Susan Combs
Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

Prepared by:

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Angleton Independent School District

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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**.

SECO
State Energy Conservation Office

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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 April, 2011, **SECO** received a request for technical assistance from Stephen Davis, Assistant Superintendent of Operations for **Angleton 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 **Angleton ISD,** (hereafter known as AISD) was completed by ESA **Energy Systems Associates, Inc**., (hereafter known as *Engineer*) to determine the annual energy cost index (ECI) and energy use index (EUI) for each campus or facility. A complete listing of the Base Year Utility Costs and Consumption is provided in Section 3.0 of this report.

Following the utility analysis and a preliminary consultation with *Stephen Davis*, 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 **$362,070** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$1,107,600**, yielding an average simple payback of **3-1/4** years.

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

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
HVAC ECRM #1	N/A	N/A	N/A
HVAC ECRM #2	$1,000	$2,000	6 Months
HVAC ECRM #3	$8,000	$2,000	4 Years
Lighting ECRM #1	$18,900	$3,150	6 Years
Lighting ECRM #2	$31,500	$6,300	5 Years
Lighting ECRM #3	$2,000	$750	2-2/3 Years
Controls ECRM #1	$600 per Gym	$300 per Gym	2 Years
Controls ECRM #2	$11,900	$3,000	3-2/3 Years
Controls ECRM #3	$1,033,700	$344,570	3 Years
TOTAL PROJECTS	**$1,107,600**	**$362,070**	**3-1/4 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 AISD. We hope to be ongoing partners in assisting you to implement the recommendations listed in this report. Please call us if you have further questions or comments regarding your Energy Management Issues.

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

2.0 ENERGY ASSESSMENT PROCEDURE:

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

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

3.0 ENERGY PERFORMANCE INDICATORS:

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

1. Energy Utilization Index

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

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

ELECTRICITY Usage

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

NATURAL GAS Usage

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

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

by the building area.

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

2. Energy Cost Index

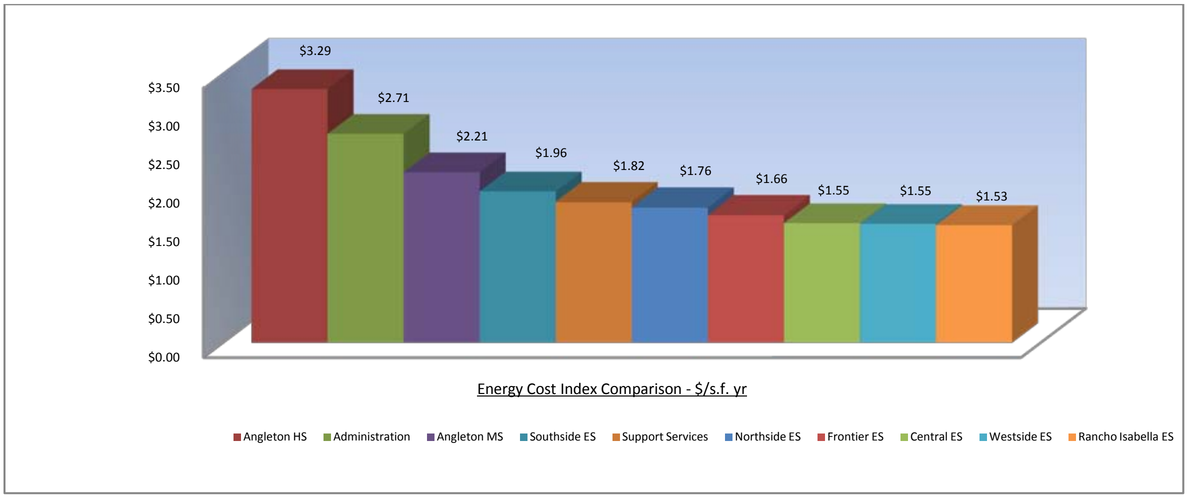
The Energy Cost Index (ECI) depicts the total annual energy cost per square foot of building space.

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

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

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

THE CURRENT AISD 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
Angleton HS	98,884	65%	$3.29	56%
Angleton MS	67,939	13%	$3.21	53%
Administration	74,300	24%	$2.71	29%
Southside ES	64,654	8%	$1.96	-7%
Support Services	51,742	-14%	$1.82	-13%
Northside ES	51,736	-14%	$1.76	-16%
Frontier ES	54,653	-9%	$1.66	-21%
Central ES	40,520	-32%	$1.55	-26%
Westside ES	44,383	-26%	$1.55	-26%
Rancho Isabella ES	50,574	-16%	$1.53	-27%
Average Value:	59,939		$2.10	

This analysis indicates high ECIs for AISD facilities as compared to other school districts around the state. The statewide average for all Texas schools is generally considered to be $1.50 per square foot. At $2.10, the average school in AISD is 40% higher than an average school in Texas. Individually, the differences are much higher for the less efficient schools in AISD. Angleton HS is currently operating with an ECI that is 220% of the average school in Texas. Angleton ISD recently changed electricity providers from Choice Energy Services to Direct Energy. There should be a significant drop in energy costs as a result of this change. The transmission and distribution utility is Texas New Mexico Power. 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: Angleton ISD **BUILDING:** Administration

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	37,752		0	0	4,571	0	0
FEBRUARY	2010	36,192		0	0	4,511	0	0
MARCH	2010	38,592		0	0	4,807	0	0
APRIL	2010	43,392		0	0	5,121	0	0
MAY	2010	52,392		0	0	6,398	0	0
JUNE	2010	47,952		0	0	5,939	0	0
JULY	2010	42,752		0	0	6,337	0	0
AUGUST	2010	51,432		0	0	6,113	0	0
SEPTEMBER	2010	43,992		0	0	5,273	0	0
OCTOBER	2010	42,192		0	0	5,103	0	0
NOVEMBER	2010	37,392		0	0	4,905	0	0
DECEMBER	2010	43,872		0	0	5,312	0	0
TOTAL		517,904	0	0	0	$64,390	0	$0

