as can be accomplished while maintaining comfort.

4.0 ENERGY PERFORMANCE INDICATORS:

In order to easily assess the *Partner's* energy utilization and current level of efficiency, there are two key "Energy Performance Indicators" calculated within this report.

1. Energy Utilization Index

The Energy Utilization Index (EUI) depicts the total annual energy consumption per square foot of building space, and is expressed in "British Thermal Units" (BTU's).

To calculate the EUI, the consumption of electricity and gas are first converted to equivalent BTU consumption via the following formulas:

$$\text{ELECTRICITY Usage} \\ [\text{Total KWH /yr}] \times [3413 \text{ BTUs/KWH}] = \text{_____ BTUs / yr}$$

$$\text{NATURAL GAS Usage} \\ [\text{Total MCF/yr}] \times [1,030,000 \text{ BTUs/MCF}] = \text{_____ BTUs / yr}$$

After adding the BTU consumption of each fuel, the total BTU's are then divided by the building area.

$$\text{EUI} = [\text{Electricity BTU's} + \text{Gas BTU's}] \text{ divided by } [\text{Total square feet}]$$

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:

$$\text{ECI} = [\text{Electricity Cost} + \text{Gas Cost}] \text{ divided by } [\text{Total square feet}]$$

These indicators may be used to compare the facility's current cost and usage to past years, or to other similar facilities in the area. Although the comparisons will not provide specific reasons for unusual operation, they serve as indicators that problems may exist within the energy consuming systems.

THE CURRENT ENERGY PERFORMANCE INDICATORS FOR :

ANDREWS ISD

CAMPUS

ENERGY UTILIZATION

ENERGY COST

	INDEX (EUI) (Btu/sf-year)	INDEX (ECI) (\$/sf-year)
2008 Clearfork ES Campus	40,370	\$0.97
Region 18 2006 Average ES:	44,314	\$0.70
1999 Clearfork ES Campus	54,746	\$0.78
2008 Junior High Campus	36,385	\$1.56
Region 18 2006 Average JH:	42,080	\$0.80
1999 Junior High Campus	61,431	\$0.89
2008 High School Campus	40,501	\$0.99
Region 18 2006 Average HS:	51,386	\$0.87
1999 High School Campus	84,263	\$0.93

Comparison: Andrews ISD, 2008 to 1999: The district has obviously made significant progress in reducing the consumption of energy on each campus from 1999 to 2008. Clearfork ES has reduced its EUI 26% from 54,746 to 40,370 BTU/sf-year. The Middle School and High School have demonstrated reductions of 41% and 52% respectively. ECIs are higher over the same time period, but this is expected given the significant energy price increases experienced since 1999.

Comparison: Andrews ISD to Regional Averages: The EUIs for the Andrews facilities are below regional averages at all three campuses: 9% for Clearfork, 14% for the Middle School, and 21% for the High School. On the other hand, the ECIs are all higher than regional averages for the facilities: 39% for Clearfork, 95% for the Middle School, and 14% for the High School.

This apparent anomaly has several possible causalities:

1. The regional averages used are from 2006 and therefore a portion of the energy price increases experienced from 2006 are not included in the averages, but are represented in the calculations made for the district's 2007-2008 utility billings.
2. The rate schedule analysis (Section 5.0) suggests that Andrews ISD has a higher cost for electricity under their current contract than other similar schools in the region.
3. Study of Base Year Utility Consumption Histories (Appendix III) suggests that the BEMS schedule is not being adjusted for reduced occupancy schedules in June and July; there is no sharp reduction in costs and consumption of electricity during summer months.

5.0 RATE SCHEDULE ANALYSIS:

RETAIL ELECTRIC PROVIDER (REP):	Direct Energy [\$0.085400 per kWh]
<i>Other Charges:</i>	
Service Charge (referred to as ESI ID Charge):	= \$193.05 per month
<i>Regulatory Charges</i>	
Public Utility Assessment	= 0.1667% of Monthly Subtotal*
<i>*Note: Utility Bill Analysis could not reproduce the "Subtotal" from the data on the bill</i>	
Texas Gross Receipts	= 1.07% of REP + T&D Charges

TRANSMISSION AND DISTRIBUTION (T&D): **Oncor**

Electric Rate: Secondary Service > 10 kW

I. TRANSMISSION AND DISTRIBUTION CHARGES:	
Customer Charge	= \$24.90 per meter
Metering Charge	= \$16.65 per meter
Transmission System Charge (Non-IDR Meter)	= \$1.19 per NCP kW
Distribution System Charge	= \$3.55 per DS Billing kW
II. SYSTEM BENEFIT FUND	= \$0.000655 per kWh
III. TRANSITION CHARGES	
Transition Charge 1	= \$0.171/kW
Transition Charge 2	= \$0.266/kW
IV. NUCLEAR DECOMMISSIONING CHARGE	= \$0.044 per DS Billing kW
V. TRANSMISSION COST RECOVERY FACTOR	= \$0.338338/NCP kW
VI. EXCESS MITIGATION CREDIT	= expired 12-31-08
VII. STATE COLLEGE DISCOUNT	= not applicable
VIII. COMPETITIVE METERING CREDIT	= \$3.15 per month

Average Savings for consumption = \$0.0854/kWh + \$0.000655/kWh = **\$0.086055/kWh**

Average Savings for demand = \$1.19 + \$3.55 + \$0.171 + \$0.266 + \$0.044 + \$0.338338 = **\$5.56/kW****

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

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

NATURAL GAS PROVIDER: Atmos

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

Total Cost of Natural Gas purchased for Clearfork ES, MS and HS: \$94,167

Total Quantity of Natural Gas purchased for Clearfork ES, MS and HS: 9,709 MCF

Cost / Quantity = Average Unit Cost

\$ 94,167 / 9,709 mcf = **\$9.70 per mcf of natural gas**

6.0 RECOMMENDATIONS:

A. MAINTENANCE AND OPERATIONS PROCEDURES

1. Weather-strip around movable portions of exterior door and operable window frames.
Stationary sections of window and door frames should be recaulked as needed.
2. Check programming for central system of the high school for simultaneous heating and cooling.
3. Implement SECO’s Watt Watcher program to turn lights off in unoccupied areas.
The Watt Watcher program gets the students involved with helping to have lights turned off when not in use. Refer to Appendix VII for more information on the Watt Watcher Program.

B. CAPITAL EXPENSE PROJECTS

I. Install Irrigation System at each campus

Currently all irrigation is accomplished by manual distribution of hoses and sprinklers. There does not appear to be any reduction of sewer charges for the water used for irrigation and not introduced into the wastewater system. Irrigation systems at each school would provide greater control of water distribution by the district. Water meters installed at the irrigation systems would provide evidence for reduced sewer charges on water bill.

Due to the array of options available for the installation of irrigation systems for a school facility, no estimate for installed cost will be provided in this report. We recommend the district request an estimate from a qualified irrigation contractor for cost and payback calculations for these systems.

