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Texas Comptroller of Public Accounts

Facility Preliminary Energy Assessments and Recommendations

City of Port Neches

Prepared by: Jacobs Engineering Group Inc.



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1. EXECUTIVE SUMMARY

A Preliminary Energy Assessment (PEA) site visit for the City of Port Neches was conducted during the month of August 2010 for the purpose of identifying viable Energy Conservation Measures (ECMs). This report documents that investigation.

This service is provided by Jacobs at no cost to the City of Port Neches by the Texas Comptroller of Public Accounts, State Energy Conservation Office (SECO). This program promotes and encourages an active partnership between SECO and local political subdivisions for the purpose of planning, funding, and implementing cost-effective energy conservation measures. The goal is to reduce energy consumption of existing facilities and ultimately reduce regional emissions and facility energy costs.

The following ECMs were investigated and recommended for implementation or further detailed analysis:

ECM 1: City Hall: Replace existing T12 fluorescent light fixtures with new T8 fixtures

ECM 2: City Hall: Install new programmable thermostats

ECM 3: Fire Station: Replace existing T12 fluorescent light fixtures with new T8 fixtures

ECM 4: Fire Station: Install new programmable thermostats

ECM 5: Police Department: Replace condensing unit.

ECM 6: Police Department: Replace existing T12 fluorescent light fixtures with new T8 fixtures

ECM 7: Police Department: Replace existing incandescent exit sign lamps with LEDs

ECM 8: Police Department: Install new programmable thermostats

ECM 9: Police Department: Replace condensing unit

ECM 10: Public Library: Replace existing T12 fluorescent light fixtures with new T8 fixtures

ECM 11: Public Library: Replace existing incandescent exit sign lamps with LEDs

ECM 12: Public Library: Replace condensing unit

ECM 13: Senior Citizen Center: Replace existing T12 fluorescent light fixtures with new T8 fixtures

ECM 14: Senior Citizen Center: Replace condensing unit

A preliminary energy and cost savings evaluation was conducted on each recommended measure listed above. Descriptions of these measures and a summary of each evaluation are presented in the following sections. An overall summary of the results is presented in the ECM Table. Each proposed utility evaluation was based on the prevalent utility costs at the time of the audit.

As seen in the ECM tables (Tables 3 through 7), the recommended measures provide for a combined estimated annual savings of up to \$8,145.88, with an estimated capital requirement of \$68,142.30 thus yielding a composite simple payback period of 8.4 years. Overall, it is estimated that by implementing these measures electric utility consumption in the buildings surveyed can be reduced by 13.5%.

Descriptions and calculations for the recommended measures can be found within this report. A follow-up visit can be scheduled to address questions regarding the report, project financing options, implementation schedules, or any other aspect of this program or its implementation.

SECO is committed to providing whatever assistance is required in planning, funding, and implementing the recommendations of this report. The City of Port Neches is encouraged to direct any questions or concerns to either of the following:

SECO
Stephen Ross
1-800-531-5441, ext 3-1896

Jacobs
Travis Alexander
817-735-7063

Included in the appendix of this report is also a list of websites that can be utilized in learning more about SECO, Senate Bill 12, various funding solutions, energy saving projects, and various state and federal agency services and programs.

2. FACILITY DESCRIPTIONS

The City of Port Neches owns and operates five buildings within the city limits.

2.1. City Hall

The City Hall is located at 634 Avenue C, Port Neches, TX 77651. The facility consists of a 7,640 square foot, one story building that was constructed in 1974. The building's exterior is a brick veneer and roof is built-up with tar and gravel.

The lighting fixtures in the building utilize 2 lamp, 4 lamp, and 6 lamp 4' T12 lamp fixtures and incandescent lamps, all with magnetic ballasts.

The building's air conditioning consists of four rooftop DX systems and one window unit. Of the rooftop units there are two Bryant gas units manufactured in 2005 (a 5 ton and a 10 ton unit), and the other two are Carrier 5 ton gas units, manufactured in 2001. The building is controlled by two non-programmable and two programmable thermostats.

2.2. Fire Station

The Fire Station is located at 1209 Merriman Street, Port Neches, TX 77651. It is a one story building of approximately 5,300 square feet. It is a structure with a complete brick veneer. The garage has three sliding bay doors for the fire trucks.

The lighting fixtures in the building utilize 2 lamp and 4 lamp T12 fluorescent fixtures with magnetic ballasts and several 4 lamp T8s with electronic ballasts. A couple of incandescent lamps are used as well.

Air conditioning is provided by two 4 ton, DX split systems and controlled by non-programmable thermostats. One is a 2008 Carrier unit and the other is an International Comfort Products Corporation unit whose age was unable to be determined.

There are two Reznor electric unit heaters that are used for freeze protection in the bay area.

2.3. Police Department and Municipal Court

The 10,800 square foot Police Station is located at 1201 Merriman Street in Port Neches. The one story building has a brick veneered exterior, built-up roof, and double paned windows.

The entire building uses T12 lamps with magnetic ballasts. Both U-bulbs and linear lamps are used.

Four DX split systems cool the Police Station and Municipal Court. All are Carrier units, but are made in different years. The 2008 unit handles 15 tons; the 1992 unit handles 4 tons; the 1998 unit handles 8 tons; and the 2007 unit handles 7.5 tons. All are operated by non-programmable thermostats.

2.4. Effie & Wilton Hebert Public Library

The Public Library is located at 2025 Merriman Street in Port Neches. The brick veneered, gravel and tar built-up roof building was built in 1982 but then expanded and renovated in 1998 to its current size of 17,350 square feet. The windows are single pane.

Lighting for the library is primarily supplied by T12 lamps with various fixtures allowing for u-bulbs and differing number of lamps. There are a few incandescent lights, a CFL, and a couple of fixtures that utilize T5 lamps.

Five Carrier DX split systems cool the renovated library. Three have been installed within the last two years (two 5 ton units and a 10 ton), a 15 ton unit was installed in 2002, and another 15 ton unit in 1997. Temperature in the building is controlled completely by programmable thermostats.

2.5. Senior Citizen Center

The Senior Citizens Center is located at 633 Grigsby Ave. Built in 1980, the building has metal siding.

Two lamp and four lamp T12 fixtures light the building. Three DX split systems cool it. All are Carrier units. Two 12.5 ton units were manufactured in 1999 and a 10 ton unit in 2005.

3. FACILITY ENERGY PERFORMANCE

Based on current utility data, the City of Port Neches buildings have the following annual electric costs, Energy Use Index (EUI), and Energy Cost Index (ECI):

Building	Electric			Natural Gas			Total	Total	EUI	ECI	SF
	kWh/Yr	MMBTU/Yr	\$Cost/Yr	MCF/Yr	MMBTU/Yr	\$Cost/Yr	\$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	\$/SF/Yr	
1 City Hall	97,760	334	\$7,420.95	1,185	1,367	\$1,403.83	\$8,824.78	1,701	223	\$1.16	7,640
2 Police Station	188,720	644	\$14,188.15	95	110	\$511.89	\$14,700.04	754	70	\$1.36	10,800
3 Fire Station	102,733	351	\$7,957.63	1,720	1,985	\$1,714.54	\$9,672.17	2,335	441	\$1.82	5,300
4 Hebert Public Library	283,000	966	\$22,474.10	67	77	\$460.51	\$22,934.61	1,043	60	\$1.32	17,350
5 Senior Citizen	65,760	224	\$5,742.39	42	48	\$469.90	\$6,212.29	273	57	\$1.29	4,800
	kWh/Yr	MMBTU/Yr	\$Cost/Yr	MCF/Yr	MMBTU/Yr	\$Cost/Yr	\$Cost/Yr	MMBTU/Yr	kBTU/SF/Yr	\$/SF/Yr	SF
	737,973	2,518	\$57,783.22	3,109	3,588	\$4,560.67	\$62,343.89	6,106	170	\$1.39	45,890

Table 1 - Energy Benchmarking

The utility data collected can be found in Appendix A.

