



Facility Preliminary Energy Assessments and Recommendations

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Wylie Independent School District

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Table of Contents

1.0 EXECUTIVE SUMMARY: 3
 Table 1: Summary of Recommended Energy Cost Reduction Measures (ECRMs) 4

2.0 ENERGY ASSESSMENT PROCEDURE: 5

3.0 ENERGY PERFORMANCE INDICATORS: 6

4.0 RATE SCHEDULE ANALYSIS: 9
 ELECTRICITY PROVIDER: 9
 NATURAL GAS PROVIDER: 9

5.0 CAMPUS DESCRIPTIONS: 10
 Table 2: School Facilities Analyzed For This Report 10

6.0 ENERGY RECOMMENDATIONS: 11
 Controls ECRM 1: RETRO-COMMISSIONING OF CONTROLS 11
 Lighting ECRM 1: RE-CIRCUIT EXTERIOR LIGHTING 11

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS 12

8.0 FINANCIAL EVALUATION 13

9.0 GENERAL COMMENTS 14

APPENDICES 15
 APPENDIX I - SUMMARY OF FUNDING AND PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE
 PROJECTS 16
 SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS 17
 SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS 18

APPENDIX II - ELECTRIC UTILITY RATE SCHEDULE 23

APPENDIX III 25

PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT 25

APPENDIX IV - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA) 27

APPENDIX V - UTILITY CHARTS ON CD 29

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**.



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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 July 2011, **SECO** received a request for technical assistance from Mr. Don Pool, Director of Facilities and Maintenance at **Wylie I.S.D.** **SECO** responded by sending **ESA Energy Systems Associates, Inc.**, a registered professional engineering firm, to prepare this preliminary report for the school district. This report is intended to provide support for the district as it determines the most appropriate path for facility renovation, especially as it pertains to the energy consuming systems around the facility. It is our opinion that significant decreases in annual energy costs, as well as major maintenance cost reductions, can be achieved through the efficiency recommendations provided herein.

This study has focused on energy efficiency and systems operations. To that end, an analysis of the utility usage and costs for **Wylie ISD**, (hereafter known as *WISD*) was completed by **ESA Energy Systems Associates, Inc.**, (hereafter known as *Engineer*) to determine the annual energy cost index (ECI) and energy use index (EUI) for each campus or facility. A complete listing of the Base Year Utility Costs and Consumption is provided in Section 3.0 of this report.

Following the utility analysis and a preliminary consultation with Mr. Pool, a walk-through energy analysis was conducted throughout the campus. Specific findings of this survey and the resulting recommendations for both operation and maintenance procedures and cost-effective energy retrofit installations are identified in Section 7.0 of this report.

We estimate that as much as **\$44,120** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **\$375,000**, yielding an average simple payback of **8-1/2 years**.

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

SUMMARY:	DESCRIPTION OF RECOMMENDATION	LOCATION OF ECRM	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
Controls ECRM #1	Controls Renovation and Optimization	DIS, CJH	\$372,000	\$43,300	8-3/4 years
Lighting ECRM #1	Re-circuit Exterior Lighting	DIS, CJH	\$3,000	\$820	3-3/4 years
TOTAL PROJECTS			\$ 375,000	\$44,120	8-1/2 years

Although additional savings from reduced maintenance expenses are anticipated, these savings projections are not included in the estimates provided above. As a result, the actual Internal Rate of Return (IRR), for this retrofit program has been calculated and shown in Section 8.0 of this report.

Our final “summary” comment is that **SECO** views the completion and presentation of this report as a beginning, rather than an end, of our relationship with WISD. 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.