II. Complete Retrofit from T12 to T8 Lighting System Components

Complete the T12 fluorescent lighting renovation to T8 lamps and electronic ballasts. Finish the retrofit of existing metal halide fixtures to T5 linear fluorescent fixtures at the gymnasiums and renovate the existing incandescent lighting system at the High School Auditorium.

Estimated Installed Cost	=	\$135,000
Estimated Energy Cost Savings	=	\$ 22,600
Simple Payback Period	=	6 Years

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
<i>Irrigation System</i>	\$-	\$ -	-
<i>Lighting</i>	\$ 135,000	\$ 22,600	6 Years
TOTAL PROJECTS	\$ 135,000	\$ 22,600	6 Years

Financing of these projects may be provided using a variety of methods as Bond Programs, municipal leases, or state financing programs like the SECO LoanSTAR Program.

In-House Funding	=	\$ 135,000	
10 year commercial loan principal	=	\$ 135,000	
10 year commercial loan interest (5%) paid	=	\$ 36,826	
10 year commercial loan TOTAL	=	\$ 171,826	
Commercial Loan Annual Payment	=	\$ 1,432/month	= \$ 17,184/yr
Total Annual Payment Minus Annual Energy Cost Savings	=	\$17,184 – 22,600	= \$ -5,416
Annual Savings to ISD (without considering Maintenance Cost Reduction)	=	\$ 5,416	

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

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

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 Theresa Sifuentes of SECO (512-463-1896) for an up-to-date evaluation of prospects for obtaining a loan in the amounts desired.

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

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

Loans On Commercial Market:

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

Leasing Corporations:

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

Bond Issue:

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

SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

State Purchasing:

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

Design/Bid/Build (Competitive Bidding):

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

Design/Build:

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

Purchasing Standardization Method:

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

Performance Contracting:

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

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*

project, including the base date (the date to which all future costs are discounted), the service date (the date when the new system will be put into service), the study period (the life of the project or the number of years over which the investor has a financial interest in the project), and the discount rate. When two or more design alternatives are compared (or even when a single alternative is compared with an existing design), these variables must be the same for each to assure that the comparison is valid. It is meaningless to compare the LCC of two or more alternatives if they are computed using different study periods or different discount rates.

Decision makers in both the public and private sectors have long used LCC analysis to obtain an objective assessment of the total cost of owning, operating, and maintaining a building or building system improvement over its useful life. Nevertheless, an LCC analysis does require a good understanding of acceptable alternatives, useful life, equipment efficiencies, and discount rates.

Selecting the "Best" Alternatives

Generally, all project alternatives should be screened using simple payback analyses. A more detailed and costly LCC analysis should be reserved for large projects or those improvements that entail a large investment, since a detailed cost analysis would then be a small part of the overall cost. Both simple payback and LCC analyses will allow you to set priorities based on measures that represent the greatest return on investment. In addition, these analyses can help you select appropriate financing options:

- Energy-efficiency measures with short payback periods, such as one to two years, are economically very attractive and should be implemented using operating reserves or other readily available internal funds, if possible.
- Energy-efficiency measures with payback periods from three to five years may be considered for funding from available internal capital investment monies, or may be attractive candidates for third-party financing through energy service companies or equipment leasing arrangements.
- Frequently, short payback measures can be combined with longer payback measures (10

years or more) in order to increase the number of measures that can be cost-effectively included in a project. Projects that combine short- and long-term paybacks are recommended to avoid "cream-skimming" (implementing only those measures that are highly cost effective and have quick paybacks) at the expense of other worthwhile measures. A selected set of measures with a combination of payback periods can be financed either from available internal funds or through third party alternatives.

If simple payback time is long, 10 or more years, economic factors can be very significant and LCC analysis is recommended. In contrast, if simple payback occurs within three to five years, more detailed LCC analysis may not be necessary, particularly if price and inflation changes are assumed to be moderate.

Weighing Non-Cost Impacts

Some factors related to building heating, air conditioning, and lighting system design are not considered in either simple payback or LCC analyses. Examples include the thermal comfort of occupants in a building and the adequacy of task lighting, both of which affect productivity. A small loss in productivity due to reduced comfort or poor lighting can quickly offset any energy cost savings.

Conventional cost/benefit analyses also normally do not consider the ancillary societal benefits that can result from reduced energy use (e.g., reduced carbon emissions, improved indoor air quality). In some cases, these ancillary benefits can be assigned an agreed upon monetary value, but the values to be used are strongly dependent on local factors. In general, if societal benefits have been assigned appropriate monetary values by a local utility, they can be easily considered in your savings calculations. However, your team should discuss this issue with your local utility or with consultants working on such values in your area.

Finally, in any cost analysis, it can be very important to include avoided cost as part of the benefit of the retrofit. When upgrading or replacing building equipment, the avoided cost of maintaining existing equipment should be considered a cost savings provided by the improvement.

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.

4

How to Finance Your Energy Program *continued*

infrastructure (such as lighting) to a complete package of measures for multiple buildings and facilities. Generally, the service provider will guarantee savings as a result of improvements in both energy and maintenance efficiencies. Flat-fee payments tend to be structured to maintain a positive cash flow to the customer with whom the agreement is made. With the increasing deregulation of conventional energy utilities, several larger utilities have formed unregulated subsidiaries that offer a full range of energy-efficiency services under performance agreements.

An energy performance contract must define the methodology for establishing the baseline costs and cost savings and for the distribution of those savings among the parties. The contract must also specify how those savings will be determined, and must address contingencies such as utility rate changes and variations in the use and occupancy of a building. While several excellent guidance documents exist for selecting and negotiating energy performance contracts, large or complicated contracts should be negotiated with the assistance of experienced legal counsel.

Utility Incentives

Some utilities still offer financial incentives for the installation of energy-efficient systems and equipment, although the number and extent of such programs appears to be decreasing as utility deregulation proceeds. These incentives are available for a variety of energy-efficient products including lighting, HVAC systems, energy management controls, and others. The most common incentives are equipment rebates, design assistance, and low-interest loans.

In general, the primary purpose of utility incentives is to lower peak demand; overall energy-efficiency is an important, but secondary consideration. Incentives are much more commonly offered by electric utilities than by natural gas utilities.

Additional Financing Sources and Considerations

State and Federal Assistance. Matching grants, loans, or other forms of financial assistance (in

addition to those listed above) may be available from the Federal government or state governments. If your community is considering energy-efficiency improvements for public or assisted multifamily housing, your program could be eligible to receive assistance through various programs of the U.S. Department of Housing and Urban Development. A variety of state-administered programs for building efficiency improvements may also be available, some of which are funded through Federal block grants and programs. Federal assistance available through states include Federal block grants and State Energy Conservation Program funds. An example of individual state programs is the Texas LoanSTAR program, which provides low-interest loans for state agencies and schools.

