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Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

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SECO State Energy Conservation Office

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1.0 EXECUTIVE SUMMARY:

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

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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 June2011, **SECO** received a request for technical assistance from Kizzy Miller, Energy Coordinator for **DeSoto 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 **DeSoto ISD,** (hereafter known as DISD) 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 *Ms. Kizzy Miller*, Energy Coordinator, 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 **$31,227** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$354,025**, yielding an average simple payback of **11-1/3** years.

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

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1	Estimated cost not in scope of this report	----	----
HVAC ECRM #2	$312,625	$26,052	12 Years
Lighting ECRM #1	Percentage of lamps for retrofit unknown	----	----
Lighting ECRM #2	$41,400	$5,175	8 Years
Controls ECRM #1	Estimated cost not in scope of this report	----	----
TOTAL PROJECTS	**$ 354,025**	**$31,227**	**11-1/3 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 DISD. 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 DISD, ESA returned to the facilities to perform the following tasks:

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

3.0 ENERGY PERFORMANCE INDICATORS:

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

1. Energy Utilization Index

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

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

ELECTRICITY Usage

[Total KWH /yr] x [3413 BTUs/KWH] = _____ BTUs / yr

NATURAL GAS Usage

[Total MCF/yr] x [1,030,000 BTUs/MCF] = _____ BTUs / yr

After adding the BTU consumption of each fuel, the total BTUs are then divided

by the building area.

EUI = [Electricity BTUs + Gas BTUs] divided by [Total square feet]

2. Energy Cost Index

The Energy Cost Index (ECI) depicts the total annual energy cost per square foot of building space.

To calculate the ECI, the annual costs of electricity and gas are totaled and divided by the total square footage of the facility:

ECI = [Electricity Cost + Gas Cost] divided by [Total square feet]

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

THE CURRENT DISD ENERGY PERFORMANCE INDICATORS:

CAMPUS	ENERGY UTILIZATION INDEX (EUI) BTUs/sf-year	COMPARISON TO DISTRICT AVERAGE	ENERGY COST INDEX (ECI) $/sf-year	COMPARISON TO DISTRICT AVERAGE
Freshman Campus	73,775	29%	$1.61	20%
McCowan	52,659	-8%	$1.44	7%
East MS	60,916	6%	$1.38	3%
DeSoto HS	41,601	-27%	$0.95	-29%
Average Value:	57,238		$1.35	

DeSoto ISD purchases electricity from Direct Energy and Reliant Energy. The energy history spreadsheets are shown on the next few pages.

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

A copy of the rate schedule is included in Appendix I

OWNER: DeSoto ISD **BUILDING:** Freshman Campus

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	139,029		564	4,270	16,781	1,361	7,647
FEBRUARY	2010	119,635		564	4,285	15,051	654	3,797
MARCH	2010	169,613		564	4,318	19,582	277	1,718
APRIL	2010	173,004		564	4,998	20,567	166	1,024
MAY	2010	216,002		564	4,934	24,373	101	600
JUNE	2010	176,344		564	4,227	20,096	83	555
JULY	2010	212,686		564	4,862	24,001	51	407
AUGUST	2010	146,420		564	3,336	16,512	73	578
SEPTEMBER	2010	116,864		799	2,753	11,724	121	896
OCTOBER	2010	200,073		741	5,329	18,644	251	1,836
NOVEMBER	2010	165,833		615	4,775	16,535	399	2,831
DECEMBER	2010	152,431		590	4,523	16,658	858	5,187
TOTAL		**1,987,934**	**0**	**7,257**	**52,610**	**$220,524**	**4,395**	**$27,076**

Annual Total Energy Cost = $247,600 Per Year

Total KWH x 0.003413 = 6,784.82 x 106
Total MCF x 1.03 = 4,526.85 x 106
Total Other x ____ x 106
Total Site BTU's/yr 11,311.67 x 106

Floor area: 153,326 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 73,775 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.61 $/s.f. yr

Electric Utility	ESID#	Gas Utility	Meter #
Direct Energy, Reliant Energy	0915	Atmos	10226

