Comprehensive Energy Audit
For
Sleetmute Community Center

Prepared For

The Traditional Council of Sleetmute, and the Alaska Rural Utility Collaborative

Apr 26, 2011

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1. EXECUTIVE SUMMARY

This report was prepared for the [Building Owner]. The scope of the audit focused on Community Center. The scope of this report is a comprehensive energy study, which included an analysis of building shell, interior and exterior lighting systems, HVAC systems, and plug loads.

Based on electricity and fuel oil prices in effect at the time of the audit, the annual energy costs for the buildings analyzed are as follows:

$1,125 for Electricity
$5,013 for #1 Oil

The total energy costs are $6,138 per year.

The following table summarizes the energy efficiency measures recommended for the Sleemute Community Center.
Listed are the estimates of the annual savings, costs, and several payback scenarios.

PRIORITY LIST – RECOMMENDED ENERGY EFFICIENCY MEASURES						
Rank	Feature	Recommendation	Annual Energy Savings	Installed Cost	SIR	Payback (Years)
1	Setback Thermostat: Community Center	Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Community Center space.	$724	$10	1085.67	0
2	Air Tightening	Perform air sealing to reduce air leakage by 50 cfm at 50 Pascals.	$119	$150	8.13	1.3
3	Lighting: Exterior Lighting	Replace with 2 INCAN A Lamp, Halogen 90W	$54	$250	1.37	4.7
4	Lighting: Fluorescent Lighting	Replace with 25 LED Replacement	$248	$3,200	0.62	12.9
	TOTAL		**$1,144**	**$3,610**	**3.99**	**3.2**

With these energy efficiency measures in place, the annual utility cost can be reduced by $1,144 per year, or 18.6 % of the buildings' total energy costs. These measures are estimated to cost $3,610, for an overall simple payback period[1] of 3.2 years.

The recommended energy efficiency measures have also been analyzed from a life-cycle perspective.

This analysis does not take into account any capital cost avoidance associated with implementing the energy efficiency measures, nor does it take into account any associated differential maintenance costs. These neglected issues will have minimal influence on the results, compared to the initial costs and energy costs associated with the systems.

Annual Energy Cost Estimate										
Description	**Space Heating**	**Space Cooling**	**Water Heating**	**Lighting**	**Other Electrical**	**Cooking**	**Clothes Drying**	**Ventilation Fans**	**Service Fees**	**Total Cost**
Existing Building	$5,164	$0	$0	$751	$137	$0	$0	$0	$0	**$6,138**
With Proposed Retrofits	$4,433	$0	$0	$337	$137	$0	$0	$0	$0	**$4,994**
SAVINGS	$731	$0	$0	$413	$0	$0	$0	$0	$0	**$1,144**

[1] Simple Payback (SP) *Simple payback period* is a measure of the length of time required for cumulative savings for an EEM to recover the initial and other accrued costs. Therefore, the simple payback method is a form of breakeven analysis.

[2] Savings to Investment Ration (SIR) is calculated by dividing the total savings over the life of each project (expressed in today's dollars), by its investment costs. This SIR is an indication of the profitability of each measure; the higher the SIR, the more profitable the project. An SIR greater than 1.0 indicates a cost-effective project. Remember that this profitability is based on the position of that EEM in the overall list, and on all of the measures above it being implemented first.

2. AUDIT AND ANALYSIS BACKGROUND

2.1 Program Description

This audit included services to identify, develop, and evaluate energy efficiency measures at the Community Center. The scope of this project included evaluating building shell, lighting and other electrical systems, and HVAC equipment, motors and pumps. Measures were selected based on a life-cycle-cost analysis which includes the initial cost of the equipment, life of the equipment, annual energy cost, annual maintenance cost, and a discount rate of

2.2 Audit Description

Preliminary audit information was gathered in preparation for the site survey. The site survey provides critical information in deciphering where energy is spent and what opportunities exist within a building. The entire site is surveyed to inventory the following to gain an understanding of how each building operates:

- Building envelope (roof, windows, etc.)
- Heating, ventilation, and air conditioning equipment (HVAC)
- Lighting systems and controls
- Building-specific equipment
- Water consumption, treatment (optional) & disposal

The building site visit was performed to survey all major building components and systems. The site visit included detailed inspection of energy consuming components. Summary of building occupancy schedules, operating and maintenance practices, and energy management programs provided by the building manager were collected along with the system and components to determine a more accurate impact on energy consumption.

