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Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

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Clear Creek Independent School District

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1.0 EXECUTIVE SUMMARY:

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

Program Administrator:	Stephen Ross
Phone:	512-463-1770
Address:	State Energy Conservation Office LBJ State Office Building 111 E. 17th Street Austin. Texas 78774

The service assists these public, non-profit institutions to take basic steps towards energy efficient facility operation. Active involvement in the partnership from the entire administration and staff within the agencies and institutions is critical in developing a customized blueprint for energy efficiency for their facilities.

In May, 2011, **SECO** received a request for technical assistance from Paul McLarty, Energy Manager for **Clear Creek 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 **Clear Creek ISD,** (hereafter known as CCISD) 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 *Jon Pinson, Kevin Harris, Director of Maintenance, and Danny Ravey*, Senior Coordinator for Maintenance and Operations, 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 **$154,450** may be saved annually if all recommended projects are implemented. The estimated installed cost of these projects should total approximately **$875,150**, yielding an average simple payback of **5-3/4** years.

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

SUMMARY:	IMPLEMENTATION COST	ESTIMATED SAVINGS	SIMPLE PAYBACK
CONTROLS ECRM #1	$60,000	$15,000	4 Years
HVAC ECRM #1	$309,250	$34,950	9 Years
HVAC ECRM #2	$25,000	$1,250	20 Years
HVAC ECRM #3	$200,000	$57,000	3-1/2 Years
HVAC ECRM #4	Beyond scope	Beyond scope	Beyond scope
HVAC ECRM #5	$250,000	$40,000	6-1/4 Years
Lighting ECRM #1	$3,000	$500	6 Years
Lighting ECRM #2	$600	$1,200	6 Months
Lighting ECRM #3	$27,300	$4,550	6 Years
TOTAL PROJECTS	**$ 875,150**	**$154,450**	**5-3/4 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 CCISD. 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., A Terracon Company James W. Brown (512) 258-0547

2.0 ENERGY ASSESSMENT PROCEDURE:

Involvement in this on-site analysis program was initiated through completion of a Preliminary Energy Assessment Service Agreement. This PEASA serves as the agreement to form a "partnership" between the client and the State Energy Conservation Office (SECO) for the purposes of energy costs and consumption reduction within owned and operated facilities. After receipt of the PEASA, an 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 CCISD, 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 CCISD 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	ENERGY STAR SCORE (FROM DISTRICT)
Greene ES	67,965	47%	$1.77	37%	37
League City ES	48,811	5%	$1.46	13%	48
Clear Lake Inter.	49,217	6%	$1.38	7%	51
Stewart ES	47,532	3%	$1.35	4%	46
Clear Creek Inter.	44,920	-3%	$1.27	-2%	38
Victory Lakes Inter.	46,916	1%	$1.27	-2%	48
Education Village	46,735	1%	$1.25	-3%	n/a - NEW
Gilmore ES	41,067	-11%	$1.23	-5%	52
Creekside Inter.	41,956	-9%	$1.21	-6%	49
Space Center Inter.	43,218	-7%	$1.19	-8%	48
North Point ES	39,409	-15%	$1.13	-13%	56
McWhirter ES	37,528	-19%	$1.00	-23%	48
Average Value:	46,273		$1.29		

Clear Creek ISD purchases electricity from Reliant Energy. The transmission and distribution utility is Centerpoint 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: Clear Creek ISD **BUILDING:** Clear Creek Int.

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	2011	143,629		0	0	14,790	89	582
FEBRUARY	2011	146,787		0	0	15,079	57	378
MARCH	2011	136,640		0	0	14,905	24	174
APRIL	2010	189,620		0	0	18,396	25	282
MAY	2010	215,681		0	0	20,542	26	295
JUNE	2010	183,072		0	0	17,943	24	277
JULY	2010	168,980		0	0	16,761	20	152
AUGUST	2010	220,893		0	0	21,059	20	151
SEPTEMBER	2010	170,041		0	0	17,336	20	157
OCTOBER	2010	158,354		0	0	16,247	25	181
NOVEMBER	2010	114,494		0	0	12,593	29	205
DECEMBER	2010	87,460		0	0	10,499	59	394
TOTAL		**1,935,651**	**0**	**0**	**0**	**$196,150**	**418**	**$3,228**

Annual Total Energy Cost = $199,378 Per Year

Total KWH x 0.003413 = 6,606.38 x 106
Total MCF x 1.03 = 430.54 x 106
Total Other x ____ x 106
Total Site BTU's/yr 7,036.92 x 106

Floor area: 156,655 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 44,920 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.27 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6136662	0	CenterPoint Energy	4679678-5

OWNER: Clear Creek ISD **BUILDING:** Clear Lake Int.

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	2011	154,196		0	0	16,600	151	1,111
FEBRUARY	2011	90,600		0	0	9,871	360	2,634
MARCH	2011	135,868		0	0	15,764	28	221
APRIL	2010	195,429		0	0	20,008	92	954
MAY	2010	221,195		0	0	22,474	60	617
JUNE	2010	162,160		0	0	16,776	39	413
JULY	2010	112,152		0	0	13,823	28	422
AUGUST	2010	255,535		0	0	25,009	17	430
SEPTEMBER	2010	225,367		0	0	22,859	44	362
OCTOBER	2010	188,273		0	0	19,671	53	438
NOVEMBER	2010	135,588		0	0	15,113	44	369
DECEMBER	2010	102,946		0	0	12,431	90	672
TOTAL		**1,979,309**	**0**	**0**	**0**	**$210,399**	**1,006**	**$8,643**

Annual Total Energy Cost = $219,042 Per Year

Total KWH x 0.003413 = 6,755.38 x 106
Total MCF x 1.03 = 1,036.18 x 106
Total Other x ____ x 106
Total Site BTU's/yr 7,791.56 x 106

Floor area: 158,310 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 49,217 BTU/s.f.yr

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

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6129017	0	CenterPoint Energy	4340744-4

OWNER: Clear Creek ISD **BUILDING:** Creekside Int.