The EUI, an estimate of the energy consumption performance, is measured in thousands of BTUs per square foot per year. Likewise, the ECI, an estimate of the energy cost performance, is measured in dollars per square foot per year.

4. ENERGY ACCOUNTING

ENERGY ACCOUNTING DESCRIPTION

Energy is accounted for through monthly utility bills. All buildings receive electricity from the same provider.

AVERAGE UTILITY RATES

Utility Name	Average Rates
Energy	\$0.08187/kWh

Table 2 - Utility Rates

5. RECOMMENDATIONS

ENERGY CONSERVATION MEASURES (ECMs)

City Hall

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 1	Replace T12 fluorescent lights with T8	\$8,485.32	12,857	\$1,052.60	8.1
ECM 2	Install new programmable thermostat	\$212.44	7,931	\$649.29	0.3

Table 3 - City Hall ECMs

Fire Station

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 3	Replace T12 fluorescent lights with T8	\$3,949.68	5,760	\$471.54	8.4
ECM 4	Install new programmable thermostat	\$212.44	6,020	\$492.90	0.4

Table 4 - Fire Station ECMs

Police Department and Municipal Court

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 5	Replace condensing unit	\$3,437.55	1,351	\$110.59	31.1
ECM 6	Replace T12 fluorescent lights with T8	\$6,172.71	8,867	\$725.90	8.5
ECM 7	Replace incandescent exit sign lamps with LEDs	\$455.23	1,178	\$96.41	4.7
ECM 8	Install new programmable thermostat	\$212.44	10,374	\$849.30	0.3
ECM 9	Replace condensing unit	\$4,155.41	1,870	\$153.13	27.1

Table 5 - Police Department and Municipal Court ECMs

Public Library

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 10	Replace T12 fluorescent lights with T8	\$19,876.22	28,586	\$2,340.30	8.5
ECM 11	Replace incandescent exit sign lamps with LEDs	\$284.81	589	\$48.21	5.9
ECM 12	Replace condensing unit	\$6,507.42	3,507	\$287.12	22.7

Table 6 - Public Library ECMs

Senior Citizen Center

Energy Conservation Measures (ECMs)					
ECM	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Estimated Annual Cost Savings	Simple Payback (years)
ECM 13	Replace T12 fluorescent lights with T8	\$3,278.51	4,764	\$390.05	8.4
ECM 14	Replace condensing unit	\$10,902.12	5,845	\$478.53	22.8

Table 7 - Senior Citizen Center

ECM 1, ECM 3, ECM 6, ECM 10, and ECM 13 involve replacing the existing T12 fluorescent lamps with new T8 lamps in order to reduce energy usage through lighting and cooling. The energy savings compared to materials and labor costs make for a very attractive payback period.

ECM 2, ECM 4, and ECM 8 involve replacing non-programmable thermostats with programmable ones. This allows for a more controlled environment and eliminates energy waste due to inefficient temperature setback patterns by the occupants. These too have very attractive payback periods.

ECM 5, ECM 9, ECM 12, and ECM 14 involve replacing condensing units that are older than 10 years. Increasing the efficiency of the new units decreases the energy usage. For units that are less than 5 tons, a minimum SEER rating of 14 is required to ensure a reasonable payback time; for units that are larger than 5 tons, a minimum EER rating of 11 is required.

ECM 7 and ECM 11 involve replacing existing exit signs with new LED exit signs at the Police Station and Public Library. While they are not excessively large energy users, they do run continuously throughout the year thus replacement with high efficiency LED fixtures is a worthwhile measure.

RECOMMENDATIONS SUMMARY

Energy Conservation Measures (ECMs)					
ECM	Location	Project Description	Estimated Implementation Cost	Estimated Annual Savings (kWh/yr)	Simple Payback (years)
ECM 1	City Hall	Lighting retrofit: T12 to T8	\$8,485.32	12,857	8.1
ECM 2	City Hall	Install programmable thermostats	\$212.44	7,931	0.3
ECM 3	Fire Station	Lighting retrofit: T12 to T8	\$3,949.68	5,760	8.4
ECM 4	Fire Station	Install programmable thermostats	\$212.44	6,020	0.4
ECM 5	Police Station	Replace condensing unit	\$3,437.55	1,351	31.1
ECM 6	Police Station	Lighting retrofit: T12 to T8	\$6,172.71	8,867	8.5
ECM 7	Police Station	Lighting retrofit: Incandescent to LED	\$455.23	1,178	4.7
ECM 8	Police Station	Install programmable thermostats	\$212.44	10,374	0.3
ECM 9	Police Station	Replace condensing unit	\$4,155.41	1,870	27.1
ECM 10	Library	Lighting retrofit: T12 to T8	\$19,876.22	28,586	8.5
ECM 11	Library	Lighting retrofit: Incandescent to LED	\$284.81	589	5.9
ECM 12	Library	Replace condensing unit	\$6,507.42	3,507	22.7
ECM 13	Senior Center	Lighting retrofit: T12 to T8	\$3,278.51	4,764	8.4
ECM 14	Senior Center	Replace condensing unit	\$10,902.12	5,845	22.8

Table 8 - ECM Summary

6. EMISSIONS CALCULATIONS

	Annual kWh Reduction	Pollution Prevention Factors			Equivalent to:		
		CO2	NOx	SO2	Annual Number of Cars Taken Off the Road	Annual Number of Acres of Trees Planted	Annual Number of American Homes
		Carbon Dioxide (Pounds)	Nitrogen Oxide (Grams)	Sulphur Dioxide (Grams)	lbs CO2 / 10,000	lbs CO2 / 7,300	kWh / 10,000
City Hall	20,788	27,531	8,263	30,135	2.75	3.77	2.08
Fire Station	11,780	15,601	4,682	17,077	1.56	2.14	1.18
Police Station	23,548	31,186	9,360	34,136	3.12	4.27	2.35
Public Library	32,636	43,221	12,972	47,310	4.32	5.92	3.26
Senior Citizen's Center	10,609	14,050	4,217	15,379	1.41	1.92	1.06
Total	99,361	131,539	39,494	144,037	13	18	10

Table 9 - Emission Calculations

With the energy savings shown above, the resulting reduced amount of pollution has been calculated. Making the proposed improvements is equivalent to 13 cars being taken off the road, planting 18 acres of trees, and powering 10 American homes.