Details collected from Community Center enable a model of the building's energy usage to be developed, highlighting the building's total energy consumption, energy consumption by specific building component, and equivalent energy cost. The analysis involves distinguishing the different fuels used on site, and analyzing their consumption in different activity areas of the building.

In addition, the methodology involves taking into account a wide range of factors specific to the building. These factors are used in the construction of the model of energy used. The factors include:

- Occupancy hours
- Local climate conditions
- Prices paid for energy

2.3. Method of Analysis

Data collected was processed using AkWarm© Energy Use Software to anticipate energy usage for each of the proposed energy efficiency measures (EEMs). The recommendations focus on the building envelope; HVAC; lighting, plug load, and other electrical improvements; and motor and pump systems that will reduce annual energy consumption.

EEMs are evaluated based on building use and processes, local climate conditions, building construction type, function, operational schedule, existing conditions, and foreseen future plans. Energy savings are calculated based on industry standard methods and engineering estimations. When new equipment is proposed, energy consumption is calculated based on manufacturer's cataloged information.

Our analysis provides a number of tools for assessing the cost effectiveness of various improvement options.

Life-cycle costing is defined in this context as a method of cost analysis that estimates the total cost of a project over the period of time that includes both the construction cost and ongoing maintenance and operating costs.

Savings to Investment Ratio = **Savings** divided by **Investment**

"Savings" includes:

- Discounted dollar savings of the measure over its lifetime
- First year energy savings of the measure
- Discounted fuel price for measure during lifetime – from DOE
- Price of fuel saved by the measure
- Conversion factor for fuel price
- Fuel price index for
- Fractional discount rate

Investment = Labor and materials for installing the measure. **Simple payback** is a cost analysis method whereby the annual savings arising from an investment are estimated, and divided by the investment cost to give the number of years required to recover the cost of the investment. This may also be compared to the expected time to replacement of the system or component. For example, if a boiler costs $12,000 and results in a saving of $1,000 per year and has an expected life to replacement of 10 years, the payback time is 12 years and it would not be financially viable to make the investment. If the annual savings is doubled (e.g. due to increased electricity cost), then the payback becomes 5 years and the investment is now viable

Internal Rate of Return is the annualized return on investment, based on the amount saved in relation to the amount invested. This is compared with similar indicators, such as the interest rate that could have been earned in an investment account to determine whether the investment is cost effective.

Net Present Value is a method of assessing the present value of future costs and returns, using a 'discount rate' to quantify the relative value of having access to money now compared to having access to it in the future.

Measures are implemented in order of cost-effectiveness. The program first calculates individual SIRs, and ranks all measures by SIR, higher SIRs at the top of the list. An individual measure must have an individual SIR>=1 to make the cut. Next the building is modified and re-simulated with the highest ranked measure included. Now all remaining measures are re-evaluated and ranked, and the next most cost-effective measure is implemented. AkWarm goes through this iterative process until all appropriate measures have been evaluated and installed.

It is important to note that the savings for each recommendation is calculated based on implementing the most cost effective measure first, and then cycling through the list to find the next most cost effective measure. Implementation of more than one EEM often affects the savings of other EEMs. The savings may in some cases be relatively higher if an individual EEM is implemented in lieu of multiple recommended EEMs. For example implementing reduced operating schedules for inefficient lighting will result in a greater relative savings. Implementing reduced operating schedules for newly installed efficient lighting will result in a lower relative savings, because there is less energy to be saved. If multiple EEM's are recommended to be implemented, the combined savings is calculated and identified appropriately.