Utility Assistance

Equipment Rebates. Some utilities offer rebates on the initial purchase price of selected energy-efficient equipment. The amount of the rebate varies substantially depending on the type of equipment. For example, a rebate of \$.50 to \$1 may be offered for the replacement of an incandescent bulb with a more efficient fluorescent lamp, while the installation of an adjustable speed drive may qualify for a rebate of \$10,000 or more.

Design Assistance. A smaller number of utilities provide direct grants or financial assistance to architects and engineers for incorporating energy-efficiency improvements in their designs. This subsidy can be based on the square footage of a building, and/or the type of energy-efficiency measures being considered. Generally, a partial payment is made when the design process is begun, with the balance paid once the design has been completed and installation has commenced.

Low-Interest Loans. Loans with below-market rates are provided by other utilities for the purchase of energy-efficient equipment and systems. Typically, these low-interest loans will have an upper limit in the \$10,000 to \$20,000 range, with monthly payments scheduled over a two- to five-year period.

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



APPENDIX II

ELECTRIC UTILITY RATE SCHEDULE

**Tariff for Retail Delivery Service
Oncor Electric Delivery Company**

6.1.1 Delivery System Charges
Applicable: Entire Certified Service Area
Effective Date: January 1, 2004

Sheet: 3
Page 1 of 2
Revision: One

6.1.1.3 - Secondary Service Greater Than 10 kW

AVAILABILITY

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

TYPE OF SERVICE

Delivery Service will be single 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 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	\$24.90	per Retail Customer per Month
Metering Charge	\$16.65	per Retail Customer per Month
Transmission System Charge		
Non-IDR Metered	\$ 1.19	per NCP kW
IDR Metered	\$ 1.47	per 4CP kW
Distribution System Charge	\$ 3.55	per Distribution System billing kW

II. System Benefit Fund: \$0.000655 per kWh, See Rider SBF

III. Transition Charge: See Rider TC

IV. Nuclear Decommissioning Charge: \$0.044 per Distribution System billing kW, See Rider NDC

V. Transmission Cost Recovery Factor: See Rider TCRF

VI. Excess Mitigation Credit: See Rider EMC

VII. State Colleges and Universities Discount: See Rider SCUD

VIII. Competitive Metering Credit: See Rider CMC

IX. Other Charges or Credits:

Not Applicable

**Tariff for Retail Delivery Service
Oncor Electric Delivery Company**

6.1.1 Delivery System Charges
Applicable: Entire Certified Service Area
Effective Date: January 1, 2004

Sheet: 3
Page 2 of 2
Revision: One

COMPANY SPECIFIC APPLICATIONS

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

DETERMINATION OF BILLING DEMAND FOR TRANSMISSION SYSTEM CHARGES

DETERMINATION OF NCP kW

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

DETERMINATION OF 4 CP kW

The 4 CP kW applicable under the Monthly Rate section shall be the average of the Retail Customer's integrated 15 minute demands at the time of the monthly ERCOT system 15 minute peak demand for the months of June, July, August and September of the previous calendar year. The Retail Customer's average 4CP demand will be updated effective on January 1 of each calendar year and remain fixed throughout the calendar year. Retail Customers without previous history on which to determine their 4 CP kW will be billed at the applicable NCP rate under the "Transmission System Charge" using the Retail Customer's NCP kW.

DETERMINATION OF BILLING DEMAND FOR DISTRIBUTION SYSTEM CHARGES

DETERMINATION OF BILLING kW

The Billing kW applicable to the Distribution System Charge shall be the higher of the NCP kW for the current billing month or 80% of the highest monthly NCP kW established in the 11 months preceding the current billing month (80% ratchet). The 80% ratchet shall not apply to retail seasonal agricultural customers, as determined by the utility.

NOTICE

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

APPENDIX III

UTILITIES CONSUMPTION HISTORY

OWNER: Andrews ISD

BUILDING: Clearfolk ES

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	2008	71,460	0	0	2,030	8,319	659	\$5,529
FEBRUARY	2008	71,460	0	0	2,030	8,319	491	\$4,460
MARCH	2008	66,038	0	0	1,992	7,731	303	\$2,853
APRIL	2008	67,613	0	0	2,025	7,900	158	\$1,703
MAY	2008	67,613	0	0	2,025	7,900	66	\$2,505
JUNE	2008	75,150	0	0	841	8,730	28	\$362
JULY	2008	81,675	0	0	2,522	9,620	19	\$282
AUGUST	2008	43,988	0	0	1,927	5,759	32	\$336
SEPTEMBER	2008	92,700	0	0	2,548	10,038	44	\$389
OCTOBER	2008	87,413	0	0	2,236	9,826	63	\$415
NOVEMBER	2008	73,013	0	0	2,204	8,548	143	\$1,099
DECEMBER	2008	59,400	0	0	1,977	7,142		
TOTAL		857,523	0	0	24,357	\$99,832	2,006	\$19,933

Annual Total Energy Cost = \$119,765 Per Year

Total KWH x 0.003413 = 2,926.73 x 106
 Total MCF x 1.03 = 2,066.18 x 106
 Total Other x _____ x 106
 Total Site BTU's/yr 4,992.91 x 106

Floor area: 123,680 s.f.

Energy Use Index:

Total Site BTU's/yr 40,370 BTU/s.f.yr
 Total Area (sq.ft.)

Energy Cost Index:

Total Energy Cost/yr \$0.97 \$/s.f. yr
 Total Area (sq.ft.)

Electric Utility

0

Account #

Multiple

Meter#

Gas Utility

Account #

0

OWNER: Andrews ISD

BUILDING: MS

MONTH / YEAR		ELECTRIC				NAT'L GAS / FUEL		
		CONSUMPTION		DEMAND		TOTAL ALL ELECTRICAL	CONSUMPTION	\$
MONTH	YEAR	KWH	METERED KW/KVA	CHARGED KW/KVA	COST OF DEMAND	COSTS \$	MCF	COSTS
JANUARY	2008	81,052	0	0	2,692	97,087	1,628	\$13,650
FEBRUARY	2008	81,052	0	0	2,692	97,087	1,198	\$10,861
MARCH	2008	68,031	0	0	2,505	8,427	639	\$6,015
APRIL	2008	71,856	0	0	2,400	8,652	292	\$3,133
MAY	2008	71,856	0	0	2,400	8,903	67	\$3,318
JUNE	2008	87,845	0	0	2,767	10,406	31	\$426
JULY	2008	99,896	0	0	3,264	11,952	25	\$388
AUGUST	2008	59,279	0	0	2,388	7,553	26	\$319
SEPTEMBER	2008	98,469	0	0	3,167	11,144	27	\$250
OCTOBER	2008	105,323	0	0	2,794	11,944	47	\$332
NOVEMBER	2008	79,929	0	0	2,725	9,679	289	\$1,716
DECEMBER	2008	68,031	0	0	2,505	8,427		
TOTAL		972,619	0	0	32,299	\$291,261	4,269	\$40,408

Annual Total Energy Cost = \$331,669 Per Year

Total KWH x 0.003413 = 3,319.55 x 106
 Total MCF x 1.03 = 4,397.07 x 106
 Total Other x _____ x 106
 Total Site BTU's/yr 7,716.62 x 106

Floor area: 212,080 s.f.

