SCHOOLS/LOCAL GOVERNMENT ENERGY MANAGEMENT PROGRAM

For

GREENWOOD INDEPENDENT SCHOOL DISTRICT
Greenwood, 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 5, 2009

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

ESA-Energy Systems Associates, Inc.
F-4882

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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: 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 *Doug Young*, Superintendent for Greenwood 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 **Greenwood ISD,** (hereafter known as GISD) 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 maintenance personnel, 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 **$73,025** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$594,625**, yielding an average simple payback of **8-1/4** years.

SUMMARY TABLE:

Recommended Project	Estimated Annual Energy Cost Avoidance	Estimated Installation Cost	Predicted Simple Payback Period (Years)
HVAC	*$74,625*	*$5,400*	*14 Years*
Lighting	*$65,000*	*$ 10,825*	*6 Years*
Controls	*$ 455,000*	*$ 56,800*	*8 Years*
Total:	$594,625	$73,025	8-1/4 Years

(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 **GISD**. 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 Greenwood ISD by providing an Energy Partnership Survey in 1998. At the time, most of Greenwood'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:

Greenwood ISD consists of an Elementary School, Junior High/High School and an Administration Building. The district serves 1,539 students and is located approximately 14 miles from Midland.

Elementary School

The lighting system at the Elementary School is approximately 95% T8 linear fluorescent fixtures. The gymnasium is one of the few locations on the campus with T12 fixtures; twenty-eight 96" 2-lamp T12 fluorescent fixtures over the bleachers matched with twenty-four 400-watt metal halide fixtures over the court area. *We recommend the district renovate the gymnasium fixtures to 4-lamp T5HO fluorescent fixtures over the bleachers and 6-lamp T5HO fluorescent fixtures over the court.* These linear fluorescent fixtures do not have the re-strike issues inherent to metal halide fixtures and will allow the district to turn off the gymnasium fixtures during unoccupied periods. Some existing exit fixtures are incandescent lamp fixtures; *we recommend retrofitting these fixtures with LED lamps.*

It was noted that the weather stripping was poor at the bottoms of the doors. *We recommend replacing all weatherstripping that that is missing or in poor condition.* It was also noted that the insulation on the hot water piping at the water heater (see picture to the right) is missing. The majority of energy losses in a hot water system occur within the piping system itself and therefore the insulation should be installed on the hot water piping.

Junior High / High School

The Junior High and High School campus is a brick clad structure with a flat built up roof. Originally constructed in 1984, the Junior High portion of the campus was built in 1996. The Intermediate section of the school was added in 1992 when the district covered the old natatorium and built classrooms over it. The last major addition occurred in 2004.

The district has retrofitted approximately 40% of the campus fluorescent fixtures from T12 to T8. The majority of this work has occurred in the corridors, maintenance office and all new restrooms. The kitchen consists of (43) 4-lamp T12 fluorescent fixtures. The old gymnasium currently is using (9) 96" 2-lamp T12 fluorescent fixtures. *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.

In addition to retrofitting the lamps in the kitchen, the current light levels at the Kitchen will allow the district to remove five to eight fixtures and still maintain levels recommended by the Illumination Engineering Society of North America (IESNA).

In the gymnasium, there is a mixture of 300-watt incandescent and sixteen mercury vapor fixtures. *We recommend replacing all of these fixtures with 6-lamp high output T5 fluorescent fixtures.* The fixtures do not have the inherent re-strike issues that the mercury vapor fixtures have and therefore the fixtures may be turned off during unoccupied periods without requiring a warm-up cycle when classes return to the gym.

It was noted during the survey that there are several incandescent exit signs in operation around the campus. *We recommend retrofitting the fixtures with LED lamps or replacing the fixture with new LED or LEC exit signs.*

The cafeteria has abundant natural daylight along with 72 4-lamp fixtures that supply the cafeteria with 76 foot candles on the table tops. IESNA recommends a cafeteria that is not used for classroom/testing activities have an average of 30 footcandles on the table tops. Therefore, if the space is not used for testing or classroom activities, *we recommend removing fixtures in order to supply only the required amount of illumination.*

The HVAC system is composed of a combination of rooftop units and split systems. Seventeen of the units serve the classroom spaces above what used to be the natatorium area. Each of these units is eighteen years old. *Given that the units are nearing the end of their 15-20 year life expectancy, we recommend the district begin to replace the units through a process called planned obsolescence.* This plan, through which the district budgets to replace as many units per year as is comfortable for the Board until all of the units have been replaced. This prevents the district from having to replace all of the units at the same time.

There are seven 3-ton heat pump split systems serving the intermediate area that could be easily replaced with new gas-fired heating rooftop units as existing gas lines are run approximately 125 feet from the existing condensing units. Gas heating is less expensive than electric heating and such an easy retrofit would make a significant impact on the utility bills for this area.

Although not an energy reduction recommendation, as a matter of occupant comfort, we recommend exhaust fans be installed in the new field house. No exhaust fans were installed during original construction and the humidity and odors in this space have become troublesome to students and staff.