Cost savings are calculated based on estimated existing costs for each measure. Installation costs include labor and equipment to estimate the full up-front investment required to implement a change. Costs are derived from Means Cost Data, industry publications, and local contractors and equipment suppliers. Maintenance savings are calculated where applicable and added to the energy savings for each EEM.

2.4 Limitations of Study

All results are dependent on the quality of input data provided, and can only act as an approximation. In some instances, several methods may achieve the identified savings. This report is not intended as a final design document. The design professional or other persons following the recommendations shall accept responsibility and liability for the results. Budget for engineering and design of these projects is not included in the cost estimate for each measure.

3. Community Center

3.1. Building Description

The 2,704 square foot Community Center was constructed in 2011, with a high occupancy use of 50, which only rarely occurs during community events.
The number of hours of operation for this building is 10.3 hours per day.

Comments on building details:
The community center has been constructed with energy efficiency in mind. The building had yet to open for operation at the time of the audit, and these numbers are based on future assumed usage.

Description of Building Shell
The exterior walls are constructed with an offsetting double wall 2x6 frame and well insulated.

Typical windows throughout the building are new double paned wood/vinyl frame operable windows.

The hot roof is a cathedral ceiling with good insulation.

The building floor is an above grade floor above a tightly sealed crawlspace with good insulation.

Description of HVAC Systems

Toyo Stove Laser 73

The existing heating system is:

Fuel Type:	Oil_No_1
Input Rating:	40000 BTU/Hr
Steady State Efficiency:	96 %
Distribution System:	Air

Currently a toyo stove is being used to heat the entire building, but eventually a boiler system will be set up to provide the heat for the building. The old boiler was broken, and a new one was being installed.

Space Heating Plant and Cooling Plant Distribution

Toyo

Toyo Stove Laser 73	100 % of Load

Lighting
The lighting in the building is made up of T8 Fluorescent lighting with electronic instant start ballasts. The lighting is set up with double switch locations and multi level lighting options, for reduced electric demand and ideal control of lighting level.

Additionally in the storage space upstairs there is a bank of energy efficient T5 lights, though the potential for using less bulbs is there, the low usage of the area makes the reduction in lamps inconsequential.

Plug Load
The plug loads in the building were difficult to identify as the building was not being used yet. However, the presence of a microwave, refrigerator, and a future operating usage of bingo fundraising are the likely largest plug loads.

Major Equipment
The equipment list, available in Appendix A, is composed of major energy consuming equipment which through energy conservation measures could yield substantial energy savings. The list shows the major equipment in the building and all pertinent information utilized in energy savings calculations.

3.2 Predicted Energy Use

3.2.1. Energy Usage / Tariffs

The electric usage profile charts (below) represents the predicted electrical usage for the building. If actual electricity usage records were available, the model used to predict usage was calibrated to approximately match actual usage. The electric utility measures consumption in kilowatthours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges.

The fuel oil usage profile shows the fuel oil usage for the building. Fuel oil consumption is measured in gallons. One gallon of Fuel oil #1 is equivalent to approximately 132,000 BTUs of energy.

The following is a list of the energy providers, and their fuel rate structure:

Middle Kuskokwim Electric Coop
Electricity, ($/kWh)
Rate1 $0.73

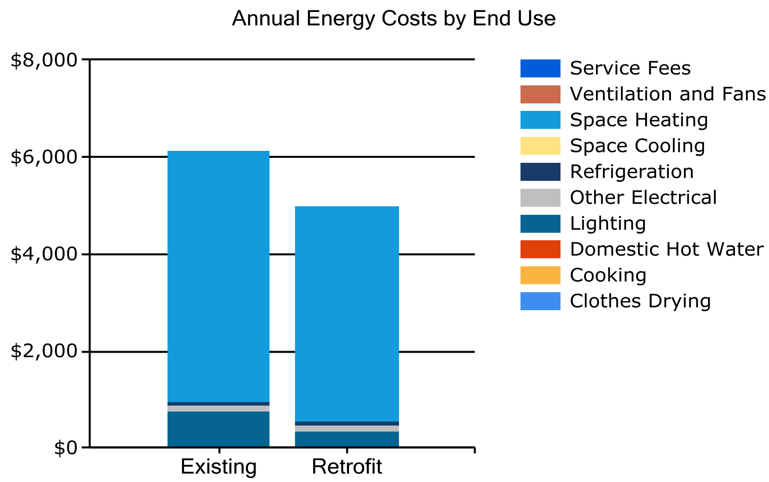
The overall cost for energy use is calculated by dividing the total annual cost by the total annual fuel usage. The current average cost for energy at this building is as follows:

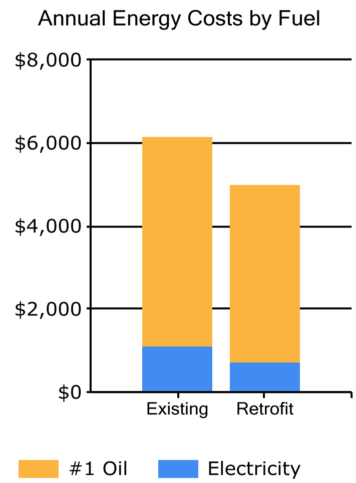
Description	Average Energy Cost
Electric	$0.26/kWh

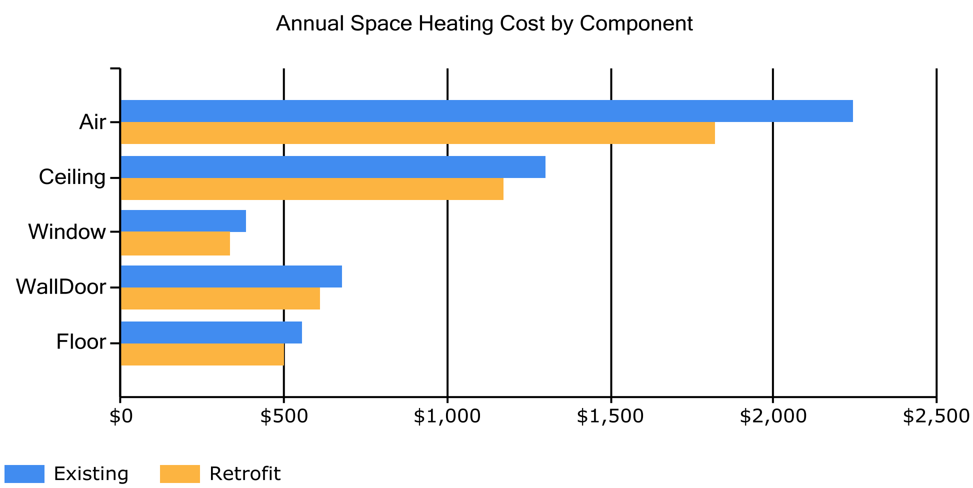
3.2.1.1 Total Energy Use and Cost Breakdown

At current rates, [Building Owner] pays approximately $6,138 annually for electricity and other fuel costs for the Community Center.

Figure 3.1 reflects the estimated distribution of costs of the primary end uses based on the AkWarm© computer simulation.







3.2.2 Energy Use Index (EUI)

Energy Use Index (EUI) is a measure of a building's annual energy utilization per square foot of building. This calculation is completed by converting all utility usage consumed by a building for one year, to British Thermal Units (Btu) or kBtu, and dividing this number by the building square footage. EUI is a good measure of a building's energy use and is utilized regularly for comparison of energy performance for similar building types. The Oak Ridge National Laboratory (ORNL) Buildings Technology Center under a contract with the U.S. Department of Energy maintains a Benchmarking Building Energy Performance Program. The ORNL website determines how a building's energy use compares with similar facilities throughout the U.S. and in a specific region or state.

