



CITY OF HOMER
PUBLIC WORKS
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MEMORANDUM 010-144

TO: Walt Wrede, City Manager
FROM: Carey Meyer, Public Works Director
DATE: November 5, 2010
RE: **Energy Audit – City Facilities**
65% Recommendations

As authorized by the City Council, Public Works has been coordinating the evaluation of energy use at sixteen City facilities to identify cost effective improvements that could be made to reduce energy usage. The Council has approved the acceptance of a Alaska Energy Authority energy efficiency improvement grant in the amount of \$227,800 and has created a revolving loan account with an additional \$315,000; providing a total of \$542,800 to evaluate and implement energy efficiency improvements. The audit is expected to cost approximately \$30,000, leaving \$512,000 to complete improvements.

Siemens Industry, Inc. was selected (through the RFP process) as the most qualified firm to complete this energy use evaluation and began work in September. Siemens has completed the facility evaluations, prepared a 65% audit report and has identified potential projects that would reduce energy costs. The cost of and the annual energy cost savings for each potential facility improvement measure (FIM) has been estimated. A total of approximately \$1.5M worth of potential improvements has been identified. These FIM's have been prioritized based on a cost/benefit analysis and simple payback evaluation (in years).

Attached is a list of recommended improvements that have a simple 10 year payback. The list is broken down into two columns; one showing the improvements that can be accomplished within the budget and those that would require some additional funding. An additional \$275,000 would be necessary to complete energy efficiency improvements at the sewer treatment plant, the raw water pump station and at the harbormasters office. These additional improvements could be directly funded through the Water/Sewer and Harbor Reserve Accounts. The additional improvements could also be funded through an expansion of the City's energy efficiency revolving loan account. All City funded improvements could be financed through loans (various sources available); with loans being paid back through the revolving loan account.

Recommendations: The City Council informally approve continued evaluation (through 95%) of all recommended improvements. At the completion of the 95% audit (January 2011), staff to evaluate additional funding sources; make recommendations and draft ordinances that would provide resources necessary to complete all recommended energy efficiency improvements.

Energy Audit - City Facilities

Recommended Facility Improvement Measures (FIM)

Non-Lighting Facility Improvement Measure (FIM)	Description	est. annual savings	FIM within budget	FIM enterprise funds	simple payback (Yrs)
FISH DOCK - REPLACE CRANE TRANSFORMERS	Remove 8 Crane Transformers, Add 3 120V Circuits from Ice Plant Building	\$ 4,400	\$ 25,000		5.7
SEWER TREATMENT PLANT - MOTOR EFFIC. IMPROVEMENTS	Replace existing motors with higher efficiency motors	\$ 13,400		\$ 110,000	8.2
RAW WATER PUMP HOUSE - MOTOR EFFIC. IMPROVEMENTS	Replace existing motors with higher efficiency motors and install VFDs	\$ 11,900		\$ 95,000	8.1
AIRPORT - HVAC IMPROVEMENTS	New Fan Motor and VFD controlled by Building Pressure & CO2	\$ 1,400	\$ 14,000		10.0
HARBORMASTER - WEATHERIZATION	Abandon in place 6 electric radiant heat ceiling tiles and replace with fuel oil heater	\$ 1,500		\$ 7,000	4.7
PUBLIC WORKS - MISC INSULATE PIPING	Insulate approximately 400' of exposed heating water piping	\$ 1,400	\$ 8,000		5.7
MISC - POLICE STATION	Police station electric heat zones with new programmable control	\$ 3,000	\$ 8,000		2.7
MISC - FIRE STATION HEAT CONTROL	Fire station electric heat zones with new programmable control	\$ 1,000	\$ 9,000		9.0
MISC - PUBLIC WORKS HEAT CONTROL	Public works electric heat zones with new programmable control	\$ 700	\$ 7,000		10.0
SEWER TREATMENT PLANT - SOLAR AERATION	Solar Aeration System	\$ 13,200	\$ 111,000		8.4
Lighting Facility Improvement Measure (FIM)	Subtotal		\$182,000	\$212,000	
LIGHTING - HOMER AIRPORT	Lighting Upgrade and Occ Controls	\$ 10,000	\$ 84,000		8.4
LIGHTING - HOMER HARBOR	Lighting Upgrade and Occ Controls	\$ 27,200	\$ 195,000		7.2
LIGHTING - POLICE STATION	Lighting Upgrade and Occ Controls	\$ 10,900	\$ 50,000		4.6
LIGHTING - SEWER TREATMENT PLANT	Lighting Upgrade and Occ Controls	\$ 7,100		\$ 63,000	8.9
	Subtotal		\$329,000	\$63,000	