The HVAC system around the district is currently controlled with a combination of conventional and programmable thermostats. We recommend installing a DDC control system to maintain tighter control over HVAC unit operation after occupied hours.

The campus has natural gas fired, instantaneous water heaters throughout campus. The staff reports they are happy with the operation of this system. Much of the dishwashing hot water requirements in the schools have been eliminated as a result of the district adopting a disposable plate and utensil system for the students.

Administration Building

The 1984 Administration Building has a brick exterior, a flat roof, acoustic ceiling, and carpeted floors.

The lighting system is a combination of T12 fluorescent lamps and incandescent lamps. *We recommend the district renovate the T12 fluorescent fixtures to T8 lamps and electronic ballasts and replace the incandescent lamps with compact fluorescent lamps.* CFL lamps consume 25% of the power requirements of the incandescent units and last approximately eight times longer. We further recommend that the offices which have three each 2-lamp T12 fluorescent fixtures be renovated to use just two each 3-lamp T8 fluorescent lamps.

The HVAC System consists of two rooftop units (pictured to the right) that have reached the end of their useful life expectancy and need to be replaced. The 5-ton and 7-1/2 ton units are natural gas fired and may simply be replaced with new gas heat units.

It was noted during the survey that the weatherstripping at the Administration Building was in poor condition. We recommend replacing the weather stripping in order to prevent dust infiltration and heating and cooling losses in the building.

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:

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 BTU's are then divided by the building area.

EUI = [Electricity BTU's + Gas BTU's] 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 ENERGY PERFORMANCE INDICATORS FOR :

GREENWOOD ISD

CAMPUS	ENERGY UTILIZATION INDEX (EUI) (Btu/sf-year)	ENERGY COST INDEX (ECI) ($/sf-year)
2008 Greenwood K-12 Campus	**48,456**	**$1.03**
Region 18 2006 Average K-12:	37,964	$0.68
1998 Greenwood K-12 Campus	50,183	$0.77

Comparison: Greenwood ISD, 2008 to 1998: The district has obviously made significant progress in reducing the consumption of energy on each campus from 1999 to 2008. The district decreased the overall EUI by 3-1/2%. ECIs are higher over the same time period, but this is expected given the significant energy price increases experienced since 1998.

Comparison: Greenwood ISD to Regional Averages: The EUI and ECI for the Greenwood facilities are above regional averages.

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. Study of Base Year Utility Consumption Histories (Appendix III) suggests that the operating schedule is not being adjusted for reduced occupancy in June and July; the reduction in costs and consumption of electricity during summer months is not as significant as would be expected in facilities that are not occupied by students during those months.

5.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER: REP: Direct Energy / T&D: Oncor

Rate Schedule: Oncor – Secondary Service Greater than 10kW
Average cost per kWh determined from utility billings.

Total Cost of Electricity purchased during Billing Period:	$270,208
Total Quantity of Natural Gas purchased during Billing Period:	2,460,083 kWh

Cost / Quantity = Average Unit Cost
$ 270,208 / 2,460,083 kWh = **$0.10984 per kWh of electricity**

NATURAL GAS PROVIDER: Atmos

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

Total Cost of Natural Gas purchased during Billing Period:	$41,220
Total Quantity of Natural Gas purchased during Billing Period:	6,122 MCF

Cost / Quantity = Average Unit Cost
$ 41,220 / 6,122 mcf = **$6.73 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. 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.
3. Install insulation on exposed hot water lines at water heater(s).
   Most energy losses occur at hot water piping.
4. Retrofit existing incandescent exit fixtures with LED lamps.
   Significantly reduce operating and maintenance expenses for constant operation devices.

B. CAPITAL EXPENSE PROJECTS

I. HVAC

1. Replace existing RTUs at the Administration Building.
2. Replace seven heat pump split systems at HS with new gas heat RTUs.

Estimated Installed Cost	=	$ 75,625
Estimated Energy Cost Savings	=	$ 5,400
Simple Payback Period	=	14 Years

II. Lighting

1. Elementary School Gymnasium:
   a. Replace F96T12 fixtures over bleachers with 4-lamp T5HO high bay fixtures.
   b. Replace existing 400-watt MH fixtures with 6-lamp T5HO high bay fixtures

2. Complete renovation of T12 fixtures to T8 lamps and electronic ballasts at JH/HS.

3. High School Gymnasium renovation of existing incandescent and mercury vapor to T5HO high bay fluorescent fixtures.

Estimated Installed Cost	=	$ 65,000
Estimated Energy Cost Savings	=	$ 10,825
Simple Payback Period	=	6 Years

II. Energy Management System

1. Install a DDC Energy Management System to eliminate operation of HVAC System after occupied hours.:

Estimated Installed Cost	=	$ 455,000
Estimated Energy Cost Savings	=	$ 56,800
Simple Payback Period	=	8 Years