APPENDIX A: UTILITY ANALYSIS DATA

Electricity Usage

City Hall

Date	Usage (kWh)	Amount
Jun-09	9,840	\$778.07
Jul-09	15,920	\$1,219.41
Aug-09	12,080	\$653.09
Sep-09	11,760	\$676.17
Oct-09	10,640	\$737.89
Nov-09	8,480	\$796.11
Dec-09	4,320	\$477.60
Jan-10	5,200	\$362.01
Feb-10	3,920	\$301.14
Mar-10	4,800	\$397.87
Apr-10	4,400	\$492.76
May-10	6,400	\$528.83
Total	97,760	\$7,420.95

Police Station

Date	Usage (kWh)	Amount
Dec-09	14,240	\$843.61
Nov-09	11,280	\$1,036.85
Oct-09	16,240	\$1,381.67
Sep-09	18,880	\$1,191.01
Aug-09	18,640	\$998.76
Jul-09	18,960	\$959.84
Jun-09	17,200	\$1,156.45
May-09	17,360	\$1,423.41
Apr-09	15,600	\$1,305.75
Mar-09	14,560	\$1,258.55
Feb-09	11,680	\$1,025.99
Jan-09	14,080	\$1,606.26
Total	188,720	\$14,188.15

Fire Department

Date	Usage (kWh)	Amount
Dec-09	8,304	\$509.81
Nov-09	5,730	\$558.92
Oct-09	8,894	\$791.96
Sep-09	10,282	\$684.47
Aug-09	13,145	\$691.05
Jul-09	7,661	\$443.76
Jun-09	9,299	\$641.60
May-09	8,608	\$725.31
Apr-09	7,562	\$663.35
Mar-09	7,474	\$652.86
Feb-09	7,096	\$626.29
Jan-09	8,678	\$968.25
Total	102,733	\$7,957.63

Senior Citizen's Center

Date	Usage (kWh)	Amount
Jun-09	4,640	\$457.75
Jul-09	6,920	\$620.08
Aug-09	6,040	\$401.15
Sep-09	6,160	\$433.04
Oct-09	5,800	\$473.24
Nov-09	4,840	\$503.67
Dec-09	3,360	\$404.62
Jan-10	6,120	\$466.09
Feb-10	6,120	\$466.09
Mar-10	6,760	\$547.79
Apr-10	4,560	\$536.21
May-10	4,440	\$432.66
Total	65,760	\$5,742.39

Library

Date	Usage (kWh)	Amount
Nov-09	22,080	\$2,000.06
Oct-09	25,760	\$2,238.36
Sep-09	26,360	\$1,733.20
Aug-09	29,560	\$1,572.43
Jul-09	28,080	\$1,484.51
Jun-09	32,080	\$2,157.24
May-09	23,880	\$2,010.76
Apr-09	20,480	\$1,773.65
Mar-09	20,800	\$1,783.21
Feb-09	17,000	\$1,490.33
Jan-09	19,160	\$2,243.08
Dec-09	17,760	\$1,987.27
Total	283,000	\$22,474.10

Gas Usage

City Hall

Date	Usage (MCF)	Amount
Jun-09	6	\$39.89
Jul-09	10	\$42.47
Aug-09	0	\$35.67
Sep-09	3	\$37.91
Oct-09	37	\$63.88
Nov-09	34	\$48.41
Dec-09	398	\$405.03
Jan-10	289	\$304.94
Feb-10	364	\$318.59
Mar-10	34	\$28.16
Apr-10	6	\$40.24
May-10	4	\$38.64
Total	1,185	\$1,403.83

Police Station Generator

Date	Usage (MCF)	Amount
Jun-09	7	\$42.18
Jul-09	17	\$50.91
Aug-09	5	\$39.57
Sep-09	8	\$43.58
Oct-09	5	\$40.70
Nov-09	6	\$38.63
Dec-09	4	\$40.61
Jan-10	8	\$45.54
Feb-10	8	\$45.54
Mar-10	3	\$29.66
Apr-10	6	\$41.69
May-10	18	\$53.28
Total	95	\$511.89

Fire Department

Date	Usage (MCF)	Amount
Jun-09	19	\$49.05
Jul-09	20	\$49.25
Aug-09	19	\$46.89
Sep-09	12	\$29.04
Oct-09	13	\$45.57
Nov-09	169	\$98.96
Dec-09	533	\$527.97
Jan-10	437	\$439.34
Feb-10	308	\$276.09
Mar-10	99	\$12.51
Apr-10	54	\$76.72
May-10	37	\$63.15
Total	1720	\$1,714.54

Senior Citizen's Center

Date	Usage (MCF)	Amount
Jun-09	8	\$43.10
Jul-09	5	\$40.16
Aug-09	7	\$41.12
Sep-09	6	\$16.47
Oct-09	5	\$40.70
Nov-09	6	\$38.63
Dec-09	4	\$40.61
Jan-10	5	\$41.85
Feb-10	6	\$41.89
Mar-10	5	\$34.75
Apr-10	4	\$39.68
May-10	6	\$41.55
Total	67	\$460.51

Library

Date	Usage (MCF)	Amount
Jun-09	3	\$38.44
Jul-09	1	\$36.56
Aug-09	1	\$36.45
Sep-09	1	\$36.66
Oct-09	1	\$36.39
Nov-09	0	\$35.67
Dec-09	0	\$35.67
Jan-10	0	\$35.67
Feb-10	1	\$36.72
Mar-10	0	\$36.32
Apr-10	32	\$67.72
May-10	2	\$37.63
Total	42	\$469.90

APPENDIX B: ECM INFORMATION

ECM 1: Lighting retrofit T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	City Hall			ESTIMATOR:			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Replace T12 with T8s			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 6 lamps/fixture	2	EA	\$58.88	\$ 118	\$54.00	\$ 108	\$225.75
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	71	EA	\$41.75	\$2,964.25	\$32.00	\$2,272.00	\$5,236.25
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	25	EA	\$24.50	\$ 613	\$23.00	\$ 575	\$1,187.50
Replace T12 fluorescents with T8s 2' x 2' U-bulbs	10	EA	\$40.00	\$ 400	\$22.00	\$ 220	\$620.00
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$0.00	\$0.00
SUBTOTAL				\$4,094.50		\$3,175.00	\$7,269.50
CONTINGENCIES			15.0%				\$1,090.43
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$125.40
TOTAL							\$8,485.32

Energy 6 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (222W/fixture)	2	EA	12	365	1,945
T-8 Fluorescents (180W/fixture)	2	EA	12	365	1,577
Estimated Annual Savings					368

Energy 4 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)	71	EA	12	365	46,025
T-8 Fluorescents (120W/fixture)	71	EA	12	365	37,318
Estimated Annual Savings					8,707

Energy 2 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)	12	EA	12	365	3,889
T-8 Fluorescents (60W/fixture)	12	EA	12	365	3,154
Estimated Annual Savings					736

Energy 2 lamp

SCENARIOS	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (86W/fixture)	13	EA	12	365	4,897
T-8 Fluorescents (60W/fixture)	13	EA	12	365	3,416
Estimated Annual Savings					1,480

Energy U bulb

SCENARIOS	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (86W/fixture)	10	EA	12	365	3,767
T-8 Fluorescents (68W/fixture)	10	EA	12	365	2,978
Estimated Annual Savings					788

Total Energy Savings Calculations

Facility Name: City Hall
 Site Address: 634 Ave. C
 ECM Number: 1
 ECM Description: T12 - T8 lighting retrofit

City: Port Neches
 County: Jefferson
 Building Area: 7,640 SF
 Predominate Use: _____