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2.0 ENERGY ASSESSMENT PROCEDURE:

Involvement in this on-site analysis program was initiated through completion of a Preliminary Energy Assessment Service Agreement. This PEASA serves as the agreement to form a "partnership" between the client and the State Energy Conservation Office (SECO) for the purposes of energy costs and consumption reduction within owned and operated facilities. After receipt of the PEASA, an initial visit was conducted by the professional engineering firm contracted by SECO to provide service within that area of the state to review the program elements that SECO provides to school districts and determine which elements could best benefit the district. A summary of the *Partner's* most recent twelve months of utility bills was provided to the engineer for the preliminary assessment of the Energy Performance Indicators. After reviewing the utility bill data analysis and consultation with SECO to determine the program elements to be provided to WISD, ESA returned to the facilities to perform the following tasks:

1. Designing and monitoring customized procedures to control the run times of energy consuming systems.
2. Analyze systems for code and standard compliance in areas such as cooling system refrigerants used, outside air quantity, and lighting illumination levels.
3. Develop an accurate definition of system and equipment replacement projects along with installation cost estimates, estimated energy and cost savings and analyses for each recommended project.
4. Develop a prioritized schedule for replacement projects.
5. Developing and drafting an overall Energy Management Policy.
6. Assist in the development of guidelines for efficiency levels of future equipment purchases.

3.0 ENERGY PERFORMANCE INDICATORS:

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

1. Energy Utilization Index

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

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

ELECTRICITY Usage

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

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 BTUs are then divided by the building area.

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

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 WISD ENERGY PERFORMANCE INDICATORS:

<u>CAMPUS</u>	ENERGY UTILIZATION INDEX (EUI) <u>BTUs/sf-year</u>	COMPARISON TO DISTRICT AVERAGE	ENERGY COST INDEX (ECI) <u>\$/sf-year</u>	COMPARISON TO DISTRICT AVERAGE
Cooper JH	44,528	-7%	\$1.18	-5%
Draper Intermediate	51,159	7%	\$1.30	5%
Average Value:	47,844		\$1.24	

Wylie ISD purchases electricity from Farmer’s Electric Coop. Farmer’s Coop is also the Transmission and Distribution Provider.

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

A copy of the rate schedule is included in Appendix I

OWNER: Wylie ISD

BUILDING: Cooper JH

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 \$
JUNE	2011	105,000		626	\$3,507	\$12,399	0	\$15
JULY	2011	63,000		577	\$3,230	\$8,662	0	\$16
AUGUST	2011	93,000		647	\$3,620	\$11,532	27	\$236
SEPTEMBER	2011	141,750		682	\$3,818	\$15,740	39	\$300
OCTOBER	2011	123,000		278	\$1,554	\$11,116	53	\$387
NOVEMBER	2011	90,750		488	\$2,734	\$10,426	89	\$582
DECEMBER	2011	82,500		461	\$2,579	\$8,728	163	\$978
JANUARY	2012	64,500		371	\$2,079	\$6,415	153	\$870
FEBRUARY	2012	84,000		347	\$1,940	\$7,509	147	\$728
MARCH	2012	76,500		361	\$2,020	\$7,113	47	\$261
APRIL	2012	81,000		425	\$2,377	\$7,772	14	\$80
MAY	2012	111,750		599	\$3,356	\$11,053	65	\$310
TOTAL		1,116,750	5,860	5,860	\$32,815	\$118,466	797	\$4,763

Annual Total Energy Cost = \$123,229 Per Year

Total KWH x 0.003413 = 3,811.47 x 106
 Total MCF x 1.03 = 820.91 x 106
 Total Other x _____ x 106
 Total Site BTU's/yr 4,632.38 x 106

Floor area: 104,045 s.f.

Electric Utility Account # Farmers Electric Cooperative 3351540100

Gas Utility Meter # Atmos Energy 548029

Energy Use Index:
 Total Site BTU's/yr 44,523 BTU/s.f.yr
 Total Area (sq.ft.)

Energy Cost Index:
 Total Energy Cost/yr \$1.18 \$/s.f. yr
 Total Area (sq.ft.)