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	2011	119,400		0	0	12,863	217	1,392
FEBRUARY	2011	109,600		0	0	12,275	126	813
MARCH	2011	105,600		0	0	12,090	51	340
APRIL	2010	171,600		0	0	17,529	50	550
MAY	2010	166,000		0	0	17,229	40	444
JUNE	2010	99,600		0	0	11,425	1	19
JULY	2010	118,400		0	0	12,882	10	88
AUGUST	2010	189,400		0	0	19,035	38	237
SEPTEMBER	2010	152,800		0	0	17,476	47	333
OCTOBER	2010	152,800		0	0	16,002	44	315
NOVEMBER	2010	95,600		0	0	11,220	46	312
DECEMBER	2010	69,600		0	0	9,361	66	434
TOTAL		**1,550,400**	**0**	**0**	**0**	**$169,387**	**736**	**$5,277**

Annual Total Energy Cost = $174,664 Per Year

Total KWH x 0.003413 = 5,291.52 x 106
Total MCF x 1.03 = 758.08 x 106
Total Other x ____ x 106
Total Site BTU's/yr 6,049.60 x 106

Floor area: 144,190 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 41,956 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.21 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6129000	0	CenterPoint Energy	4785047-4

OWNER: Clear Creek ISD **BUILDING:** Education Village

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	2011	680,945		0	0	73,054	1,065	6,762
FEBRUARY	2011	711,680		0	0	75,964	1,730	10,961
MARCH	2011	603,740		0	0	67,689	459	2,936
APRIL	2010	538,514		0	0	63,538	202	4,359
MAY	2010	477,441		0	0	60,290	100	1,083
JUNE	2010	574,158		0	0	67,045	168	1,840
JULY	2010	752,684		0	0	79,314	390	3,726
AUGUST	2010	1,015,442		0	0	102,787	796	5,388
SEPTEMBER	2010	885,462		0	0	92,579	672	4,555
OCTOBER	2010	849,504		0	0	88,481	546	3,705
NOVEMBER	2010	671,669		0	0	73,540	653	4,430
DECEMBER	2010	474,345		0	0	57,882	745	4,744
TOTAL		**8,235,584**	**0**	**0**	**0**	**$902,163**	**7,526**	**$54,489**

Annual Total Energy Cost = $956,652 Per Year

Total KWH x 0.003413 = 28,108.05 x 106
Total MCF x 1.03 = 7,751.78 x 106
Total Other x ____ x 106
Total Site BTU's/yr 35,859.83 x 106

Floor area: 767,298 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 46,735 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.25 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	7828214	0	CenterPoint Energy	8529221-7

OWNER: Clear Creek ISD **BUILDING:** Gilmore 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	2011	90,600		0	0	9,724	228	1,457
FEBRUARY	2011	90,600		0	0	9,871	13	98
MARCH	2011	77,400		0	0	9,278	13	139
APRIL	2010	115,800		0	0	12,215	13	160
MAY	2010	121,800		0	0	12,594	10	126
JUNE	2010	71,400		0	0	8,491	6	77
JULY	2010	67,800		0	0	8,551	11	92
AUGUST	2010	131,100		0	0	13,560	6	55
SEPTEMBER	2010	125,400		0	0	12,871	0	18
OCTOBER	2010	104,400		0	0	11,237	13	108
NOVEMBER	2010	79,500		0	0	9,734	36	246
DECEMBER	2010	64,800		0	0	7,937	58	383
TOTAL		**1,140,600**	**0**	**0**	**0**	**$126,063**	**407**	**$2,959**

Annual Total Energy Cost = $129,022 Per Year

Total KWH x 0.003413 = 3,892.87 x 106
Total MCF x 1.03 = 419.21 x 106
Total Other x ____ x 106
Total Site BTU's/yr 4,312.08 x 106

Floor area: 105,000 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 41,067 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.23 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6129007	0	CenterPoint Energy	4790969-2

OWNER: Clear Creek ISD **BUILDING:** Greene 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	2011	100,744		0	0	9,758	129	886
FEBRUARY	2011	92,178		0	0	9,033	198	1,347
MARCH	2011	99,482		0	0	9,685	44	323
APRIL	2010	105,934		0	0	10,396	45	532
MAY	2010	127,177		0	0	12,053	21	248
JUNE	2010	82,659		0	0	8,623	19	231
JULY	2010	81,235		0	0	8,538	0	14
AUGUST	2010	140,223		0	0	13,079	4	42
SEPTEMBER	2010	111,271		0	0	10,810	13	109
OCTOBER	2010	107,282		0	0	10,482	18	141
NOVEMBER	2010	96,931		0	0	9,583	30	246
DECEMBER	2010	79,183		0	0	8,366	89	620
TOTAL		**1,224,299**	**0**	**0**	**0**	**$120,406**	**610**	**$4,739**

Annual Total Energy Cost = $125,145 Per Year

Total KWH x 0.003413 = 4,178.53 x 106
Total MCF x 1.03 = 628.30 x 106
Total Other x ____ x 106
Total Site BTU's/yr 4,806.83 x 106

Floor area: 70,725 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 67,965 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.77 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6129009	0	CenterPoint Energy	4819354-4

OWNER: Clear Creek ISD **BUILDING:** League City 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	2011	44,640		0	0	5,769	113	731
FEBRUARY	2011	80,280		0	0	8,435	44	296
MARCH	2011	63,360		0	0	7,319	18	137
APRIL	2010	74,040		0	0	8,094	10	128
MAY	2010	89,040		0	0	9,474	10	120
JUNE	2010	88,440		0	0	9,618	4	57
JULY	2010	68,280		0	0	7,647	4	44
AUGUST	2010	75,000		0	0	8,004	6	59
SEPTEMBER	2010	103,440		0	0	10,802	9	79
OCTOBER	2010	89,760		0	0	9,592	11	95
NOVEMBER	2010	76,080		0	0	8,611	38	261
DECEMBER	2010	58,680		0	0	6,850	44	297
TOTAL		**911,040**	**0**	**0**	**0**	**$100,215**	**311**	**$2,304**

Annual Total Energy Cost = $102,519 Per Year

Total KWH x 0.003413 = 3,109.38 x 106
Total MCF x 1.03 = 320.33 x 106
Total Other x ____ x 106
Total Site BTU's/yr 3,429.71 x 106

Floor area: 70,265 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 48,811 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.46 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6139368	0	CenterPoint Energy	4843397-3

OWNER: Clear Creek ISD **BUILDING:** McWhirter 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	2011	119,306		0	0	12,533	75	509
FEBRUARY	2011	110,926		0	0	12,002	224	1,485
MARCH	2011	122,988		0	0	12,913	40	278
APRIL	2010	145,215		0	0	14,724	252	2,784
MAY	2010	185,617		0	0	17,561	38	431
JUNE	2010	183,651		0	0	17,022	19	227
JULY	2010	177,402		0	0	16,612	13	158
AUGUST	2010	217,420		0	0	20,093	9	81
SEPTEMBER	2010	166,020		0	0	15,789	23	181
OCTOBER	2010	148,447		0	0	14,428	30	232
NOVEMBER	2010	104,443		0	0	11,101	35	262
DECEMBER	2010	86,366		0	0	9,731	0	301
TOTAL		**1,767,801**	**0**	**0**	**0**	**$174,509**	**758**	**$6,929**