\$107,100	\$51,1000	\$275,000	7.2
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Energy Audit - City Facilities

Recommended Facility Improvement Measures (FIM)

Non-Lighting Facility Improvement Measure (FIM)	Description	est. annual savings	FIM within budget	FIM	simple payback (yrs)
FISH DOCK - REPLACE CRANE TRANSFORMERS	Remove 8 Crane Transformers. Add 3 120V Circuits from Ice Plant Building	\$ 4,400	\$ 25,000		5.7
SEWER TREATMENT PLANT - MOTOR EFFIC. IMPROVEMENTS	Replace existing motors with higher efficiency motors	\$ 13,400	\$ 110,000		8.2
RAW WATER PUMP HOUSE - MOTOR EFFIC. IMPROVEMENTS	Replace existing motors with higher efficiency motors and install VFDs	\$ 11,900	\$ 96,000		8.1
AIRPORT - HVAC IMPROVEMENTS	New Fan Motor and VFD controlled by Building Pressure & CO2	\$ 1,400		\$ 14,000	10.0
HARBORMASTER - WEATHERIZATION	Abandon in place 6 electric radiant heat ceiling tiles and replace with fuel oil heater	\$ 1,500	\$ 7,000		4.7
PUBLIC WORKS - MISC INSULATE PIPING	Insulate approximately 400' of exposed heating water piping	\$ 1,400	\$ 8,000		5.7
MISC - POLICE STATION	Police station electric heat zones with new programmable control	\$ 3,000	\$ 8,000		2.7
MISC - FIRE STATION HEAT CONTROL	Fire station electric heat zones with new programmable control	\$ 1,000	\$ 9,000		9.0
MISC - PUBLIC WORKS HEAT CONTROL	Public works electric heat zones with new programmable control	\$ 700		\$ 7,000	10.0
SEWER TREATMENT PLANT - SOLAR AERATION	Solar Aeration System	\$ 13,200		\$ 111,000	8.4
Lighting Facility Improvement Measure (FIM)			\$263,000	\$132,000	
LIGHTING - HOMER AIRPORT	Lighting Upgrade and Occ Controls	\$ 10,000		\$ 84,000	8.4
LIGHTING - HOMER HARBOR	Lighting Upgrade and Occ Controls	\$ 27,200	\$ 195,000		7.2
LIGHTING - POLICE STATION	Lighting Upgrade and Occ Controls	\$ 10,900	\$ 50,000		4.6
LIGHTING - SEWER TREATMENT PLANT	Lighting Upgrade and Occ Controls	\$ 7,100		\$ 63,000	8.9
Subtotal			\$245,000	\$147,000	

\$107,100	\$508,000	\$279,000	7.2
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CITY OF HOMER
DETAILED ENERGY AUDIT FACILITY IMPROVEMENT MEASURE LIST