Annual Total Energy Cost = $64,390 Per Year

Total KWH x 0.003413 = 1,767.61 x 106
Total MCF x 1.03 = 0.00 x 106
Total Other x ____ x 106
Total Site BTU's/yr 1,767.61 x 106

Floor area: 23,790 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 74,300 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $2.71 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Choice Energy Services	10400511263190001	0	CenterPoint Energy	0

OWNER: Angleton ISD **BUILDING:** Angleton HS

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	332,365		0	0	44,438	759	6,911
FEBRUARY	2010	612,552		0	0	78,664	616	6,599
MARCH	2010	697,962		0	0	86,442	448	4,820
APRIL	2010	765,065		0	0	97,512	345	3,728
MAY	2010	1,222,222		0	0	139,958	205	2,221
JUNE	2010	1,071,582		0	0	123,903	114	1,257
JULY	2010	1,164,404		0	0	130,524	15	177
AUGUST	2010	1,461,617		0	0	161,759	7	64
SEPTEMBER	2010	776,556		0	0	98,214	93	670
OCTOBER	2010	658,941		0	0	87,516	156	1,123
NOVEMBER	2010	538,836		0	0	75,160	174	1,244
DECEMBER	2010	435,685		0	0	63,981	405	2,639
TOTAL		9,737,787	0	0	0	$1,188,071	3,337	$31,453

Annual Total Energy Cost = $1,219,524 Per Year

Total KWH x 0.003413 = 33,235.07 x 106
Total MCF x 1.03 = 3,437.11 x 106
Total Other x ____ x 106
Total Site BTU's/yr 36,672.18 x 106

Floor area: 370,860 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 98,884 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $3.29 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Choice Energy Services	1040051474725000	0	CenterPoint Energy	970050051703

OWNER: Angleton ISD **BUILDING:** Angleton MS

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	434,013		0	0	54,310	667	6,081
FEBRUARY	2010	437,816		0	0	54,211	691	7,401
MARCH	2010	449,215		0	0	55,420	445	4,790
APRIL	2010	540,589		0	0	64,609	220	2,400
MAY	2010	693,455		0	0	77,397	76	838
JUNE	2010	510,708		0	0	60,580	50	559
JULY	2010	559,748		0	0	64,628	62	690
AUGUST	2010	622,490		0	0	71,583	58	424
SEPTEMBER	2010	466,338		0	0	57,696	31	233
OCTOBER	2010	398,237		0	0	50,526	4	54
NOVEMBER	2010	337,881		0	0	41,021	31	244
DECEMBER	2010	172,075		0	0	26,650	28	292
TOTAL		5,622,565	0	0	0	$678,631	2,363	$24,006

Annual Total Energy Cost = $702,637 Per Year

Total KWH x 0.003413 = 19,189.81 x 106
Total MCF x 1.03 = 2,433.89 x 106
Total Other x ____ x 106
Total Site BTU's/yr 21,623.70 x 106

Floor area: 318,279 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 67,939 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $2.21 $/s.f. yr

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Choice Energy Services	1040051126081000	0	CenterPoint Energy	946680489322

OWNER: Angleton ISD **BUILDING:** Central ES

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	89,714		0	0	12,403	58	580
FEBRUARY	2010	88,199		0	0	12,174	53	625
MARCH	2010	85,311		0	0	11,944	34	411
APRIL	2010	103,064		0	0	14,066	31	373
MAY	2010	128,784		0	0	17,207	26	312
JUNE	2010	87,891		0	0	12,965	14	183
JULY	2010	99,005		0	0	13,678	7	102
AUGUST	2010	142,625		0	0	18,365	9	80
SEPTEMBER	2010	114,977		0	0	15,851	25	199
OCTOBER	2010	100,060		0	0	14,547	25	196
NOVEMBER	2010	83,684		0	0	12,294	31	243
DECEMBER	2010	73,051		0	0	11,205	36	261
TOTAL		1,196,365	0	0	0	$166,699	349	$3,565

Annual Total Energy Cost = $170,264 Per Year

Total KWH x 0.003413 = 4,083.19 x 106
Total MCF x 1.03 = 359.47 x 106
Total Other x ____ x 106
Total Site BTU's/yr 4,442.66 x 106

Floor area: 109,640 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 40,520 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.55 $/s.f. yr

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Choice Energy Services	1040051433248000	0	CenterPoint Energy	385040028559

OWNER: Angleton ISD   BUILDING: Frontier ES

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
MONTH	YEAR	CONSUMPTION KWH	METERED KW/KVA	CHARGED KW/KVA	COST OF DEMAND	TOTAL ALL ELECTRICAL COSTS $	CONSUMPTION MCF	COSTS $
JANUARY	2010	55,574		0	0	7,206	91	814
FEBRUARY	2010	52,454		0	0	6,925	86	908
MARCH	2010	64,814		0	0	8,020	67	710
APRIL	2010	75,014		0	0	8,954	56	595
MAY	2010	82,934		0	0	9,625	54	574
JUNE	2010	56,414		0	0	7,189	62	657
JULY	2010	94,214		0	0	10,410	3	46
AUGUST	2010	132,494		0	0	13,978	19	142
SEPTEMBER	2010	110,654		0	0	12,100	33	231
OCTOBER	2010	97,574		0	0	10,930	32	223
NOVEMBER	2010	88,454		0	0	9,816	37	258
DECEMBER	2010	56,414		0	0	7,789	53	341
TOTAL		**967,008**	**0**	**0**	**0**	**$112,942**	**593**	**$5,499**

Annual Total Energy Cost =	$118,441	Per Year	**Energy Use Index:** Total Site BTU's/yr Total Area (sq.ft.)	54,653	BTU/s.f.yr
Total KWH x 0.003413 =	3,300.40	x 106			
Total MCF x 1.03 =	610.79	x 106	**Energy Cost Index:** Total Energy Cost/yr Total Area (sq.ft.)	$1.66	$/s.f. yr
Total Other x ____		x 106			
Total Site BTU's/yr	3,911.19	x 106			
Floor area:	71,564	s.f.			