Annual Total Energy Cost = $181,438 Per Year

Total KWH x 0.003413 = 6,033.50 x 106
Total MCF x 1.03 = 780.74 x 106
Total Other x ____ x 106
Total Site BTU's/yr 6,814.24 x 106

Floor area: 181,577 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 37,528 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.00 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6129014	0	CenterPoint Energy	4777997-0

OWNER: Clear Creek ISD **BUILDING:** North Point 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	2011	88,704		0	0	8,887	10	87
FEBRUARY	2011	74,880		0	0	7,889	35	274
MARCH	2011	119,520		0	0	11,353	7	63
APRIL	2010	100,512		0	0	9,348	38	399
MAY	2010	135,648		0	0	12,217	5	68
JUNE	2010	61,632		0	0	6,832	12	138
JULY	2010	63,360		0	0	6,962	2	39
AUGUST	2010	133,056		0	0	12,657	4	(55)
SEPTEMBER	2010	103,392		0	0	10,143	4	49
OCTOBER	2010	95,040		0	0	10,108	8	78
NOVEMBER	2010	87,264		0	0	9,532	9	84
DECEMBER	2010	76,320		0	0	8,709	10	92
TOTAL		**1,139,328**	**0**	**0**	**0**	**$114,637**	**144**	**$1,316**

Annual Total Energy Cost = $115,953 Per Year

Total KWH x 0.003413 = 3,888.53 x 106
Total MCF x 1.03 = 148.32 x 106
Total Other x ____ x 106
Total Site BTU's/yr 4,036.85 x 106

Floor area: 102,435 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 39,409 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.13 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6136722	0	CenterPoint Energy	4261018-8

OWNER: Clear Creek ISD **BUILDING:** Space Center Int

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	2011	122,024		0	0	13,475	126	933
FEBRUARY	2011	0		0	0	0	429	3,138
MARCH	2011	118,311		0	0	13,560	74	554
APRIL	2010	171,016		0	0	17,862	100	1,037
MAY	2010	196,818		0	0	19,835	30	322
JUNE	2010	169,454		0	0	17,863	28	302
JULY	2010	114,278		0	0	13,109	21	230
AUGUST	2010	172,012		0	0	17,461	9	87
SEPTEMBER	2010	234,039		0	0	22,909	25	214
OCTOBER	2010	175,518		0	0	18,372	29	246
NOVEMBER	2010	171,448		0	0	17,708	31	262
DECEMBER	2010	118,005		0	0	13,534	80	599
TOTAL		**1,762,923**	**0**	**0**	**0**	**$185,688**	**982**	**$7,924**

Annual Total Energy Cost = $193,612 Per Year

Total KWH x 0.003413 = 6,016.86 x 106
Total MCF x 1.03 = 1,011.46 x 106
Total Other x ____ x 106
Total Site BTU's/yr 7,028.32 x 106

Floor area: 162,625 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 43,218 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.19 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6151561	0	CenterPoint Energy	4171646-5

OWNER: Clear Creek ISD **BUILDING:** Stewart 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	2011	66,750		0	0	7,663	208	1,370
FEBRUARY	2011	66,097		0	0	7,637	171	1,126
MARCH	2011	65,444		0	0	7,610	11	86
APRIL	2010	81,796		0	0	8,831	10	124
MAY	2010	104,675		0	0	10,701	9	111
JUNE	2010	87,585		0	0	9,528	3	43
JULY	2010	57,458		0	0	7,159	1	18
AUGUST	2010	95,484		0	0	10,087	0	18
SEPTEMBER	2010	123,403		0	0	12,327	5	52
OCTOBER	2010	102,836		0	0	10,415	6	58
NOVEMBER	2010	88,004		0	0	9,286	7	65
DECEMBER	2010	67,533		0	0	7,672	68	463
TOTAL		**1,007,065**	**0**	**0**	**0**	**$108,916**	**499**	**$3,534**

Annual Total Energy Cost = $112,450 Per Year

Total KWH x 0.003413 = 3,437.11 x 106
Total MCF x 1.03 = 513.97 x 106
Total Other x ____ x 106
Total Site BTU's/yr 3,951.08 x 106

Floor area: 83,125 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 47,532 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.35 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6153080	0	CenterPoint Energy	4623011-6

OWNER: Clear Creek ISD **BUILDING:** Victory Lakes Int.

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	2011	111,424		0	0	13,243	282	1,801
FEBRUARY	2011	167,373		0	0	17,467	482	3,060
MARCH	2011	153,504		0	0	16,997	103	673
APRIL	2010	164,632		0	0	17,325	45	503
MAY	2010	191,556		0	0	19,518	42	463
JUNE	2010	204,259		0	0	20,475	19	227
JULY	2010	127,233		0	0	14,534	4	62
AUGUST	2010	142,831		0	0	15,606	5	50
SEPTEMBER	2010	212,757		0	0	21,834	33	240
OCTOBER	2010	215,453		0	0	20,798	36	261
NOVEMBER	2010	192,379		0	0	19,578	63	444
DECEMBER	2010	147,558		0	0	16,825	173	1,219
TOTAL		**2,030,959**	**0**	**0**	**0**	**$214,200**	**1,287**	**$9,003**

Annual Total Energy Cost = $223,203 Per Year

Total KWH x 0.003413 = 6,931.66 x 106
Total MCF x 1.03 = 1,325.61 x 106
Total Other x ____ x 106
Total Site BTU's/yr 8,257.27 x 106

Floor area: 176,000 s.f.

Energy Use Index:
Total Site BTU's/yr / Total Area (sq.ft.) = 46,916 BTU/s.f.yr

Energy Cost Index:
Total Energy Cost/yr / Total Area (sq.ft.) = $1.27 $/s.f. yr

Electric Utility	Account #	Meter#	Gas Utility	Meter #
Reliant Energy	6139378	0	CenterPoint Energy	4732201-1

4.0 RATE SCHEDULE ANALYSIS:

ELECTRICITY PROVIDER:

RETAIL ELECTRIC PROVIDER: Reliant Energy Contract price: $0.07081 per kWh

TRANSMISSION AND DISTRIBUTION UTILITY: Centerpoint Energy

Electric Rate: Secondary Service > 10 kVA

I.	TRANSMISSION AND DISTRIBUTION CHARGES:		
	Customer Charge	=	$5.27 per meter
	Metering Charge	=	$116.89 per Month
	Transmission System Charge	=	$1.4709 per 4CP kVA
	Distribution System Charge	=	$3.118137 per Billing kVA
II.	SYSTEM BENEFIT FUND	=	$0.000657 per kWh
III.	TRANSITION CHARGES		
	Transition Charge 1	=	$0.636156/kVA
	Transition Charge 2	=	$1.113893/kVA
	Transition Charge 3	=	$0.455734/kVA
IV.	NUCLEAR DECOMMISSIONING CHARGE	=	$0.008909 per kVA
V.	TRANSMISSION COST RECOVERY FACTOR	=	$0.618334/kVA
VI.	COMPETITIVE METERING CREDIT	=	$15.69 per Customer
VII.	OTHER CHARGES		
	a. Municipal Account Franchise Credit	=	$-0.002207 per kWh
	b. Rate Case Expenses Surcharge	=	$15.69 per Customer
	c. Rider UCOS Retail Credit	=	$-0.016314 per kVA
	d. Advanced Metering System Surcharge	=	$3.16 per Non-IDR Meter
	e. Energy Efficiency Cost Recovery Factor	=	$3.30/Customer per Month
	f. ADFIT Credit	=	$-0.056777 per kVA
VIII.	SYSTEM RESTORATION CHARGE	=	$0.153885 per kVA
IX.	TAXES		
	Reimbursement of Misc. Gross Receipts Tax/Fee	=	1.997%
	Reimbursement of UDC PUC Gross Receipts	=	0.167%
X.	UTILITY SERVICE DISCRE-UCS CREDIT	=	$-0.01227765
XI.	GROSS RECEIPTS TAX	=	.1997% Of All T&D Charges

Average Savings for consumption = $0.07081/kWh + $0.000657/kWh + $-0.00207/kWh = **$0.069397/kWh**

Average Savings for demand = $1.4709 + $3.118137 + $0.636156 + $1.113893 + $0.455734 + $0.008909 + $0.618334 + $-0.016314 + $-0.056777 + $0.153885 **= $ 7.502857/kVA****

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

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

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: $110,345

Total quantity purchased during the analyzed billing cycle: 14,684 MCF

Average cost per MCF = Cost of natural gas / quantity purchased = $110,345 / 14,684 MCF

Average cost per MCF = $7.52

5.0 CAMPUS DESCRIPTIONS:

Clear Creek ISD consists of 45 educational campuses (9 High Schools, 10 Middle Schools and 26 Elementary Schools) which are located in Harris and Galveston Counties; in and throughout the cities of El Lago, Kemah, Nassau Bay, Seabrook, Taylor Lake Village, Webster, Friendswood, Pasadena, League City, Pasadena, Pearland, Houston and Clear Lake Shores. The energy survey focused on twelve of the educational campuses:

Table 2: School Facilities Analyzed For This Report

Facility	Approx Square Footage	Basic HVAC Cool/Heat	Basic HVAC Air Distribution	Basic Lighting System Description	Basic Control System Description
Clear Lake Intermediate	158,310	Air cooled chiller/boiler / rooftop unit near Admin	AHU / RTU	T8/Metal Halide	Novar DDC
North Point ES	102,435	Water cooled chillers/Boilers	MZAHU (no VAV)	T8	Novar DDC
Space Center Intermediate	162,625	Water cooled chillers/Boilers	MZAHU / duct HW reheat	T8	ALC DDC Full Control
Creekside Int.	144,190	Water Source Heat Pumps	AHU	T8	Andover (4 zones); ALC schedule
Gilmore ES	105,000	Turbocore chillers/ Boilers	MZAHU	T8	ALC DDC
Clear Creek Intermediate	156,655	Water Source Heat Pumps	AHU	T8 / T12 in corridors	Andover Controls / Conventional Thermostat
Stewart ES	83,125	Air cooled chiller/DX at cafe/stage	MZAHU / AHU for cafe and stage	T8	Novar DDC
Victory Lakes Int	176,000	Water cooled chillers/Boilers	MZAHU	T8	ALC DDC
League City Intermediate	70,265	Primarily Water Source Heat Pumps	AHUs	T8 / MH at Library	Novar DDC
McWhirter ES	181,577 / 950 students	Water Source Heat Pumps / air cooled chiller / DX at Gym	AHUs, some electric heat	T12/T8 Lighting	ALC Start/Stop with pneumatics
Greene ES	70,725	Air cooled chillers/gas boilers/DX at Admin	4-pipe FCUs/ AHU at Kitchen	All T8 but Gym = T12	ALC Start/Stop with pneumatics
Mossman ES	n/a	Water cooled chillers/Boilers	MZAHU (pressure problems)	T8	ALC DDC

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:

CONTROLS ECRM 1: INSTALLATION OF IP ADDRESSABLETHERMOSTATS AT PORTABLES

It was reported during the survey that CCISD has already initiated plans to install IP Addressable thermostats at their portable buildings. There are currently about 150 portable buildings not under energy management system control within the district. Seventy-five of these buildings are scheduled to be retrofit with new thermostats this summer and the remainder in 2012. *We concur with the district's plans and recommend the project continue as planned.*

Estimated Cost: $60,000	*Estimated Savings: $15,000*	*Estimated Payback: 4 Years*

HVAC ECRM #1: RENOVATION OF AGED HVAC EQUIPMENT

It was noted during the survey that several pieces of equipment have reached the end of their useful life expectancy. We recommend this equipment be included in subsequent maintenance budgets to be replaced as planned equipment upgrades in order to avoid the higher cost of emergency replacement when they inevitably fail.

Clear Lake Intermediate

The space heating water at this facility is a 1973 Cleaver Brooks 3-1/2 MMBTUh 2-stage boiler. When new, the anticipated efficiency of this boiler was 80%. *We recommend the district install two modular condensing boilers.* These modular boilers have efficiencies of up to 98% and can be staged to meet the heat load conditions so a significant amount of energy savings is possible with the new system.

Estimated Cost: $50,000	*Estimated Savings: $4,500*	*Estimated Payback: 11-1/4 Years*

Space Center Intermediate

The portable buildings at this facility have Through-The-Wall (TTW) units, some of which are over 15 years old and have surpassed their anticipated useful life. As such, they are not operating efficiently and are suspect to high maintenance costs in the near future. We recommend these units be replaced with split system units that offer significant energy efficiency improvements even over new TTW units.

Estimated Cost: $8,750 per portable	*Est Savings: $1,200*	*Est Payback: 7-1/3 Years*

Clear Creek Intermediate

The Evapco cooling tower at CCI serves as the backbone for the water source heat pump HVAC system. The fill is in poor condition and the tower leaks significant amounts of water which leads to high chemical treatment and make-up costs. *We recommend the tower be replaced with a stainless steel unit for maximum life expectancy.*

Estimated Cost: $62,500	*Estimated Savings: $6,250*	*Estimated Payback: 10 Years*

Stewart Elementary

This 1996 built facility has two Trane 30HB10530 chillers that were installed at the time the building was constructed. At 25 years old, they have reached the end of their anticipated useful life. *We recommend the chillers be replaced with new oil free centrifugal chillers, equal or similar to the ones already in operation at Gilmore Elementary.*

Estimated Cost: $160,000	*Estimated Savings: $20,000*	*Estimated Payback: 8 Years*

McWhirter Elementary

Two of the air handlers at McWhirter are 1986 Carrier 40FS220310 unit with 51amps (230V/ 3ø, 20 kW)) of electric heat. *We recommend the air handler be replaced with a new unit that utilizes hot water re-heat or a natural gas-fired heating coil. The modifications to alternative heating strategies can be combined with ECRM-4 in which the old Library area system is recommended to be replaced.*

Estimated Cost: $28,000	*Estimated Savings: $3,000*	*Estimated Payback: 9-1/3 Years*

Summary of HVAC ECRM-1:

Estimated Cost: $279,250	***Estimated Savings: $32,600***	***Estimated Payback: 8-1/2 Years***

HVAC ECRM #2: PROVIDE SEPARATE DX SYSTEMS FOR AFTER-HOUR ZONES

It was noted during the survey that areas in facilities with frequent after-hour activities are not always zoned with redundant DX systems that would allow the central systems to be turned off after normal occupancy hours have concluded. Some facilities, like Greene ES, do have these types of systems. *We recommend the district consider installing these redundant systems at central system schools where they do not currently exist.* One example of this condition is Stewart ES, where a redundant system is installed for the Cafeteria and Stage, but the Kitchen was left off. Therefore the central system has to start at 5:30 in the morning to pre-condition the Kitchen where it could remain off until 6:30 or 7:00 if the Kitchen had a separate system.

Having redundant systems in areas that do not adhere to traditional occupancy schedules, would allow the energy management system to turn the central systems off earlier each day and could allow them to stay off all day during the summer whenever custodial and dehumidification activities were not required. The cost estimate below is to supply and install a 10-ton redundant system at one school that does not currently have this asset. The payback reflected is slightly longer than the efficiency advantages would implicate due to the relatively short runtimes for the unit(s).

Estimated Cost: $25,000	*Estimated Savings: $1,250*	*Estimated Payback: 20 Years*

HVAC ECRM 3: RECOMMISSION CHILLED AND HOT WATER DISTRIBUTION PIPING

Several facilities were noted to have the manual throttling valves at the air handlers at least partially, and some almost completely, closed. The condition was wide-spread but the configuration of the equipment and piping involving the closed valve was not always consistent. In some cases, the valve was throttled back and was the only valve installed on that particular pipe. At other times, the valve was adjacent to an automated control valve in the system. Occasionally the closed valve was on air handler piping (as pictured to the right) and at other times it was on piping associated with a pump. The equipment occasionally had Variable Frequency Drives (VFDs) installed in the system; other times there was no VFD.

There are generally two reasons that a manual valve may be closed in a water distribution system including VFDs. One is that the Belimo control valve in the piping with the manual control valve may have flow limitations for it to work properly. If the water piping was oversized it would allow too much flow for the Belimo to work correctly and throttling the manual valves is required for the system to operate predictably. The other is that the valves were closed as part of a test and balance exercise and never returned to full open position. Having the manual valves in a partially closed position introduces an artificially high differential pressure measurement within the equipment room and an artificially low differential pressure reading in the main branch piping. The artificially low reading forces the secondary chilled water pumps to operate at higher power consumption than if the differential pressure was accurately sampled. Therefore, we recommend the district perform a test and balance of the water-side system. Adjusting the valve positions correctly will allow the VFDs to modulate chilled and hot water pumps' power requirements to actual load conditions and will result in pump savings for the facility.

If there is not a VFD in the system, then the valve may have been inadvertently left closed after some work was done on the system, or to ensure proper flow through an overly sized piping system. Piping systems are often sized to allow for expansion in capacity for future additions or as a means to insure proper flows are obtained after a new system has been installed but can cause flow issues if flow control valves are not utilized.

Our recommendation is for the district to retro-commission the systems where these valves are inexplicably closed so that the system may operate at optimum efficiency.

Estimated Cost: $200,000	*Estimated Savings: $57,000*	*Estimated Payback: 3-1/2 Years*

HVAC ECRM 4: UPGRADE ENERGY MANAGEMENT SYSTEMS

Several schools were noted to operate with a combination of electronic energy management systems and pneumatic thermostats and controls. We recommend retrofitting the existing energy management systems to full DDC (Direct Digital Control) systems. To achieve the full benefit of these new DDC systems, we recommend the district involve two steps:

Controls ECRM 1a: Replace pneumatic controls with DDC systems

Pneumatic controls require operation of an air compressor and are inherently cost intensive systems to maintain. Some of the pneumatic controllers were noted to be disabled and may or may not have been appropriately capped off when they were disabled. Converting the systems to DDC will allow the air compressor to be abandoned and, if appropriately commissioned, will result in significant energy savings for the district.

Controls ECRM 1b: Minimize system run schedules.

Currently, the district's EMCS is typically programmed to allow HVAC systems to operate 10 to 12 hours per day. Many of the facilities are only occupied from 7:30am to 3:45pm. There is significant energy savings available by limiting the HVAC system operation to times coinciding with occupancy schedules. For Elementary and Middle Schools, we recommend limiting operation of the systems to 7:30am to 4:00pm; for High Schools, we recommend limiting operation to 7:30am to 6:00pm. There are custodial and extracurricular activities that occur outside these hours, but in most cases, the residual heating or cooling should be adequate to provide at least minimal comfort for these occupants during these extended hours.

Estimated Cost and Annual Savings beyond scope of this report……

HVAC ECRM 5: REPLACE LIBRARY AREA HVAC SYSTEM AND DISTRIBUTION PIPING

McWhirter Elementary used to be two separate schools that were later combined into one facility. Consequently, the HVAC system is composed of multiple types that vary in age, coverage and efficiency: DX units at the gymnasium, ground source heat pumps, air-cooled chillers and gas-fired boilers, multi-zone air handlers and Packaged Terminal Air Conditioners (PTACs). There are 4-pipe and 2-pipe distribution systems in different areas of the campus.