Source use differs from site usage when comparing a building's energy consumption with the national average. Site energy use is the energy consumed by the building at the building site only. Source energy use includes the site energy use as well as all of the losses to create and distribute the energy to the building. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses, which allows for a complete assessment of energy efficiency in a building. The type of utility purchased has a substantial impact on the source energy use of a building. The EPA has determined that source energy is the most comparable unit for evaluation purposes and overall global impact. Both the site and source EUI ratings for the building are provided to understand and compare the differences in energy use.
The site and source EUI for this building is calculated as follows. (See Table 3.4 for details):

$$\text{Building Site EUI} = \frac{(\text{Electric Usage in kBtu} + \text{Gas Usage in kBtu})}{\text{Building Square Footage}}$$

$$\text{Building Source EUI} = \frac{(\text{Electric Usage in kBtu X SS Ratio} + \text{Gas Usage in kBtu X SS Ratio})}{\text{Building Square Footage}}$$

Table 3.4
Community Center EUI Calculations

Energy Type	Building Energy Use per Year			Site Energy Use per Year	Site/Source	Source Energy Use per Year
	kWh	ccf	Gallons	kBTU	Ratio	kBTU
Electric (kWh)	4,327			14,768	3.340	49,324
Oil_No_1 (gallons)			833	109,927	1.010	111,027
Total	**4,327**		**833**	**124,695**		**160,350**
BUILDING AREA				2,704	SQUARE FEET	
BUILDING SITE EUI				46	kBtu/Ft²/Yr	
BUILDING SOURCE EUI				59	**kBtu/Ft²/Yr**	
* Site - Source Ratio data is provided by the Energy Star Performance Rating Methodology for Incorporating Source Energy Use document issued Dec 2007.						

3.3 AkWarm© Building Simulation

An accurate model of the building performance can be created by simulating the thermal performance of the walls, roof, windows and floors of the building. The HVAC system and central plant are modeled as well, accounting for the outside air ventilation required by the building and the heat recovery equipment in place.

The model uses local weather data and is trued up to historical energy use to ensure its accuracy. The model can be used now and in the future to measure the utility bill impact of all types of energy projects, including improving building insulation, modifying glazing, changing air handler schedules, increasing heat recovery, installing high efficiency boilers, using variable air volume air handlers, adjusting outside air ventilation and adding cogeneration systems.

For the purposes of this study, the Community Center was modeled using AkWarm© energy use software to establish a baseline space heating and cooling energy usage. Climate data from Sleetmute was used for analysis. From this, the model was be calibrated to predict the impact of theoretical energy savings measures. Once annual energy savings from a particular measure were predicted and the initial capital cost was estimated, payback scenarios were approximated. Equipment cost estimate calculations are provided in Appendix D.

Limitations of AkWarm© Models

• The model is based on typical mean year weather data for Sleetmute. This data represents the average ambient weather profile as observed over approximately 30 years. As such, the gas and electric profiles generated will not likely compare perfectly with actual energy billing information from any single year. This is especially true for years with extreme warm or cold periods, or even years with unexpectedly moderate weather.
• The heating and cooling load model is a simple two-zone model consisting of the building's core interior spaces and the building's perimeter spaces. This simplified approach loses accuracy for buildings that have large variations in cooling/heating loads across different parts of the building.
• The model does not model HVAC systems that simultaneously provide both heating and cooling to the same building space (typically done as a means of providing temperature control in the space).

The energy balances shown in Section 3.1 were derived from the output generated by the AkWarm© simulations.

4. RECOMMENDED ENERGY COST SAVING MEASURES

4.1 Summary of Results

The recommended measures are summarized in Table 4.1. Please refer to the individual measure descriptions later in this report for more detail. Calculations and cost estimates for analyzed measures are provided in Appendix C.