Energy Use Index:

Total Site BTU's/yr 36,385 BTU/s.f.yr
 Total Area (sq.ft.)

Energy Cost Index:

Total Energy Cost/yr \$1.56 \$/s.f. yr
 Total Area (sq.ft.)

OWNER: Andrews ISD

BUILDING: 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	2008	165,243	0	0	3,586	17,857	1,084	\$9,088
FEBRUARY	2008	165,243	0	0	3,586	17,857	725	\$6,566
MARCH	2008	275,261	0	0	3,312	27,111	509	\$4,850
APRIL	2008	143,797	0	0	3,246	15,697	292	\$3,134
MAY	2008	143,797	0	0	3,246	15,697	111	\$4,463
JUNE	2008	151,671	0	0	3,711	16,864	50	\$631
JULY	2008	171,716	0	0	3,870	18,738	21	\$309
AUGUST	2008	89,761	0	0	3,128	10,914	56	\$549
SEPTEMBER	2008	117,527	0	0	3,803	18,855	91	\$789
OCTOBER	2008	176,931	0	0	3,898	19,215	138	\$882
NOVEMBER	2008	154,345	0	0	3,747	17,115	357	\$2,565
DECEMBER	2008	165,638	0	0	3,823	18,165		
TOTAL		1,920,930	0	0	42,956	\$214,085	3,434	\$33,826

Annual Total Energy Cost = \$247,911 Per Year

Total KWH x 0.003413 = 6,556.13 x 106
 Total MCF x 1.03 = 3,537.02 x 106
 Total Other x _____ x 106
 Total Site BTU's/yr 10,093.15 x 106

Floor area: 249,209 s.f.

Energy Use Index:

Total Site BTU's/yr 40,501 BTU/s.f.yr
 Total Area (sq.ft.)

Energy Cost Index:

Total Energy Cost/yr \$0.99 \$/s.f. yr
 Total Area (sq.ft.)

Electric Utility
0

Account # **Meter#**

Gas Utility **Account #**
Texas Gas Services 9868

APPENDIX IV

ENERGY POLICY

ENERGY POLICY

[Name of Institution]

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

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

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

Adopted this _____ day of _____, 200 .

President, Board of Trustees

Attest: _____
Secretary, Board of Trustees

APPENDIX V

Preliminary Energy Assessment Service Agreement

24-04-2009 15:16 From:ANDREWS ISD

432523343

T-593 P.002/002 F-495



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 ANDREWS 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 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 and recommendations to key decision makers.

Acceptance of Agreement

This agreement should be signed by your organization's chief executive officer or other upper management staff.

Signature: *Bobby Azam* Date: 4-24-9
 Name (Mr./Ms./Dr.): BOBBY AZAM Title: SUPERINTENDENT
 Organization: ANDREWS ISD Phone: 432-523-3640
 Street Address: 405 NW 3RD ST Fax: 432-523-3343
 Mailing Address: 405 NW 3RD ST EMail: BAZAM@andrews.eco.tx.net
 County: ANDREWS

CONTACT INFORMATION:

Name (Mr./Ms./Dr.): DAN WEBB Title: ASST. Supt. OPERATIONS
 Phone: 432-523-3640 Fax: 432-523-3343
 E-Mail: dwebb@andrews.eco.tx.net County: ANDREWS

Please sign & FAX or mail to Glenda Baldwin at State Energy Conservation Office, FAX: 512-475-2569
 Address: LBJ State Office Building, 111 E. 17th Street, Austin, Texas 78774. Phone: 512-463-1731
AND also, please fax a copy to your SECO Contractor: ESA Energy Systems Associates, Inc.: Attn: Yvonne Huneycutt FAX: 512-388-3312 Phone: 512-258-0547 x124

APPENDIX VI

AMORTIZATION SCHEDULE

Loan Amortization Schedule

Enter values	
Loan amount	\$ 135,000.00
Annual interest rate	5.00 %
Loan period in years	10
Number of payments per year	12
Start date of loan	7/1/2009
Optional extra payments	\$ -

Loan summary	
Scheduled payment	\$ 1,431.88
Scheduled number of payments	120
Actual number of payments	120
Total early payments	\$ -
Total interest	\$ 36,826.13

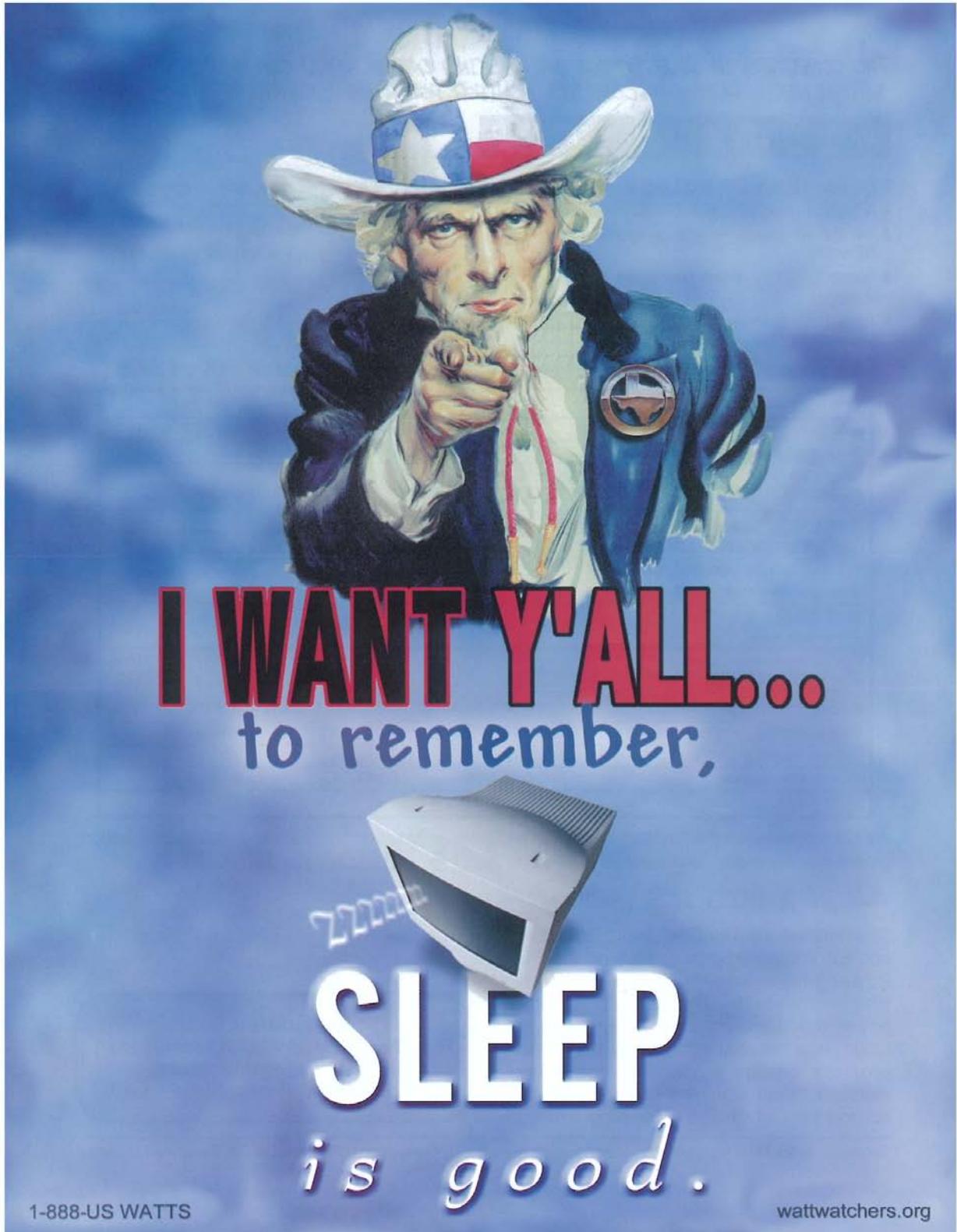
Lender name:

Pmt No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance	Cumulative Interest
1	8/1/2009	\$ 135,000.00	\$ 1,431.88	\$ -	\$ 1,431.88	\$ 869.38	\$ 562.50	\$ 134,130.62	\$ 562.50
2	9/1/2009	134,130.62	1,431.88	-	1,431.88	873.01	558.88	133,257.61	1,121.38
3	10/1/2009	133,257.61	1,431.88	-	1,431.88	876.64	555.24	132,380.96	1,676.62
4	11/1/2009	132,380.96	1,431.88	-	1,431.88	880.30	551.59	131,500.67	2,228.20
5	12/1/2009	131,500.67	1,431.88	-	1,431.88	883.97	547.92	130,616.70	2,776.12
6	1/1/2010	130,616.70	1,431.88	-	1,431.88	887.65	544.24	129,729.05	3,320.36
7	2/1/2010	129,729.05	1,431.88	-	1,431.88	891.35	540.54	128,837.71	3,860.90
8	3/1/2010	128,837.71	1,431.88	-	1,431.88	895.06	536.82	127,942.65	4,397.72
9	4/1/2010	127,942.65	1,431.88	-	1,431.88	898.79	533.09	127,043.86	4,930.82
10	5/1/2010	127,043.86	1,431.88	-	1,431.88	902.54	529.35	126,141.32	5,460.17
11	6/1/2010	126,141.32	1,431.88	-	1,431.88	906.30	525.59	125,235.03	5,985.75
12	7/1/2010	125,235.03	1,431.88	-	1,431.88	910.07	521.81	124,324.95	6,507.57
13	8/1/2010	124,324.95	1,431.88	-	1,431.88	913.86	518.02	123,411.09	7,025.59
14	9/1/2010	123,411.09	1,431.88	-	1,431.88	917.67	514.21	122,493.42	7,539.80
15	10/1/2010	122,493.42	1,431.88	-	1,431.88	921.50	510.39	121,571.92	8,050.19
16	11/1/2010	121,571.92	1,431.88	-	1,431.88	925.33	506.55	120,646.59	8,556.74
17	12/1/2010	120,646.59	1,431.88	-	1,431.88	929.19	502.69	119,717.40	9,059.43
18	1/1/2011	119,717.40	1,431.88	-	1,431.88	933.06	498.82	118,784.34	9,558.26
19	2/1/2011	118,784.34	1,431.88	-	1,431.88	936.95	494.93	117,847.39	10,053.19
20	3/1/2011	117,847.39	1,431.88	-	1,431.88	940.85	491.03	116,906.53	10,544.22
21	4/1/2011	116,906.53	1,431.88	-	1,431.88	944.77	487.11	115,961.76	11,031.33
22	5/1/2011	115,961.76	1,431.88	-	1,431.88	948.71	483.17	115,013.05	11,514.51
23	6/1/2011	115,013.05	1,431.88	-	1,431.88	952.66	479.22	114,060.39	11,993.73
24	7/1/2011	114,060.39	1,431.88	-	1,431.88	956.63	475.25	113,103.75	12,468.98
25	8/1/2011	113,103.75	1,431.88	-	1,431.88	960.62	471.27	112,143.13	12,940.24
26	9/1/2011	112,143.13	1,431.88	-	1,431.88	964.62	467.26	111,178.51	13,407.51
27	10/1/2011	111,178.51	1,431.88	-	1,431.88	968.64	463.24	110,209.87	13,870.75
28	11/1/2011	110,209.87	1,431.88	-	1,431.88	972.68	459.21	109,237.19	14,329.96
29	12/1/2011	109,237.19	1,431.88	-	1,431.88	976.73	455.15	108,260.47	14,785.11
30	1/1/2012	108,260.47	1,431.88	-	1,431.88	980.80	451.09	107,279.67	15,236.20
31	2/1/2012	107,279.67	1,431.88	-	1,431.88	984.89	447.00	106,294.78	15,683.20
32	3/1/2012	106,294.78	1,431.88	-	1,431.88	988.99	442.89	105,305.79	16,126.09
33	4/1/2012	105,305.79	1,431.88	-	1,431.88	993.11	438.77	104,312.68	16,564.87
34	5/1/2012	104,312.68	1,431.88	-	1,431.88	997.25	434.64	103,315.43	16,999.50
35	6/1/2012	103,315.43	1,431.88	-	1,431.88	1,001.40	430.48	102,314.03	17,429.98
36	7/1/2012	102,314.03	1,431.88	-	1,431.88	1,005.58	426.31	101,308.45	17,856.29
37	8/1/2012	101,308.45	1,431.88	-	1,431.88	1,009.77	422.12	100,298.69	18,278.41
38	9/1/2012	100,298.69	1,431.88	-	1,431.88	1,013.97	417.91	99,284.71	18,696.32
39	10/1/2012	99,284.71	1,431.88	-	1,431.88	1,018.20	413.69	98,266.52	19,110.01
40	11/1/2012	98,266.52	1,431.88	-	1,431.88	1,022.44	409.44	97,244.07	19,519.45
41	12/1/2012	97,244.07	1,431.88	-	1,431.88	1,026.70	405.18	96,217.37	19,924.64
42	1/1/2013	96,217.37	1,431.88	-	1,431.88	1,030.98	400.91	95,186.39	20,325.54
43	2/1/2013	95,186.39	1,431.88	-	1,431.88	1,035.27	396.61	94,151.12	20,722.15
44	3/1/2013	94,151.12	1,431.88	-	1,431.88	1,039.59	392.30	93,111.53	21,114.45
45	4/1/2013	93,111.53	1,431.88	-	1,431.88	1,043.92	387.96	92,067.61	21,502.41
46	5/1/2013	92,067.61	1,431.88	-	1,431.88	1,048.27	383.62	91,019.34	21,886.03
47	6/1/2013	91,019.34	1,431.88	-	1,431.88	1,052.64	379.25	89,966.71	22,265.28
48	7/1/2013	89,966.71	1,431.88	-	1,431.88	1,057.02	374.86	88,909.68	22,640.14
49	8/1/2013	88,909.68	1,431.88	-	1,431.88	1,061.43	370.46	87,848.26	23,010.59
50	9/1/2013	87,848.26	1,431.88	-	1,431.88	1,065.85	366.03	86,782.41	23,376.63
51	10/1/2013	86,782.41	1,431.88	-	1,431.88	1,070.29	361.59	85,712.11	23,738.22
52	11/1/2013	85,712.11	1,431.88	-	1,431.88	1,074.75	357.13	84,637.36	24,095.36
53	12/1/2013	84,637.36	1,431.88	-	1,431.88	1,079.23	352.66	83,558.13	24,448.01
54	1/1/2014	83,558.13	1,431.88	-	1,431.88	1,083.73	348.16	82,474.41	24,796.17
55	2/1/2014	82,474.41	1,431.88	-	1,431.88	1,088.24	343.64	81,386.17	25,139.81
56	3/1/2014	81,386.17	1,431.88	-	1,431.88	1,092.78	339.11	80,293.39	25,478.92
57	4/1/2014	80,293.39	1,431.88	-	1,431.88	1,097.33	334.56	79,196.06	25,813.48
58	5/1/2014	79,196.06	1,431.88	-	1,431.88	1,101.90	329.98	78,094.16	26,143.46
59	6/1/2014	78,094.16	1,431.88	-	1,431.88	1,106.49	325.39	76,987.67	26,468.85
60	7/1/2014	76,987.67	1,431.88	-	1,431.88	1,111.10	320.78	75,876.57	26,789.64
61	8/1/2014	75,876.57	1,431.88	-	1,431.88	1,115.73	316.15	74,760.84	27,105.79
62	9/1/2014	74,760.84	1,431.88	-	1,431.88	1,120.38	311.50	73,640.46	27,417.29
63	10/1/2014	73,640.46	1,431.88	-	1,431.88	1,125.05	306.84	72,515.41	27,724.13
64	11/1/2014	72,515.41	1,431.88	-	1,431.88	1,129.74	302.15	71,385.67	28,026.27
65	12/1/2014	71,385.67	1,431.88	-	1,431.88	1,134.44	297.44	70,251.23	28,323.71

Pmt No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance	Cumulative Interest
66	1/1/2015	70,251.23	1,431.88	-	1,431.88	1,139.17	292.71	69,112.05	28,616.43
67	2/1/2015	69,112.05	1,431.88	-	1,431.88	1,143.92	287.97	67,968.14	28,904.40
68	3/1/2015	67,968.14	1,431.88	-	1,431.88	1,148.68	283.20	66,819.45	29,187.60
69	4/1/2015	66,819.45	1,431.88	-	1,431.88	1,153.47	278.41	65,665.98	29,466.01
70	5/1/2015	65,665.98	1,431.88	-	1,431.88	1,158.28	273.61	64,507.71	29,739.62
71	6/1/2015	64,507.71	1,431.88	-	1,431.88	1,163.10	268.78	63,344.60	30,008.40
72	7/1/2015	63,344.60	1,431.88	-	1,431.88	1,167.95	263.94	62,176.66	30,272.34
73	8/1/2015	62,176.66	1,431.88	-	1,431.88	1,172.82	259.07	61,003.84	30,531.41
74	9/1/2015	61,003.84	1,431.88	-	1,431.88	1,177.70	254.18	59,826.14	30,785.59
75	10/1/2015	59,826.14	1,431.88	-	1,431.88	1,182.61	249.28	58,643.53	31,034.86
76	11/1/2015	58,643.53	1,431.88	-	1,431.88	1,187.54	244.35	57,455.99	31,279.21
77	12/1/2015	57,455.99	1,431.88	-	1,431.88	1,192.48	239.40	56,263.51	31,518.61
78	1/1/2016	56,263.51	1,431.88	-	1,431.88	1,197.45	234.43	55,066.06	31,753.04
79	2/1/2016	55,066.06	1,431.88	-	1,431.88	1,202.44	229.44	53,863.61	31,982.49
80	3/1/2016	53,863.61	1,431.88	-	1,431.88	1,207.45	224.43	52,656.16	32,206.92
81	4/1/2016	52,656.16	1,431.88	-	1,431.88	1,212.48	219.40	51,443.68	32,426.32
82	5/1/2016	51,443.68	1,431.88	-	1,431.88	1,217.54	214.35	50,226.14	32,640.67
83	6/1/2016	50,226.14	1,431.88	-	1,431.88	1,222.61	209.28	49,003.53	32,849.94
84	7/1/2016	49,003.53	1,431.88	-	1,431.88	1,227.70	204.18	47,775.83	33,054.12
85	8/1/2016	47,775.83	1,431.88	-	1,431.88	1,232.82	199.07	46,543.01	33,253.19
86	9/1/2016	46,543.01	1,431.88	-	1,431.88	1,237.96	193.93	45,305.06	33,447.12
87	10/1/2016	45,305.06	1,431.88	-	1,431.88	1,243.11	188.77	44,061.94	33,635.89
88	11/1/2016	44,061.94	1,431.88	-	1,431.88	1,248.29	183.59	42,813.65	33,819.48
89	12/1/2016	42,813.65	1,431.88	-	1,431.88	1,253.49	178.39	41,560.15	33,997.87
90	1/1/2017	41,560.15	1,431.88	-	1,431.88	1,258.72	173.17	40,301.44	34,171.04
91	2/1/2017	40,301.44	1,431.88	-	1,431.88	1,263.96	167.92	39,037.48	34,338.96
92	3/1/2017	39,037.48	1,431.88	-	1,431.88	1,269.23	162.66	37,768.25	34,501.62
93	4/1/2017	37,768.25	1,431.88	-	1,431.88	1,274.52	157.37	36,493.73	34,658.98
94	5/1/2017	36,493.73	1,431.88	-	1,431.88	1,279.83	152.06	35,213.90	34,811.04
95	6/1/2017	35,213.90	1,431.88	-	1,431.88	1,285.16	146.72	33,928.74	34,957.77
96	7/1/2017	33,928.74	1,431.88	-	1,431.88	1,290.51	141.37	32,638.23	35,099.14
97	8/1/2017	32,638.23	1,431.88	-	1,431.88	1,295.89	135.99	31,342.34	35,235.13
98	9/1/2017	31,342.34	1,431.88	-	1,431.88	1,301.29	130.59	30,041.05	35,365.72
99	10/1/2017	30,041.05	1,431.88	-	1,431.88	1,306.71	125.17	28,734.33	35,490.89
100	11/1/2017	28,734.33	1,431.88	-	1,431.88	1,312.16	119.73	27,422.17	35,610.62
101	12/1/2017	27,422.17	1,431.88	-	1,431.88	1,317.63	114.26	26,104.55	35,724.88
102	1/1/2018	26,104.55	1,431.88	-	1,431.88	1,323.12	108.77	24,781.43	35,833.65
103	2/1/2018	24,781.43	1,431.88	-	1,431.88	1,328.63	103.26	23,452.80	35,936.90
104	3/1/2018	23,452.80	1,431.88	-	1,431.88	1,334.16	97.72	22,118.64	36,034.62
105	4/1/2018	22,118.64	1,431.88	-	1,431.88	1,339.72	92.16	20,778.92	36,126.78
106	5/1/2018	20,778.92	1,431.88	-	1,431.88	1,345.31	86.58	19,433.61	36,213.36
107	6/1/2018	19,433.61	1,431.88	-	1,431.88	1,350.91	80.97	18,082.70	36,294.34
108	7/1/2018	18,082.70	1,431.88	-	1,431.88	1,356.54	75.34	16,726.16	36,369.68
109	8/1/2018	16,726.16	1,431.88	-	1,431.88	1,362.19	69.69	15,363.97	36,439.37
110	9/1/2018	15,363.97	1,431.88	-	1,431.88	1,367.87	64.02	13,996.10	36,503.39
111	10/1/2018	13,996.10	1,431.88	-	1,431.88	1,373.57	58.32	12,622.53	36,561.71
112	11/1/2018	12,622.53	1,431.88	-	1,431.88	1,379.29	52.59	11,243.24	36,614.30
113	12/1/2018	11,243.24	1,431.88	-	1,431.88	1,385.04	46.85	9,858.20	36,661.15
114	1/1/2019	9,858.20	1,431.88	-	1,431.88	1,390.81	41.08	8,467.40	36,702.22
115	2/1/2019	8,467.40	1,431.88	-	1,431.88	1,396.60	35.28	7,070.79	36,737.50
116	3/1/2019	7,070.79	1,431.88	-	1,431.88	1,402.42	29.46	5,668.37	36,766.97
117	4/1/2019	5,668.37	1,431.88	-	1,431.88	1,408.27	23.62	4,260.10	36,790.58
118	5/1/2019	4,260.10	1,431.88	-	1,431.88	1,414.13	17.75	2,845.97	36,808.34
119	6/1/2019	2,845.97	1,431.88	-	1,431.88	1,420.03	11.86	1,425.94	36,820.19
120	7/1/2019	1,425.94	1,431.88	-	1,425.94	1,420.00	5.94	0.00	36,826.13

APPENDIX VII

SECO PROGRAM CONTACTS
WATT WATCHERS OF TEXAS



THE COMPUTERS IN YOUR SCHOOL ARE WASTING ENERGY. YOU CAN HELP YOUR SCHOOL SAVE MONEY. IMPLEMENT COMPUTER MONITOR POWER MANAGEMENT.

WHAT Y'ALL NEED TO REMEMBER:

- Screen savers **DO NOT** save energy!
- A typical monitor uses 60-90 watts
- While in sleep mode a monitor uses 2-10 watts
- Your Energy Star features may not be enabled
- Use free Energy Star software to capture savings
- Utilize your network, put all monitors to sleep at once
- Turn off your monitor at night
- Save energy, save money, prevent pollution

SOME ACTUAL EXAMPLES FROM DISTRICTS THAT ALREADY SET THEIR MONITORS TO SLEEP:

	District A	District B	District C
# of computers	3,000	10,000	15,000
% of monitors enabled	55	0	50
% of monitors enabled after mandate	100	100	100
Cost of electricity	7.5¢	5.8¢	6.0¢
Hours monitors are used per week	9	9	9
Days monitors are used per week	5	5	5
% of monitors that are turned off at night and weekends	35	35	35
% of monitors turned off after mandate	65	65	65
Current energy use	953,620 kWh	5,522,790 kWh	5,087,745 kWh
Future energy use	349,479 kWh	1,164,930 kWh	1,747,395 kWh
Energy savings	604,141 kWh	4,357,860 kWh	3,340,350 kWh
Current energy costs	\$71,522	\$320,322	\$305,265
Future energy costs	\$26,211	\$67,566	\$104,844
Monetary savings	\$45,311	\$252,756	\$200,421
% of savings	63	79	65

*If all of the estimated 1.2 million computer monitors in Texas schools were enabled for monitor power management, Texas would save up to **\$20.5 MILLION EACH YEAR!***

ALL IN A DAY'S REST...

To download the free Energy Star EZ Save and EZ Wizard programs, click on the PC Power Management link on the Watt Watchers Website. The computer monitor power management campaign, Sleep is Good, is a national effort by EPA/DOE to promote energy savings in computer monitors. Watt Watchers is helping Texas schools take advantage of the program.

Watt Watchers of Texas
 Phone/Fax 1-888-US WATTS (1-888-879-2887)
 e-mail info@wattwatchers.org
 Visit our website <http://wattwatchers.org>

Sponsored by the Texas Comptroller of Public Accounts, State Energy Conservation Office, and the U.S. Department of Energy.



**I WANT Y'ALL
FOR WATT WATCHERS**

1-888 US WATTS
wattwatchers.org

SPONSORED BY THE TEXAS STATE ENERGY CONSERVATION OFFICE

-IT'S FREE!-IT'S SIMPLE!-IT WORKS!- START YOUR PROGRAM TODAY!

Watt Watchers of Texas is a FREE energy efficiency program for Texas schools sponsored by the Texas Comptroller of Public Accounts, State Energy Conservation Office, and the U.S. Department of Energy. The program is designed to help school districts save energy and money by getting students involved. It is simple and effective! Students patrol the halls of the schools reducing energy waste by turning off lights and leaving "tickets" for empty classrooms with the lights on. Turning out the lights in a classroom during two unoccupied hours per day (lunch & after school) can save \$50 over a school year.

GET STARTED

Call 1-888-USWATTS or

Sign up for a free kit. go on-line at <http://wattwatchers.org> to enroll. You will receive a free kit which includes a set of 4 Watt Watchers binders, 4 name badges and 4 name tags with 4 lanyards, 4 pencils, a complete instruction manual on CD-ROM, plus a supply of forms, sample tickets and thank you notes. Everything you need — open your kit and get started today! Not only will your school be provided with all of the materials listed above (approximately a \$25 value), Watt Watchers will provide free support for the program, including:

- * WATTS NEWS — Quarterly 20 page Newspaper
- * Toll Free Phone & Toll Free Fax support line
- * Website and e-mail support
- * E-Mail Update — Monthly news for Watt Watchers
- * Workshops — Watt Watchers sponsors regional workshops

- * Conferences — Watt Watchers attends educational conferences — see you there.
- * CD-ROM with all the materials — Over 450MB!
- * Five Year Lapel Pins for dedicated Watt Watchers sponsors
- * Watt Watchers Certificates for participation and Zero Hero Awards

BUT THAT'S NOT ALL, Y'ALL!

In addition to student energy patrols that find waste and raise awareness, Watt Watchers also has additional programs for your school:

- * Traveling Energy Exploration Stations — free loans of hands-on kits for classes
- * Knowledge is Power — an energy efficiency curriculum supplement
- * Sleep Is Good — a computer monitor power management program
- * Junior Solar Sprint — a model solar race car project
- * Energy Encounter — a one day workshop for high school students
- * District Energy Council — students assisting energy managers
- * The Weatherization Project — a residential community energy project
- * Benchmarking — compare your school district energy use nationally

Watt Watchers of Texas
Phone/Fax 1-888-US WATTS (1-888-879-2887)
e-mail info@wattwatchers.org
Visit our website <http://wattwatchers.org>

Sponsored by the Texas Comptroller of Public Accounts, State Energy Conservation Office, and the U.S. Department of Energy.

**ENROLL IN
WATT WATCHERS
NOW
IT'S EASY!**

**SIGN-UP
FOR YOUR**

**FREE
KIT**

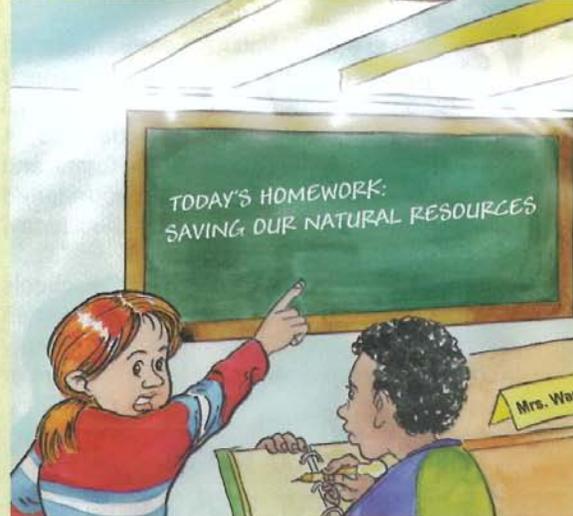
- 4-NAME BADGES
- 4-NOTEBOOKS
- 4-LANYARDS
- 4-PENCILS

**FORMS &
MANUAL**

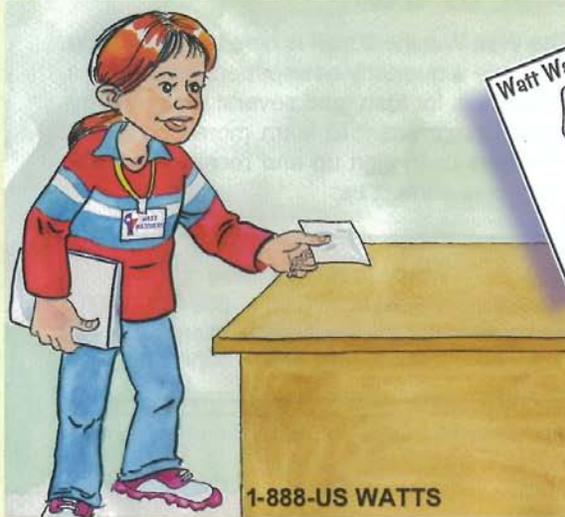
**1 YOUR STUDENTS
PATROL THE SCHOOL**



**2 FIND EMPTY CLASSROOMS
WITH THE LIGHTS ON**



**3 LEAVE TICKETS, SOMETIMES
THANK YOU NOTES...**



**...REMINDING EVERYONE
TO SAVE ENERGY AND MONEY**



wattwatchers.org

ENROLL IN WATT WATCHERS OF TEXAS



Getting a Watt Watchers program started in your school is so simple. All you need to do is order the FREE kit! Your kit comes complete with 4 name badges, 4 lanyards, 4 notebooks, 4 pencils, the forms, and a CD-ROM with a manual to get you started saving energy and money for your school today!

Your students will patrol the halls of the schools to see where energy is being wasted. When they locate a classroom or office that is empty and the lights are on they will leave a reminder ticket ...

"OH, NO -YOU FORGOT TO TURN YOUR LIGHTS OUT WHEN YOU LEFT THE ROOM!"

If they notice classrooms that consistently turn the lights out they leave them a thank-you note...

"THIS ROOM IS FIRST RATE -THANKS FOR SAVING ENERGY FOR OUR SCHOOL!"

IT IS THAT SIMPLE.

Your students and your entire school will learn a valuable lesson about energy efficiency and its benefits that will last a lifetime. Your students will change habits and attitudes about our environment while saving money and preventing pollution. You will change the world for the better.

Teachers, just place the Watt Watchers materials in a bin at your front door and assign your students a time to go on patrols throughout the day and the work is done. The program can be adapted to fit your teaching needs and demands. The Watt Watchers program is designed not to interrupt daily school activities. Thousands of programs across Texas are now patrolling quickly and quietly.

JOIN US TODAY!

The Watt Watchers staff is here to support you. We have a quarterly newspaper, lesson plans, energy kits for loan, and several more energy-related programs. To learn more about Watt Watchers or to sign up and receive your free kit, please contact us:

Watt Watchers of Texas
 Phone/Fax 1-888-US WATTS (1-888-879-2887)
 e-mail info@wattwatchers.org
 Visit our website <http://wattwatchers.org>

Sponsored by the Texas Comptroller of Public Accounts, State Energy Conservation Office, and the U.S. Department of Energy

APPENDIX VIII

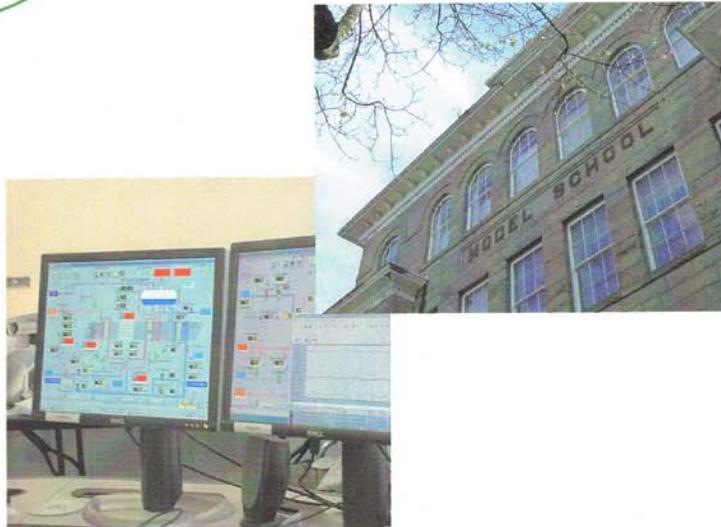
TEXAS ENERGY MANAGERS ASSOCIATION
(TEMA)

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.



APPENDIX IX

UTILITY CHARTS ON DISKETTE