The Library area of McWhirter is an area with two different systems, a 2-pipe distribution system for air cooled chillers and an exterior boiler and a cooling tower (pictured to the right) for ground source heat pumps that serve about 10 classrooms. The piping and equipment is all over 15 years old and in poor condition. *We recommend the district replace both systems with a new ground source heat pump system.*

Estimated Cost: $250,000 Estimated Savings: $40,000 Estimated Payback: 6-1/4 Years

Lighting ECRM 1: RETROFIT OF T12 LIGHTING TO T8:

It was noted during the survey that some areas still utilize T12 components in their linear fluorescent lighting fixtures. One such area was Clear Creek Intermediate where there are U-lamp T12 fixtures in the corridor and 2-lamp T12 fixtures in the mechanical rooms. 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 the fixtures at these facilities with T8 lamps and electronic ballasts.*

Estimated Cost: $3,000	Estimated Savings: $500	Estimated Payback: 6 years

Lighting ECRM 2: OCCUPANCY SENSOR INSTALLATION AT GYM

Creekside Intermediate has T8 fixtures in the gymnasium, but they were found operating while the space was unoccupied. The first line of defense for the district to eliminate unnecessary fixture operation is to conduct staff training to turn lights off as the last occupant leaves the room. Studies have shown that linear fluorescent fixtures, the type of fixture most often found in classrooms, 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. If the training is unsuccessful in changing the behavior of the occupants, then automatic means of turning off the lights, most commonly occupancy sensors, can be employed to perform the task. *We recommend installing occupancy sensors to ensure the lights are off when nobody is in the space*.

Estimated Cost: $600	Estimated Savings: $1,200	Estimated Payback: 6 months

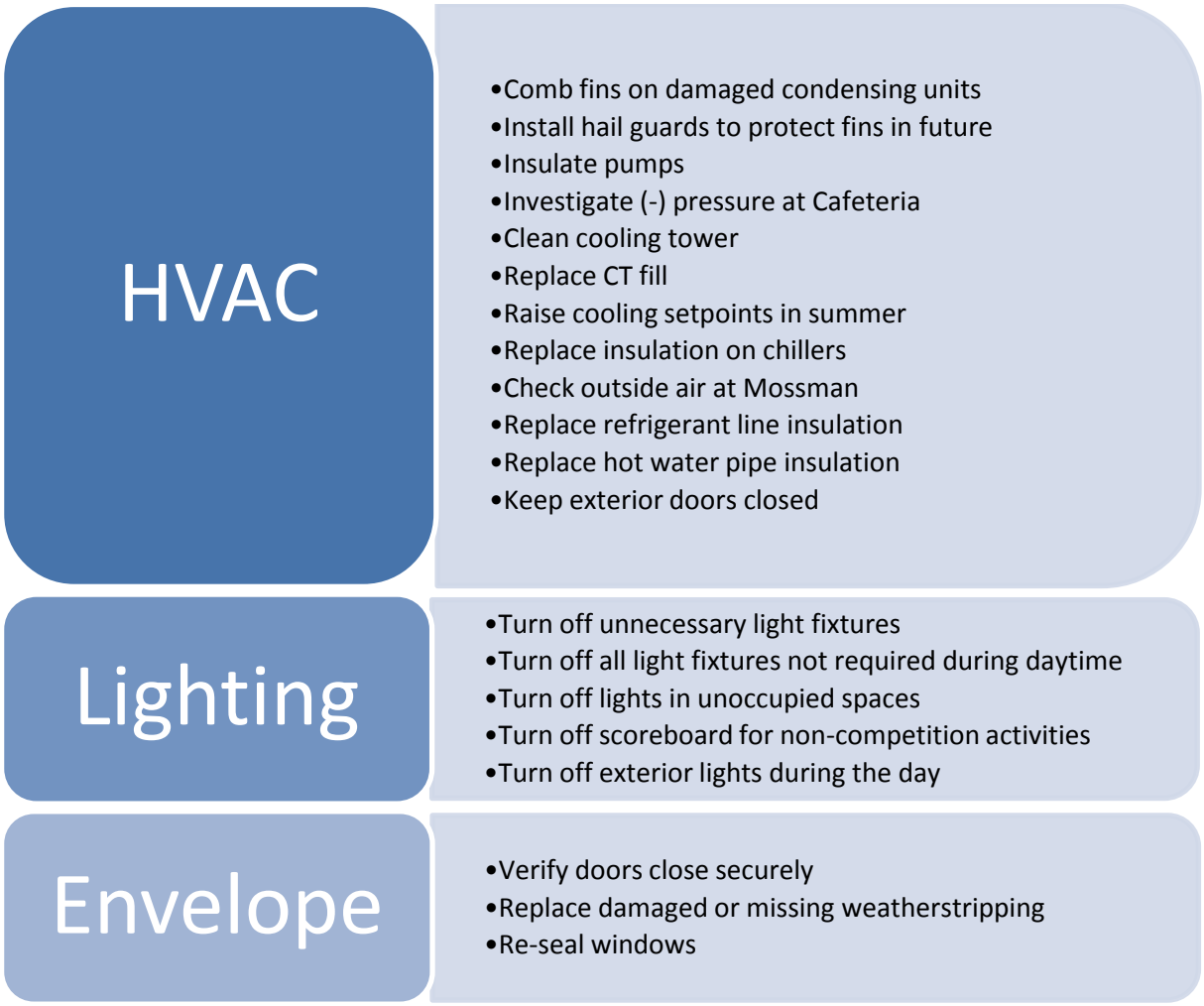
Lighting ECRM 3: METAL HALIDE FIXTURE RETROFIT TO T5

There were several areas noted to utilize metal halide fixtures. 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 400 watt metal halides with 6-lamp T5 high-bay fixtures and 250 watt metal halides with 4-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.* The following areas were noted to have metal halide fixtures:

Facility	Location	Quantity
Clear Lake Intermediate	Cafeteria	35
Clear Creek Intermediate	Cafeteria	18
McWhirter	Gym	19
Bauerschlag	Library	6

Estimated Cost: $27,300	Estimated Savings: $4,550	Estimated Payback: 6 Years

7.0 MAINTENANCE AND OPERATION RECOMMENDATIONS



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

HVAC M&O #1, #2

At CCISD, one of the M&O opportunities involves combing the condenser fins [combs available for less than $10] on air-cooled equipment. Equipment with damage to just 10% of the coil fins can result in a loss of operating efficiency of up to 30% as the equipment can no longer adequately dissipate heat to the atmosphere. The installation of coil guards prevents future fin combing, which is ultimately a combination of deferred labor savings for eliminating the need for maintenance personnel to perform the task and energy savings resulting from the units

maintaining optimum operating efficiency. *We recommend installing hail guards on the units that do not currently have them to prevent future coil fin damage.* This condition was noted at the Bauerschlag Gymnasium unit and the air cooled chillers at Clear Lake Intermediate (pictured to the right).

HVAC M&O #3

At Clear Lake Intermediate, there are two 10hp chilled water pumps that are not fully insulated. *We recommend the district install the missing insulation to prevent the chilled water piping from absorbing heat from the mechanical space.*

HVAC M&O #4

Mossman ES, constructed in 2009, is part of the Education Village project, along with Bayside Intermediate and Clear Falls HS that were built in 2010. There has been a history of humidity and air balance issues in the Cafeteria and Kitchen spaces since the school was constructed. Design documents show that the Kitchen air handler exhausts 13,800 CFM of return air and brings in 8,000 CFM of outside air. Kitchen spaces should remain slightly negative to surrounding spaces so that odors do not infiltrate the building from the Kitchen space. The outside air duct, shown in the picture to the right, is approximately 12"x12". 8,000 CFM of air in this size duct would travel at 8500 feet per minute and have a friction loss of 7" of water per 100' of duct. This represents a large amount of static pressure and it is doubtful the design quantity of outside air is making it to the unit. Therefore, the 5,800 CFM difference of outside air to exhaust air is likely even greater than design conditions would indicate. The mechanical room is definitely under a severe negative pressure as can be evidenced when the mechanical room is attempted to be opened. While not experienced at the time of the survey, the staff reports at times, occupants in the cafeteria can feel and hear a change in pressure when the mechanical room door down an adjacent hall is opened. At one point last year, mold was discovered growing across the tile floor ½-way into the Cafeteria from the Kitchen.

In addition to the high negative pressure condition in the mechanical room, many of the manual control valves on the Kitchen and Cafeteria air handlers are throttled down (see picture to the right); some of the valves are almost closed completely closed. This condition slows down the flow of the chilled water through the coil which limits the ability for the unit to maintain setpoint and dehumidify the supply air. The district reports that these units have a difficult time keeping the space at design temperature.

We recommend the district hire an independent third party to re-commission the air and water systems for the Kitchen and Cafeteria areas at Mossman ES.

HVAC M&O #5

Some of the cooling towers were noted to be dirty and need to be cleaned. The cooling towers at Space Center Intermediate and Creekside (see picture to the right) were specifically noted about this condition. *We recommend these towers be cleaned.*

HVAC M&O #6

In addition to being dirty, the cooling tower at Gilmore needs to have its fill replaced. The existing condition of the fill is inhibiting the tower from rejecting as much heat as designed for the system.

HVAC M&O #7

The current cooling temperature setpoint for the HVAC system at Clear Creek Intermediate is 69°F. We recommend raising the temperature setpoint as much as possible yet still provide comfort for the majority of occupants during the school year. Especially in the summer months, the setpoint could be raised to 74 or 75°F and still provide adequate comfort for the few staff present at the facility. Studies indicate that the district can save 2-3% of the electricity costs for every degree that the cooling setpoint is raised.

HVAC M&O #8

The current chilled water temperature setpoint (CHWTSP) for the chilled water system at Victory Lakes is 44°F; the CHWTSP for Mossman is 42°F. Similar to the recommendation in M&O #7, we recommend the summer chilled water setpoint be raised to 46°F at these schools.

HVAC M&O #9

When manual pressure was placed on the chiller barrel insulation at Victory Lakes, there was significant water seepage from the depressed area. The insulation is not in direct contact with the chiller barrel and condensation on the barrel is collecting in the interstitial spaces of the insulation and minimizing the insulation's effectiveness on the chiller. *We recommend the existing insulation be removed, the barrel dried completely and new insulation be installed.*

HVAC M&O #10

There were air cooled systems that were noted to have damaged or missing refrigerant line insulation. This condition allows the refrigerant to absorb heat from the exterior space and minimizes the unit's ability to condition the space. This condition was noted on the 20-ton condensing units at McWhirter Gymnasium. *We recommend the insulation on the refrigerant line be replaced.*

HVAC M&O #11

It was noted during the survey that some of the hot water piping had damaged or missing insulation. The majority of the energy losses in a hot water system occur through the piping. This condition was specifically noted at Bauerschlag and Greene ES. *We recommend the insulation be installed or replaced as necessary.*

Lighting M&O #1

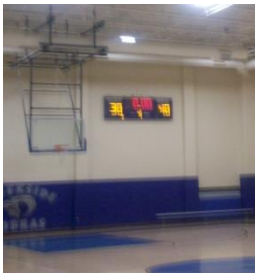
Some areas of the buildings noted in Section 6.0 of the report have windows, skylights, or light wells that are providing natural daylight into spaces but the light fixtures are still operating during the daytime hours. Examples of the fixtures that can be turned off during the daytime are:

Facility	Quantity	Description
North Point	4	uplight fixtures at skylight
Victoria Lakes	10	T8 U-lamp fixtures Lobby
McWhirter	n/a	window corridor fixtures
Clear Lake Int.	6	CFL Lobby recessed can lights
Clear Lake Int.	29	window lined corridor fixtures
Space Center Int	n/a	cafeteria lights

We recommend the district train staff to not turn these fixtures on during daytime hours, or the district can install photocells that prevent these fixtures from operating during sunny days.

Lighting M&O #2

It was noted during the survey that the scoreboard at Creekside Intermediate was on while a standard PE class was occurring. The activity did not require the scoreboard and therefore *we recommend that the scoreboard be kept off when there is not a competition event occurring.*



Lighting M&O #3

At Gilmore ES, it was noted that the corridor fixtures have 3-lamps operating in the fixtures. The Illumination Engineering Society of North America (IESNA) recommends that school corridors have 10-15 footcandles for safe activity. These light levels can be more than adequately met with just 2 lamps in each fixture, therefore *we recommend the district de-lamp the corridor fixtures by one lamp each fixture.*

Lighting M&O #4

At Bauerschlag, the exterior sconces on the Library wall were noted to be operating during daytime hours. We recommend the photocell or timeclock that is supposed to control the fixtures during daytime hours be repaired.

Envelope M&O #1

It was noted during the survey that a set of exterior doors (pictured to the right) at Creekside Intermediate were not closing tightly and other door sets were propped open while the HVAC system was operating. Both of these conditions allow conditioned air to escape and non-conditioned air and contaminants to enter the building. *We recommend ensuring doors close properly and doors are not propped open while the HVAC system operates.*

Envelope M&O #2

There were sets of exterior doors at North Pointe and McWhirter Elementaries with damaged or missing weatherstripping. Missing weatherstripping (see picture to the right) has similar problems as the poor door closing listed above, but additionally makes it difficult to maintain the appropriate slightly positive pressure within the building during occupied hours.

Envelope M&O #3

There were four 4'x8' windows across from the Gym (see picture at right) at North Pointe ES that had poor seals between the frames and the glass. *We recommend replacing the seals at these windows.*

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	($875,150)		0	($875,150)
Year 1		$ 154,450.00	0	$154,450
Year 2		$ 154,450.00	0	$154,450
Year 3		$ 154,450.00	0	$154,450
Year 4		$ 154,450.00	0	$154,450
Year 5		$ 154,450.00	0	$154,450
Year 6		$ 146,727.50	($5,000)	$141,728
Year 7		$ 139,005.00	($5,000)	$134,005
Year 8		$ 131,282.50	($5,000)	$126,283
Year 9		$ 123,560.00	($5,000)	$118,560
Year 10		$ 115,837.50	($5,000)	$110,838
Year 11		$ 108,115.00	($10,000)	$98,115
Year 12		$ 100,392.50	($10,000)	$90,393
Year 13		$ 92,670.00	($10,000)	$82,670
Year 14		$ 84,947.50	($10,000)	$74,948
Year 15		$ 77,225.00	($10,000)	$67,225
			Internal Rate of Return	**13.01%**

More information regarding financial programs available to CCISD 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

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

CenterPoint Energy Houston Electric, LLC
Applicable: Entire Service Area

CNP 8017

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

VI.	**Excess Mitigation Credit:**		Not Applicable
VII.	**State Colleges and Universities Discount:**		See Rider SCUD
VIII.	**Competition Transition Charge:**		See Rider CTC
IX.	**Competitive Metering Credit:**		See Rider CMC
X.	**Other Charges or Credits:**		
	A. Municipal Account Franchise Credit (see application and explanation below)	$(.002207)	per kWh
	B. Rate Case Expenses Surcharge		See Rider RCE
	C. Rider UCOS Retail Credit		See Rider RURC
	D. Advanced Metering System Surcharge		See Rider AMS
	E. Energy Efficiency Cost Recovery Factor		See Rider EECRF
	F. Accumulated Deferred Federal Income Tax Credit		See Rider ADFITC

COMPANY SPECIFIC APPLICATIONS

DETERMINATION OF BILLING DEMAND FOR TRANSMISSION SYSTEM CHARGES

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

Determination of 4 CP kVA The 4 CP kVA 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 kVA will be billed at the applicable NCP rate under the "Transmission System Charge" using the Retail Customer's NCP kVA.

DETERMINATION OF BILLING DEMAND FOR DISTRIBUTION SYSTEM CHARGES

Determination of Billing kVA The Billing kVA applicable to the Distribution System Charge shall be the higher of the NCP kVA for the current billing month or 80% of the highest monthly NCP kVA established in the 11 months preceding the current billing month (80% ratchet). The 80% ratchet shall not apply to seasonal agricultural Retail Customers.

OTHER PROVISIONS

Secondary Service Greater Than 10 kVA. This Rate Schedule is applicable only to Retail Customers whose peak demand for the current month is greater than 10 kVA, as measured in the fifteen minute period of highest demand, or whose peak demand exceeded 10 kVA in any of the previous eleven months, and that otherwise qualify under this Rate. This Rate Schedule is applicable to Delivery Service provided for Electric Power and Energy supplied by Retail Customer's REP for Temporary service subject to provisions of Section 6.1.2.2, Construction Services. The Electric Power and Energy delivered may not be re-metered or sub-metered by the Retail Customer for resale except pursuant to lawful sub-metering regulations of Applicable Legal Authorities. Retail Customer's previous metered usage under this or any other Rate Schedule will be used, as needed, in determining the billing determinants under the Monthly Rate section.

Subclass Exception. The Subclass Exception is applicable only to Retail Customers who otherwise qualify for the Secondary Service Greater Than 10 kVA rate schedule and either: (1) whose highest NCP kVa for the most recent 12 months is equal to or less than 50 kVA; or (2) whose highest NCP kVa for the most recent 12 months is greater than 50 kVA but less than or equal to 400 kVA and whose load factor was less than or equal to 10% for each of the most recent 12 months. The most recent 12 months ends with and includes the current month. The monthly load factor is determined as follows:

load factor = billing kWh for the month/ (NCP kVA X number of days in billing period X 24)

Service Voltages. Company's standard service voltages are described in 6.2.2, Standard Voltages and in the Company's Service Standards.

Municipal Account Franchise Credit. A credit equal to the amount of franchise fees included in the Transmission and Distribution Charges will be applied to municipal accounts receiving service within the incorporated limits of such municipality which imposes a municipal franchise fee upon the

Company based on the kWh delivered within that municipality and who have signed an appropriate Franchise Agreement.

Adjustment To The Charges Applied To Retail Customer's Demand Measurement If data to determine the Retail Customer's *Demand Measurement* becomes no longer available, the Company will determine a *Conversion Factor* which will be used as an adjustment to all per unit charges that will then be applied to the *New Demand Measurement*. *Demand Measurement* shall include the Billing kVA, the 4 CP kVA, NCP kVA or any other demand measurement required for billing under this Rate Schedule or any applicable rider(s) or any other applicable schedule(s). *New Demand Measurement* shall be the billing determinants which replace the *Demand Measurement*. The *Conversion Factor* will apply to unit prices per kVA such that when applied to the *New Demand Measurement*, the revenue derived by the Company under demand based charges shall be unaffected by such lack of data.

This adjustment may become necessary because of changes in metering capabilities, such as, Meters that record and /or measure kW with no ability to determine kVA or Meters which meter data in intervals other than 15 minutes. This adjustment also may become necessary due to changes in rules, laws, procedures or other directives which might dictate or recommend that Electric Power and Energy, electric power related transactions, wire charges, nonbypassable charges and/or other transactions measure demand in a way that is inconsistent with the definitions and procedures stated in the Company's Tariff. This adjustment is applicable not only in the instances enumerated above but also for any and all other changes in *Demand Measurement* which would prevent the Company from obtaining the necessary data to determine the kVA quantities defined in this Rate Schedule, applicable Riders and other applicable schedules.

The Conversion Factor shall render the Company revenue neutral to any change in *Demand Measurement* as described above.

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

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 _____, 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: 5/17/11

Name (Mr./Ms./Dr.) Paul McLarty Title: Deputy Superintendent

Organization: Clear Creek ISD Phone: (281)284 0181

Street Address: 2425 East Main, League City Fax: _____

Mailing Address: 2425 East Main, League City, Texas 77573 E-Mail: pmclarty@ccisd.net

County: Galveston/Harris

Contact Information:

Name (Mr./Ms./Dr.):_____ Title: _____

Phone: _____ Fax: _____

E-Mail:_____ County: _____

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.**

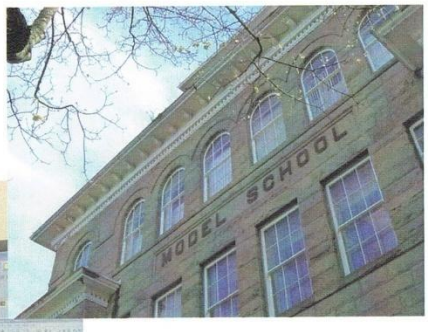
APPENDIX V - TEXAS ENERGY MANAGERS ASSOCIATION (TEMA)

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.

SECO
State Energy Conservation Office

APPENDIX VI - UTILITY CHARTS ON CD