OWNER: DeSoto ISD **BUILDING:** McCowan

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	130,652		410	4,600	16,358	840	4,779
FEBRUARY	2010	129,419		360	4,599	16,246	152	919
MARCH	2010	132,006		429	4,633	16,512	92	587
APRIL	2010	163,107		542	4,653	19,331	77	528
MAY	2010	189,103		652	5,020	21,972	56	341
JUNE	2010	254,690		723	5,577	28,497	1	18
JULY	2010	172,781		699	5,430	20,978	2	29
AUGUST	2010	188,616		701	5,507	22,481	23	195
SEPTEMBER	2010	143,919		826	6,360	16,720	52	407
OCTOBER	2010	282,200		741	5,705	27,435	105	803
NOVEMBER	2010	148,975		549	10,468	15,549	161	1,190
DECEMBER	2010	117,332		363	8,240	13,301	424	2,674
TOTAL		**2,052,800**	**0**	**6,995**	**70,792**	**$235,380**	**1,985**	**$12,470**

Annual Total Energy Cost = $247,850 Per Year

Total KWH x 0.003413 = 7,006.21 x 106
Total MCF x 1.03 = 2,044.55 x 106
Total Other x ____ x 106
Total Site BTU's/yr 9,050.76 x 106

Floor area: 171,875 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 52,659 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.44 $/s.f. yr

Electric Utility	ESID#	Meter#	Gas Utility	Meter #
Direct Energy, Reliant Energy	8705	0	Atmos	6378

OWNER: DeSoto ISD **BUILDING:** East Middle School

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	85,675	321	321	3,036	10,746	1,007	5,601
FEBRUARY	2010	80,649	284	284	2,904	10,703	511	3,052
MARCH	2010	68,511	356	356	3,088	9,208	292	1,751
APRIL	2010	94,929	411	411	3,134	11,677	48	301
MAY	2010	125,095	503	503	3,523	14,779	22	149
JUNE	2010	177,002	571	571	3,862	19,790	35	291
JULY	2010	170,059	500	500	3,460	18,762	13	126
AUGUST	2010	182,753	616	616	3,963	20,409	17	153
SEPTEMBER	2010	85,503	538	538	2,015	8,716	29	237
OCTOBER	2010	101,010	538	538	3,545	10,133	69	523
NOVEMBER	2010	78,415	441	441	3,337	8,897	275	1,954
DECEMBER	2010	59,768	289	289	3,075	7,312	574	3,467
TOTAL		**1,309,369**	**5,368**	**5,368**	**38,942**	**$151,132**	**2,892**	**$17,605**

Annual Total Energy Cost = $168,737 Per Year

Total KWH x 0.003413 = 4,468.88 x 106
Total MCF x 1.03 = 2,978.76 x 106
Total Other x ____ x 106
Total Site BTU's/yr 7,447.64 x 106

Floor area: 122,260 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 60,916 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.38 $/s.f. yr

Electric Utility	ESID#	Gas Utility	Meter #
Direct Energy, Reliant Energy	5991	Atmos	4661

OWNER: DeSoto ISD **BUILDING:** High School

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	200,096	1030	1,030	6,504	24,526	1,929	10,665
FEBRUARY	2010	191,483	1019	1,019	6,497	23,730	456	2,656
MARCH	2010	214,000	1018	1,018	6,512	25,769	205	1,268
APRIL	2010	209,645	1016	1,016	6,497	25,362	153	1,000
MAY	2010	215,325	1017	1,017	6,507	25,883	145	827
JUNE	2010	219,545	781	781	7,495	27,252	76	572
JULY	2010	231,713	1372	1,372	7,950	28,802	63	494
AUGUST	2010	148,233	834	834	5,144	18,455	107	822
SEPTEMBER	2010	128,857	975	975	4,420	14,355	139	1,019
OCTOBER	2010	196,606	915	915	7,381	20,298	247	1,792
NOVEMBER	2010	183,757	697	697	7,175	20,205	523	3,683
DECEMBER	2010	163,950	626	626	7,170	18,789	1,277	7,695
TOTAL		**2,303,210**	**11,300**	**11,300**	**79,252**	**$273,426**	**5,320**	**$32,493**

Annual Total Energy Cost = $305,919 Per Year

Total KWH x 0.003413 = 7,860.86 x 106
Total MCF x 1.03 = 5,479.60 x 106
Total Other x ____ x 106
Total Site BTU's/yr 13,340.46 x 106