Table 4.1
Community Center, Sleetmute, Alaska

PRIORITY LIST – RECOMMENDED ENERGY EFFICIENCY MEASURES						
Rank	**Feature**	**Recommendation**	**Annual Energy Savings**	**Installed Cost**	**SIR**	**Payback (Years)**
1	Setback Thermostat: Community Center	Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Community Center space.	$724	$10	1085.67	0
2	Air Tightening	Perform air sealing to reduce air leakage by 50 cfm at 50 Pascals.	$119	$150	8.13	1.3
3	Lighting: Exterior Lighting	Replace with 2 INCAN A Lamp, Halogen 90W	$54	$250	1.37	4.7
4	Lighting: Fluorescent Lighting	Replace with 25 LED Replacement	$248	$3,200	0.62	12.9
		TOTAL	**$1,144**	**$3,610**	**3.99**	**3.2**

4.2 Interactive Effects of Projects

Savings for the recommended measures were calculated assuming all recommended EEMs are implemented. If some EEMs are not implemented, savings for the remaining EEMs will be affected, in some cases positively and in others, negatively. For example, if the fan motors are not replaced with premium-efficiency motors, then the savings for the project to install variable-speed drives (VSDs) on the fans will be decreased.

In general, all projects are evaluated sequentially so energy savings associated with one EEM would not also be attributed to another EEM. For example, the night setback EEM was analyzed using the fan and heating load profile that will be achieved after the installation of the VSD project is complete. By modeling the recommended project sequentially, the analysis accounts for interactive affects among the EEMs and does not “double count” savings.

Interior lighting, plug loads, facility equipment, and occupants generate heat within the building. When the building is in cooling mode, these items contribute to the overall cooling demands of the building; therefore, lighting efficiency improvements will reduce cooling requirements in air-conditioned buildings. Conversely, lighting-efficiency improvements are anticipated to slightly increase heating requirements. Heating penalties were included in the lighting project analysis.

4.3 Building Shell Measures

ENERGY AUDIT REPORT – ENERGY EFFICIENT RECOMMENDATIONS					
1. Building Envelope					
Air Leakage					
Rank	**Location**	**Estimated Air Leakage**	**Recommended Air Leakage Target**	**Installed Cost**	**Annual Energy Savings**
2		Air Tightness from Blower Door Test: 1000 cfm at 50 Pascals	Perform air sealing to reduce air leakage by 50 cfm at 50 Pascals.	$150	$119
2. Mechanical Equipment					
Setback Thermostat					
Rank	**Location**	**Size/Type/Condition**	**Recommendation**	**Installed Cost**	**Annual Energy Savings**
1	Community Center	Existing Unoccupied Heating Setpoint: 70.0 deg F	Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Community Center space.	$10	$724
3. Appliances and Lighting					
Lighting Fixtures and Controls					
Rank	**Location**	**Existing**	**Recommended**	**Installed Cost**	**Annual Energy Savings**
3	Exterior Lighting	2 INCAN A Lamp, Halogen 90W with Manual Switching	Replace with 2 INCAN A Lamp, Halogen 90W	$250	$54
4	Fluorescent Lighting	25 FLUOR (3) T8 4' F32T8 32W Standard Instant StdElectronic with Manual Switching	Replace with 25 LED Replacement	$3,200	$248

4.3.4. Energy Efficiency Measure: Seal Air Leaks

Rank	**Estimated Air Leakage**	**Recommended Air Leakage Target**	**Energy Auditor Comments**	**Cost**	**Savings**
2	Air Tightness from Blower Door Test: 1000 cfm at 50 Pascals	Perform air sealing to reduce air leakage by 50 cfm at 50 Pascals.		$150	$119

Many buildings, especially older ones, have air leaks allowing heated and cooled air to escape when the air pressure differs between the inside and outside of the building. Because these leaks allow unconditioned air to enter as conditioned air is lost, air leaks can be a significant waste of energy and money. They also make the building drafty. Many buildings have hidden air leaks requiring a weatherization technician to find and seal. It is recommended you find a seal-up technician who uses a blower door to help identify where the air is leaking and, after sealing the leaks, verifies the reduction in leakage. Buildings with indoor air pollution caused by combustion heating, tobacco smoking, or moisture problems, may require more ventilation than average buildings.