SUMMARY:	***IMPLEMENTATION COST***	***ESTIMATED SAVINGS***	***SIMPLE PAYBACK***
HVAC	*$ 74,625*	*$ 5,400*	*14Years*
Lighting	*$ 65,000*	*$ 10,825*	*6 Years*
Controls	*$ 455,000*	*$ 56,800*	*8 Years*
TOTAL PROJECTS	*$ 594,625*	*$ 73,025*	*8-1/4 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	=	$ 594,625	
10 year commercial loan principal	=	$ 594,625	
10 year commercial loan interest (5%) paid	=	$ 162,205	
10 year commercial loan TOTAL	=	$ 756,830	
Commercial Loan Annual Payment	=	$ 6,307/month	= $ 75,684/yr
Total Annual Payment Minus Annual Energy Cost Savings = $75,684 – 73,025			= $ 2,659
Annual Cost to ISD (without considering Maintenance Cost Reduction)			**= $ 2,659**

More information regarding financial programs available to GISD 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.

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*

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.

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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

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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.

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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.

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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

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APPENDIX II

ELECTRIC UTILITY RATE SCHEDULE

Tariff for Retail Delivery Service
Oncor Electric Delivery Company

6.1.1 Delivery System Charges Sheet: 3
Applicable: Entire Certified Service Area Page 1 of 2
Effective Date: January 1, 2004 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

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Tariff for Retail Delivery Service
Oncor Electric Delivery Company

6.1.1 Delivery System Charges Sheet: 3
Applicable: Entire Certified Service Area Page 2 of 2
Effective Date: January 1, 2004 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: Greenwood ISD **BUILDING:** K-12

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	2009	213,453				23,710	1,384	$ 8,899.12
FEBRUARY	2008	206,474				22,806	1,044	$ 6,712.92
MARCH	2008	167,442				19,246	777	$ 4,459.98
APRIL	2008	182,112				20,487	229	$ 1,206.83
MAY	2008	232,215				24,789	125	$ 612.50
JUNE	2008	150,499				25,598	50	$ 641.00
JULY	2008	196,293				17,667	79	$ 971.70
AUGUST	2008	252,222				21,741	100	$ 821.00
SEPTEMBER	2008	252,222				27,279	92	$ 751.64
OCTOBER	2008	210,511				23,376	158	$ 932.20
NOVEMBER	2008	184,523				20,618	623	$ 4,180.33
DECEMBER	2008	212,117				22,891	1,461	$ 11,030.55
TOTAL		2,460,083	0	0	0	$270,208	6,122	$41,220

Annual Total Energy Cost =	$311,428	Per Year	**Energy Use Index:** Total Site BTU's/yr / Total Area (sq.ft.)	48,456	BTU/s.f.yr
Total KWH x 0.003413 =	8,396.26	x 106			
Total MCF x 1.03 =	6,305.66	x 106	**Energy Cost Index:**		
Total Other x ____		x 106	Total Energy Cost/yr / Total Area (sq.ft.)	$1.03	$/s.f. yr
Total Site BTU's/yr	14,701.92	x 106			
Floor area:	303,406	s.f.			

Electric Utility	Account #	Meter#	Gas Utility	Account #
Direct Energy / Oncor	Multiple		Atmos	Multiple

Note: Natural Gas consumption was available at the time of the survey, but the cost for the natural gas was not included in the summary billing. The cost for the gas has been approximated using the natural gas rate schedule and the correct consumption indicated in the summary billing data.

Additionally, the facilities were grouped together as a K-12 facility because the summary billing data did not distinguish electrical costs associated individually between the Elementary School and the High School Accounts. The K-12 aggregate also allows for direct comparison to the Energy Performance Indicators that were prepared for GISD by SECO in 1998.

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

JUN-23-2009 16:00 ESA P.001/001
04/17/2009 12:11 4326857804 GREENWOOD ISD PAGE 02/02

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 GREENWOOD 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: Doug Young Date: 4-17-09
Name (Mr./Ms./Dr.) Doug Young Title: Superintendent
Organization: Greenwood ISD Phone: 432-685-7800
Street Address: 2700 FM 307 Fax: 432-685-7804
Mailing Address: 2700 FM 307 EMail: rdougyoung@esc18.net
Midland TX 79706 County Midland

CONTACT INFORMATION:

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

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

Total P.001

APPENDIX VI

AMORTIZATION SCHEDULE

Loan Amortization Schedule

	Enter values
Loan amount	$ 594,625.00
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	$ 6,306.92
Scheduled number of payments	120
Actual number of payments	120
Total early payments	$ -
Total interest	$ 162,205.48