OWNER: Wylie ISD

BUILDING: Draper Intermediate

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 \$
JUNE	2011	92,000		418	\$2,339	\$10,117	0	\$15
JULY	2011	69,200		347	\$1,942	\$7,832	0	\$15
AUGUST	2011	84,400		410	\$2,294	\$9,446	31	\$269
SEPTEMBER	2011	116,000		550	\$3,082	\$12,861	43	\$331
OCTOBER	2011	103,200		278	\$1,555	\$9,855	46	\$342
NOVEMBER	2011	75,600		381	\$2,135	\$8,558	81	\$535
DECEMBER	2011	72,000		386	\$2,162	\$7,542	179	\$1,069
JANUARY	2012	62,000		264	\$1,481	\$5,633	131	\$747
FEBRUARY	2012	73,200		305	\$1,707	\$6,577	126	\$624
MARCH	2012	69,200		333	\$1,866	\$6,487	57	\$313
APRIL	2012	77,200		389	\$2,180	\$7,324	11	\$66
MAY	2012	96,000		478	\$2,677	\$9,299	82	\$384
TOTAL		990,000	4,539	4,539	\$25,417	\$101,530	787	\$4,710

Annual Total Energy Cost = \$106,240 Per Year

Total KWH x 0.003413 = 3,378.87 x 106
 Total MCF x 1.03 = 810.61 x 106
 Total Other x _____ x 106
 Total Site BTU's/yr 4,189.48 x 106

Floor area: 81,892 s.f.

Electric Utility Account # Farmers Electric Cooperative 3351419500

Gas Utility Meter # Atmos Energy 659927

Energy Use Index:
 Total Site BTU's/yr 51,159 BTU/s.f.yr
 Total Area (sq.ft.)

Energy Cost Index:
 Total Energy Cost/yr \$1.30 \$/s.f. yr
 Total Area (sq.ft.)

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Farmer's Coop Contract price: \$0.078362 per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: Farmer's

Electric Rate:

I. TRANSMISSION AND DISTRIBUTION CHARGES:

Distribution System Charge = \$.000631 per kWh

II. Demand Charge: \$5.60 per kW

Average Savings for consumption = \$0.078362/kWh + \$0.000631 = \$0.078993/kWh

Average Savings for demand **Non-IDR meter** = \$ 5.60/kW

NATURAL GAS PROVIDER:

Total cost for natural gas at the eight facilities in the analyzed billing cycle: \$9,472

Total quantity purchased during the analyzed billing cycle: 1,584 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = \$9,472 / 1,584 MCF

Average cost per MCF = \$5.98

5.0 CAMPUS DESCRIPTIONS:

Wylie ISD consists of nearly 20 educational campuses, many of which have achieved an *Energy Star* certification. The energy assessment documented in this report includes an analysis of two WISD campuses which have not met the Energy Star requirements, Draper Intermediate and Cooper Junior High.

Table 2: School Facilities Analyzed For This Report

Facility	Approximate Year of Construction and Additions	Approximate Square Footage	Basic HVAC Cool/Heat	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Draper Intermediate School	2007	81,892	Packaged RTUs, Gas Heat	SZRTU, DOAS	T8, T5HO	Cohesive DDC System
Cooper Junior High School	2006	104,045	Packaged RTUs, Gas Heat	SZRTU, DOAS	T8, T5HO	Cohesive DDC System

Note: SZRTU = Single-Zone Rooftop Unit

DOAS = Dedicated Outside Air System

6.0 ENERGY RECOMMENDATIONS:

Controls ECRM 1: RETRO-COMMISSIONING OF CONTROLS

All schools in the District which have achieved an *Energy Star* certification have an Enviromatics DDC HVAC control system. Draper Intermediate and Cooper Jr. High have a control system by Cohesive, Inc.; we suspect that the Cohesive DDC system may be a road block hindering these two schools from performing as efficiently as others in the district.

The Enviromatics control system allows the District Energy Manager to write custom control sequence code and see exactly how the system is controlling the equipment. The Cohesive system limits the user to a software control panel which only allows setpoint adjustments, equipment lockouts and scheduling and a few other binary selections. Only the Cohesive technicians have access to re-program the controls. Since controls are typically installed with default cookie-cutter sequences, the controls may not be optimized to the actual equipment or zones. In the past, through the analysis of the Enviromatics system code, the District Energy Manager has identified control problems (such as a single zone calling for cooling which brings on an entire chiller plant) and has been able to adjust the sequence to achieve significant energy savings. The Energy Manager has already identified a few control issues in the equipment under the Cohesive system such as compressor short-cycling due to setpoint ranges and timing settings, but is not able to make adjustments. *We recommend that the Cohesive control systems be replaced with Enviromatics to unify the district control system and give the Energy Manager access to optimize the HVAC operation at all schools.*