Floor area: 320,679 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 41,601 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $0.95 $/s.f. yr

Electric Utility	ESID#	Gas Utility	Meter #
Direct Energy, Reliant Energy	6904	Atmos	6531

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Direct Energy/Reliant Energy Contract price: $0.084294per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: Oncor

Electric Rate: Secondary Service > 10 kVA

I. TRANSMISSION AND DISTRIBUTION CHARGES:

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

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

II. System Benefit = $0.000654 per kWh

III. TRANSITION CHARGES
Transition Charge 1 = $0.188 per NCP kW
Transition Charge 2 = $0.265 per NCP kW

IV. NUCLEAR DECOMMISSIONING CHARGE = $0.0089154 per Billing kW
V. TRANSMISSION COST RECOVERY FACTOR = $2.059691/4CP Kw
VI. ENERGY EFFICIENCY COST RECOVERY FACTOR = $8.14 per Month
VII. COMPETITIVE METER CREDIT = $-1.82 per Month
VIII. ADVANCED METERING COST RECOVERY FACTOR = $3.98/Month
IX. RATE CASE EXPENSE SURCHARGE = $0.007944/kWh

Average Savings for consumption = $0.084294/kWh + $0.000654/kWh + $0.007944/kWh = $0.092892/kWh
Average Minimum Savings for demand, $4.24 + $.188 + $0.265 +$0.044 + $2.059691 = $6.80/kVA**
Average Maximum Savings for demand, $5.30 + $.188 + $0.265 +$0.044 + $2.059691 = $7.86/kVA**

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

1. NCP kVA: Peak demand during 15 minute interval of current billing cycle
2. 4CP kVA: Average demands of June, July, August and September of previous calendar year; usually only applied to IDR metered accounts
3. Billing kVA: Ratchet demand representing higher of two calculations: 80% of peak demand in last 11 months or current NCP kVA
4. Load Factor: kWh used previous calendar year / (Maximum NCP kW * Days in Billing Period * 24)

NATURAL GAS PROVIDER:

The rate schedule for Natural gas is unavailable, but we have calculated the average cost per MCF of purchased natural gas in the district by analyzing the utility histories for the schools surveyed in this report.

Total cost for natural gas at the eight facilities in the analyzed billing cycle: $89,644

Total quantity purchased during the analyzed billing cycle: 14,592 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = $89,644/ 14,592 MCF

Average cost per MCF = $6.14

5.0 CAMPUS DESCRIPTIONS:

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

FCU = Fan coil Unit, VAVAHU = variable air volume air handling unit; RTU = Roof Top Unit

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

Facility	Year originally Constructed	Approximate Square Footage	Basic HVAC Cool/Heat	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Amber Terrace ES	1979	50,428	RTU's	RTUs	T8/T12	N/A
Freshman Campus	1987	153,326	Water Cooled Chiller/RTU's	RTUs	T8/T12 MH Gym	CSI/Alerton Controls
McCowan MS	2007	171,875	RTU's	RTUs	T8 and Halogens MH in Gym	Alerton Controls
East MS	1962	126,436	Cooling Tower/Water Cooled Chiller	Cooling Tower/Water Cooled Chiller	T8	CSI/Alerton Controls

6.0 ENERGY RECOMMENDATIONS:

HVAC ECRM 1: REPLACE CENTRAL SYSTEM

It was noted during our survey that the cooling tower at East Middle School is inoperable. Both of the drive belts are off of their pulley; one of the drive belts is wrapped around the fan blades. This condition is preventing the fan from operating. The basin float is stuck in a position that does not turn off the make up water flow as evidenced by the basin water draining out of the overflow pipe. Despite the cooling tower's inability to operate, the condenser water pump was still on and pumping water through the inoperable tower. This condition will result in high make-up water and chemical treatment costs for the campus.

Inside the mechanical room, one of the chillers was inoperable because of an alarm, most likely associated with the inoperable cooling tower.