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Choice Energy Services	1040051338245000	0	CenterPoint Energy	9519100041477

OWNER: Angleton ISD   BUILDING: Marshall Education Center

MONTH / YEAR		ELECTRIC					NAT'L GAS / FUEL	
			DEMAND					
MONTH	YEAR	CONSUMPTION KWH	METERED KW/KVA	CHARGED KW/KVA	COST OF DEMAND	TOTAL ALL ELECTRICAL COSTS $	CONSUMPTION MCF	COSTS $
JANUARY	2010	32,014		0	0	4,138	14	147
FEBRUARY	2010	32,094		0	0	4,296	12	140
MARCH	2010	27,245		0	0	3,889	7	84
APRIL	2010	33,150		0	0	4,431	4	53
MAY	2010	40,657		0	0	5,182	2	33
JUNE	2010	32,967		0	0	4,364	1	21
JULY	2010	30,716		0	0	4,136	61	1,006
AUGUST	2010	27,958		0	0	3,915	3	16
SEPTEMBER	2010	17,385		0	0	2,806	0	14
OCTOBER	2010	30,627		0	0	3,913	0	15
NOVEMBER	2010	22,388		0	0	3,172	0	16
DECEMBER	2010	20,310		0	0	2,967	3	35
TOTAL		**347,511**	**0**	**0**	**0**	**$47,209**	**107**	**$1,580**

Annual Total Energy Cost =	$48,789	Per Year	**Energy Use Index:** Total Site BTU's/yr Total Area (sq.ft.)	110,716	BTU/s.f.yr
Total KWH x 0.003413 =	1,186.06	x 106			
Total MCF x 1.03 =	110.21	x 106	**Energy Cost Index:** Total Energy Cost/yr Total Area (sq.ft.)	$4.17	$/s.f. yr
Total Other x ____		x 106			
Total Site BTU's/yr	1,296.27	x 106			
Floor area:	11,708	s.f.			

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Choice Energy Services	1040051412392000	0	CenterPoint Energy	3830900120665

OWNER: Angleton ISD **BUILDING:** Northside ES

MONTH / YEAR		ELECTRIC	DEMAND				NAT'L GAS / FUEL	
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	73,200		0	0	9,630	95	869
FEBRUARY	2010	76,600		0	0	9,933	79	856
MARCH	2010	69,200		0	0	9,196	35	385
APRIL	2010	97,000		0	0	11,759	19	220
MAY	2010	100,800		0	0	12,191	13	157
JUNE	2010	37,200		0	0	6,227	5	66
JULY	2010	133,400		0	0	14,848	0	13
AUGUST	2010	144,200		0	0	16,589	1	23
SEPTEMBER	2010	104,200		0	0	13,130	12	95
OCTOBER	2010	90,800		0	0	11,842	15	117
NOVEMBER	2010	79,600		0	0	10,167	26	194
DECEMBER	2010	70,000		0	0	9,221	90	576
TOTAL		**1,076,200**	**0**	**0**	**0**	**$134,733**	**390**	**$3,571**

Annual Total Energy Cost = $138,304 Per Year

Total KWH x 0.003413 = 3,673.07 x 106
Total MCF x 1.03 = 401.70 x 106
Total Other x ____ x 106
Total Site BTU's/yr 4,074.77 x 106

Floor area: 78,761 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 51,736 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.76 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Choice Energy Services	1040051123126000	0	CenterPoint Energy	9518400028989

OWNER: Angleton ISD **BUILDING:** Rancho Isabella ES

MONTH / YEAR		ELECTRIC	DEMAND				NAT'L GAS / FUEL	
		CONSUMPTION	METERED	CHARGED	COST OF	TOTAL ALL ELECTRICAL	CONSUMPTION	COSTS
MONTH	YEAR	KWH	KW/KVA	KW/KVA	DEMAND	COSTS $	MCF	$
JANUARY	2010	49,760		0	0	6,957	163	1,474
FEBRUARY	2010	55,840		0	0	7,481	194	2,067
MARCH	2010	58,400		0	0	7,804	163	1,737
APRIL	2010	74,400		0	0	9,542	129	1,384
MAY	2010	88,000		0	0	10,877	76	812
JUNE	2010	43,200		0	0	6,663	12	144
JULY	2010	97,760		0	0	11,427	7	86
AUGUST	2010	129,600		0	0	14,741	12	97
SEPTEMBER	2010	77,600		0	0	9,689	18	135
OCTOBER	2010	67,520		0	0	8,991	19	148
NOVEMBER	2010	58,560		0	0	7,835	66	454
DECEMBER	2010	48,000		0	0	6,862	126	800
TOTAL		**848,640**	**0**	**0**	**0**	**$108,869**	**985**	**$9,338**

Annual Total Energy Cost = $118,207 Per Year

Total KWH x 0.003413 = 2,896.41 x 106
Total MCF x 1.03 = 1,014.55 x 106
Total Other x ____ x 106
Total Site BTU's/yr 3,910.96 x 106

Floor area: 77,332 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 50,574 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.53 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Choice Energy Services	1040051127846000	0	CenterPoint Energy	9528406050499