In order to qualify for *Energy Star*, each facility must have an Energy Performance Rating in the 75th percentile when compared to similar facilities nationwide. Based on the Energy Star Target Finder online tool, Draper Intermediate must reduce energy use by 15.7%, and Cooper JH must reduce energy use by 13.3% to qualify for *Energy Star*. Based on the district's experience with similar facilities, it is reasonable to assume that the controls at Draper Intermediate and Cooper JH can be optimized to achieve the energy use reduction goals and become *Energy Star* certified.

Estimated Cost: \$372,000 Estimated Ann. Savings: \$43,300 Estimated Payback: 8.6 Years

Lighting ECRM 1: RE-CIRCUIT EXTERIOR LIGHTING

Exterior lighting at Draper Intermediate and Cooper Jr. High is controlled to remain off during daylight hours, but at night all exterior lights turn on, including parking lot lights. The existing exterior lighting circuits do not allow separate control of parking lot lights and security lighting. If there are no events at the school in the evening, the parking lot lights could be turned off and only the exterior wallpacks around the building would remain on for security lighting. *We recommend that the parking lot lighting circuits be separated from building exterior (security) lighting so that parking lot lights can be turned off when there are no evening events at the school.*

Estimated Cost: \$3,000 Estimated Annual Savings: \$820 Estimated Payback: 3-3/4 Years

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

Maintenance and Operation procedures are strategies that can offer significant energy savings potential, yet require little or no capital investment by the district to implement. Exact paybacks are at times difficult to calculate, but are typically always less than one year. The difficulties with payback calculation are often related to the fact that the investigation required to make the payback calculation, for example measuring the air gap between exterior doors and missing or damaged weatherstripping so that exact air losses may be determined, is time and cost prohibitive when the benefits of renovating door and weather weatherstripping are well documented and universally accepted.

HVAC M&O #1

At Draper Intermediate and Cooper Jr. High, outside air is pre-conditioned by AAON dedicated outside air system (DOAS) rooftop units, which then supply the conditioned outside air to the packaged rooftop units (RTU's) serving the building. The HVAC systems typically run each weekday from 5:30am until school is out. The AAON DOAS units are the last units to turn on and first units to turn off each day to limit the time that these units run since outside air is only necessary when the building is occupied. During the summer, the RTU's and DOAS units are run from 5am-9am, 3 days per week for dehumidification. However, the DOAS units do not need to be run during the summer if the buildings are unoccupied. *We recommend that the DOAS units be scheduled or locked out to remain off during the summer.*

Estimated Annual Savings: \$15,000

9.0 GENERAL COMMENTS

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

APPENDICES

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

SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

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

LoanSTAR Program:

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

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

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

Loans on Commercial Market:

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

Leasing Corporations:

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

Bond Issue:

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

SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

State Purchasing:

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

Design/Bid/Build (Competitive Bidding):

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

Design/Build:

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

Purchasing Standardization Method:

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

Performance Contracting:

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

How to Finance Your Energy Program



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

Selecting a Cost/Benefit Analysis Method

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

Simple Payback Analysis

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

This kind of analysis assumes that the service life of the energy-efficiency measure will equal or exceed the simple payback time. Simple payback analysis provides a relatively easy way to examine the overall costs and savings potentials for a variety of project alternatives. However, it does

not consider a number of factors that are difficult to predict, yet can have a significant impact on cost savings. These factors may be considered by performing a life-cycle cost (LCC) analysis.

Simple Payback

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

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

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

Life-Cycle Cost Analysis

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

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

continued

How to Finance Your Energy Program *continued*

Financing Mechanisms

Capital for energy-efficiency improvements is available from a variety of public and private sources, and can be accessed through a wide and flexible range of financing instruments.