It was also noted that the campus had an aged boiler that has reached or exceeded the anticipated lifespan for a typical boiler. *We recommend the district shut off the condenser water pump until repairs to the cooling tower have been made. We also recommend the district plan to replace the chiller, cooling tower, and boiler that make up the central system in this area of the building to improve operating efficiency and comfort for the occupants in this service area of the school.*

Estimated Cost: Beyond the scope of this report

HVAC ECRM 2: REPLACE AGED HVAC EQUIPMENT

The Engineer observed roof top units (RTUs) at the freshman campus that are 15 years old. The average anticipated useful lifespan of RTUs is 15-20 years. Below is a chart listing all units *we recommend be replaced within the next 5 years:*

Brand	Manufacture Year	Tons	Quantity	Total Tons
Lennox	1996	15	1	15
Lennox	1996	12.5	1	12.5
Lennox	1996	10	1	10
Lennox	N/A	10	3	30
Lennox	1996	8.5	3	25.5
Lennox	1996	7.5	3	22.5
Trane	????	7.5	2	15
Lennox	1996	6	1	6
Lennox	1996	4	3	12
Lennox	1996	2	2	4
Total Tons				***152.5***

Estimated Cost: $312,625 Estimated Savings: $26,052 Estimated Payback: 12 Year

Lighting ECRM 1: RETROFIT OF T12 LIGHTING TO T8:

The district has currently has a program in place to retrofit T12 fluorescent lamps and ballasts with T8 fluorescent lamps and electronic ballasts as the current T12 components cease functioning. T12 components produce approximately 18% less light and consume about 20% more energy than the T8 lamps and electronic ballasts that may be retrofit into the existing linear fluorescent fixtures. Senate Bill 300 requires Texas school districts to install the most efficient lamps and ballasts possible in their existing fixtures. *Therefore we recommend the district continue to retrofit the fixtures at these facilities with T8 lamps and electronic ballasts.* The exact percentage of the district still operating with T12 lamps and magnetic ballasts is unknown, therefore project costs and savings cannot be determined. Typical anticipated paybacks for this type of retrofit is 4-6 years.

Lighting ECRM 2: METAL HALIDE FIXTURE RETROFIT TO T5 LINEAR FLUORESCENT

The McCowan MS has 48 400-watt metal halide fixtures in the gymnasium. The Freshman Campus has an additional (56) 400 watt metal halides and (12) 250 watt metal halides. One characteristic of metal halide fixtures is their inherently long re-strike. This means that if the fixtures are ever turned off, it can take up to 15 minutes for them to come back on. This long re-strike encourages staff to leave the lights on throughout the day, even if the space is not occupied. *We recommend replacing the 400 watt metal halides with 6-lamp T5 high-bay fixtures, and the 250 watt metal halides with 4-lamp T5 high bay fixtures. Replacing these fixtures will improve overall light levels in the space and allow the fixtures to be turned off during unoccupied periods of the day.* See table below to see the cost break down per campus:

Campus	Metal Halide Watts	Quantity	Total Cost
McCowan MS	400	48	$17,280
Freshman Campus	400	56	$20,160
	250	12	$3,960
Total Retrofit Cost			***$41,400***

Estimated Cost: $41,400 Estimated Savings: $5,175 Estimated Payback: 8 Years

Controls ECRM 1: CONVERT ALL CONTROLS TO ALERTON

During the survey it was noted that the district is utilizing various control systems for their HVAC system. However, most of the district is operating on Alerton Controls. We recommend the district modify all controls to Alerton in order to ensure efficient controls communication across the entire district.

Estimate Project Cost: Not in scope of this report.

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

HVAC	•Ensure large RTU is operating corrctly at Freshman Campus •Repair boiler exhaust vent at freshmen campus •Install Coil Guards - comb fins as needed •Repair refrigerant insulation
Lighting	•Turn off all light fixtures not required during daytime •Fix all exterior lighting controls •Turn off lights in unoccupied spaces •Daylighting/delamping opportunities
Controls	•Upgrade to full Alerton System •Experiment with 74 set point •Install vending machine controls •Adjust IT control system
Envelope	•Replace and repair weather stripping

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

It was noted during the survey that the supply fan in a large RTU at the Freshman Campus appeared to be operating in reverse. The evidence for this condition is that the supply plenum had a much higher negative pressure than the return air plenum. The supply plenum access doors were hard to pull open. The staff stated that the rooms in this area do not ever seem to reach setpoint and stay markedly warmer than other areas of the building. *We recommend the district inspect these units for correct supply air fan operation.*

Also at the Freshman Campus it was noted that the boiler exhaust vent was disconnected. We recommend the district repair the vent in order to properly vent the heat and combustion gases to the exterior of the building.