OWNER: **Angleton ISD** **BUILDING:** **Southside ES**

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	51,360		0	0	6,854	142	1,284
FEBRUARY	2010	51,240		0	0	6,861	193	2,050
MARCH	2010	48,120		0	0	6,660	212	2,258
APRIL	2010	70,320		0	0	8,509	96	1,028
MAY	2010	85,560		0	0	10,332	55	598
JUNE	2010	27,000		0	0	5,368	48	526
JULY	2010	93,480		0	0	10,609	6	81
AUGUST	2010	145,080		0	0	15,732	0	0
SEPTEMBER	2010	90,960		0	0	11,135	28	237
OCTOBER	2010	81,840		0	0	10,292	34	241
NOVEMBER	2010	68,280		0	0	8,587	0	0
DECEMBER	2010	52,800		0	0	7,158	59	382
TOTAL		**866,040**	**0**	**0**	**0**	**$108,097**	**873**	**$8,685**

Annual Total Energy Cost = $116,782 Per Year

Total KWH x 0.003413 = 2,955.79 x 106
Total MCF x 1.03 = 899.19 x 106
Total Other x ____ x 106
Total Site BTU's/yr 3,854.98 x 106

Floor area: 59,625 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 64,654 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.96 $/s.f. yr

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Choice Energy Services	1040051122405000	0	CenterPoint Energy	970050051703

OWNER: **Angleton ISD** **BUILDING:** **Stadium**

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	4,144		0	0	2,006	7	82
FEBRUARY	2010	2,512		0	0	1,711	4	62
MARCH	2010	4,740		0	0	1,905	4	59
APRIL	2010	4,930		0	0	1,920	4	64
MAY	2010	5,239		0	0	1,871	3	50
JUNE	2010	3,356		0	0	1,698	3	48
JULY	2010	3,044		0	0	1,666	3	53
AUGUST	2010	2,239		0	0	1,601	3	37
SEPTEMBER	2010	2,093		0	0	1,939	3	38
OCTOBER	2010	1,578		0	0	1,263	4	42
NOVEMBER	2010	1,621		0	0	1,276	4	43
DECEMBER	2010	2,244		0	0	1,328	5	51
TOTAL		**37,740**	**0**	**0**	**0**	**$20,184**	**47**	**$629**

Annual Total Energy Cost = $20,813 Per Year

Total KWH x 0.003413 = 128.81 x 106
Total MCF x 1.03 = 48.41 x 106
Total Other x ____ x 106
Total Site BTU's/yr 177.22 x 106

Floor area: 630 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 281,296 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $33.04 $/s.f. yr

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Choice Energy Services	10400511263230001	0	CenterPoint Energy	0

OWNER: **Angleton ISD** **BUILDING:** **Support Services**

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	34,640		0	0	4,030	0	13
FEBRUARY	2010	35,040		0	0	4,067	0	14
MARCH	2010	24,720		0	0	3,151	0	13
APRIL	2010	22,000		0	0	2,813	0	14
MAY	2010	26,960		0	0	3,254	0	13
JUNE	2010	27,760		0	0	3,339	0	13
JULY	2010	29,840		0	0	3,528	0	13
AUGUST	2010	32,080		0	0	3,722	0	14
SEPTEMBER	2010	32,160		0	0	3,757	0	14
OCTOBER	2010	31,920		0	0	3,844	0	15
NOVEMBER	2010	35,840		0	0	4,408	0	15
DECEMBER	2010	36,480		0	0	4,387	0	15
TOTAL		**369,440**	**0**	**0**	**0**	**$44,300**	**0**	**$166**

Annual Total Energy Cost = $44,466 Per Year

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 51,742 BTU/s.f.yr

Total KWH x 0.003413 = 1,260.90 x 106
Total MCF x 1.03 = 0.00 x 106
Total Other x ____ x 106
Total Site BTU's/yr 1,260.90 x 106

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.82 $/s.f. yr

Floor area: 24,369 s.f.

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Choice Energy Services	1040051129737000	0	CenterPoint Energy	312010018841

OWNER: **Angleton ISD** **BUILDING:** **Westside ES**

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	150,176		0	0	18,304	187	1,687
FEBRUARY	2010	130,339		0	0	16,600	128	1,366
MARCH	2010	141,726		0	0	17,584	101	1,084
APRIL	2010	163,875		0	0	20,425	36	399
MAY	2010	156,523		0	0	20,006	15	172
JUNE	2010	99,009		0	0	14,390	12	139
JULY	2010	198,351		0	0	23,760	0	13
AUGUST	2010	207,078		0	0	24,864	0	14
SEPTEMBER	2010	168,952		0	0	21,071	8	71
OCTOBER	2010	154,042		0	0	19,040	2	31
NOVEMBER	2010	131,011		0	0	17,026	10	181
DECEMBER	2010	111,529		0	0	15,233	2	30
TOTAL		**1,812,611**	**0**	**0**	**0**	**$228,303**	**501**	**$5,187**

Annual Total Energy Cost = $233,490 Per Year

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) 44,383 BTU/s.f.yr

Total KWH x 0.003413 = 6,186.44 x 106
Total MCF x 1.03 = 516.03 x 106
Total Other x ____ x 106
Total Site BTU's/yr 6,702.47 x 106

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) $1.55 $/s.f. yr

Floor area: 151,016 s.f.