While variations may occur, there are five general financing mechanisms available today for investing in energy-efficiency:

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

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

Internal Funds

The most direct way for the owner of a building or facility to pay for energy-efficiency improvements is to allocate funds from the internal capital or operating budget. Financing internally has two clear advantages over the other options discussed below – it retains internally all savings from increased energy-efficiency, and it is usually the simplest option administratively. The resulting savings may be used to decrease overall operating

expenses in future years or retained within a revolving fund used to support additional efficiency investments. Many public and private organizations regularly finance some or all of their energy-efficiency improvements from internal funds.

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

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

Debt Financing

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

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

How to Finance Your Energy Program *continued*

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

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

Lease and Lease-Purchase Agreements

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

Energy Performance Contracts

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

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

Types of Leasing Agreements

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

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

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

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

4

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

Not Applicable - Farmer's Electric Coop stated they do not have an active Rate Schedule

APPENDIX III
PRELIMINARY ENERGY ASSESSMENT
SERVICE AGREEMENT



Public Schools, Colleges and Non-Profit Hospitals

Preliminary Energy Assessment Service Agreement

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

Description of the Service

The State Energy Conservation Office (SECO) will analyze electric, gas and other utility data and work with WYLIE ISD, hereinafter referred to as Partner, to identify energy cost-savings potential. To achieve this potential, SECO and Partner have agreed to work together to complete an energy assessment of mutually selected facilities.

SECO agrees to provide this service at no cost to the Partner with the understanding that the Partner is ready and willing to consider implementing the energy savings recommendations.

Principles of the Agreement

Specific responsibilities of the Partner and SECO in this agreement are listed below.

- Partner will select a contact person to work with SECO and its designated contractor to establish an Energy Policy and set realistic energy efficiency goals.
SECO's contractor will go on site to provide walk through assessments of selected facilities. SECO will provide a report which identifies no cost/low cost recommendations, Capital Retrofit Projects, and potential sources of funding. Portions of this report may be posted on the SECO website.
Partner will schedule a time for SECO's contractor to make a presentation of the assessment findings key decision makers.

Acceptance of Agreement

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

Signature: [Handwritten Signature] Date: 6/20/11
Name (Mr./Ms./Dr.): MR. DON POOL Title: DIRECTOR OF FACILITIES & MAINT.
Organization: WYLIE INDEPENDENT SCHOOL DISTRICT Phone: 972-429-2325
Street Address: 951 S. BALLARD WYLIE TX 75098 Fax: 972-429-2493
Mailing Address: Same E-Mail: DON.POOL@WYLIEISD.NET
County: COLLIN

Contact Information:

Name (Mr./Ms./Dr.): MR. DON POOL Title: DIRECTOR OF FACILITIES & MAINT.
Phone: 972-429-2325 Fax: 972-429-2493
E-Mail: DON.POOL@WYLIEISD.NET County: COLLIN

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

AND fax to the SECO Contractor for this service, Eric Ryan, ESA Energy Systems Associates, Inc. Phone: 512-628-8623. Fax: 512-258-5638.

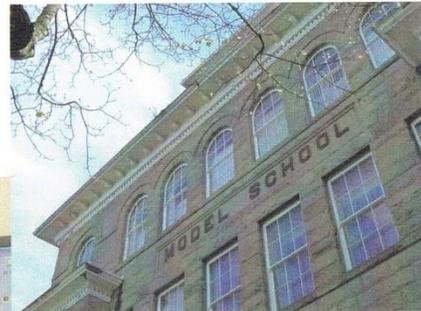
APPENDIX IV - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

ANNOUNCING!

TEMA

TEXAS ENERGY MANAGERS ASSOCIATION

A PROFESSIONAL ASSOCIATION
FOR THOSE RESPONSIBLE FOR
ENERGY MANAGEMENT IN TEXAS
PUBLIC FACILITIES



WWW.TEXASEMA.ORG

Check the website for
Membership
and Association
information.

- Networking
- Sharing Knowledge and Resources
- Training Workshops
- Regional Meetings
- Annual Conference
- Certification
- Legislative Updates
- Money-Saving Opportunities



APPENDIX V - UTILITY CHARTS ON CD