Existing T12 lighting in City Hall could be upgraded to T8 lighting

Elec Rate= 0.08187

# lamps	6	4	2	2	U	
Existing Conditions:	2	71	12	13	10	Number of florescent fixtures in area observed
	222	148	74	86	86	Wattage of fixtures observed in area
	180	120	60	60	68	Wattage of fixtures after retrofit
	4,380	4,380	4,380	4,380	4,380	Annual lighting hours
	0.084	1.988	0.168	0.338	0.180	kW savings due to lighting consumption
	368	8707	736	1480	788	Annual kWh savings due to lighting consumption
9075	1.44	1.44	1.44	1.44	1.44	Assumed kW/ton of cooling
	0.02	0.57	0.05	0.10	0.05	Peak tons of cooling saved from lighting retrofit
	0.03	0.81	0.07	0.14	0.07	kW savings due to cooling load reduction
	24	560	47	95	51	Annual kWh savings due to cooling load reduction
			3.89			Total Annual kW savings
			12,857			Total Annual kWh savings
			\$1,053			Total Cost Savings
			\$8,485			Estimated Cost
			8.1			Simple Payback

ECM 2: Install programmable thermostats
Cost Estimate

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME: Port Neches		PROJECT NO.: FEWE0701-TRWD					
PROJECT LOCATION: City Hall		ESTIMATOR: K. Popp					
SUBMITTAL: PEA Cost Estimates		DATE: 8/24/2010					
SYSTEM DESCRIPTION: Install Programmable Thermostats		CHECKED BY: T. Alexander					
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Programmable Thermostat	1	EA	\$49.00	\$ 49	\$133.00	\$ 133	\$182.00
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$49.00		\$133.00	\$182.00
CONTINGENCIES		15.0%					\$27.30
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$3.14
TOTAL							\$212.44

Energy Savings Calculations

Facility Name: City Hall	City: Port Neches
Site Address: 634 Ave. C	County: Jefferson
ECM Number: 2	Building Area: 7,640 SF
ECM Description: Programmable Thermostats	Predominate Use:

Opportunity: When the space is unoccupied, setpoint temperature can change to reduce heating/cooling load

Assumed U-Values Walls	0.124 Btu/hr-ft ² -F	
Assumed Wall Area	3,496 ft ²	Electric Rate: 0.08187
Assumed U-Values Roof	0.064 Btu/hr-ft ² -F	
Assumed Roof Area	7,640 ft ²	
Heating Season Thermostat Setpoint	70 F	
Heating Season Thermostat Setback	60 F	
Heating Season Setback Hours	1,456 hrs	
Heating Equipment Efficiency	100%	
Cooling Season Thermostat Setpoint	72 F	
Cooling Season Thermostat Setback	85 F	
Cooling Season Setback Hours	3,276 hrs	
Performance of Cooling System	1.22 kW/ton	
Total Envelope UA- Value	922 Btu/hr-F	
Electric Heating Energy Savings	3,937 kWh/yr	
Electric Heating Cost Reduction	322 \$/yr	
Cooling Energy Savings	3,994 kWh/yr	
Estimated Electricity Rate	\$0.082 per kWh	
Cooling Cost Savings	327 \$/yr	
Annual Cost Savings	\$649	
Installed cost	\$212	
Simple Payback	0.3 years	

ECM 3: Lighting retrofit T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Fire Station			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Replace T12 with T8s			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	41	EA	\$41.75	\$1,711.75	\$32.00	\$1,312.00	\$3,023.75
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	6	EA	\$37.00	\$222	\$23.00	\$138	\$360.00
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$1,933.75		\$1,450.00	\$3,383.75
CONTINGENCIES		15.0%					\$507.56
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$58.37
TOTAL							\$3,949.68

Energy 4 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)	41	EA	12	365	26,578
T-8 Fluorescents (120W/fixture)	41	EA	12	365	21,550
Estimated Annual Savings					5,028

Energy 2 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)	6	EA	12	365	1,945
T-8 Fluorescents (60W/fixture)	6	EA	12	365	1,577
Estimated Annual Savings					368

Total Energy Savings Calculations

Facility Name: Fire Station
 Site Address: 1209 Merriman Street
 ECM Number: 3
 ECM Description: T12 - T8 lighting retrofit

City: Port Neches
 County: Jefferson
 Building Area: 5,300 SF
 Predominate Use: _____

Existing T12 lighting in Fire Station could be upgraded to T8 lighting

	4 lamp	2 lamp	Elec Rate=	0.08187
Existing Conditions:	41	6	Number of florescent fixtures in area observed	
	148	74	Wattage of fixtures observed in area	
	120	60	Wattage of fixtures after retrofit	
	4,380	4,380	Annual lighting hours	
	1.148	0.084	kW savings due to lighting consumption	
	5028	368	Annual kWh savings due to lighting consumption	
	1.44	2.44	Assumed kW/ton of cooling	
	0.33	0.02	Peak tons of cooling saved from lighting retrofit	
	0.47	0.06	kW savings due to cooling load reduction	
	323	40	Annual kWh savings due to cooling load reduction	
		1.76	Total Annual kW savings	
		5,760	Total Annual kWh savings	
		\$472	Total Cost Savings	
		\$3,950	Estimated Cost	
		8.4	Simple Payback	

ECM 4: Install programmable thermostats
Cost Estimate

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.:	FEWE0701-TRWD		
PROJECT LOCATION:	Fire Station			ESTIMATOR:	K. Popp		
SUBMITTAL:	PEA Cost Estimates			DATE:	8/24/2010		
SYSTEM DESCRIPTION:	Install Programmable Thermostats			CHECKED BY:	T. Alexander		
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Programmable Thermostat	1	EA	\$49.00	\$ 49	\$133.00	\$ 133	\$182.00
<p style="text-align: center;">THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$49.00		\$133.00	\$182.00
CONTINGENCIES		15.0%					\$27.30
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$3.14
TOTAL							\$212.44

Energy Savings Calculation

Facility Name: Fire Station	City: Port Neches
Site Address: 1209 Merriman Street	County: Jefferson
ECM Number: 4	Building Area: 5,300 SF
ECM Description: Programmable Thermostats	Predominate Use:

Opportunity: When the space is unoccupied, setpoint temperature can change to reduce heating/cooling load

Assumed U-Values Walls	0.124 Btu/hr-ft ² -F		
Assumed Wall Area	2,912 ft ²	Electric Rate:	0.08187
Assumed U-Values Roof	0.064 Btu/hr-ft ² -F		
Assumed Roof Area	5,300 ft ²		
Heating Season Thermostat Setpoint	70 F		
Heating Season Thermostat Setback	60 F		
Heating Season Setback Hours	1,456 hrs		
Heating Equipment Efficiency	100%		
Cooling Season Thermostat Setpoint	72 F		
Cooling Season Thermostat Setback	85 F		
Cooling Season Setback Hours	3,276 hrs		
Performance of Cooling System	1.22 kW/ton		
Total Envelope UA - Value	700 Btu/hr-F		
Electric Heating Energy Savings	2,988 kWh/yr		
Electric Heating Cost Reduction	245 \$/yr		
Cooling Energy Savings	3,032 kWh/yr		
Estimated Electricity Rate	\$0.082 per kWh		
Cooling Cost Savings	248 \$/yr		
Annual Cost Savings	\$493		
Installed cost	\$212		
Simple Payback	0.4 years		

ECM 5: Replace condenser unit

Unit Cost

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWED701-NECHES			
PROJECT LOCATION:	Police Department			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 7/28/2010			
SYSTEM DESCRIPTION:	Condenser Replacement			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Condensing Unit	1	EA	\$ 1,120	\$ 1,120	\$ 1,825	\$ 1,825	\$ 2,945
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$ -	\$ -
SUBTOTAL				\$ 1,120		\$ 1,825	\$ 2,945
CONTINGENCIES			15.0%				\$ 442
DESIGN			0.0%				\$ -
CONSTRUCTION ADMINISTRATION			1.5%				\$ 51
TOTAL							\$ 3,438