Electric Utility	**Account #**	**Meter#**	**Gas Utility**	**Meter #**
Choice Energy Services	1040051346999000	0	CenterPoint Energy	0

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Choice Energy Services Contract price: $0.0821 per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: Texas-New Mexico Power Company

Electric Rate: Secondary Service > 5 kVA

I.	TRANSMISSION AND DISTRIBUTION CHARGES:		
	Customer Charge	=	$2.56 per ESI ID per Month
	Metering Charge	=	$10.74 per ESI ID per Month
	Transmission System Charge	=	$0.00 per 4CP kW
	Distribution System Charge	=	$5.2808 per NCP Billing kW
II.	SYSTEM BENEFIT FUND	=	$0.000654 per kWh
III.	TRANSITION CHARGES	=	Not Applicable
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	Not Applicable
V.	TRANSMISSION COST RECOVERY FACTOR	=	$2.05 per 4CP kW
VI.	OTHER CHARGES		
	a. Competitive Metering Credit	=	$-2.00 per month
	b. Competitive Transition Charge	=	$0.90307 per kW
	c. Rate Case Expense #2	=	$0.000135 per kWh
	d. Rate Case Expense #3	=	Not Applicable
	e. Hurricane Cost Recovery Factor	=	$0.24357 per NCP Billing kW
	f. Energy Efficiency Cost Recovery Factor	=	$5.06 per ESI ID Per Month
	g. State College and University Discount	=	Not Applicable

Average Savings for consumption = $0.0821/kWh + $0.000654/kWh + $0.000135/kWh = $0.082889/kWh
Average Savings for demand = $5.2808 + $2.05 + $0.90307 + $0.24357 = $ 8.47744/kW**

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

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

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: $62,226

Total quantity purchased during the analyzed billing cycle: 9,545 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = $62,226/ 9,545 MCF

Average cost per MCF = $6.52

5.0 CAMPUS DESCRIPTIONS:

Angleton ISD consists of 9 educational campuses (2 High Schools, 2 Middle Schools and 5 Elementary Schools) which are located in Brazoria County. The energy survey focused on four of the educational campuses:

Table 2: School Facilities Analyzed For This Report

Facility	Year originally Constructed	Approximate Square Footage	Basic HVAC Cool/Heat	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Angleton HS	2010	370,860	Air-Cooled Chiller/ HW Boiler	MZAHU with hot water reheat	100% T8	Siemens DDC
Westside ES	1993 Original 2002 Renovation	151,016	Water cooled chillers / natural gas boilers	MZAHU with hot water reheat	T8	Siemens DDC
Frontier ES	2004	71,564	Air cooled chillers / natural gas boilers	MZAHU with hot water reheat	100% T8	Siemens DDC
Southside ES	1955 Original 1985 Renovation	59,625	Rooftop Units / Air-cooled chiller	RTUs / AHUs	100% T8	Automated Logic tied to Pneumatic

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

6.0 ENERGY RECOMMENDATIONS:

HVAC ECRM 1: COMPLETE INSTALLATION TO OPERATE VFDs

It was noted during the survey that several Variable Frequency Drives (VFDs) have been installed on pumps and air handlers around the district, but except for the High School, they are not adjusting motor operation to match the loads required by the equipment on which they are installed. This is because the VFDs are currently only operating as soft-start motor starters. VFDs require input from the air or water distribution systems in order to adjust the motor to match the load required and this source of this input has yet to be installed in these systems.

For water distribution systems, the drive should adjust the loading of the pump based on changes in pressure between the main supply and return distribution piping branches. As spaces become satisfied and approach setpoint, the flow control valve on the terminal fan coil or VAV unit begins to close. This decreases the overall volume of the supply piping system and increases the pressure in the supply piping as less water is required by each terminal unit and more water is diverted back to the main mechanical room. This condition causes the pressure between the supply and return piping to be more equal and serves as a signal to the VFD that spaces are satisfied and the water distribution pump can slow down. The pump operates with a lower loading and therefore consumes less energy than a pump that did not have a VFD and ran at full load 100% of the time.

As spaces deviate from setpoint, the reverse occurs; valves open in the terminal units, the volume of the supply system is increased and the supply and return pressures get farther apart. The pump receives a signal from the drive that it needs to speed up to increase the water flow through the system.

In the case of the hot and chilled water pumps at AISD, the system will require a pressure sensor be installed in the supply and return distribution piping main branches and it may be necessary to replace some three-way valves with two-way valves in the main distribution piping. It is necessary to have three-way valves in the last terminal unit in a distribution loop (to allow water to be routed to the return piping system), but the other units should have two way valves so the system is more responsive to changes in load conditions.

Air handlers operate with a similar control strategy, except the medium is air and the differential pressure sensor is installed in the ductwork instead of piping.

Estimating the cost for this implementation is difficult as the number of valves that need to be replaced is not information normally discovered in the scope of this preliminary survey. However, the drive is frequently the largest component of the expense required to change from a constant flow to a variable flow system and the drives have already been installed. Therefore, the cost should remain relatively low, the energy savings high and the simple payback should be between 1-2 years. This measure represents one of the largest single opportunities for energy savings within AISD.

HVAC ECRM 2: SEAL EXHAUST FAN OPENINGS AT SOUTHSIDE GYMNASIUM

It was noted during the survey, that the abandoned exhaust fan penetrations at Southside's gymnasium have not been sealed (see picture to the right). *We recommend the district insulate and seal the exhaust fan penetrations in the ceiling of the gymnasium*. In addition to offering energy savings, this measure will significantly improve the comfort of the gymnasium during heating season by preventing the heat from going straight out through the roof

Estimated Cost: $1,000 *Estimated Savings: $2,000* *Estimated Payback: 1/2 Year*

HVAC ECRM 3: REPLACE ELECTRIC WATER HEATERS WITH GAS-FIRED ON-DEMAND UNITS

Southside ES was noted to have a 36kW and a 9kW electric water heater. The facility has natural gas on site.

Based on the rate schedules for AISD, natural gas costs $6.52 per MCF or
$6.52/ (1,030,000 BTUs/MCF * 80% efficiency) = 0.0000079126 per BTU.

Electricity costs $0.082889 per kWh or
$0.082889/ (3,413 BTUs/kWh * 100% efficiency) = $0.0000242863 per BTU

Therefore, electricity cost the district 3 times more ($0.0000242863 / $0.0000079126) than natural gas for equivalent amounts of energy.