Updated = 10/22/2010

FIM #	Facility Improvement Measure	FIM DESCRIPTION	Preliminary Annual Savings Estimate	ROM Implementation Cost	Years Simple Payback	Move Forward to 95%				Notes/Next Steps
						Grant Eligible Work	Additional Program Funding	Future Work	Other Fund Sources	
1.01	FISH DOCK - ICE PLANT UPGRADES	Upgrade Ice Plant Refrigeration System	\$ 32,000	\$ 950,000	29.7				\$950,000	Energy savings calculations from SRC unavailable
2.01	FISH DOCK - PUMP AND PROCESS MOTOR UPGRADES	Replace existing motors with higher efficiency motors	\$ 400	\$ 28,000	70.0			\$28,000		
3.01	FISH DOCK - CRANE MOTOR UPGRADES	Replace existing motors with higher efficiency motors	\$ 100	\$ 85,000	850.0			\$85,000		Want to investigate crane motor VFDs also? George to share (e) quote?
3.02	FISH DOCK - 120 V POWER	Remove 8 Crane Transformers. Add 3 120V Circuits from Ice Plant Building	\$ 4,400	\$ 25,000	5.7	\$25,000				
4.01	SEWER TREATMENT PLANT - MOTOR EFFICIENCY IMPROVEMENTS	Replace existing motors with higher efficiency motors	\$ 13,400	\$ 110,000	8.2	\$110,000				
4.02	RAW WATER PUMP HOUSE - MOTOR EFFICIENCY IMPROVEMENTS	Replace existing motors with higher efficiency motors and install VFDs	\$ 11,900	\$ 96,000	8.1	\$96,000				
5.01	AIRPORT - HVAC IMPROVEMENTS	Upgrade controls and implement new control strategies	\$ 700	\$ 48,000	68.6			\$48,000		
5.02	AIRPORT - HVAC IMPROVEMENTS	New Fan Motor and VFD controlled by Building Pressure & CO2	\$ 1,400	\$ 22,000	15.7		\$22,000			
5.03	AIRPORT - HVAC IMPROVEMENTS	Put Unit Heaters on automated control and setback evening temperature	\$ 400	\$ 20,000	50.0			\$20,000		
5.04	AIRPORT - HVAC IMPROVEMENTS	Install 6 Freezer Curtains on Baggage Doors.	\$ 1,000	\$ 32,000	32.0			\$32,000		
6.01	FISH DOCK - WEATHERIZATION	Weather Stripping on 2nd Story and 3rd Story Access Doors	\$ 100	\$ 3,000	30.0			\$3,000		
6.02	HARBORMASTER - WEATHERIZATION	Abandon in place 6 electric radiant heat ceiling tiles and replace with fuel oil h	\$ 1,500	\$ 7,000	4.7	\$7,000				
6.03	HARBORMASTER - WEATHERIZATION	Replace 11 Windows and 2 Doors	\$ 800	\$ 19,000	23.8			\$19,000		
7.01	PUBLIC WORKS - MISC INSULATE PIPING	Insulate approximately 400' of exposed heating water piping	\$ 1,400	\$ 8,000	5.7	\$8,000				
7.02	MISC - HERC 1 FAN TIMERS	Install timers on 5 supply/exhaust fans	\$ 4,600	\$ 9,000	2.0			\$9,000		COH already purchased timers? Siemens to provide install only?
7.03	MISC - ANIMAL SHELTER HEAT EXCHANGER	Install Air-to-Air Heat Exchanger	\$ 2,000	\$ 78,000	39.0			\$78,000		
7.04	MISC - POLICE STATION	Police station electric heat zones with new programmable control	\$ 3,000	\$ 8,000	2.7	\$8,000				
7.05	MISC - FIRE STATION HEAT CONTROL	Fire station electric heat zones with new programmable control	\$ 1,000	\$ 9,000	9.0	\$9,000				
7.06	MISC - PUBLIC WORKS HEAT CONTROL	Public works electric heat zones with new programmable control	\$ 700	\$ 7,000	10.0		\$7,000			
7.07	MISC - AIRBLADE HAND DRYERS	Airport and Harbor Restroom Hand Dryers	\$ 1,700	\$ 57,000	33.5			\$57,000		
7.08	MISC - VENDING MISERS (AIRPORT & PUBLIC WORKS)	Airport and Public Works Vending Machine Occupancy Control	\$ 400	\$ 5,000	12.5			\$5,000		
11.01	SEWER TREATMENT PLANT - SOLAR AERATION	Solar Aeration System	\$ 13,200	\$ 111,000	8.4	\$111,000				
FIM #	Lighting Facility Improvement Measure			Subtotal (non-lighting)		\$374,000	\$29,000	\$384,000	\$950,000	
8101a	Lighting-Animal Shelter		\$ 200	\$ 13,000	65.0			\$13,000		
8101b	Lighting-Fire Station	Lighting Upgrade and Occ Controls	\$ 2,500	\$ 37,000	14.8			\$37,000		
8101c	Lighting-Herc 1	Lighting Upgrade and Occ Controls	\$ 11,100	\$ 114,000	10.3			\$114,000		
8101d	Lighting-Herc 2	Lighting Upgrade and Occ Controls	\$ 2,600	\$ 41,000	15.8			\$41,000		
8101e	Lighting-Homer Airport	Lighting Upgrade and Occ Controls	\$ 10,000	\$ 84,000	8.4	\$84,000				
8101f	Lighting-Homer Harbor	Lighting Upgrade and Occ Controls	\$ 27,200	\$ 195,000	7.2		\$195,000			
8101g	Lighting-Police Station	Lighting Upgrade and Occ Controls	\$ 10,900	\$ 50,000	4.6	\$50,000				
8101h	Lighting-Public Works Shop and Garage	Lighting Upgrade and Occ Controls	\$ 4,900	\$ 66,000	13.5			\$66,000		
8101i	Lighting-Sewer Treatment Plant	Lighting Upgrade and Occ Controls	\$ 7,100	\$ 63,000	8.9		\$63,000			
				Subtotal (lighting)		\$134,000	\$258,000	\$271,000	\$0	
		City of Homer Project Totals	\$ 140,600	\$ 1,450,000	10.3	\$508,000	\$287,000	\$655,000	\$950,000	

Siemens Industry, Inc.
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