Energy Savings Calculations

Facility Name: <u>Fire Station</u>	City: <u>Port Neches</u>
Site Address: <u>1209 Merriman Street</u>	County: <u>Jefferson</u>
ECM Number: <u>5</u>	Building Area: <u>NA</u>
ECM Description: <u>Replace Condensing Unit</u>	Predominate Use: <u>Air Cooling</u>

Opportunity: Replace condensing unit with a higher efficiency unit

Elec. Rate= 0.0819

	1	Number of units
	5	Tons per unit
	10.0	Estimated existing EER
	1.20	Estimated existing kW/ton
	14.0	New equipment EER
	0.86	New equipment kW/ton
	788	Estimated equivalent full load hours
Estimated peak kW Savings:	1.7	kW
Total Estimated kWh Savings:	1,351	kWh per year
Cost Savings:	\$111	per year
Estimated Cost:	\$3,438	
Simple Payback:	31.1	years

ECM 6: Lighting retrofit T12 to T8
Cost Estimate

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Police Department			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Replace T12s with T8s			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 2' x 2' U-bulbs	22	EA	\$40.00	\$ 880	\$22.00	\$484.00	\$1,364.00
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	17	EA	\$24.50	\$ 417	\$23.00	\$391.00	\$807.50
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	35	EA	\$41.75	\$ 1,461	\$32.00	\$1,120.00	\$2,581.25
Replace T12 fluorescents with T8s 96" length - 2 lamps/fixture	9	EA	\$31.50	\$ 284	\$28.00	\$252.00	\$535.50
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$0.00	\$0.00
SUBTOTAL				\$3,041.25		\$2,247.00	\$5,288.25
CONTINGENCIES			15.0%				\$793.24
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$91.22
TOTAL							\$6,172.71

Energy 4 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)	35	EA	12	365	22,688
T-8 Fluorescents (120W/fixture)	35	EA	12	365	18,396
Estimated Annual Savings					4,292

Energy 2 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)	17	EA	12	365	5,510
T-8 Fluorescents (60W/fixture)	17	EA	12	365	4,468
Estimated Annual Savings					1,042

Energy U bulb

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (86W/fixture)	22	EA	12	365	8,287
T-8 Fluorescents (68W/fixture)	22	EA	12	365	6,552
Estimated Annual Savings					1,734

Energy 2 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (156W/fixture)	9	EA	12	365	6,150
T-8 Fluorescents (124W/fixture)	9	EA	12	365	4,888
Estimated Annual Savings					1,261

Total Energy Savings Calculations

Facility Name: Police Department
 Site Address: 1201 Merriman Ave.
 ECM Number: 6
 ECM Description: T12 - T8 lighting retrofit

City: Port Neches
 County: Jefferson
 Building Area: 10,800 SF
 Predominate Use: _____

Existing T12 lighting in Fire Station could be upgraded to T8 lighting

Elec Rate= 0.08187

	4 lamp	4', 2 lamp	u bulb	8', 2 lamp	
Existing Conditions:	35	17	22	9	Number of florescent fixtures in area observed
	148	74	86	156	Wattage of fixtures observed in area
	120	60	68	124	Wattage of fixtures after retrofit
	4,380	4,380	4,380	4,380	Annual lighting hours
	0.980	0.238	0.396	0.288	kW savings due to lighting consumption
	4292	1042	1734	1261	Annual kWh savings due to lighting consumption
	1.44	1.44	1.44	1.44	Assumed kW/ton of cooling
	0.28	0.07	0.11	0.08	Peak tons of cooling saved from lighting retrofit
	0.40	0.10	0.16	0.12	kW savings due to cooling load reduction
	276	67	112	81	Annual kWh savings due to cooling load reduction
			1.38		Total Annual kW savings
			8,867		Total Annual kWh savings
			\$726		Total Cost Savings
			\$6,172.71		Estimated Cost
			8.5		Simple Payback

ECM 7: Exit lights retrofit
Cost Estimation

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Police Station			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Exit Lights Retrofit			CHECKED BY: T.Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Incandescent Exit Signs w/ LED Signs	4	EA	\$24.50	\$98.00	\$73.00	\$292.00	\$390.00
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$98.00		\$292.00	\$390.00
CONTINGENCIES		15.0%					\$58.50
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$6.73
TOTAL							\$455.23

Energy

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR
Incandescent Exit Signs (2 x 20W bulbs = 40W input)	4	EA	24	365	1,402
LED Exit Signs (9W input)	4	EA	24	365	315
Estimated Annual Savings					1,086

Energy Savings Calculation

Facility Name: Police Station
 Site Address: 1201 Merriman Street
 ECM Number: 7
 ECM Description: Exit Lights Retrofit

City: Port Neches
 County: Jefferson
 Building Area: 10,800 SF
 Predominate Use: _____

Existing T12 lighting in Eagle Mountain Office could be upgraded to T8 lighting Elec Rate= 0.08187

Existing Conditions: 4 Number of florescent fixtures in area observed
 40 Wattage of fixtures observed in area
 9 Wattage of fixtures after retrofit

8,760 Annual lighting hours
 0.124 kW savings due to lighting consumption
 1086 Annual kWh savings due to lighting consumption

1.44 Assumed kW/ton of cooling
 0.04 Peak tons of cooling saved from lighting retrofit
 0.05 kW savings due to cooling load reduction
 91 Annual kWh savings due to cooling load reduction
 0.17 Total Annual kW savings
 1,178 Total Annual kWh savings
 \$96 Total Cost Savings

\$455 Estimated Cost

4.7 Simple Payback

ECM 8: Install programmable thermostats
Cost Estimation

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-TRWD			
PROJECT LOCATION:	Police Station			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Install Programmable Thermostats			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Programmable Thermostat	1	EA	\$49.00	\$ 49	\$133.00	\$ 133	\$182.00
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$49.00		\$133.00	\$182.00
CONTINGENCIES		15.0%					\$27.30
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$3.14
TOTAL							\$212.44

Energy Savings Calculation

Facility Name: Police Station	City: Port Neches
Site Address: 1201 Merriman Street	County: Jefferson
ECM Number: 8	Building Area: 10,800 SF
ECM Description: Programmable Thermostats	Predominate Use:

Opportunity: When the space is unoccupied, setpoint temperature can change to reduce heating/cooling load

Assumed U-Values Walls	0.124 Btu/hr-ft ² -F		
Assumed Wall Area	4,157 ft ²	Electric Rate:	0.08187
Assumed U-Values Roof	0.064 Btu/hr-ft ² -F		
Assumed Roof Area	10,800 ft ²		
Heating Season Thermostat Setpoint	70 F		
Heating Season Thermostat Setback	60 F		
Heating Season Setback Hours	1,456 hrs		
Heating Equipment Efficiency	100%		
Cooling Season Thermostat Setpoint	72 F		
Cooling Season Thermostat Setback	85 F		
Cooling Season Setback Hours	3,276 hrs		
Performance of Cooling System	1.22 kW/ton		
Total Envelope UA - Value	1,207 Btu/hr-F		
Electric Heating Energy Savings	5,149 kWh/yr		
Electric Heating Cost Reduction	422 \$/yr		
Cooling Energy Savings	5,225 kWh/yr		
Estimated Electricity Rate	\$0.082 per kWh		
Cooling Cost Savings	428 \$/yr		
Annual Cost Savings	\$849		
Installed cost	\$212		
Simple Payback	0.3 years		