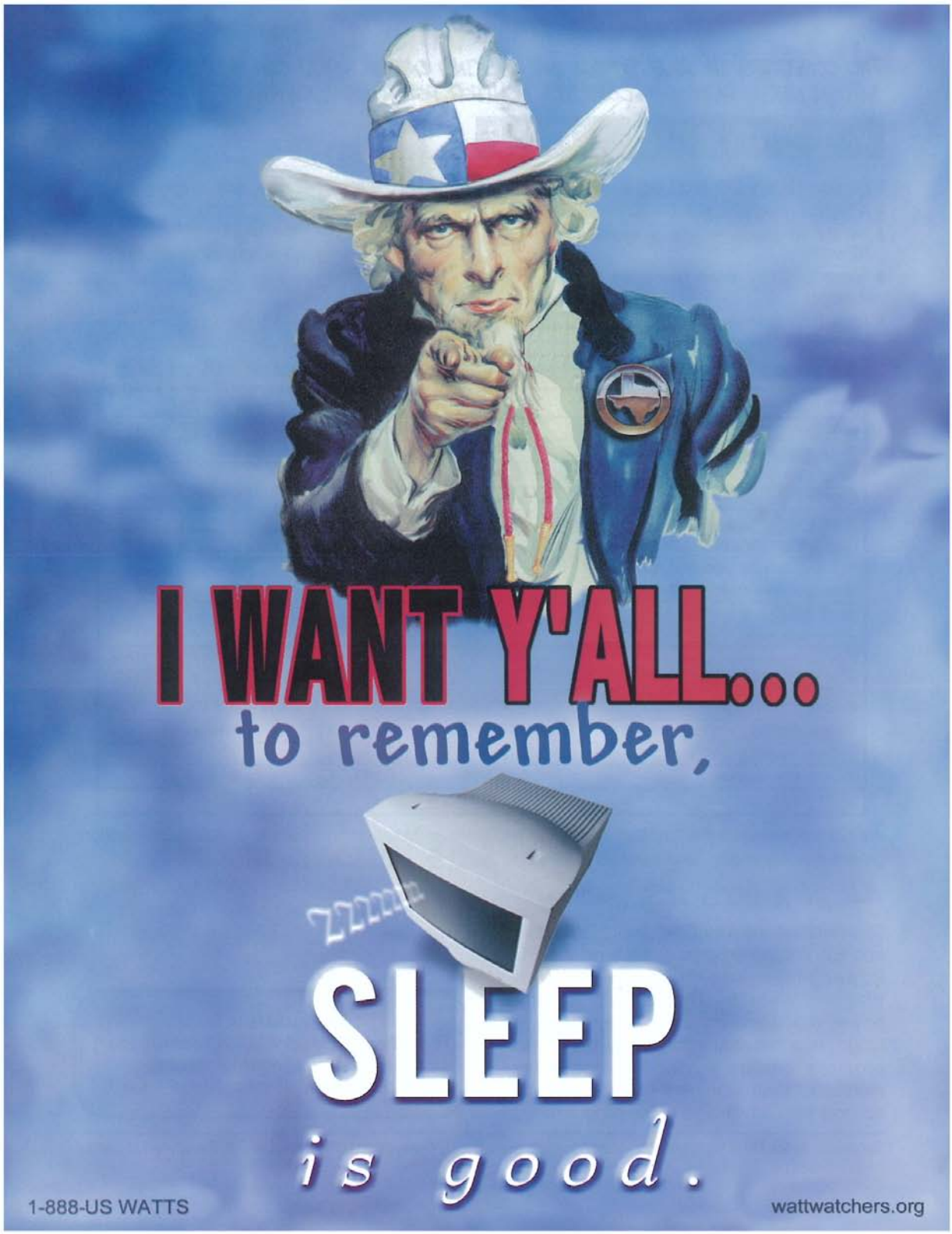
Lender name:

Pmt No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance	Cumulative Interest
1	8/1/2009	$ 594,625.00	$ 6,306.92	$ -	$ 6,306.92	$ 3,829.32	$ 2,477.60	$ 590,795.68	$ 2,477.60
2	9/1/2009	590,795.68	6,306.92	-	6,306.92	3,845.27	2,461.65	586,950.41	4,939.25
3	10/1/2009	586,950.41	6,306.92	-	6,306.92	3,861.29	2,445.63	583,089.12	7,384.88
4	11/1/2009	583,089.12	6,306.92	-	6,306.92	3,877.38	2,429.54	579,211.73	9,814.42
5	12/1/2009	579,211.73	6,306.92	-	6,306.92	3,893.54	2,413.38	575,318.20	12,227.80
6	1/1/2010	575,318.20	6,306.92	-	6,306.92	3,909.76	2,397.16	571,408.43	14,624.96
7	2/1/2010	571,408.43	6,306.92	-	6,306.92	3,926.05	2,380.87	567,482.38	17,005.83
8	3/1/2010	567,482.38	6,306.92	-	6,306.92	3,942.41	2,364.51	563,539.97	19,370.34
9	4/1/2010	563,539.97	6,306.92	-	6,306.92	3,958.84	2,348.08	559,581.13	21,718.42
10	5/1/2010	559,581.13	6,306.92	-	6,306.92	3,975.33	2,331.59	555,605.80	24,050.01
11	6/1/2010	555,605.80	6,306.92	-	6,306.92	3,991.90	2,315.02	551,613.91	26,365.03
12	7/1/2010	551,613.91	6,306.92	-	6,306.92	4,008.53	2,298.39	547,605.38	28,663.42
13	8/1/2010	547,605.38	6,306.92	-	6,306.92	4,025.23	2,281.69	543,580.14	30,945.11
14	9/1/2010	543,580.14	6,306.92	-	6,306.92	4,042.00	2,264.92	539,538.14	33,210.03
15	10/1/2010	539,538.14	6,306.92	-	6,306.92	4,058.85	2,248.08	535,479.30	35,458.11
16	11/1/2010	535,479.30	6,306.92	-	6,306.92	4,075.76	2,231.16	531,403.54	37,689.27
17	12/1/2010	531,403.54	6,306.92	-	6,306.92	4,092.74	2,214.18	527,310.80	39,903.45
18	1/1/2011	527,310.80	6,306.92	-	6,306.92	4,109.79	2,197.13	523,201.01	42,100.58
19	2/1/2011	523,201.01	6,306.92	-	6,306.92	4,126.92	2,180.00	519,074.09	44,280.58
20	3/1/2011	519,074.09	6,306.92	-	6,306.92	4,144.11	2,162.81	514,929.98	46,443.39
21	4/1/2011	514,929.98	6,306.92	-	6,306.92	4,161.38	2,145.54	510,768.60	48,588.93
22	5/1/2011	510,768.60	6,306.92	-	6,306.92	4,178.72	2,128.20	506,589.88	50,717.14
23	6/1/2011	506,589.88	6,306.92	-	6,306.92	4,196.13	2,110.79	502,393.75	52,827.93
24	7/1/2011	502,393.75	6,306.92	-	6,306.92	4,213.61	2,093.31	498,180.14	54,921.23
25	8/1/2011	498,180.14	6,306.92	-	6,306.92	4,231.17	2,075.75	493,948.97	56,996.99
26	9/1/2011	493,948.97	6,306.92	-	6,306.92	4,248.80	2,058.12	489,700.17	59,055.11
27	10/1/2011	489,700.17	6,306.92	-	6,306.92	4,266.50	2,040.42	485,433.66	61,095.52
28	11/1/2011	485,433.66	6,306.92	-	6,306.92	4,284.28	2,022.64	481,149.38	63,118.16
29	12/1/2011	481,149.38	6,306.92	-	6,306.92	4,302.13	2,004.79	476,847.25	65,122.95
30	1/1/2012	476,847.25	6,306.92	-	6,306.92	4,320.06	1,986.86	472,527.20	67,109.82
31	2/1/2012	472,527.20	6,306.92	-	6,306.92	4,338.06	1,968.86	468,189.14	69,078.68
32	3/1/2012	468,189.14	6,306.92	-	6,306.92	4,356.13	1,950.79	463,833.01	71,029.47