During the survey we observed that the condenser fins are dirty and bent. They should be cleaned and straightened [combs available for less than $10]. The installation of coil guards protects the equipment and allows for savings in two ways. First, maintenance personnel will not have to spend the time and energy to comb the fins. Second, when the coil fins are undamaged they allow the unit to operate more efficiently because the air can flow through the unit carrying the rejected heat out of the unit without hindrance. We recommend installing coil and hail guards on the units to prevent future coil fin damage.

It was also noted at the Freshman Campus that the refrigerant piping insulation was frayed and deteriorating (see picture to the right). When the piping is exposed to the heat of the environment the refrigerant temperature increases, decreasing the cooling efficiency of the refrigerant. We recommend the district repair all refrigerant insulation.

During the survey it was observed that the refrigerant lines on the roof of the Freshman Campus are not being properly supported. A lack of support for these lines risks the lines becoming bent or even cracked, thus causing the piping to leak and need to be replaced. *We recommend the district ensure that all lines are appropriately supported to eliminate the risk of damaging the piping, causing leaks in the system.*

Lighting M&O

Some areas of the buildings noted in Section 6.0 of the report had light fixtures that were not required to be operating during the day or fixtures left operating in unoccupied spaces. The least expensive remedy to these issues is to train staff to not turn on fixtures not needed during daytime hours and to turn off fixtures in unoccupied spaces. Failure of the behavioral modification training will require the district to invest capital into automatic controls for the fixtures. It was noticed that the Energy Education Coordinator and the district have already implemented behavioral adjustments. If the district continues to implement these adjustments they will not have to invest the capital into a control system installation.

Many campuses had exterior night lighting operating during the daytime. We recommend the district install a daylight savings time automatic adjustment time clock with photocell backup. This allows the district to set the appropriate time schedule for their specific needs. The time clock backup offers a failsafe in case the photocell stops functioning.

Daylighting is the practice of incorporating natural daylight into spaces to reduce the reliance on artificial light fixtures. These same areas require artificial light fixtures at night when the natural light contribution has ceased. Unfortunately, many times the artificial fixtures in these areas are switched on throughout the day because of poor staff training or because the lighting design did not incorporate appropriate lighting controls to promote the operation of the daylighting strategies. As a result, there are often energy saving opportunities available to school districts with only minor lighting control modifications or staff training. One of the schools demonstrating this type of opportunity is at Freshman Campus. The main corridor has approximately 30' ceilings with skylights that stretch the length of the corridor. There are numerous fluorescent fixtures in the corridor area that are switched on during the day, when the natural daylight contribution is all that is required for proper illumination. During the second visit the Engineer made to the district it was noted that the energy manager had already begun to implement staff behavior training that caused all of these lights to be turned off.

At McCowan Middle School there is a similar situation with 16 2-lamp up-lights installed in an architectural dome. *We recommend the district continue training staff not to turn these fixtures on during the day, or if necessary, make proper switching scheme modifications to allow the fixtures to be left off during the day.* There are also (25) 40 watt halogen sconces that are turned on during daylighting periods. It was noted that the sconces are not connected to switches. *We recommend the district install new switches in the sconce lighting circuit to allow these fixtures to be controlled during the day.*

Controls M&O

It was noted that the district has an aggressive energy management plan, and has implemented many behavioral changes. In order to further increase efficiency *we recommend the district adjust the control system to match the school occupancy schedule to ensure that the energy consuming systems are not operated at times of zero occupancy.* It was noted during the survey that the cooling set point for the district is set on 72° F. *We recommend the district experiment setting this set point to 74° F to see if most of the students and faculty are comfortable.* This experiment will help the district determine the appropriate balance as they track the number of complaints about the temperature from the faculty. The closer the interior temperature is to

the exterior temperature increases the energy savings. Each degree the cooling setpoint is increased can save as much as 3% of the energy cost.