ECM 9: Replace condenser unit

Unit Cost

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Police Department			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Condenser Replacement			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Condensing Unit	1	EA	\$ 1,160	\$ 1,160	\$ 2,400	\$ 2,400	\$ 3,560
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$ -	\$ -
SUBTOTAL				\$ 1,160		\$ 2,400	\$ 3,560
CONTINGENCIES		15.0%					\$ 534
DESIGN		0.0%					\$ -
CONSTRUCTION ADMINISTRATION		1.5%					\$ 61
TOTAL							\$ 4,155

Energy Savings Calculations

Facility Name: <u>Police Department</u>	City: <u>Port Neches</u>
Site Address: <u>1201 Merriman St.</u>	County: <u>Jefferson</u>
ECM Number: <u>9</u>	Building Area: <u>10,800</u>
ECM Description: <u>Replace Condensing Unit</u>	Predominate Use: _____

Opportunity: Replace condensing unit with a higher efficiency unit

Elec. Rate= 0.0819

	1	Number of units
	8	Tons per unit
	10.4	Estimated existing EER
	1.15	Estimated existing kW/ton
	14.0	Newequipment EER
	0.86	Newequipment kW/ton
	788	Estimated equivalent full load hours
Estimated peak kW Savings:	2.4	kW
Total Estimated kWh Savings:	1,870	kWh per year
Cost Savings:	\$153	per year
Estimated Cost:	\$4,155	
Simple Payback:	27.1	years

ECM 10: Lighting retrofit T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Library			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Replace T12 with T8s			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 2' x 2' U-bulbs	6	EA	\$40.00	\$ 240	\$22.00	\$ 132	\$372.00
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	2	EA	\$24.50	\$ 49	\$23.00	\$ 46	\$95.00
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	219	EA	\$41.75	\$ 9,143	\$32.00	\$7,008.00	\$16,151.25
Replace T12 fluorescents with T8s 48" length - 1 lamp/fixture	10	EA	\$21.00	\$ 210	\$20.00	\$200.00	\$410.00
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$0.00	\$0.00
SUBTOTAL				\$9,642.25		\$7,386.00	\$17,028.25
CONTINGENCIES			15.0%				\$2,554.24
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$293.74
TOTAL							\$19,876.22

Energy 4 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)	219	EA	12	365	141,965
T-8 Fluorescents (120W/fixture)	219	EA	12	365	115,106
Estimated Annual Savings					26,858

Energy 2 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)	2	EA	12	365	648
T-8 Fluorescents (60W/fixture)	2	EA	12	365	526
Estimated Annual Savings					123

Energy U bulb

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (86W/fixture)	6	EA	12	365	2,260
T-8 Fluorescents (68W/fixture)	6	EA	12	365	1,787
Estimated Annual Savings					473

Energy 1 lamp

SCENARIOS	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (54W/fixture)	6	EA	12	365	1,419
T-8 Fluorescents (32W/fixture)	6	EA	12	365	841
Estimated Annual Savings					578

Energy 1 lamp

SCENARIOS	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (40W/fixture)	4	EA	12	365	701
T-8 Fluorescents (32/fixture)	4	EA	12	365	561
Estimated Annual Savings					140

Total Energy Savings Calculation

Facility Name: Library
 Site Address: 2025 Merriman Street
 ECM Number: 10
 ECM Description: T12 - T8 lighting retrofit

City: Port Neches
 County: Jefferson
 Building Area: 17,350 SF
 Predominate Use: _____

Existing T12 lighting in Fire Station could be upgraded to T8 lighting

Elec Rate= 0.08187

	4 lamp	2 lamp	u bulb	1 lamp	1 lamp	
Existing Conditions:	219	2	6	6	4	Number of florescent fixtures in area observed
	148	74	86	54	40	Wattage of fixtures observed in area
	120	60	68	32	32	Wattage of fixtures after retrofit
	4,380	4,380	4,380	4,380	4,380	Annual lighting hours
	6.132	0.028	0.108	0.132	0.032	kW savings due to lighting consumption
28172	26858	123	473	578	140	Annual kWh savings due to lighting consumption
0						
	1.44	1.44	1.44	1.44	1.44	Assumed kW/ton of cooling
	1.74	0.01	0.03	0.04	0.01	Peak tons of cooling saved from lighting retrofit
	2.51	0.01	0.04	0.05	0.01	kW savings due to cooling load reduction
	1,727	8	30	37	9	Annual kWh savings due to cooling load reduction
			9			Total Annual kW savings
			28585.51			Total Annual kWh savings
			\$2,340.30			Total Cost Savings
						28585.51
			\$19,876.22			Estimated Cost
			8.5			Simple Payback

ECM 11: Exit lights retrofit
Cost Estimates

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches		PROJECT NO.: FEWE0701-NECHES				
PROJECT LOCATION:	Public Library		ESTIMATOR: K. Popp				
SUBMITTAL:	PEA Cost Estimates		DATE: 8/24/2010				
SYSTEM DESCRIPTION:	Exit Lights Retrofit		CHECKED BY: T. Alexander				
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Incandescent Exit Signs w/ LED Signs	2	EA	\$49.00	\$98.00	\$73.00	\$146.00	\$244.00
<p style="text-align: center;">THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$0.00	\$0.00
SUBTOTAL				\$98.00		\$146.00	\$244.00
CONTINGENCIES		15.0%					\$36.60
DESIGN		0.0%					\$0.00
CONSTRUCTION ADMINISTRATION		1.5%					\$4.21
TOTAL							\$284.81

Energy

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KWH/YR
Incandescent Exit Signs (2 x 20W bulbs = 40W input)	2	EA	24	365	701
LED Exit Signs (9W input)	2	EA	24	365	158
Estimated Annual Savings					543

Energy Saving Calculation

Facility Name: Port Neches
 Site Address: Public Library
 ECM Number: 11
 ECM Description: Exit Lights Retrofit

City: Fort Worth
 County: Tarrant
 Building Area: 4,770 SF
 Predominate Use: Office, Shop

Existing T12 lighting in Eagle Mountain Office could be upgraded to T8 lighting

Elec Rate= 0.08187

Existing Conditions: 2 Number of florescent fixtures in area observed
 40 Wattage of fixtures observed in area
 9 Wattage of fixtures after retrofit

8,760 Annual lighting hours
 0.062 kW savings due to lighting consumption
 543 Annual kWh savings due to lighting consumption

1.44 Assumed kW/ton of cooling
 0.02 Peak tons of cooling saved from lighting retrofit
 0.03 kW savings due to cooling load reduction
 46 Annual kWh savings due to cooling load reduction
 0.09 Total Annual kW savings
 589 Total Annual kWh savings
 \$48 Total Cost Savings

\$285 Estimated Cost

5.9 Simple Payback

ECM 12: Replace condenser unit

Unit Cost

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Public Library			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Condenser Replacement			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Condensing Unit	1	EA	\$ 1,425	\$ 1,425	\$ 4,150	\$ 4,150	\$ 5,575
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)		0.0%				\$ -	\$ -
SUBTOTAL				\$ 1,425		\$ 4,150	\$ 5,575
CONTINGENCIES		15.0%					\$ 836
DESIGN		0.0%					\$ -
CONSTRUCTION ADMINISTRATION		1.5%					\$ 96
TOTAL							\$ 6,507

Energy Savings Calculations

Facility Name: <u>Public Library</u>	City: <u>Port Neches</u>
Site Address: <u>2025 Merriman Street</u>	County: <u>Jefferson</u>
ECM Number: <u>12</u>	Building Area: <u>17,350</u>
ECM Description: <u>Replace Condensing Unit</u>	Predominate Use: _____

Opportunity: Replace condensing unit with a higher efficiency unit

Elec. Rate= 0.0819

	1	Number of units
	15	Tons per unit
	10.4	Estimated existing EER
	1.15	Estimated existing kW/ton
	14.0	Newequipment EER
	0.86	Newequipment kW/ton
	788	Estimated equivalent full load hours
Estimated peak kW Savings:	4.5	kW
Total Estimated kWh Savings:	3,507	kWh per year
Cost Savings:	\$287	per year
Estimated Cost:	\$6,507	
Simple Payback:	22.7	years

ECM 13: Lighting retrofit T12 to T8

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWE0701-NECHES			
PROJECT LOCATION:	Public Library			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Replace T12 with T8s			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace T12 fluorescents with T8s 48" length - 4 lamps/fixture	31	EA	\$41.75	\$1,294.25	\$32.00	\$992.00	\$2,286.25
Replace T12 fluorescents with T8s 48" length - 2 lamps/fixture	11	EA	\$24.50	\$270	\$23.00	\$253	\$522.50
<p>THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.</p>							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$0.00	\$0.00
SUBTOTAL				\$1,563.75		\$1,245.00	\$2,808.75
CONTINGENCIES			15.0%				\$421.31
DESIGN			0.0%				\$0.00
CONSTRUCTION ADMINISTRATION			1.5%				\$48.45
TOTAL							\$3,278.51

Energy 4 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (148W/fixture)	31	EA	12	365	20,095
T-8 Fluorescents (120W/fixture)	31	EA	12	365	16,294
Estimated Annual Savings					3,802

Energy 2 lamp

	QUANTITY		USAGE		ENERGY USE
	NO/UNIT	UNIT	HRS/DAY	DAYS/YR	KHW/YR
T-12 Fluorescents (74W/fixture)	11	EA	12	365	3,565
T-8 Fluorescents (60W/fixture)	11	EA	12	365	2,891
Estimated Annual Savings					675

Total Energy Savings Calculations

Facility Name: Senior Citizen's Center
 Site Address: 633 Grigsby Ave.
 ECM Number: 13
 ECM Description: T12 - T8 lighting retrofit

City: Port Neches
 County: Jefferson
 Building Area: 4,800 SF
 Predominate Use: _____

Existing T12 lighting in Fire Station could be upgraded to T8 lighting			Elec Rate= 0.08187
	office	bay	
	4 lamp	2 lamp	
Existing Conditions:	31	11	Number of florescent fixtures in area observed
	148	74	Wattage of fixtures observed in area
	120	60	Wattage of fixtures after retrofit
	4,380	4,380	Annual lighting hours
	0.868	0.154	kW savings due to lighting consumption
	3802	675	Annual kWh savings due to lighting consumption
	1.44	1.44	Assumed kW/ton of cooling
	0.25	0.04	Peak tons of cooling saved from lighting retrofit
	0.36	0.06	kW savings due to cooling load reduction
	245	43	Annual kWh savings due to cooling load reduction
	1.44		Total Annual kW savings
	4,764		Total Annual kWh savings
	\$390		Total Cost Savings
			4764.252
	\$3,279		Estimated Cost
	8.4		Simple Payback

ECM 14: Condenser unit replacement

Unit Cost

JACOBS COST ESTIMATING ANALYSIS							
PROJECT NAME:	Port Neches			PROJECT NO.: FEWED701-NECHES			
PROJECT LOCATION:	Senior Citizen Center			ESTIMATOR: K. Popp			
SUBMITTAL:	PEA Cost Estimates			DATE: 8/24/2010			
SYSTEM DESCRIPTION:	Condenser Replacement			CHECKED BY: T. Alexander			
TASK DESCRIPTION	QUANTITY		LABOR		MATERIALS		TOTAL COSTS
	NO/UNIT	UNIT	UNIT PRICE	COST	UNIT PRICE	COST	
Replace Condensing Unit	2	EA	\$ 1,320	\$ 2,640	\$ 3,350	\$ 6,700	\$ 9,340
THIS IS A PRELIMINARY COST ESTIMATE WHICH DOES NOT REPRESENT ACTUAL CONSTRUCTION COSTS OR CONTRACTOR BID PRICES. UNIT PRICES FOR MATERIAL AND LABOR COSTS WERE DEVELOPED USING PUBLISHED COST DATA AND OTHER RELIABLE SOURCES. A CONSERVATIVE CONTINGENCY HAS BEEN INCLUDED IN THIS ESTIMATE TO ACCOUNT FOR UNKNOWN FACTORS BUT DESIGN DEVELOPMENT ISSUES, SCOPE CHANGES, AND MARKET CONDITIONS AT THE TIME OF BIDDING MAY AFFECT ACTUAL CONSTRUCTION COSTS.							
TAX (ASSUMES TAX EXEMPT)			0.0%			\$ -	\$ -
SUBTOTAL				\$ 2,640		\$ 6,700	\$ 9,340
CONTINGENCIES			15.0%				\$ 1,401
DESIGN			0.0%				\$ -
CONSTRUCTION ADMINISTRATION			1.5%				\$ 161
TOTAL							\$ 10,902

Energy Savings Calculations

Facility Name: <u>Senior Citizen Center</u>	City: <u>Port Neches</u>
Site Address: <u>633 Grigsby Ave.</u>	County: <u>Jefferson</u>
ECM Number: <u>14</u>	Building Area: <u>4,800</u>
ECM Description: <u>Replace Condensing Unit</u>	Predominate Use: _____

Opportunity: Replace condensing unit with a higher efficiency unit

	2	Number of units	Elec. Rate=	0.0819
	12.5	Tons per unit		
	10.4	Estimated existing EER		
	1.15	Estimated existing kW/ton		
	14.0	New equipment EER		
	0.86	New equipment kW/ton		
	788	Estimated equivalent full load hours		
Estimated peak kW Savings:	7.4	kW		
Total Estimated kWh Savings:	5,845	kWh per year		
Cost Savings:	\$479	per year		
Estimated Cost:	\$10,902			
Simple Payback:	22.8	years		

APPENDIX C: ENERGY STAR – PORTFOLIO MANAGER

Energy Star is a joint program between the US Environmental Protection Agency (US EPA) and the Department of Energy (US DOE) that promotes the efficient use of energy in multiple industries. One focus of the Energy Star program is on energy efficiency of existing buildings.

Portfolio Manager was created as an industry tool to aid those that work with existing buildings in benchmarking energy performance. Portfolio Manager benchmarking data is based on the Commercial Buildings Energy Consumption Survey administered by the US DOE Energy Information Administration every four years. The survey includes energy use figures from thousands of buildings throughout the United States for various end uses. For a particular building type (e.g. and office building), the building is compared statistically to similar buildings in the survey and assigned a score of 1-100. A score of 50 indicates an average building in terms of energy performance. A score of 1 means that the building is in the lowest 1% of buildings for energy performance and a score of 100, indicates performance in the top 1%.