4.4 Heating and Cooling Measures

4.4.1. EEM Heating Plants, Cooling Plants, and Distribution Systems

A heating system is expected to last approximately 20-25 years, depending on the system. If the system is nearing the end of its life, it is better to replace it sooner rather than later to avoid being without heat for several days when it fails. This way, you will have time to compare bids, check references and ensure the contractors are bonded and insured.

Recommendation:
Proper installation and maintenance of the new boiler system will be more efficient and effective at maintaining proper temperatures in the building. Proper programming of a setback thermostat will ensure lower heating costs in the building when not in use and allow for comfort when the building is in use.

4.4.1.1. EXISTING SYSTEMS

4.4.1.1.1 Toyo Stove Laser 73
Description: heating plant fueled by #1 Fuel Oil, with a Natural draft.
Size : 40,000 BTU/h
Efficiency (Steady State & Idle): 96%
Portion of heat supplied by this unit: 100%
Notes:

4.4.2 Programmable Thermostat

Location	Existing Situation	Recommended Improvement	Install Cost	Annual Savings	Notes
Community Center	Existing Unoccupied Heating Setpoint: 70.0 deg F	Implement a Heating Temperature Unoccupied Setback to 60.0 deg F for the Community Center space.	$10	$724	

4.5 LIGHTING UPGRADES

The goal of this section is to present any lighting energy conservation measures that may also be cost beneficial. It should be noted that replacing current bulbs with more energy-efficient equivalents will have a small effect on the building heating and cooling loads. The building cooling load will see a small decrease from an upgrade to more efficient bulbs and the heating load will see a small increase, as the more energy efficient bulbs give off less heat.

The Lighting Audit appendix outlines the proposed retrofits, costs, savings, and payback periods for each location.

4.5.1 Lighting Upgrade – Replace Existing Fixtures and Bulbs

Location	Existing Lighting	Recommended Improvement	Install Cost	Annual Savings	Notes
Exterior Lighting	2 INCAN A Lamp, Halogen 90W with Manual Switching	Replace with 2 INCAN A Lamp, Halogen 90W	$250	$54	
Fluorescent Lighting	25 FLUOR (3) T8 4' F32T8 32W Standard Instant StdElectronic with Manual Switching	Replace with 25 LED Replacement	$3,200	$248	Not recommended at current energy prices

Description:
This EEM includes replacement of the existing fixtures containing T8 lamps and electronic ballasts with fixtures containing LED Replacement lamps and no ballasts. The new energy efficient LED Lamps will provide adequate lighting and will save the owner on electrical costs due to the better performance of the lamp and increased efficiency from no ballast losses. This EEM will also provide maintenance savings through the reduced number of lamps replaced per year. The expected lamp life of an LED Lamp is approximately 50,000 burn-hours, in comparison to the existing T8 lamps which is approximately 30,000 burn-hours. The building will need 40% less lamps replaced per year.

This EEM additionally includes the replacement of the existing exterior low pressure sodium wall pack fixtures with LED wall pack alternatives. These LEDS have a longer life, are quicker starting, work more effectively in cold temperatures, and use less electricity.

4.7.5 Water Heater

The design life of most water heaters is 13 years. It is advisable to replace a water heater if it is older than its design life rather than waiting until it unexpectedly breaks down. If a water heater is not working properly, a technician should decide whether it should be repaired or replaced.