We recommend the district install natural gas fired, on-demand water heaters to replace the 9 and 36kW water heaters currently in use.

Estimated Cost: $8,000 *Estimated Savings: $2,000* *Estimated Payback: 4 Years*

Lighting ECRM 1: RETROFIT OF T12 LIGHTING TO T8:

Westside Elementary is estimated to still have 20% of their light fixtures utilizing T12 lamps and magnetic ballasts. There are other smaller areas (portable building at Westside and some mechanical rooms throughout the district) that utilize T12 fixtures as well. 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 retrofit these fixtures at Westside with T8 lamps and electronic ballasts.*

Estimated Cost: $18,900   Estimated Savings: $3,150   Estimated Payback: 6 years

Lighting ECRM 2: METAL HALIDE FIXTURE RETROFIT TO T5

The gymnasium at Angleton HS has 36-400 watt metal halide fixtures and the Westside Elementary gymnasiums have an additional 54. 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 to improve overall light levels in the space and to allow the fixtures to be turned off during unoccupied periods of the day.*

Estimated Cost: $31,500   Estimated Savings: $6,300   Estimated Payback: 5 Years

Lighting ECRM 3: EXTERIOR LIGHT TIMECLOCK AND PHOTOCELL INSTALLATION

It was noted during the survey that several of the exterior lights at Southside Elementary were operating during the daytime hours. AISD staff reported that the existing timeclock gave them difficulties keeping the schedule maintained and that this condition did happen frequently. *We recommend replacing the existing timeclock to improve the reliability of the program maintenance and install a redundant photocell controller in the system to ensure lights did not operate during the day if scheduling difficulties with the timeclock did return.*

Estimated Cost: $2,000   Estimated Savings: $750   Estimated Payback: 2-2/3 Years

Controls ECRM 1: OCCUPANCY SENSOR INSTALLATION

The district is conducting an experiment at Frontier ES to see the benefits of occupancy sensors used to control the operation of light fixtures in the gymnasium. We recommend the use of occupancy sensors in gymnasiums with T5 fixtures, the type of fixture we recommend the district have installed in their gymnasiums (see Lighting ECRM #2), and recommend the district expand the installation of the occupancy sensors at all gymnasiums. Studies have shown that linear fluorescent fixtures offer energy savings 23 seconds after they have been turned off when considering the startup current required to turn the fixtures back on when the occupants return.

Estimated Cost: $600 per gym   Est. Savings: $300 per gym   Est. Payback: 2 Years

Controls ECRM 2: INSTALL VFD ON HOT WATER PUMP-2 AT SOUTHSIDE ES

It was noted during the survey that the HWP-2 did not have a VFD and the manual throttling valve was closed 50%. This indicates that the 40hp pump might be oversized for the distribution system. A VFD will offer energy savings as the pump can be operated at only the load required by the system and not at full speed pumping against a ½ way closed flow control valve. This measure will also require a differential pressure sensor be installed in the hot water distribution system as described in HVACECRM 1.

Estimated Cost: $11,900 Estimated Savings: $3,000 Estimated Payback: 3-2/3 Years

Controls ECRM 3: RETROCOMMISSION EXISTING BUILDING ENERGY MANAGEMENT SYSTEM

Angleton High School is essentially a new facility, yet it operates at the highest cost per square foot within the district. The facility has efficient equipment and state of the art control systems, yet the cost remain extremely high. Facilities with this condition are usually indicative of a control system that has not been well commissioned, a condition in which many of the control advantages of the DDC control system are not being realized. We recommend the district consider Retrocommissioning the system to identify the control issues limiting the savings available in the HVAC and lighting systems. Typically, poor control of the EMS is associated with the incorporation of hard and soft equipment overrides introduced into the control system by construction personnel, district maintenance and/or energy management staff that were never corrected or removed. These changes occur when staff members need to put overrides in the system in order to account for special events at the facility or to perform maintenance on the equipment. After the precipitating event is concluded, the override is not always removed from the system. Similarly, some problems in the HVAC system, like a faulty temperature sensor, can be masked by re-programming the settings for the device in software. These changes may or may not be restored after the faulty equipment is or is not repaired. After a given period of time, the only tool available to the district to identify and correct these types of issues is a retro-commissioning of the energy management system. This process works to identify changes implemented in the system and uncover the reason why the change was implemented. If the precipitating cause for the change can be repaired, the override can be removed and the facility can return to correct operational sequences. Retro-commissioning the system can eliminate unnecessary simultaneous heating and cooling processes that can occur during start-up or dehumidification processes outside the normal occupancy hours. The estimated cost includes retro-commissioning the Middle and High School as they are the campuses with the highest ECIs

Estimated Cost: $1,033,700 Estimated Savings: $344,570 Estimated Payback: 3 Years

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS

HVAC

- Experiment with higher cooling temperature setpoints
- Turn off water fountains during summer
- Seal ductwork connections at AHUs
- Turn off pilot lights during summer
- Eliminate re-heat during dehumidification

Lighting

- Turn off all light fixtures not required during daytime
- Turn off lights in unoccupied spaces
- De-lamp 3-lamp corridor fixtures

Controls

- Repair boiler control
- Put computers and/or monitors to sleep
- Install vending machine controls

Envelope

- Replace damaged or missing weatherstripping

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

The current cooling temperature setpoint at Westside ES is 70°F. The ASHRAE recommended setpoint is 76-78°F. Studies have shown up to 3% of conditioning costs can be saved for each degree the setpoint is raised. The district reports they have tried to raise the cooling setpoint in the past and received lots of complaints. We anticipate there were some other conditions which did not allow an increase in temperature setpoint to provide both energy savings and comfort for the occupants. There are no other school districts we have surveyed that have setpoints lower than 72°F and the occupants in those districts remain comfortable.