During our survey the engineer noticed that there were vending machines that were not under control. *We recommend the district install vending machine control sensors at each vending machine location*. These controls cycle the compressor so that the compressor does not operate all of the time but does turn it on to prevent the chilled product from exceeding a programmed temperature. The controls also turn off the vending machine lighting when there is not activity detected in the immediate area.

It was noted that the district utilizes an IT control system that does not incorporate a "sleep mode" for the computers and monitors, but does shut off the entire network of computers at 10pm. We recommend the district consider re-programming the current schedule to match the time of school open to the time of business close. This will decrease the energy consumption of all IT equipment by approximately 4 hours.

Envelope M&O

It was noted throughout the district that the weather stripping at the exterior doors is not creating an adequate seal. Thus, the conditioned air inside the building is allowed to escape the building and the outside air is allowed to come into the building. Both scenarios cause the HVAC system to be less efficient than it should be.

The district is currently operating some HVAC units 24/7 at Amber Terrace to prevent mold from growing on the carpet in the space. We recommend the district replace the carpet in these spaces with tile so the HVAC system is not required to operate during unoccupied periods.

8.0 FINANCIAL EVALUATION

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

If the project was financed with in-house funds, the internal rate of return for the investment would be as follows:

Proposal:	Perform recommended ECRMs			
Assumptions:				
1. Equipment will last at least 15 years prior to next renovation				
2. No maintenance expenses for first five years (warranty period)				
3. $1,000 maintenance expense next 5 years				
4. $2,000 maintenance expense next 5 years				
5. Savings decreases 5% per year after year 5				
Cash Flow	**Project Cost**	**Project Savings**	**Maintenance Expense**	**Net Cash Flow**
Time 0	($354,025)		0	($354,025)
Year 1		$ 31,227.00	0	$31,227
Year 2		$ 31,227.00	0	$31,227
Year 3		$ 31,227.00	0	$31,227
Year 4		$ 31,227.00	0	$31,227
Year 5		$ 31,227.00	0	$31,227
Year 6		$ 29,665.65	($1,000)	$28,666
Year 7		$ 28,104.30	($1,000)	$27,104
Year 8		$ 26,542.95	($1,000)	$25,543
Year 9		$ 24,981.60	($1,000)	$23,982
Year 10		$ 23,420.25	($1,000)	$22,420
Year 11		$ 21,858.90	($2,000)	$19,859
Year 12		$ 20,297.55	($2,000)	$18,298
Year 13		$ 18,736.20	($2,000)	$16,736
Year 14		$ 17,174.85	($2,000)	$15,175
Year 15		$ 15,613.50	($2,000)	$13,614
			Internal Rate of Return	**0.55%**

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

APPENDIX I: SUMMARY OF FUNDING AND PROCUREMENT OPTIONS

9.0 GENERAL COMMENTS

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

APPENDICES

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

SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

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

LoanSTAR Program:

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

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

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

Loans on Commercial Market:

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

Leasing Corporations:

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

Bond Issue:

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

SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

State Purchasing:

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

Design/Bid/Build (Competitive Bidding):

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

Design/Build:

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

Purchasing Standardization Method:

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

Performance Contracting:

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

Solution Center

How to Finance Your Energy Program

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

Selecting a Cost/Benefit Analysis Method

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

Simple Payback Analysis

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

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

Simple Payback

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

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

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

Life-Cycle Cost Analysis

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

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

continued

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

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

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

Lease and Lease-Purchase Agreements

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

Energy Performance Contracts

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

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

Types of Leasing Agreements

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

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

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

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

How to Finance Your Energy Program *continued*

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

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

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

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

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

Rebuild America
U.S. Dept. of Energy

APPENDIX II - ELECTRIC UTILITY RATE SCHEDULE

6.1.1.1.3 Secondary Service Greater Than 10 kW

AVAILABILITY

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

TYPE OF SERVICE

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

MONTHLY RATE

I. Transmission and Distribution Charges:

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

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

II. System Benefit Fund:	$0.000654	per kWh, See Rider SBF
III. Transition Charge:	See Riders TC1 and TC2	per Distribution System billing kW
IV. Nuclear Decommissioning Charge:	$0.044	per Distribution System billing kW, See Rider NDC
V. Transmission Cost Recovery Factor:	See Rider TCRF	
VI. Energy Efficiency Cost Recovery Factor:	See Rider EECRF	
VII. Competitive Meter Credit:	See Rider CMC	