33	4/1/2012	463,833.01	6,306.92	-	6,306.92	4,374.28	1,932.64	459,458.72	72,962.11
34	5/1/2012	459,458.72	6,306.92	-	6,306.92	4,392.51	1,914.41	455,066.21	74,876.52
35	6/1/2012	455,066.21	6,306.92	-	6,306.92	4,410.81	1,896.11	450,655.40	76,772.63
36	7/1/2012	450,655.40	6,306.92	-	6,306.92	4,429.19	1,877.73	446,226.21	78,650.36
37	8/1/2012	446,226.21	6,306.92	-	6,306.92	4,447.64	1,859.28	441,778.57	80,509.63
38	9/1/2012	441,778.57	6,306.92	-	6,306.92	4,466.18	1,840.74	437,312.39	82,350.38
39	10/1/2012	437,312.39	6,306.92	-	6,306.92	4,484.79	1,822.13	432,827.60	84,172.51
40	11/1/2012	432,827.60	6,306.92	-	6,306.92	4,503.47	1,803.45	428,324.13	85,975.96
41	12/1/2012	428,324.13	6,306.92	-	6,306.92	4,522.24	1,784.68	423,801.90	87,760.64
42	1/1/2013	423,801.90	6,306.92	-	6,306.92	4,541.08	1,765.84	419,260.82	89,526.49
43	2/1/2013	419,260.82	6,306.92	-	6,306.92	4,560.00	1,746.92	414,700.82	91,273.41
44	3/1/2013	414,700.82	6,306.92	-	6,306.92	4,579.00	1,727.92	410,121.81	93,001.33
45	4/1/2013	410,121.81	6,306.92	-	6,306.92	4,598.08	1,708.84	405,523.73	94,710.17
46	5/1/2013	405,523.73	6,306.92	-	6,306.92	4,617.24	1,689.68	400,906.50	96,399.85
47	6/1/2013	400,906.50	6,306.92	-	6,306.92	4,636.48	1,670.44	396,270.02	98,070.29
48	7/1/2013	396,270.02	6,306.92	-	6,306.92	4,655.80	1,651.13	391,614.22	99,721.42
49	8/1/2013	391,614.22	6,306.92	-	6,306.92	4,675.19	1,631.73	386,939.03	101,353.14
50	9/1/2013	386,939.03	6,306.92	-	6,306.92	4,694.67	1,612.25	382,244.35	102,965.39
51	10/1/2013	382,244.35	6,306.92	-	6,306.92	4,714.24	1,592.68	377,530.12	104,558.07
52	11/1/2013	377,530.12	6,306.92	-	6,306.92	4,733.88	1,573.04	372,796.24	106,131.12
53	12/1/2013	372,796.24	6,306.92	-	6,306.92	4,753.60	1,553.32	368,042.64	107,684.43
54	1/1/2014	368,042.64	6,306.92	-	6,306.92	4,773.41	1,533.51	363,269.23	109,217.94
55	2/1/2014	363,269.23	6,306.92	-	6,306.92	4,793.30	1,513.62	358,475.93	110,731.57
56	3/1/2014	358,475.93	6,306.92	-	6,306.92	4,813.27	1,493.65	353,662.66	112,225.22
57	4/1/2014	353,662.66	6,306.92	-	6,306.92	4,833.33	1,473.59	348,829.33	113,698.81
58	5/1/2014	348,829.33	6,306.92	-	6,306.92	4,853.47	1,453.46	343,975.87	115,152.27
59	6/1/2014	343,975.87	6,306.92	-	6,306.92	4,873.69	1,433.23	339,102.18	116,585.50
60	7/1/2014	339,102.18	6,306.92	-	6,306.92	4,893.99	1,412.93	334,208.18	117,998.42
61	8/1/2014	334,208.18	6,306.92	-	6,306.92	4,914.39	1,392.53	329,293.80	119,390.96
62	9/1/2014	329,293.80	6,306.92	-	6,306.92	4,934.86	1,372.06	324,358.93	120,763.02
63	10/1/2014	324,358.93	6,306.92	-	6,306.92	4,955.43	1,351.50	319,403.51	122,114.51
64	11/1/2014	319,403.51	6,306.92	-	6,306.92	4,976.07	1,330.85	314,427.43	123,445.36
65	12/1/2014	314,427.43	6,306.92	-	6,306.92	4,996.81	1,310.11	309,430.63	124,755.47

Pmt No.	Payment Date	Beginning Balance	Scheduled Payment	Extra Payment	Total Payment	Principal	Interest	Ending Balance	Cumulative Interest
66	1/1/2015	309,430.63	6,306.92	-	6,306.92	5,017.63	1,289.29	304,413.00	126,044.77
67	2/1/2015	304,413.00	6,306.92	-	6,306.92	5,038.53	1,268.39	299,374.47	127,313.16
68	3/1/2015	299,374.47	6,306.92	-	6,306.92	5,059.53	1,247.39	294,314.94	128,560.55
69	4/1/2015	294,314.94	6,306.92	-	6,306.92	5,080.61	1,226.31	289,234.33	129,786.86
70	5/1/2015	289,234.33	6,306.92	-	6,306.92	5,101.78	1,205.14	284,132.56	130,992.00
71	6/1/2015	284,132.56	6,306.92	-	6,306.92	5,123.04	1,183.89	279,009.52	132,175.89
72	7/1/2015	279,009.52	6,306.92	-	6,306.92	5,144.38	1,162.54	273,865.14	133,338.43
73	8/1/2015	273,865.14	6,306.92	-	6,306.92	5,165.82	1,141.10	268,699.32	134,479.53
74	9/1/2015	268,699.32	6,306.92	-	6,306.92	5,187.34	1,119.58	263,511.98	135,599.12
75	10/1/2015	263,511.98	6,306.92	-	6,306.92	5,208.95	1,097.97	258,303.03	136,697.08
76	11/1/2015	258,303.03	6,306.92	-	6,306.92	5,230.66	1,076.26	253,072.37	137,773.34
77	12/1/2015	253,072.37	6,306.92	-	6,306.92	5,252.45	1,054.47	247,819.92	138,827.81
78	1/1/2016	247,819.92	6,306.92	-	6,306.92	5,274.34	1,032.58	242,545.58	139,860.40
79	2/1/2016	242,545.58	6,306.92	-	6,306.92	5,296.31	1,010.61	237,249.27	140,871.00
80	3/1/2016	237,249.27	6,306.92	-	6,306.92	5,318.38	988.54	231,930.88	141,859.54
81	4/1/2016	231,930.88	6,306.92	-	6,306.92	5,340.54	966.38	226,590.34	142,825.92
82	5/1/2016	226,590.34	6,306.92	-	6,306.92	5,362.79	944.13	221,227.55	143,770.05
83	6/1/2016	221,227.55	6,306.92	-	6,306.92	5,385.14	921.78	215,842.41	144,691.83
84	7/1/2016	215,842.41	6,306.92	-	6,306.92	5,407.58	899.34	210,434.83	145,591.17
85	8/1/2016	210,434.83	6,306.92	-	6,306.92	5,430.11	876.81	205,004.72	146,467.98
86	9/1/2016	205,004.72	6,306.92	-	6,306.92	5,452.73	854.19	199,551.99	147,322.17
87	10/1/2016	199,551.99	6,306.92	-	6,306.92	5,475.45	831.47	194,076.53	148,153.64
88	11/1/2016	194,076.53	6,306.92	-	6,306.92	5,498.27	808.65	188,578.27	148,962.29
89	12/1/2016	188,578.27	6,306.92	-	6,306.92	5,521.18	785.74	183,057.09	149,748.03
90	1/1/2017	183,057.09	6,306.92	-	6,306.92	5,544.18	762.74	177,512.91	150,510.77
91	2/1/2017	177,512.91	6,306.92	-	6,306.92	5,567.28	739.64	171,945.62	151,250.41
92	3/1/2017	171,945.62	6,306.92	-	6,306.92	5,590.48	716.44	166,355.14	151,966.85
93	4/1/2017	166,355.14	6,306.92	-	6,306.92	5,613.77	693.15	160,741.37	152,659.99
94	5/1/2017	160,741.37	6,306.92	-	6,306.92	5,637.17	669.76	155,104.20	153,329.75
95	6/1/2017	155,104.20	6,306.92	-	6,306.92	5,660.65	646.27	149,443.55	153,976.02
96	7/1/2017	149,443.55	6,306.92	-	6,306.92	5,684.24	622.68	143,759.31	154,598.70
97	8/1/2017	143,759.31	6,306.92	-	6,306.92	5,707.92	599.00	138,051.39	155,197.69
98	9/1/2017	138,051.39	6,306.92	-	6,306.92	5,731.71	575.21	132,319.68	155,772.91
99	10/1/2017	132,319.68	6,306.92	-	6,306.92	5,755.59	551.33	126,564.09	156,324.24
100	11/1/2017	126,564.09	6,306.92	-	6,306.92	5,779.57	527.35	120,784.52	156,851.59
101	12/1/2017	120,784.52	6,306.92	-	6,306.92	5,803.65	503.27	114,980.87	157,354.86
102	1/1/2018	114,980.87	6,306.92	-	6,306.92	5,827.83	479.09	109,153.03	157,833.95
103	2/1/2018	109,153.03	6,306.92	-	6,306.92	5,852.12	454.80	103,300.92	158,288.75
104	3/1/2018	103,300.92	6,306.92	-	6,306.92	5,876.50	430.42	97,424.42	158,719.17
105	4/1/2018	97,424.42	6,306.92	-	6,306.92	5,900.99	405.94	91,523.43	159,125.11
106	5/1/2018	91,523.43	6,306.92	-	6,306.92	5,925.57	381.35	85,597.86	159,506.45
107	6/1/2018	85,597.86	6,306.92	-	6,306.92	5,950.26	356.66	79,647.60	159,863.11
108	7/1/2018	79,647.60	6,306.92	-	6,306.92	5,975.06	331.86	73,672.54	160,194.98
109	8/1/2018	73,672.54	6,306.92	-	6,306.92	5,999.95	306.97	67,672.59	160,501.95
110	9/1/2018	67,672.59	6,306.92	-	6,306.92	6,024.95	281.97	61,647.64	160,783.91
111	10/1/2018	61,647.64	6,306.92	-	6,306.92	6,050.06	256.87	55,597.58	161,040.78
112	11/1/2018	55,597.58	6,306.92	-	6,306.92	6,075.26	231.66	49,522.32	161,272.44
113	12/1/2018	49,522.32	6,306.92	-	6,306.92	6,100.58	206.34	43,421.74	161,478.78
114	1/1/2019	43,421.74	6,306.92	-	6,306.92	6,126.00	180.92	37,295.74	161,659.70
115	2/1/2019	37,295.74	6,306.92	-	6,306.92	6,151.52	155.40	31,144.22	161,815.10
116	3/1/2019	31,144.22	6,306.92	-	6,306.92	6,177.15	129.77	24,967.07	161,944.87
117	4/1/2019	24,967.07	6,306.92	-	6,306.92	6,202.89	104.03	18,764.18	162,048.90
118	5/1/2019	18,764.18	6,306.92	-	6,306.92	6,228.74	78.18	12,535.44	162,127.08
119	6/1/2019	12,535.44	6,306.92	-	6,306.92	6,254.69	52.23	6,280.75	162,179.31
120	7/1/2019	6,280.75	6,306.92	-	6,280.75	6,254.58	26.17	0.00	162,205.48

APPENDIX VII

SECO PROGRAM CONTACTS
WATT WATCHERS OF TEXAS


I WANT Y'ALL...
to remember,
Zzzzz
SLEEP
is good.
1-888-US WATTS
wattwatchers.org

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. Call 1-888-USWATTS or 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 – 0ver 450MB!
- Five Year Lapel Pins for dedicated Watt Watchers sponsors
- Watt Watchers Certificates for participation and Zero Hero Awards

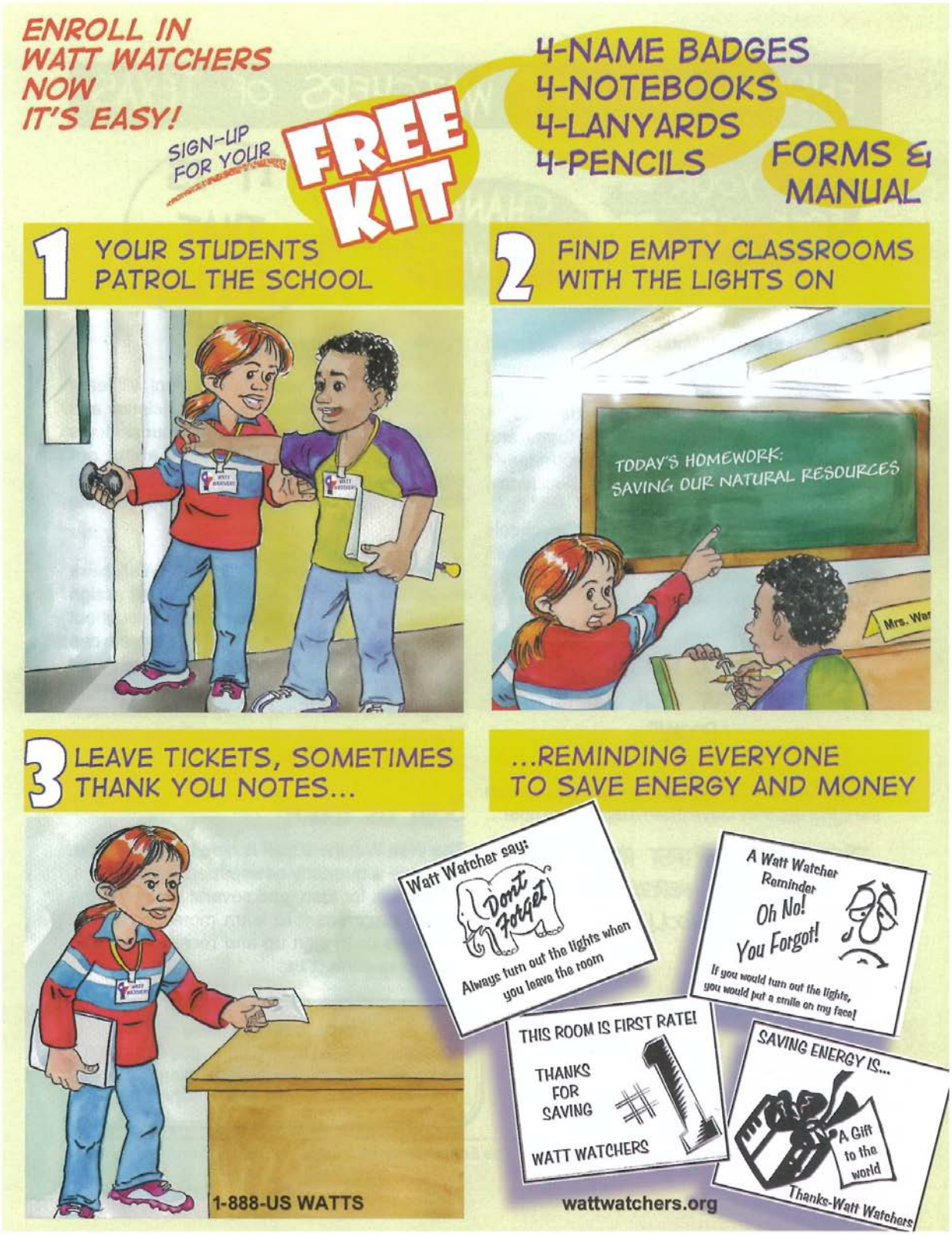
BUT THAT'S NOT ALL, Y'ALL!

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
TODAY'S HOMEWORK: SAVING OUR NATURAL RESOURCES
3 LEAVE TICKETS, SOMETIMES THANK YOU NOTES...
...REMINDING EVERYONE TO SAVE ENERGY AND MONEY
Watt Watcher say:
Don't Forget
Always turn out the lights when you leave the room
A Watt Watcher Reminder
Oh No! You Forgot!
If you would turn out the lights, you would put a smile on my face!
THIS ROOM IS FIRST RATE!
THANKS FOR SAVING
WATT WATCHERS
SAVING ENERGY IS...
A Gift to the world
Thanks-Watt Watchers
1-888-US WATTS
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.

SECO
State Energy Conservation Office

APPENDIX IX

UTILITY CHARTS ON DISKETTE