HVAC M&O #2

It was noted during the survey that the water fountain at the Frontier ES gymnasium is running during the summer vacation period while there are no occupants in the space. *We recommend this unit be turned off during the summer.*

HVAC M&O #3
The ductwork connections to one of the air handlers at the Main Mechanical Room were leaking significant quantities of supply air to the mechanical room space. *We recommend the ductwork connections be sealed to prevent leaks into unintended spaces.*

HVAC M&O #4
It was noted during the survey that pilot lights on the gas cooker in the Southside Kitchen were on during the summer break. This consumes small amounts of gas 24/7 throughout the summer and raises the ambient temperature in the Kitchen space unnecessarily. *Ultimately, we recommend the district replace all Kitchen equipment with pilot lights with new automatic ignition equipment.*

HVAC M&O #5
The dehumidification schedule the district operates during the summer is not differentiated from the conditioning cycle during the school year and therefore the system is operating boilers to allow for re-heat as the building is dehumidified. The only purpose for re-heat in a cooling process is to ensure cold air required to dehumidify the air is not distributed to spaces where students and teachers located directly under supply grills become cold. During unoccupied times such as start-up and dehumidification, there should be no simultaneous re-heat process to the cooling process and the boiler system can be turned off.

Lighting M&O #1
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 minor lighting control modifications or staff training. One of the schools demonstrating these opportunities is Southside Elementary. The classrooms in the 117+ classroom wing have 3-lamp fixtures producing 86 footcandles at the desktops when all of the lamps are on. The Illumination Engineering Society of North America (IESNA) recommends classroom spaces have 50 footcandles on the desktop. The classrooms have dual-switching which allows one switch in the space to control the two outboard lamps and a second switch controls the inboard only lamps in the fixtures. With the outboard-only switch turned on, the space has 65 footcandles on the desktops. Therefore, we recommend training staff not to turn both switches in these classrooms during the day, or if necessary, install photocell controls that only allow the inboard lamps to be turned on during evening occupancy hours.

Lighting M&O #2
The cafeteria at Southside is operating fixtures when nobody is in the space. We recommend turning off all fixtures in spaces where there is no occupancy.

Lighting M&O #3
The corridors at Angleton High (1st floor), Westside and Frontier have 3-lamp fixtures in some of the corridors. IESNA's recommendation for corridors is 5-10 footcandles. The 3-lamp fixtures are providing significantly more light; de-lamping these fixtures to two lamps will provide more than recommended light levels and reduce energy consumption by one lamp per fixture.

Controls M&O#1
The boiler system control was in noted to be in alarm and trying to initiate heating processes at Angleton High when the building was unoccupied. *We recommend the district not operate simultaneous heating and cooling processes, especially during primarily unoccupied times.*

Controls M&O#2
It was noted during the survey that some computers were on with no students in the building; the system is not allowing the monitor or the CPU to go to sleep. Computers consume considerable amounts of energy while in a screensaver mode. *We recommend the district implement a program that allows the computers, or at least the monitors, to go to "sleep" while not in use.*

Controls M&O#3
There were several vending machines noted around the district that had no controls installed. Vending machine controls utilize occupancy sensors to control operation of the system compressor and advertisement lighting throughout the day. The temperature to which the contents of the machine are allowed to elevate is programmable, therefore the compressor will cycle as much as necessary to satisfy consumers, but will minimize the operation of the system to produce energy savings. Lighting is kept off when the sensor does not detect occupancy in the area.

Envelope M&O#1
It was noted during the survey that the exterior doors opposite the Library at Southside had damaged or missing weatherstripping. This allows conditioned air to escape the building and contaminants to enter the building. *We recommend the district replace all damaged or missing weatherstripping.*

8.0 FINANCIAL EVALUATION

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

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

Proposal:	Perform recommended ECRMs			
Assumptions:				
1. Equipment will last at least 15 years prior to next renovation				
2. No maintenance expenses for first five years (warranty period)				
3. $5,000 maintenance expense next 5 years				
4. $10,000 maintenance expense next 5 years				
5. Savings decreases 5% per year after year 5				
Cash Flow	**Project Cost**	**Project Savings**	**Maintenance Expense**	**Net Cash Flow**
Time 0	($1,107,600)		0	($1,107,600)
Year 1		$ 362,070.00	0	$362,070
Year 2		$ 362,070.00	0	$362,070
Year 3		$ 362,070.00	0	$362,070
Year 4		$ 362,070.00	0	$362,070
Year 5		$ 362,070.00	0	$362,070
Year 6		$ 343,966.50	($5,000)	$338,967
Year 7		$ 325,863.00	($5,000)	$320,863
Year 8		$ 307,759.50	($5,000)	$302,760
Year 9		$ 289,656.00	($5,000)	$284,656
Year 10		$ 271,552.50	($5,000)	$266,553
Year 11		$ 253,449.00	($10,000)	$243,449
Year 12		$ 235,345.50	($10,000)	$225,346
Year 13		$ 217,242.00	($10,000)	$207,242
Year 14		$ 199,138.50	($10,000)	$189,139
Year 15		$ 181,035.00	($10,000)	$171,035
			Internal Rate of Return	**30.54%**

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

APPENDIX I: SUMMARY OF FUNDING AND PROCUREMENT OPTIONS

9.0 GENERAL COMMENTS

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

APPENDICES

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

SUMMARY OF FUNDING OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

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

LoanSTAR Program:

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

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

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

Loans on Commercial Market:

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

Leasing Corporations:

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

Bond Issue:

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

SUMMARY OF PROCUREMENT OPTIONS FOR CAPITAL EXPENDITURE PROJECTS

State Purchasing:

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

Design/Bid/Build (Competitive Bidding):

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

Design/Build:

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

Purchasing Standardization Method:

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

Performance Contracting:

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

Solution Center

How to Finance Your Energy Program

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

Selecting a Cost/Benefit Analysis Method

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

Simple Payback Analysis

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

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

Simple Payback

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

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

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

Life-Cycle Cost Analysis

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

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

continued

How to Finance Your Energy Program *continued*

Financing Mechanisms

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

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

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

Internal Funds

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

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

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

Debt Financing

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

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

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How to Finance Your Energy Program *continued*

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

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

Lease and Lease-Purchase Agreements

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

Energy Performance Contracts

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

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

Types of Leasing Agreements

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

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

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

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

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 KVA

AVAILABILITY
This schedule is applicable to Delivery Service for non-residential purposes at secondary voltage with demand greater than 10 kVA 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. Any Meter other than the standard Meter will be provided at an additional charge and/or will be provided by a Meter Owner other than the Company pursuant to Applicable Legal Authorities. 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, Construction Services, in this Tariff.

MONTHLY RATE

I. Transmission and Distribution Charges:

	Standard Class	Subclass Exception	
Customer Charge	$5.27	$0.00	per Retail Customer per Month
Metering Charge			
Non-IDR Metered	$31.86	$17.07	per Retail Customer per Month
IDR Metered	$116.89	$116.89	per Retail Customer per Month
Transmission System Charge			
Non-IDR Metered	$1.1027	$1.1027	per NCP kVA
IDR Metered	$1.4709	$1.4709	per 4CP kVA
Distribution System Charge	$3.118137	$3.118137	per Billing kVA

The following charges are applicable to both the Standard Class and the Subclass Exception

II.	**System Benefit Fund:**	See Rider SBF
III.	**Transition Charge:**	See Schedules TC, TC2, TC3 and SRC
IV.	**Nuclear Decommissioning Charge:**	See Rider NDC
V.	**Transmission Cost Recovery Factor:**	See Rider TCRF

TEXAS-NEW MEXICO POWER COMPANY
TARIFF FOR RETAIL DELIVERY SERVICE

6.1. Rate Schedules
Applicable: Entire Certified Service Area
Effective Date: February 1, 2011

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6.1.1.1.3 SECONDARY SERVICE (GREATER THAN 5 KW)

AVAILABILITY

This schedule is applicable to Delivery Service for non-residential purposes at secondary voltage with Demand greater than 5 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. Any Meter other than the standard Meter 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	$2.56	per ESI ID per month
	Metering Charge	$10.74	per ESI ID per month
	Transmission System Charge		
	Non-IDR Metered	$0.00	per NCP kW
	IDR Metered	$0.00	per 4CP kW
	Distribution System Charge		
	Non-IDR Metered	$ 6.0981	per NCP Billing kW
	IDR Metered	$ 5.2808	per NCP Billing kW
III.	**Transition Charge:**		Not Applicable
IV.	**Nuclear Decommissioning Charge:**		Not Applicable
V.	**Transmission Cost Recovery Factor:**		See Rider TCRF
VI.	**Other Charges or Credits:**		See Rider CMC See Rider CTC See Rider RCE-2 See Rider RCE-3 See Rider HCRF See Rider EECRF See Rider SCUD

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COMPANY SPECIFIC APPLICATIONS

Minimum Bill

Includes customer charge and metering charge per ESI ID per month.

Standard Secondary Voltage

Company's standard secondary voltages are described in Section 6.2.2, STANDARD VOLTAGES.

Power Factor (PF)

For average lagging Power Factors of less than 95% the measured Demand will be increased according to the following formula:

$$\frac{kW \times .95}{PF}$$

The average lagging power factor is determined using monthly metered kWh and kVARh data. The following formula is used to calculate the average lagging power factor for the billing month:

$$PF = \frac{kWh}{(kWh^2 + kVARh^2)^{1/2}}$$

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 minutes 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 minutes 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.

TEXAS-NEW MEXICO POWER COMPANY
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DETERMINATION OF BILLING DEMAND FOR DISTRIBUTION SYSTEM CHARGES

Determination of Billing kW

The Billing kW applicable to the "Distribution System Charge" shall be the higher of the NCP kW for the current billing month or 80% of the highest monthly NCP kW established in the 11 months preceding the current billing month (80% ratchet). The 80% ratchet shall not apply to Retail Seasonal Agricultural or Municipal Pumping Customers, or customers whose peak demand in the most current 12-month period is equal to or less than 20 kW.

NOTICE

This Rate Schedule is subject to the Company's Tariff and Applicable Legal Authorities.

APPENDIX IV - PRELIMINARY ENERGY ASSESSMENT SERVICE AGREEMENT

OFFICE OF THE COMPTROLLER ★ TEXAS ★

SECO State Energy Conservation Office

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 Angleton 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: [signature]
Date: 5-9-11
Name (Mr./Ms./Dr.) Stephen Davis
Title: Asst. Supt. of Operations
Organization: Angleton ISD
Phone: 979-481-0771
Street Address: 1900 N. Downing
Fax: 979-864-8738
Mailing Address: Angleton, TX 77515
E-Mail: sdavis@angletonisd.net
County: Brazoria

Contact Information:

Name (Mr./Ms./Dr.): Stephen Davis
Title: Asst. Supt. of Operations
Phone: 979-481-0771
Fax: 979-864-8738
E-Mail: sdavis@angletonisd.net
County: Brazoria

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, **Colby May**, ESA Energy Systems Associates, Inc. Phone: 512-258-0547, x124. **Fax: 512-388-3312.**

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.

Texas Energy Managers Association

SECO
State Energy Conservation Office

APPENDIX VI - UTILITY CHARTS ON CD