VIII. Advanced Metering Cost Recovery Factor:	See Rider AMCRF	
Other Charges or Credits		
IX. Rate Case Expense Surcharge:	See Rider RCE	per Distribution System billing kW
X. State Colleges and Universities Discount:	See Rider SCUD	

COMPANY SPECIFIC APPLICATIONS

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

DETERMINATION OF BILLING DEMAND FOR TRANSMISSION SYSTEM CHARGES

DETERMINATION OF NCP kW

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

DETERMINATION OF 4 CP kW

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

DETERMINATION OF BILLING DEMAND FOR DISTRIBUTION SYSTEM CHARGES

DETERMINATION OF ANNUAL LOAD FACTOR

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

The Annual Load Factor calculation is as follows:

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

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

DETERMINATION OF BILLING kW

For loads whose maximum NCP kW established in the 11 months preceding the current billing month is less than or equal to 20 kW, the Billing kW applicable to the Distribution System Charge shall be the NCP kW for the current billing month.

For loads whose maximum NCP kW established in the 11 months preceding the current billing month is greater than 20 kW and their Annual Load Factor is less than or equal to 25%, the Billing kW applicable to the Distribution System Charge shall be the NCP kW for the current billing month. Billing kW applicable to Riders TC, NDC, RCE charges shall be the higher of the NCP kW for the current billing month or 80% of the highest monthly NCP kW established in the 11 months preceding

the current billing month (80% ratchet).

For all other loads, the Billing kW applicable to the Distribution System Charge shall be the higher of the NCP kW for the current billing month or 80% of the highest monthly NCP kW established in the 11 months preceding the current billing month (80% ratchet).

The 80% ratchet and the Annual Load Factor Provisions shall not apply to Retail Seasonal Agricultural Customers.

NOTICE

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

APPENDIX IV - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

SECO
State Energy Conservation Office

Local Governments and Municipalities

Preliminary Energy Assessment Service Agreement

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

Description of the Service

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

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

Principles of the Agreement

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

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

Acceptance of Agreement

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

Signature: _____ Date: 6/7/2011

Name (Mr./Ms./Dr.) Bobby LaBorde Title: CFO

Organization: DeSoto ISD Phone: 972-223-6666

Street Address: 200 E. Belt Line Fax: 972-274-1269

Mailing Address: DeSoto, TX 75115 E-Mail: blaborde@desotoisd.org

County: Dallas

Contact Information:

Name (Mr./Ms./Dr.): Kizzy Miller Title: Energy Coordinator

Phone: 214-536-2209 Fax: _____

E-Mail: kmiller@desotoisd.org County: Dallas

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

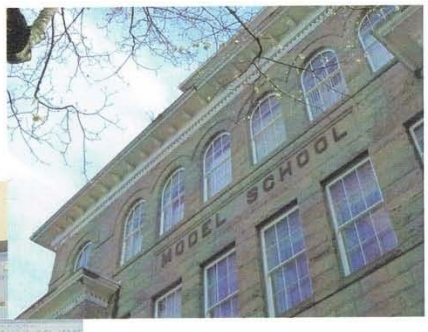
APPENDIX V - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

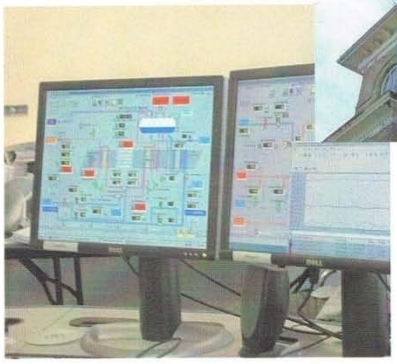
ANNOUNCING!

TEMA

TEXAS ENERGY MANAGERS ASSOCIATION

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





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

WWW.TEXASEMA.ORG

Check the website for Membership and Association information.

SECO
State Energy Conservation Office

APPENDIX VI - UTILITY CHARTS ON CD