Energy Star - Portfolio Manager			
Building	Site EUI (kbtu/sf/yr)	Source EUI (kbtu/sf/yr)	Energy Star Rating (1-100)
City Hall	203.1	312.8	N/A
Fire Station	66.5	221.2	N/A
Police Station	59.6	199.1	N/A
Senior Center	55.3	155.0	N/A
Library	58.1	188.5	N/A

Site Energy Use Intensity (EUI) uses figures of metered energy (electrical, kWh and any other fossil fuel types, such as natural gas, MCF) to the building and then converts them to kBtus. This is the same procedure used for EUI earlier in this report. Portfolio Manager also calculates source EUI for easier comparison among fuel types. Source EUI takes into account energy losses from the original fuel source. For electricity, the original fuel consumption occurs at the power plant where electrical conversion efficiencies are often 30-40% for traditional fossil fuel sources. Portfolio Manager uses a source-site factor (or ratio) to convert site energy to source energy and it uses the same figure for all grid-supplied electricity. This ratio is specific to the type of energy used. Grid purchased electricity has a Source-Site Ratio of 3.340; Natural Gas has a ratio of 1.047. Because Port Neches uses both types of energy, their overall Source-Site Ratio is a weighted average of the two.

None of the building have an Energy Star Rating because of the special nature of their usage. The Energy Star Portfolio compares buildings of similar type, size, and usage against each other with respect to energy. There is a lack of data to compare the city buildings to and the Senior Citizen Center is not large enough (a minimum size of 5,000 square feet is required to benchmark the buildings).

The utility data given to compute the energy performance do not all come from the same time period (e.g. the Police Station electricity data runs from 01/2009 to 12/2009 but the natural gas data runs from 06/2009 to 05/2010). So the data was normalized across one year in order to get an indicative Energy Star score. A consistent 12 month reporting period is required, however, in order to submit to Energy Star for the purpose of achieving the Energy Star label.

APPENDIX D: FUNDING AND PROCUREMENT

NON-TRADITIONAL FUNDING METHODS

When traditional means of funding projects are not available, non-traditional funding may be desirable in order to implement beneficial projects. Energy and operational cost savings can be used to fund projects such as the ones recommended in this report. A couple of options are available when considering funding projects with cost savings.

The first way would be to secure a low interest loan and fund the projects internally by “fixing” the operational budgets over the term of the loan and use the savings to pay back the loan. Low interest loans are available through the State’s Texas LoanSTAR (Saving Taxes and Resources) Program.

The LoanSTAR Program has served as a national model for state and federal loan programs for energy efficiency retrofits, and is SECO’s most highly visible program. Legislatively mandated to be funded at a minimum of \$95 million at all times, to date the LoanSTAR Program has saved Texas taxpayers over \$250 million through energy efficiency projects, financed for state agencies, institutions of higher education, school districts, and local governments. The program’s revolving loan mechanism allows borrowers to repay loans through the stream-of-cost savings generated by the funded projects. The program will fund energy saving projects with a maximum combined simple payback of 10 years.

Currently the interest rate for all new loans funded from now until 8/31/2009 is set at 3% APR. The interest rate for the LoanSTAR Program is based on several factors which include money market rates and LoanSTAR administrative cost. Rates are evaluated and set every fiscal year, from 9/01 - 8/31.

In order to qualify for funding from the LoanSTAR Program, a detailed energy audit or energy assessment report (EAR) must be completed for the facility/department by a licensed professional engineer in the State of Texas. The purpose of the EAR is to validate the savings estimated in this PEA, through a very detailed approach, as well as confirm the scope of work required for each project.

To assure the borrower that projects are constructed according to the EAR and LoanSTAR technical guidelines, SECO performs design specification review and on-site construction monitoring at 50% and 100% complete.

Another non-traditional solution to funding these projects is to secure the services of a performance contractor. Performance contractors can finance projects in the same manner as the LoanSTAR program by using energy and operational savings as funding for the projects. Performance contractors can package projects with paybacks up to 20 years and pull from a large variety of financial resources for low-interest funding (including the LoanSTAR Program). For more information on this subject feel free to visit the SECO website or call Jacobs at the number shown on the front cover of this PEA.

APPENDIX E: GOVERNMENT LEGISLATION AND STANDARDS

Energy Efficiency Programs in Political Subdivisions

Senate Bill 12

An Act relating to programs for the enhancement of air quality, including energy efficiency standards in state purchasing and energy consumption.

House Bill 3693

An Act relating to energy demand, energy load, energy efficiency initiatives, energy programs, and energy performance measures.

HB 3693 and SB 12 Rules

The State Energy Conservation Office (SECO) has published rules on House Bill (HB) 3693 and Senate Bill (SB) 12 for persons who have an interest in the adoption of energy codes to have an opportunity to comment on newly published editions of the International Energy Conservation Code and the International Residential Code. The code manuals can be purchased at the **International Code Council** web site.

BACKGROUND

In 2001, the 77th Texas Legislature passed **Senate Bill 5 (SB5)**, also known as the Texas Emissions Reduction Plan, to amend the Texas Health and Safety Code. The legislation required ambitious, fundamental changes in energy use to help the state comply with federal Clean Air Act standards. It applied to all political subdivisions within 38 designated counties, later expanded to **41 counties**.

In 2007, the 80th Texas Legislature passed **Senate Bill 12 (SB 12)** which among other things extended the timeline set in SB 5 for emission reductions. Where SB 5 required political subdivisions to reduce their electrical consumption by five percent (5%) for five years beginning January 1, 2002, the SB 12 legislation requires that such entities establish a goal to make the five percent (5%) reductions each year for six years, effective September 1, 2007.

SB 12 amended the Health and Safety Code Section 388.005, in part, by requiring affected political subdivisions to: implement all cost-effective energy-efficiency measures, establish a goal to reduce electricity consumption by 5 percent each year for 6 years, and report efforts and progress annually to the State Energy Conservation Office (SECO). The report details the efforts being undertaken by SECO to provide assistance and information to affected entities, as well as the progress and efforts made by political subdivisions in meeting the energy efficiency mandates of SB 5/SB 12.

Meeting Your Energy Efficiency Goals

In terms of energy efficiency, the biggest step is requiring new buildings to meet the state's energy performance standards. These standards call for better weather stripping, more efficient air conditioners, stricter insulation guidelines, switches to turn off water heaters, tighter building envelopes and energy-efficient windows for new buildings. Under the new law, municipalities and counties can continue to make local amendments to the state energy codes as long as they are not less stringent than the statewide standard.

Source: <http://www.seco.cpa.state.tx.us/sb5compliance.htm>

APPENDIX F: SERVICE AGREEMENT



Local Governments and Municipalities

Preliminary Energy Assessment Service Agreement

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

Description of the Service

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

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

Principles of the Agreement

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

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

Acceptance of Agreement

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

Signature: _____

Date: 6/2/2009

Name (Mr./Ms./Dr.) Andre' Wimer

Title: City Manager

Organization: City of Port Neches

Phone: (409) 727-2182

Street Address: 634 Avenue C

Fax: (409) 719-4302

Mailing Address: P.O. Box 758

E-Mail: awimer@ci.port-neches.tx.us

Port Neches, TX 77651

County: Jefferson

Contact Information:

Name (Mr./Ms./Dr.): Taylor Shelton

Title: Public Works Director

Phone: (409) 727-2182

Fax: (409) 719-4302

E-Mail: tshelton@ci.port-neches.tx.us

County: Jefferson

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

5/13/10 Jacobs
SRV

6/4/09
Jacobs