Lower the temperature of the water heater to 120° F to save energy and reduce the chance of scalding. If the hot water supply is insufficient at this setting, increase the water heater temperature by 5 degrees Fahrenheit and try it for a few days. CAUTION: If your dishwasher does not have a booster heater and your dishes do not come out clean, you should raise the water temperature to the setting recommended by the dishwasher manufacturer.

Energy can be saved by installing an insulating blanket around the water tank to reduce standby heat losses. When the water heater is located in a conditioned space that requires cooling in the summer, insulating will also lower the cooling load. Many business owners can install this product themselves. CAUTION: If the tank has a warning label against the installation of additional insulation, do not install a wrap.

Another energy saving option is an electric timer which shuts off an electric water heater when hot water is not needed, thus reducing standby losses. This measure typically saves between 5%–12% of the energy used by the water heater. CAUTION: Contact a qualified electrician to perform the installation of the electric timer (the breaker must be turned off or the fuse must be disconnected).

5. ENERGY EFFICIENCY ACTION PLAN

Through inspection of the energy-using equipment on-site and discussions with site facilities personnel, this energy audit has identified several energy-saving measures. The measures will reduce the amount of fuel burned and electricity used at the site. The projects will not degrade the performance of the building and, in some cases, will improve it.

Several types of EEMs can be implemented immediately by building staff, and others will require various amounts of lead time for engineering and equipment acquisition. In some cases, there are logical advantages to implementing EEMs concurrently. For example, if the same electrical contractor is used to install both lighting equipment and motors, implementation of these measures should be scheduled to occur simultaneously.

APPENDICES (Please Attach Documents for Appendixes A through D)

Appendix A – Major Equipment List

Appendix B – Scanned Energy Billing Data

1. Electricity Billing Data
2. Billing Data for the following Fuel Types
   Electricity
   #1 Oil

Appendix C – Performance Results

1. Thermal Imaging/Blower Door Test

Appendix D – Detailed Cost Breakdown per EEM

ENERGY AUDIT REPORT – PROJECT SUMMARY

General Project Information

PROJECT INFORMATION	AUDITOR INFORMATION
Building: Community Center	**Auditor Company:** ANTHC
Address: P.O. Box 109 Sleetmute, AK 99668	**Auditor Name:** ANTHC Energy Program
City: Sleetmute	**Auditor Address:** 1901 Bragaw St. Suite 200 Anchorage, AK 99508
Client Name: No contact listed	
Client Address:	**Auditor Phone:** (907) 729-3548
	Auditor FAX: ( ) -
Client Phone: (907) 449-4205	**Auditor Comment:**
Client FAX:	

Design Data

Building Area: 2,704 square feet	**Design Heating Load:** Design Loss at Space: 51,293 Btu/hour with Distribution Losses: 51,293 Btu/hour Plant Input Rating assuming 82.0% Plant Efficiency and 25% Safety Margin: 78,190 Btu/hour Note: Additional Capacity should be added for DHW load, if served.
Typical Occupancy: 50 people	**Design Indoor Temperature:** 70 deg F (building average)
Actual City: Sleetmute	**Design Outdoor Temperature:** -40.1 deg F
Weather/Fuel City: Sleetmute	**Heating Degree Days:** 13,339 deg F-days

Utility Information

Electric Utility: Middle Kuskokwim Electric Coop	**Natural Gas Provider:** None
Average Annual Cost/kWh: $0.260/kWh	**Average Annual Cost/ccf:** $0.000/ccf

Annual Energy Cost Estimate

Description	Space Heating	Space Cooling	Water Heating	Lighting	Other Electrical	Cooking	Clothes Drying	Ventilation Fans	Service Fees	Total Cost
Existing Building	$5,164	$0	$0	$751	$137	$0	$0	$0	$0	**$6,138**
With Proposed Retrofits	$4,433	$0	$0	$337	$137	$0	$0	$0	$0	**$4,994**
SAVINGS	$731	$0	$0	$413	$0	$0	$0	$0	$0	**$1,144**

Appendix F – Photographs from AkWarm Program: