Commercial Facility Energy Audits

Penobscot Indian Nation Indian Island, Maine.

Alan R. Mulak, PE, LLC
July 11, 2006
U.S. DOE Grant DE-FG35-05GO15175, A000

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Disclaimer

The information contained within this report is based upon a walk-through assessment of the facility on the date of the audit. I have based my findings and suggestions on what I observed at the time, data I was provided with, studies performed by potential vendors, and in some cases what was provided to me anecdotally. The suggested courses of action are my opinion and in no way am I guaranteeing energy savings, installation, or performance.

Section 1 - Executive Summary

1.1 Introduction:

This report details the recommendations and conclusions of energy audits conducted at the thirteen largest commercial Penobscot Indian Nation facilities on March 27 and 28, 2006. This effort resulted from a contract between the Penobscot Indian Nation and Alan R. Mulak, PE for energy audit services dated February 27, 2006.

During the time on site, Alan R Mulak P.E., an independent consulting engineer working for the Penobscot Indian Nation had assistance from David Pardilla, Facility Manager, William Thompson, Air Quality Specialist, and Mike Sockalexis, Tribal Energy Coordinator. Also assisting was David Climo, Master Electrician with regards to lighting counts and estimates.

Section one of this study provides summary level information on findings, recommendations, and projected savings if all measures are implemented.

Section two of this study breaks out each facility separately and all are contained within. Each section includes recommendations for Energy Conservation Measures (ECM) addressing the electric, oil, and gas usage in the facilities. Details of the findings and recommendations are contained in their respective sections of this report.

A summary table showing energy savings, cost savings, implementation costs, and simple payback period for the recommended energy conservation measure considered is shown in the four sections that follow. Equipment specifications also known as “cut sheets” on recommended technologies have been included in the appendix. The cut sheets are included to offer an idea of the type of technology recommend…not the specific product.

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Note: This report was made possible by a grant from the U.S. Department of Energy. It is grant number DE-FG35-05GO15175, A000

1.2 Summary of Energy Conservation Measures:

The following table is a summary of all recommended Energy Conservation Measures (ECMs) for all thirteen studied facilities. When implementing these measures, it is recommended that this energy saving equipment be installed (where appropriate) in the smaller facilities as well.

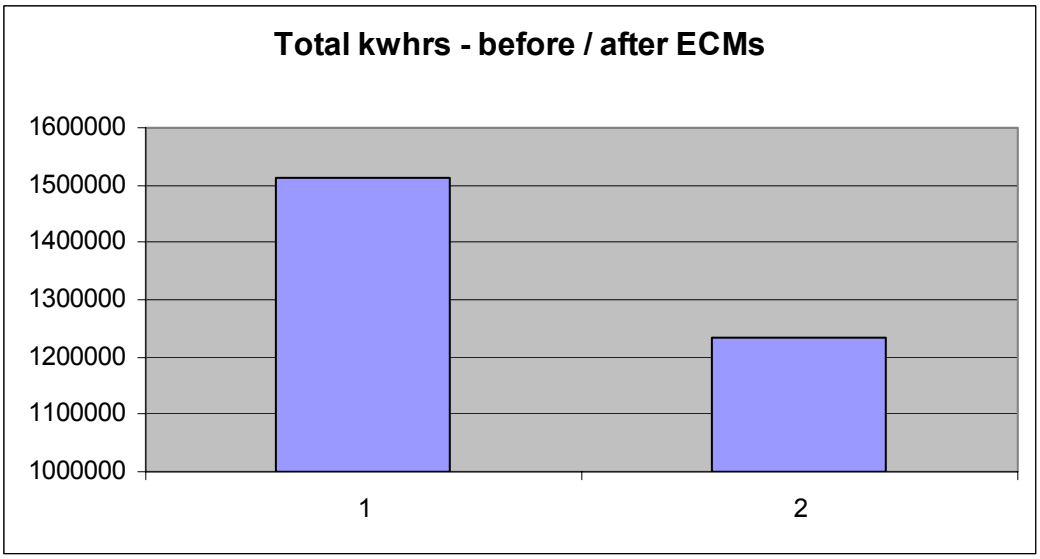
Chart 1.2.1 Summary ECMs

Measure	Annual Energy Savings (kwhr)	Demand Savings (KW)	Oil Savings (Gallons)	Propane Savings (Gallons)	Installed cost	Annual Cost Savings	Utility Rebate	Simple Payback (years)
ECM-1: Upgrade Lighting	165369	34	0	0	$ 117,365	$ 31,651	$ 28,512	2.8
ECM-2: Occupancy Sensors	41141	0	0	0	$ 17,950	$ 7,817	$ 8,050	1.3
ECM-3: Vendor Misers	20160	0	0	0	$ 1,925	$ 3,830	$ -	0.5
ECM-4: Setback Thermostats	21280	2	6791	1250	$ 17,150	$ 15,664	$ -	1.1
ECM-5: Cooler / Freezer Economizers	2500	0	0	0	$ 3,000	$ 475	$ -	6.3
ECM-6: Electric Motors	3518	1	0	0	$ 1,268	$ 675	$ 120	1.7
ECM-8: Tankless Water Heaters	24585	6	0	-150	$ 6,000	$ 4,459	$ -	1.3
Totals	278553	43	6791	1100	$ 164,658	$ 64,571	$ 36,682	2.0

1.3 Summary of Projected Economics

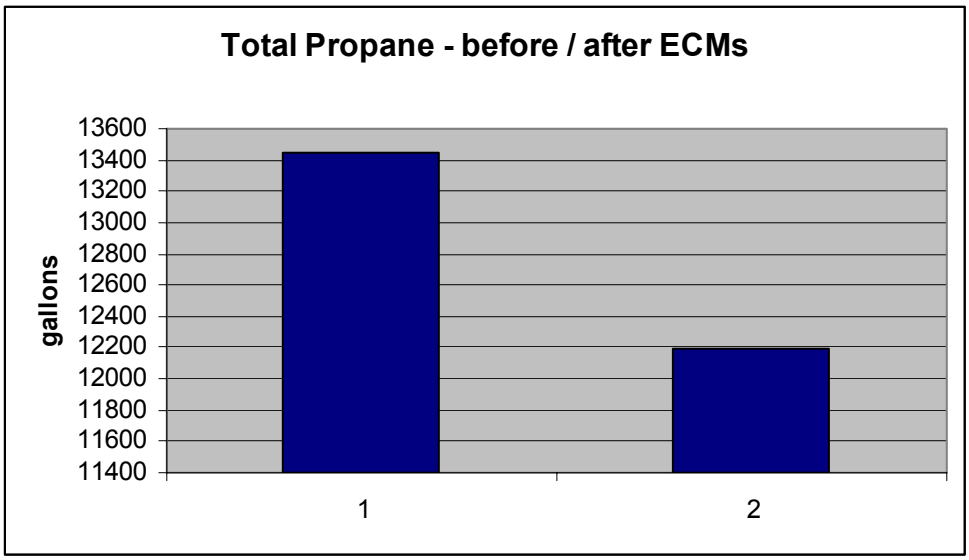
The following graphs and tables offer an estimation of energy savings and cash flow if all ECMs are implemented. These values assume no change in occupancy patterns or energy usage.

Graph 1.3.1 Total kwhrs



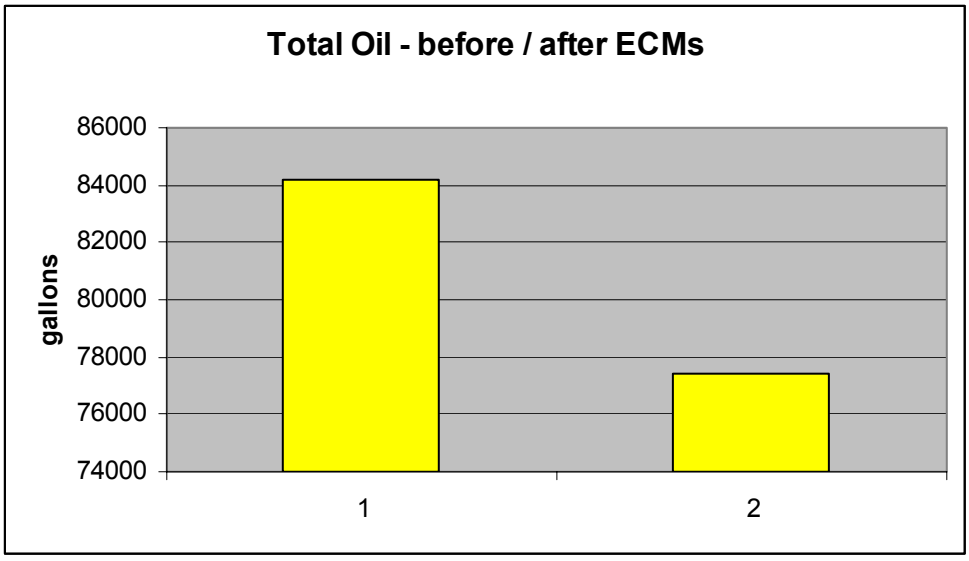
Graph 1.3.1 (above) illustrates the results in energy savings measured in kwhrs if all ECMs are implemented. The savings is estimated to be 278,553 kwhrs which at current Bangor Hydro electric rates amounts to $52,925 per year.

Graph 1.3.2 Total Propane



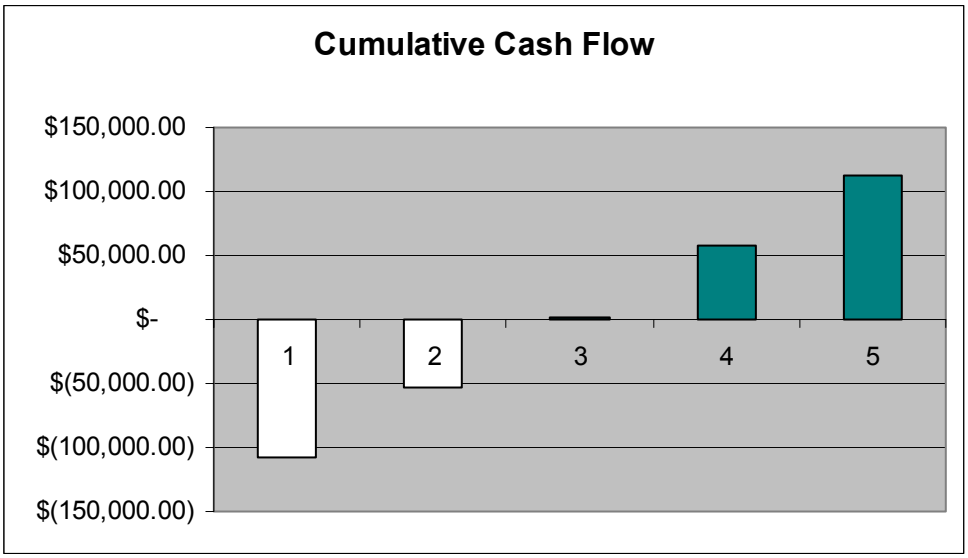
Graph 1.3.2 (above) illustrates the results in energy savings measured in gallons of propane if all ECMs are implemented. The savings is estimated to be 1,250 gallons which at current AmeriGas rates amounts to $2,099 per year.

Graph 1.3.3 Total Oil



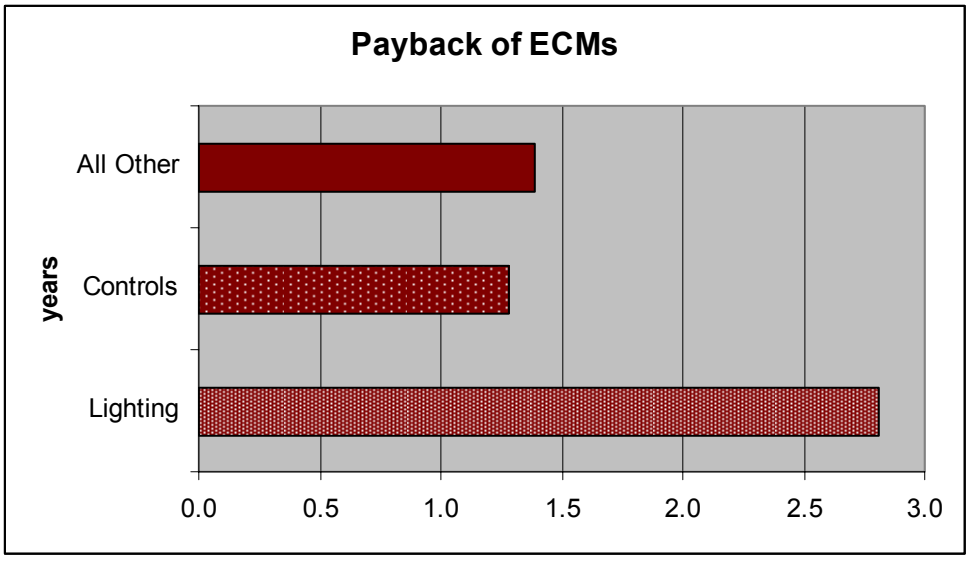
Graph 1.3.3 (above) illustrates the results in energy savings measured in gallons of oil if all ECMs are implemented. The savings is estimated to be 6,791 gallons which at contract rates of $1.40 per gallon amounts to $9,507 per year. Also, this estimated savings does not include savings from (1) actuator replacement and (2) roof repairs, both of which could result in significant oil savings.

Graph 1.3.4 Cash Flow



Graph 1.3.4 (above) illustrates the projected cash flow is all measures are implemented in the first year of the project. Based upon estimates, the break-even time period is roughly 2.05 years.

Graph 1.3.5 Simple Payback



Graph 1.3.5 (above) illustrates the calculated simple payback of the recommended ECMs. All SPBs are less than three years, thus excellent projects.

Chart 1.3.6 Oil Comparison

Oil Pricing Economics

Annual Usage	Gallons	Cost per Gal. $2.05	Cost per Gal. $1.40	Projected Savings
Current	84200	$172,610.00	$117,880.00	$54,730.00
After ECMs	77409	$158,688.45	$108,372.60	$64,237.40

Chart 1.3.6 (above) illustrates the difference between continued purchases of oil from R. H. Foster and the contracted amount of $1.40 / gallon from Venezuela.

1.4 Suggested Energy Conservation Measures Technologies and Equipment:

The following are the technologies and equipment recommended in the ECMs:

1. LED Exit Signs. The most common exit sign upgrade is to replace signs using incandescent and fluorescent bulbs with signs that use LED (high efficiency light emitting diode) bulbs. This retrofit both reduces energy use by up to 80% and lowers maintenance costs. One sign alone can save about $15-20 annually on electricity costs and can last up to 25 years without a lamp replacement. Replace all exit signs with LED exits, similar to one shown at right. In K-12 schools, Efficiency Maine offers a rebate on this technology.

2. High Performance T8 Lamps with Electronic Ballasts. Fluorescent lighting has improved over time. Switching from standard T12 (1-1/2 inch diameter) fluorescent tubes with magnetic ballasts to thinner T8 tubes with electronic ballasts will save over 40 percent in electricity usage. Ballasts are an essential part of fluorescent lamps. Magnetic ballasts are now being phased out in favor of more energy-efficient electronic ballasts Electronic ballasts have different starting characteristics depending on the specific use. These include rapid start, instant start, and program start varieties. The new "Super T8s" are more efficient than the standard T8s and Efficiency Maine offers a rebate on this technology.

3. Compact Fluorescent Lamps. Replacing incandescent bulbs with fluorescent lamps will save up to 75% of the electricity costs per lamp. Fluorescent lamps also last up to 10 times longer than incandescent bulbs and produce 90% less heat. Although the initial cost of CFLs is high relative to incandescent lamps, the energy savings and reduced

maintenance time and expense from lamp replacement make CFLs a cost-effective energy conservation measure for many applications. CFLs should be installed in areas with the heaviest use, such as hallways, stairwells, lobbies, and community areas. To obtain sufficient light levels, the wattage of the CFL should generally be one-third to one-fourth that of the incandescent it is replacing. If you are unfamiliar with the best CFL wattage to use for your lighting needs, determine the lumens (light output) of the current incandescent bulb and look for this lumen level when selecting the appropriate CFL. Efficiency Maine offers a rebate on this technology, as long as the fixtures are hard wired, not screw in.

4. Install T5 "High Bay" Fixtures. In the gymnasium, bingo hall, maintenance bays, and other high bay applications, replace the existing Metal Halide fixtures with T-5, High Output lamps and appropriate ballasts. This is new technology and the benefits of T-5s over traditional HID fixtures are well documented. In addition to the energy savings, the improvement in light quality will be significant. In several locations, existing Metal Halide lamps are nearing the end of their life and have faded to roughly 65% of their original light output. Along with the T5 fixtures, a ceiling mounted occupancy sensor is an absolute must and will essentially double the energy savings. Efficiency Maine offers a rebate on this technology.

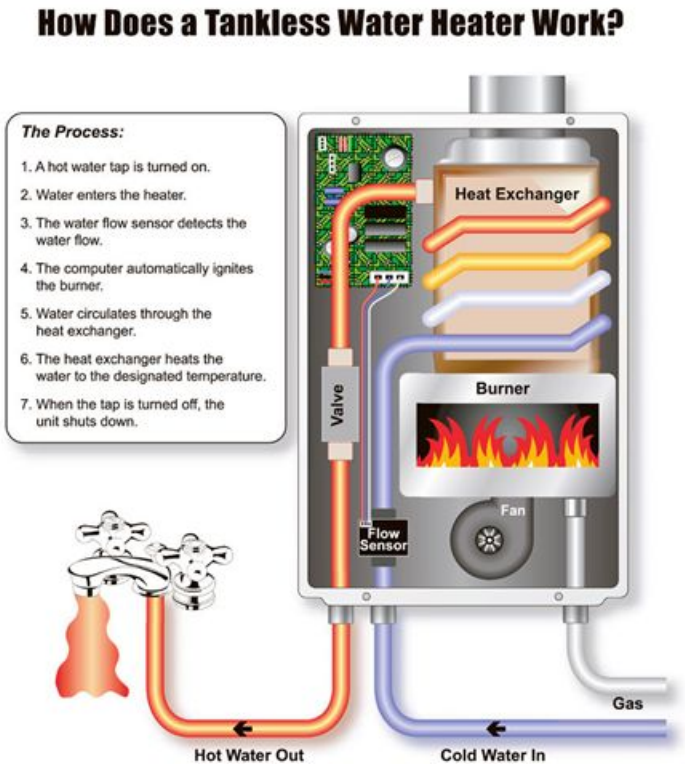
5. Set back thermostats. Throughout the Island, the only significant energy controls in place are the facility operators. Heating, cooling, ventilation, and lighting are all operating without automatic controls. This practice becomes problematic and expensive when systems are inadvertently left "on" during "off" time periods. Frequently in facilities without automated controls, exhaust fans, heating and cooling devices, and various other equipment are not controlled and run 24/7 even during periods when they could be turned off. Even a simple 5/2 setback thermostat will all but eliminate this uncontrolled and very expensive practice.

6. Occupancy Sensors. All classrooms, rest rooms, and offices should have an occupancy sensor similar to the one shown at right. These are proven energy savers. There are a number of varieties and manufacturers of these devices but the most important criteria should be two sources of detection – IR and UV – which most quality devices employ. These devices come in two basic types – wall switch and ceiling mounted. They both have their advantages. Ceiling mount occupancy sensors are considered tamper proof and Efficiency Maine offers a rebate on this technology. Wall switch sensors can be over-ridden and thus are not eligible for a rebate. Within this report, it is assumed all sensors will be ceiling mount.

7. Controls for vending machines. Vending machine controls power down vending machines when the area surrounding it is unoccupied and automatically re-powers the vending machine when the area is reoccupied. Additionally, these controls monitor the ambient temperature while the vending machine is powered down. Using this information, these controls automatically power up the vending machine at appropriate intervals, independent of occupancy, to ensure that the vended product stays cold. These inexpensive devices should be installed on all vending machines. In K-12 Schools, Efficiency Maine offers a rebate on this technology.

8. Cooler and Freezer Economizers. The recommended walk in cooler and freezer economizers regulates the speed of the evaporator fan motors to meet the exact needs of the refrigeration cycle and runs the fans at full speed only as needed. This lowers energy costs and extends the life of the perishables and the equipment. Further, there is a system add-on which utilizes outdoor air when the winter temperatures are equal to those required for safe food storage. This add-on would be particularly beneficial for any coolers adjacent to exterior walls. These systems should be installed in all walk-in cooler / freezer equipment.

9. Tankless Hot Water Heaters. Replace existing electric hot water heaters with propane fired tankless DHW units. Installing a tankless water heater would eliminate the need to keep the existing electric hot water tanks "on" 24/7. These economical devices would easily handle the domestic hot water needs of all facilities. Tankless hot water heaters have no standby losses._A popular product, the Rinnai Continuum is up to 50 percent more energy efficient than a traditional natural gas water heater and up to 70 percent more efficient than an electric water heater. These products utilize on-demand water heater technology which is more efficient because it only heats water when it is needed.



Note: the greatest savings from this ECO will be realized when the existing electric hot water heaters are replaced at the end of their useful life, not via wholesale replacement.

10. NEMA Premium Efficiency Electric Motors. With the exception of the treatment facility, it appears as if all electric motors are of standard efficiency. NEMA Premium efficiency motors are generally 5 to 10% more efficient which results in a significant reduction in electric expenses. Motors such as those on the boiler circulation pumps which are 81% efficient run about 3000 hours per year. The cost of replacement with premium efficiency motors will be realized in energy savings in roughly two years. Efficiency Maine offers a rebate on this technology.

Note: the greatest savings from this ECO will be realized when existing motors are replaced upon burnout, not via wholesale replacement.

1.5 General Observations and Recommendations:

The 13 facilities studied in this report are typical of most small communities. Some are modern and in excellent shape, others are not so. The following are general observations and recommendations. More specific details can be found in the section of the report that follows. Also, these general findings have been offered in suggested priorities wherein the highest priority is recommended for immediate action, the second priority should be added to a future budget, and the lowest priority are contingent upon first and second priority recommendations being implemented.

1.5.1 Highest Priority

1. **Lighting Retrofit.** Throughout most facilities, old technology fluorescent T12, Metal Halide HID lighting, incandescent bulbs, and incandescent exits signs are in place. This technology has been replaced by more efficient, better colored, longer lasting lamps, ballasts, and fixtures. This report recommends the immediate retrofit as detailed in each facility studied. Efficiency Maine cash incentives are available High Performance Lighting lamps and ballasts for this project.

2. **Lighting Controls.** Perhaps the least intrusive ECM is the widespread installation of controls. These would apply to lighting via occupancy sensors and heat/air conditioning via set back thermostats. This report recommends the immediate installation of energy controls as detailed in each facility studied. Efficiency Maine cash incentives are available for the electrical portion of this project.

3. **Setback Thermostats.** This inexpensive, easy to program devices would eliminate the problem of heat (and in some cases, air conditioning) being left on overnight when the various building are unoccupied. The savings in oil and propane would be significant. Recommended are Honeywell (or equivalent) T1000 which are essentially a 5 day / 2 day setting – perfect for most PIN buildings.

4. **Actuator Replacement.** Actuators are the moving device inside wall thermostats. They generally need replacement every five years or so. They fail open which results in uncontrolled heating – an issue which anecdotally, is a widespread problem on the PIN. Costing lass than $10 each, the actuators in all thermostats older than 5 years could be changed in a few days. The energy savings potential is very great.

1.5.2 Second Priority

1. **BOC training for O&M staff**.

The Building Operator Certification training program is perfect for hands-on facility operators. It is offered in Maine once or twice each year. PIN facility operators would gain a great deal of practical knowledge by attending plus would be provided with valuable resources for more efficient facility operations. It can be offered on site and modified for regional issues if the minimum number of students sign up. More details can be found on the Northeast Energy Efficiency Partnership (NEEP) website at www.neep.org.

Without modifications or customization, the basic course consists of eight full days of training on the following topics:

- **101 - Building Overview**
- **102 – Energy Conservation**
- **103a – HVAC Systems**
- **103b – HVAC Controls**
- **104 – Lighting**
- **106 – Indoor Air Quality**
- **107 – Electrical systems**
- **111 – Energy Management Planning**

Efficiency Maine offers co-payment plans for this course. See more course details in the appendix.

2. **Purchase, populate, and utilize a Preventative Maintenance and O&M Automated System.**

Currently, all facility operations and maintenance are directed by David Pardilla, Facility Manager. This system is working very well as evidenced by the condition and performance of the buildings studied. However, this knowledge should be automated and tracked for trending and productivity purposes. A PM system would capture all maintenance tasks from the details of routine daily cleaning to schedule overhauls of major HVAC equipment. The O&M portion of an automated system would keep track of tasks, products, special notes, and other pertinent data needed to maximize efficiency and productivity.

One automated system to examine is produced by www.schooldude.com/. This easy to use system, originally designed for use by school building operators, has expanded to service all types of facilities, included municipal buildings. It has components connecting all major components of O&M and is recommended for consideration.

Typically, the major components of a PM system would contain features such as:

- Maintenance work order issuance and tracking on a regular schedule. Details of routine maintenance would be listed on daily work orders. Items such as cleaning, proper handling of potentially hazardous cleaning materials, checking operation of vent fans, replacing burn-out lamps and ballast, etc would all be included in any PM system chosen.
- Inventory verification and update in conjunction with the scheduling of work orders. Updated parts, costs, and material lists would be added to and maintained on the PM system. Inventory would be maintained by automatically issuing reorder slips for items used.
- Provides "reminder" services via coordination with existing calendars. This generally operates off "run-time" set points which yield work orders for equipment after a given number of run hours. These set points are available from the equipment specifications and tracked by completed work orders.
- Coordinates with existing maintenance/payroll/inventory control formats. All PM systems connect to purchasing, accounting, and payroll.
- Reminders to address steam traps, changing filters, and seasonal maintenance. All PM systems have a module for seasonal work such as storm window maintenance, cooling and heating system "tune-ups and check-ups," filter changes, etc.

Benefits from a PM system would include:

- Elimination of reliance upon one source of direction.
- Ease of tracking total PM costs by building component system
- Extends the life of equipment and building assets
- Improves building comfort
- Reduces the O&M costs (vs not performing PM tasks)
- An excellent memory!

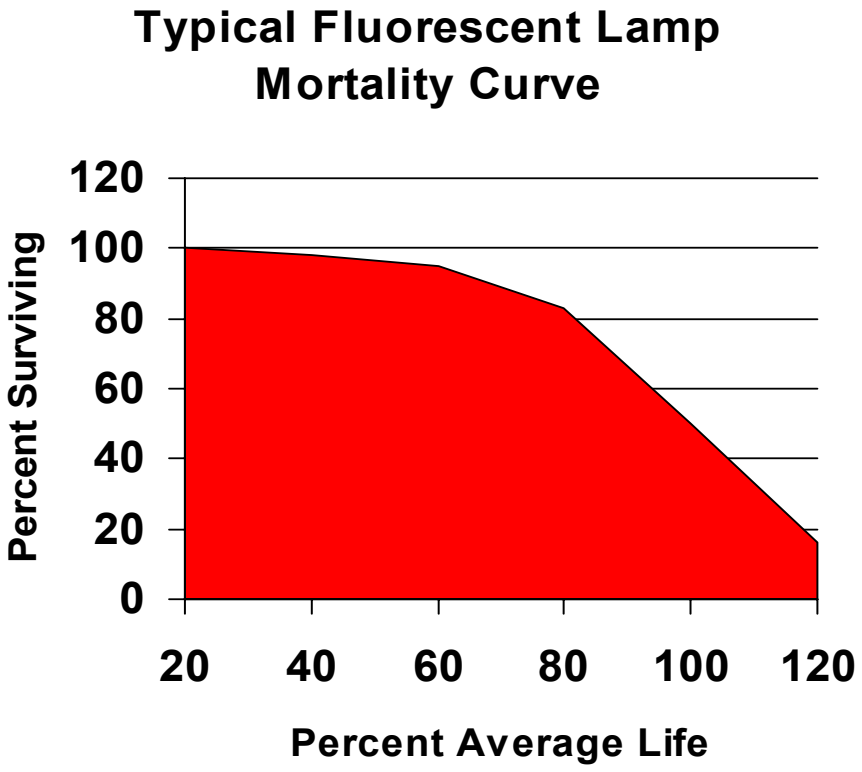
It takes at least two full years to create a useful, populated data base of PMs for an O&M staff to utilize. The time to start is ASAP.

3. Replace Standard Efficiency Motors upon burnout with NEMA Premium Efficiency Electric Motors.

With the exception of the treatment facility, it appears as if all electric motors are of standard efficiency. Premium efficiency motors are generally 5 to 10% more efficiency which results in a significant reduction in electric expenses. Motors such as those on the boiler circulation pumps which are 81% efficient run as much as 3000 hours per year. The cost of replacement with premium efficiency motors will be realized in energy savings in roughly two years. Efficiency Maine offers a rebate toward the purchase of these motors.
Note: the greatest savings from this ECO will be realized when existing motors are replaced upon burnout, not via wholesale replacement.

4. Lighting "group" relamping of Nick Sapiel Office in 2007 and Treatment Plant Facility in 2008.

In 2007, the existing lighting throughout the Nick Sapiel Office facility will be approaching the critical 75% point of the rated life. Studies have demonstrated the economic wisdom of conducting a group relamping at this point, thus avoiding increased labor expenses involved with changing random burnouts of ever increasing frequency after the 75% point. See the graph below.

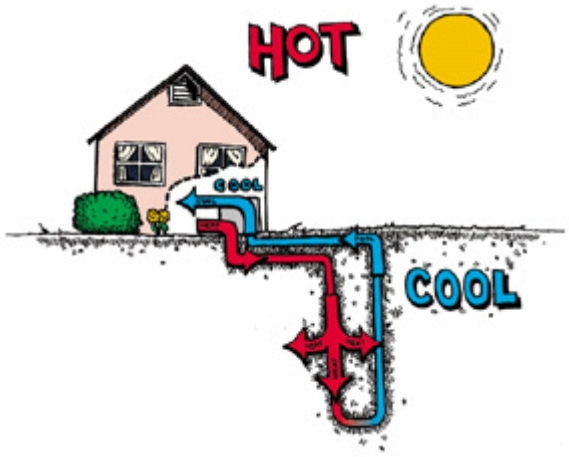


All CFLs should also be changed at the same time. The recommended replacement lamp/ballast would be a "super" T8. Efficiency Maine cash incentives are available High Performance Lighting lamps and ballasts for this project.

Repeat this action in the Treatment Plant Facility in 2008.

1.5.3 Future Consideration

1. **Geothermal Heat Pump for Nick Sapiel, Treatment, and PIN RX facilities.** Geothermal heat pumps can be a very efficient means to provide heating and cooling to some facilities. GHPs are similar to ordinary heat pumps, but use the ground instead of outside air to provide heating, air conditioning and, in most cases, hot water. Because they use the earth's natural heat, they are among the most efficient and comfortable heating and cooling technologies currently available. Ground source heat pumps can be categorized as having closed or open loops, and those loops can be installed in three ways: horizontally, vertically, or in a pond/lake. The type chosen depends on the available land areas and the soil and rock type at the installation site. These factors will help determine the most economical choice for installation of the ground loop. For closed loop systems, water or antifreeze solution is circulated through plastic pipes buried beneath the earth's surface. During the winter, the fluid collects heat from the earth and carries it through the system and into the building. During the summer, the system reverses itself to cool the building by pulling heat from the building, carrying it through the system and placing it in the ground. This process creates free hot water in the summer and delivers substantial hot water savings in the winter. Open loop systems operate on the same principle as closed loop systems and can be installed where an adequate supply of suitable water is available and open discharge is feasible. Benefits similar to the closed loop system are obtained. Per well, they can provide as much as 5 tons of cooling or heating. The Admin and PIN Rx facilities are prime candidates for the traditional GHP as they have both heating and cooling loads. The treatment facility could take advantage of well water already in place. All three facilities should first, take an aggressive approach to energy efficiency and "tighten" up the energy consumption as much as practical. Then, after all energy efficiency work is complete, an expert such as Turner Building Science should be called in for a free assessment of the project.

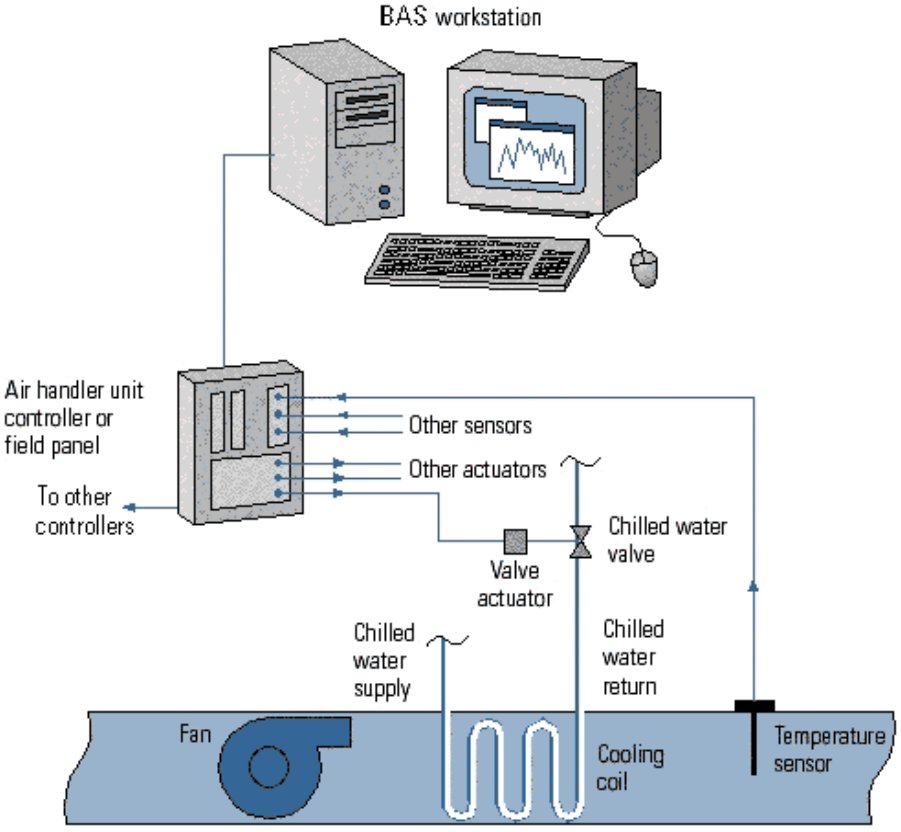


2. **Energy Star Building award for school.** Although the initial score for the Indian Island School was well below the qualifying grade of 75%, huge improvements can be expected once the suggested energy efficiency programs are implemented. Due to a large number of inefficient lighting sources, the relative lighting power density for this facility is very high. The ECMs would dramatically reduce this number, thus improving the score. Further, the lack of controls on all energy sources creates a situation wherein energy usage is unchecked. Gymnasium lighting (HID metal halide) is on from early morning to late evening, yet the gym is unoccupied 33% of the time. Controls can alleviate this wasteful practice. Thermostat actuators are in need of a complete change out as they fail in an open position…evident during the walk thru. Setback thermostats would automatically turn down the heat at night and weekends…something that is not currently being done. The qualifying score of 75% is not out of reach but much has to be done.

3. **New Roof for Community and Public Service buildings.** In both facilities, the roof is leaking and the insulation has been compromised and in some cases, removed altogether. New roofs are expensive but simultaneous with this project, new insulation and ventilation can be installed, thus improving the energy performance of both facilities as well as creating a more comfortable working environment.

4. **Upgrade wiring in Public Service building.** The existing wiring may be not be up to local code minimums. If the wiring is upgraded, it would be an excellent time to wire in occupancy sensors, setback thermostats, and modern lighting fixtures.

5. **Implement a wireless Energy Management System for all commercial facilities.** Once staff training and energy conservation measures have been implemented, consider installing an island wide wireless energy management system. A building automation system (BAS), also called an energy management system (EMS), controls energy-consuming equipment in a building to make it operate more efficiently while maintaining a comfortable environment. This system may include other features such as maintenance planning, fire- and physical-safety functions, and security services. Building automation systems, which are present in more than half of all buildings in the U.S. larger than 100,000 square feet, save an average of about 10 percent of overall building energy consumption. For older or poorly maintained buildings, the savings can be even greater. In addition to saving energy, these systems may also reduce the costs of overall building maintenance. Estimated cost of such a system: $150,000.



Section 2 – Findings for Individual Facilities

2.1 Nicholas H. Sapiel Jr. Office Facility

Address: 27 Wabanaki Way:

- One story office facility, basic block construction, covering 11,019 square feet.
- Roughly 5 years old, in excellent condition.
- Well maintained. Modern office facility with good windows and doors.
- Normal business hours of operation (roughly 40 hours per week).
- Heated and cooled by 4 Trane RTUs.
- The lighting is primarily T8 U tubes (2x2 fixtures) with some CFLs and LED exits.
- Electric DHW tank – 40 gallons. Uninsulated.
- Automated controls – none.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensors for all offices, restrooms, and conference rooms.
2. Set back T'Stats for the four RTUs. Heat was on when building was entered at the beginning of the day. Controls are needed.

3. "Mizers" or similar controls on both vending machines shown at left. These should be installed on all vending machines.
4. Replace the existing unwrapped electric water heater with a propane tankless hot water heater.

Economics of Recommended ECMs:

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in all offices, restrooms, and conference rooms.

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	47	$5,170.00	5752.8	$1,070.02	$2,350.00	2.6
Totals	47	$5,170.00	5752.8	$1,070.02	$2,350.00	2.6

Description: There are automated controls on RTUs.

Recommendation: Install setback T'stats on RTUs

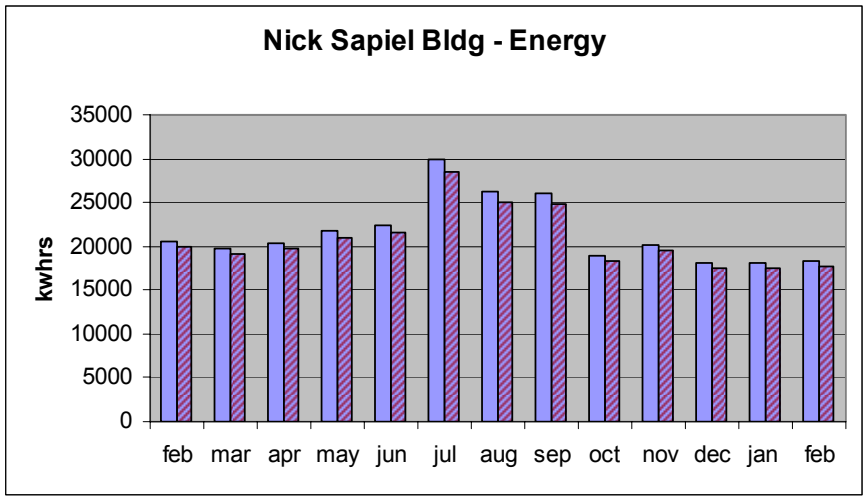
	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings Propane	Est Annual Savings $	Rebate $	Simple Payback (years)
	4	$1,400.00	21280	1249.8	$5,053.20	$ 400.00	0.2
Totals	4	$1,400.00	21280		$5,053.20	$ 400.00	0.2

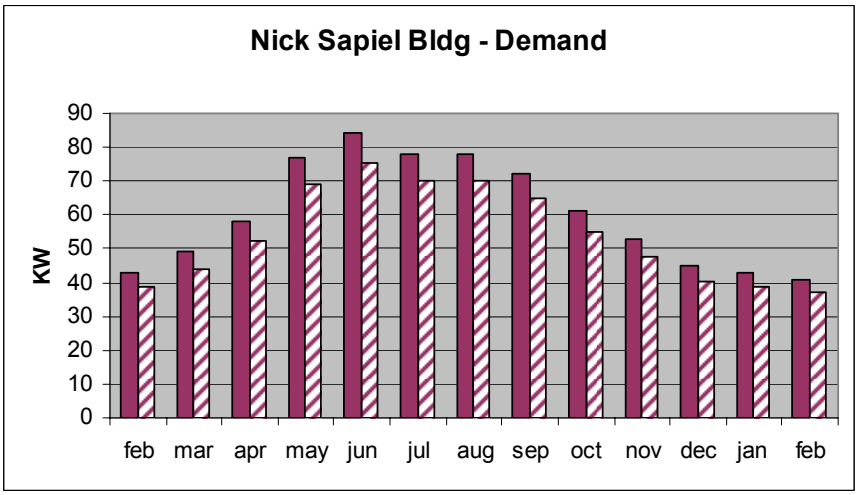
Description:	There are no controls on vending machines.					
Recommendation:	Install Vendor Misers					
	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	2	$ 350.00	2688	$ 500.00	$ -	0.7
Totals	**2**	**$350.00**	**2688**	**$500.00**	**$0.00**	**0.7**

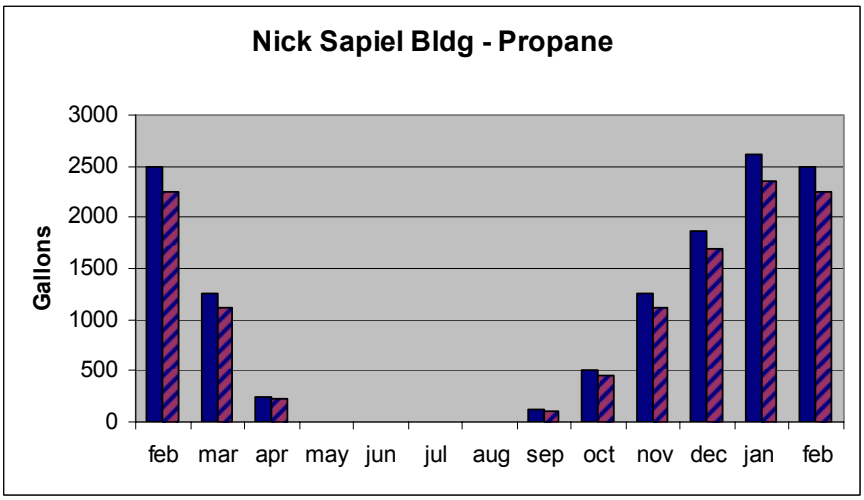
Recommendation:	Replace electric DHW	tank with propane tankless			
	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	1	$1,000.00	4097	$ 762.12	$ -	1.3
Totals	**1**	**$1,000.00**	**4097**	**$762.12**	**$0.00**	**1.3**

Billing Data per Energy Source:

The following graphs indicate energy use before and after proposed ECMs.







2.2 Indian Island School

Address: 10 Wabanaki Way

- One story school facility, basic block construction, covering 35,800 square feet.
- Doors and windows in good shape.
- Normal school hours of operation (roughly 45 hours per week).
- Heated by oil hot water boiler.
- The lighting is primarily T12s with HIDs in gym. No controls.
- Roughly 20 years old, in excellent condition.
- Walk in Cooler/Freezer in kitchen. No economizer.
- Automated controls – none.

Recommended Energy Conservation Measures:

1 Dual sensing occupancy sensors for all classrooms, offices, restrooms, and conference rooms.
2 Boiler night set back controls and / or set back thermostats.
3 Economizer on walk in cooler in kitchen.
4 Replace HID fixtures with T5HOs in gym.
5 Replace T12s with HPT8 systems.
6 Install LED exits.
7 Change actuators in classrooms.
8 Apply for an Energy Star Building award after the ECMs are implemented.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	471	$ -	28316	14.2	$ 11,891	$ 7,065	n/a
2. Replace existing incandescent bulbs with HWCFL	16	$ -	3020	1.5	$ 1,269	$ 192	n/a
3. Replace existing MH fixtures in gym with T5HOs	61	$ -	-5368	-2.7	$ (2,256)	$ 4,575	n/a
4. Replace existing exit signs with LED exits	6	$ -	1945	0.2	$ 3,255	$ 90	n/a
Totals:		**$ 36,453**	**27,913**	**13.2**	**$ 14,159**	**$ 11,922**	**1.7**

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in all classrooms, gym and restrooms and conference rooms.

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
classrms	17	$1,870.00	8976	$1,669.54	$ 850.00	0.6
gym	1	$ 350.00	4095	$ 761.67	$ 50.00	0.4
Totals	18	$2,220.00	13071	$2,431.21	$ 900.00	0.5

Observation: The walk-in cooler/freezer runs uncontrolled

Recommendation: Install an Economizer

Number	Est Cost	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback Years
1	$3,000	2500	$ 475.00	$ -	6.3

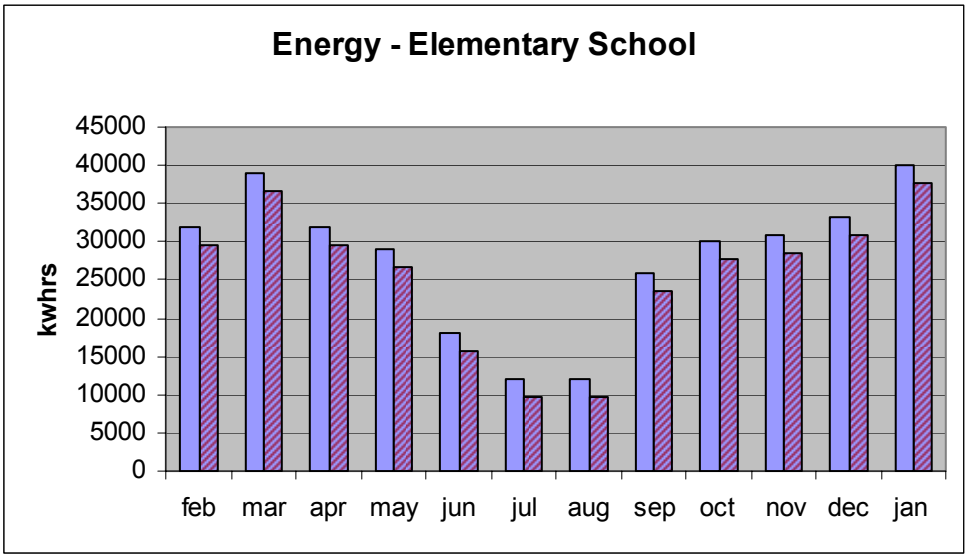
Description: There are automated controls on heating or cooling

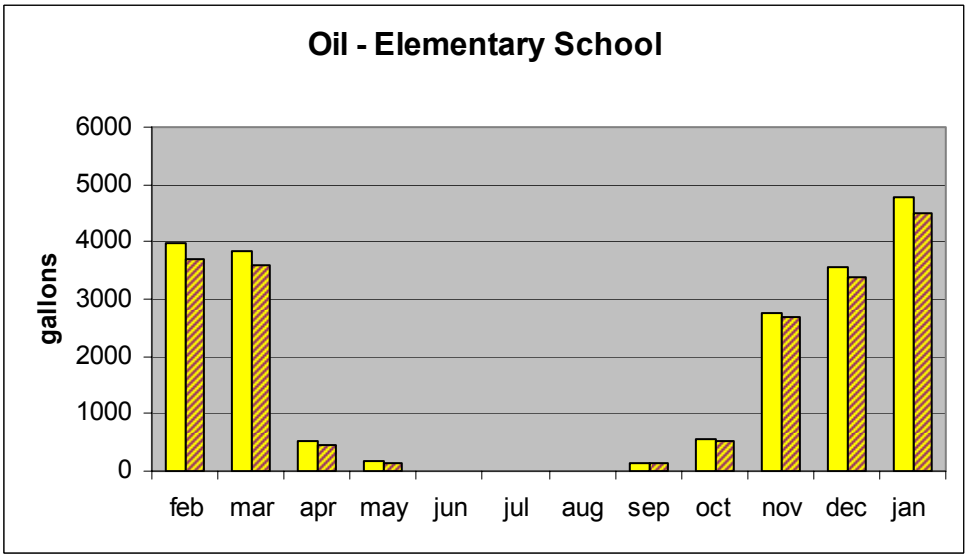
Recommendation: Install setback T'stats in each zone

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings Oil	Est Annual Savings $	Rebate $	Simple Payback (years)
	13	$4,550.00	0	2034.5	$2,848.30	$ -	1.6
Totals	13	$4,550.00	$ -	2034.5	$2,848.30	$ -	1.6

Billing Data per Energy Source:

The following graphs indicate energy use before and after proposed ECMs.





2.3 Maintenance Facility

Address: 29 Wabanaki Way

- One story garage facility, basic shed construction, covering 1,800 square feet.
- Normal business hours of operation (roughly 40 hours per week).
- Heated by oil hot water boiler and blowers.
- Electric strip in office.
- The lighting is primarily T12s and HIDs.
- Roughly 8 years old.
- Doors and windows in adequate condition.
- Automated controls – none.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for office. Attach to strip heat as well as lighting.
2. Replace HID fixtures with T5HOs in vehicle bay.
3. Replace T12s with HPT8s.
4. Replace incandescent bulbs with HWCFLs.
5. Install LED exit signs.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	13	$ -	1269	0.3	$ 526	$ 195	n/a
2. Replace existing incandescent bulbs with HWCFL	2	$ -	353.6	0.2	$ 153	$ 24	n/a
3. Replace existing MH fixtures with T5HOs	4	$ -	832	0.4	$ 329	$ 300	n/a
4. Replace existing incand exit signs with LED exits	2		648	0.1	$ 1,085	$ -	n/a
Totals:		**$ 3,232**	**3103**	**1**	**$2,093.20**	**$ 519.00**	**1.3**

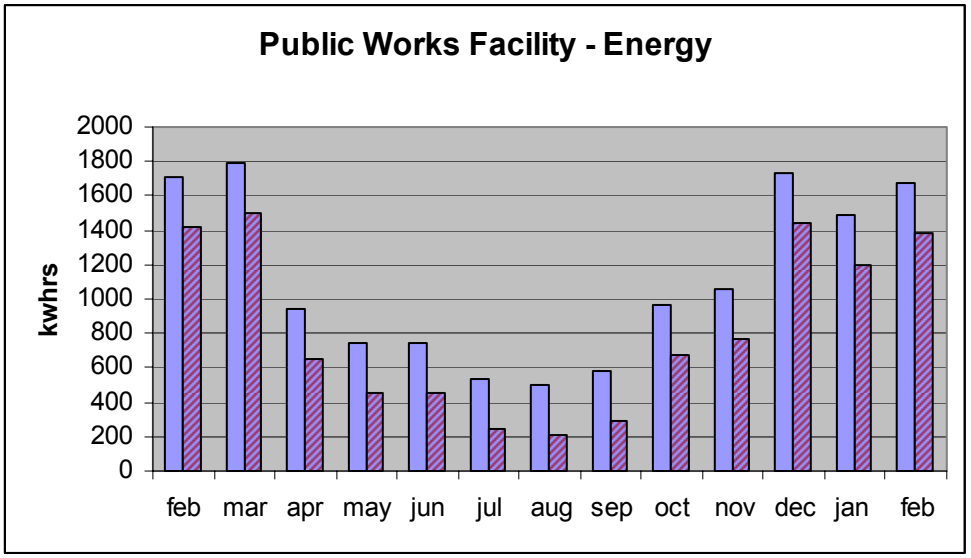
Description: There are no lighting controls.

Recommendation: Install occupancy sensor in office

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
gym	1	$ 110.00	391.04	$ 74.30	$ 50.00	0.8
Totals	1	$ 110.00	391.04	$ 74.30	$ 50.00	0.8

Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.



2.4 Olamon Industries / PIN Rx

Address: 31 Wabanaki Way

- One story large garage facility, basic shed construction, covering 37,000 square feet.
- One portion unoccupied, the other side (PIN Rx) has normal business hours of operation (roughly 40 hours per week).
- The large empty area is heated by oil hot water boiler and blowers.
- The PIN-Rx area is heated via propane.
- The lighting is primarily T12s and HIDs.
- Roughly 20 years old.

Note: This report primarily focuses upon the occupied portion of the facility – PIN Rx. It is unclear as to the future use of the empty sections and thus, all energy consuming equipment could change with the change of occupancy. With this said, if nothing else is done and at a minimum, it is important to turn off the heat in the unoccupied warehouse until such time as the new tenants move in.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace HID fixtures with T5HOs in vehicle bay.
3. Replace T12s with HPT8s.
4. Replace incandescent bulbs with HWCFLs.
5. Replace exit signs with LED exits.
6. Turn off the heat in the unoccupied warehouse.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	34	$ -	4337	1.0	$ 2,197	$ 510	n/a
2. Replace existing MH fixtures with T5HOs	38	$ -	-3224	0.4	$ (1,717)	$ 2,850	n/a
3. Replace existing incand exit signs with LED exits	4	$ -	1296	0.2	$ 2,170	$ -	n/a
Totals:		**$ 7,976**	**2,409**	**2**	**$2,650.25**	**$3,360.00**	**1.7**

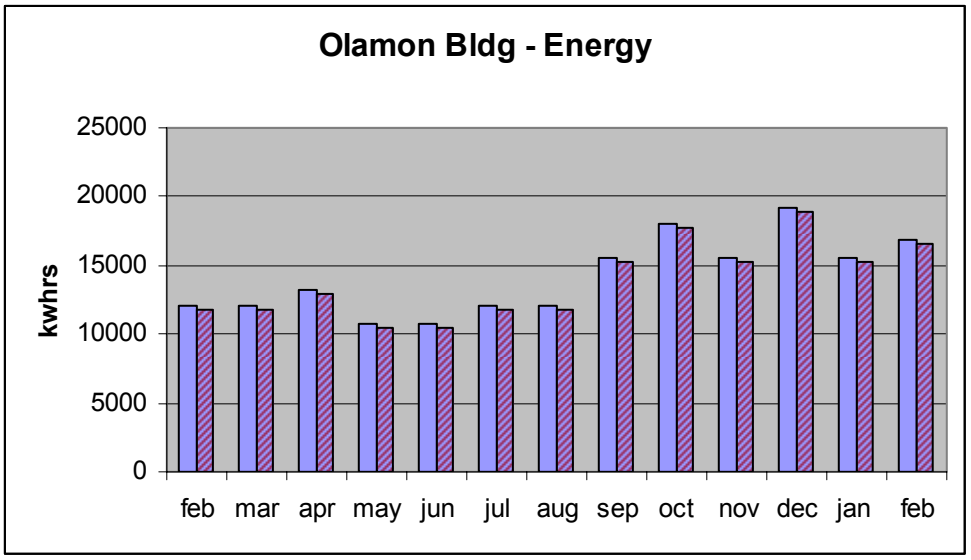
Description: There are no lighting controls.

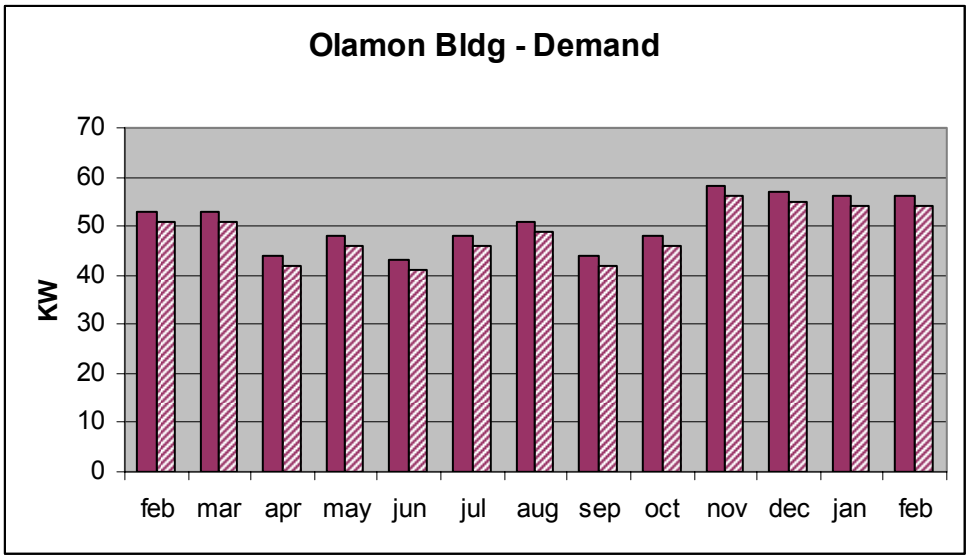
Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	3	$ 330.00	1092	$ 207.48	$ 150.00	0.9
Totals	3	$ 330.00	1092	$ 207.48	$ 150.00	0.9

Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.





2.5 Sockalexis Bingo Palace

Address: 16 Wabanaki Way

- One story large former hockey rink facility, basic shed construction, covering 125,000 square feet.
- Normal business hours of operation (roughly 40 hours per week). Far less is meeting area.
- Heated by oil hot water boiler and blowers.
- McQuay air cooled condensing unit to provide ventilation.
- The lighting is primarily T12s and HIDs.
- Roughly 25 years old.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace HID fixtures (shown at right) with T5HOs. This technology can operate with an occupancy sensor, thus eliminating the need to keep all the lights on for an extended period…even when the hall is empty.
3. Replace T12s with HPT8s.
4. Replace exit signs with LED exits.
5. "Mizers" or similar controls on both vending machines.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	108	$ -	9547	1.0	$ 5,012	$ 1,620	n/a
2. Replace existing MH fixtures with T5HOs	39	$ -	10140	0.4	$ 5,009	$ 2,925	n/a
3. Replace existing incand exit signs with LED exits	8	$ -	2593	0.2	$ 4,340	$ -	n/a
Totals:		**$ 21,266**	**22,280**	**2**	**$14,360.70**	**$4,545.00**	**1.2**

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	8	$ 880.00	1560	$ 296.40	$ 400.00	1.6
Totals	8	$ 880.00	1560	$ 296.40	$ 400.00	1.6

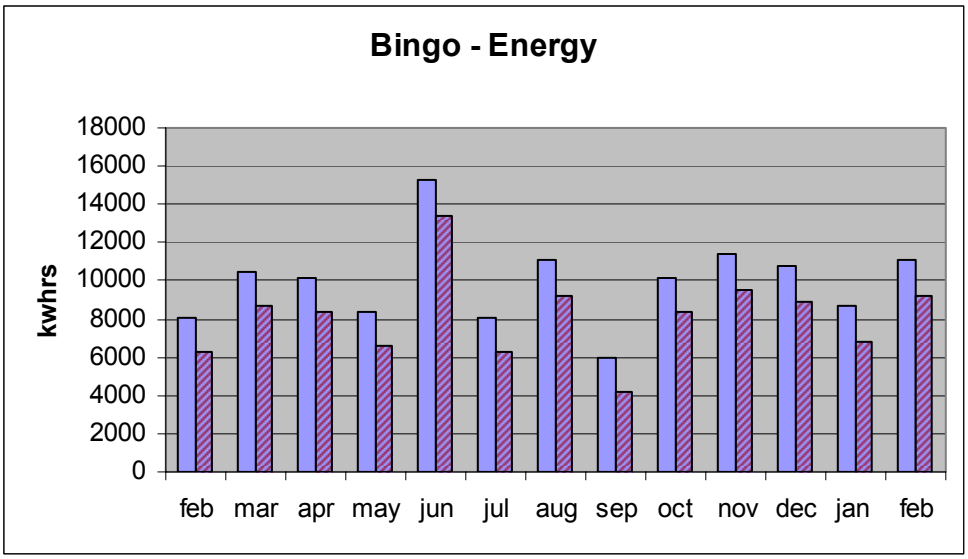
Description: There are no controls on vending machines.

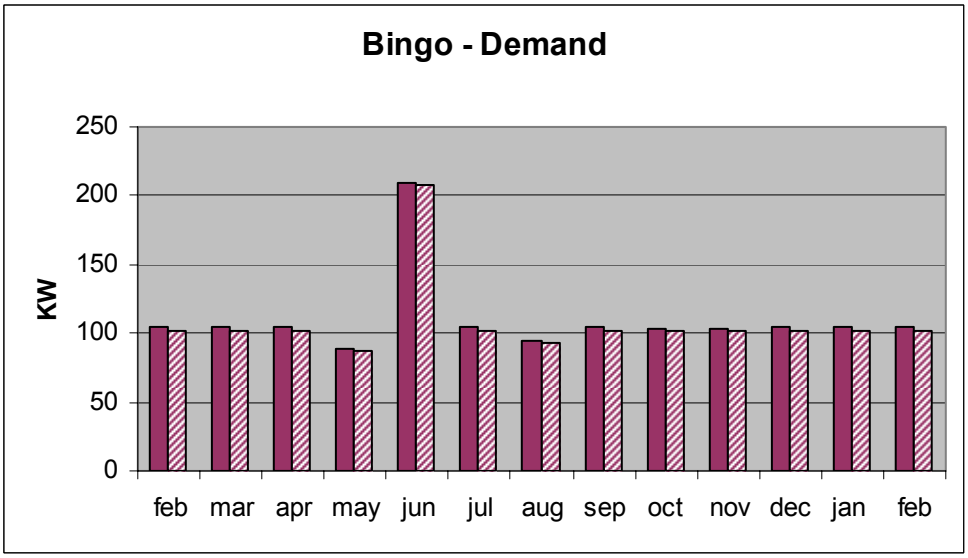
Recommendation: Install Vendor Misers

	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	2	$ 350.00	2688	$ 510.72	$ -	0.7
Totals	**2**	**$350.00**	**2688**	**$510.72**	**$0.00**	**0.7**

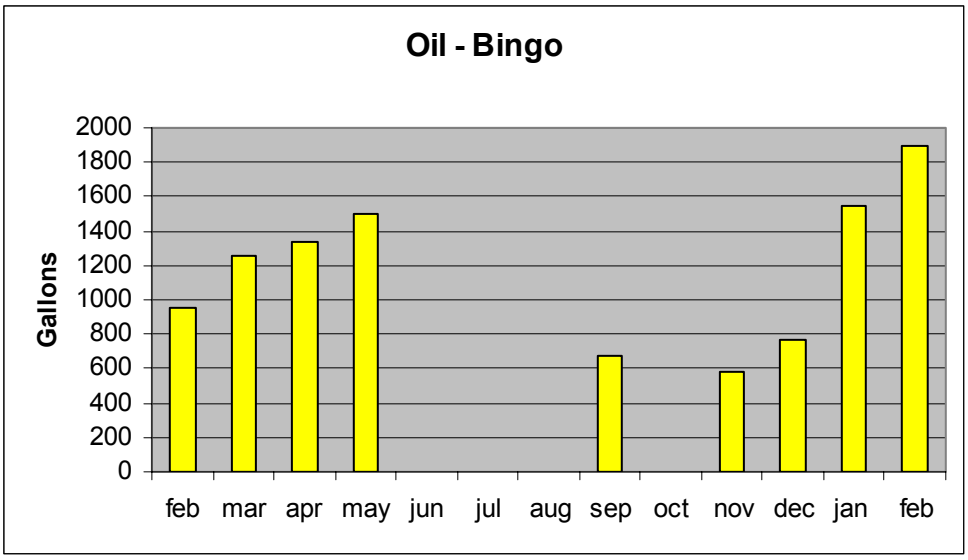
Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.





Note: the spike in demand is due to both AC units being energized for summer bingo. If possible, it would be economically advantageous to schedule these annual events sometime other than the peak of the AC season.


Oil - Bingo
Gallons
2000
1800
1600
1400
1200
1000
800
600
400
200
0
feb
mar
apr
may
jun
jul
aug
sep
oct
nov
dec
jan
feb

2.6 Sewage Treatment Facility

Address: 14 Wabanaki Way

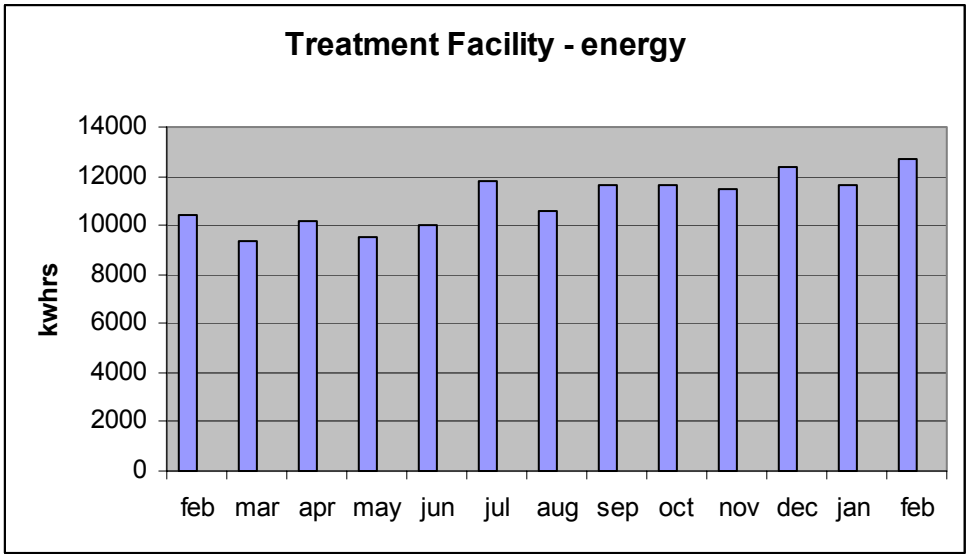
- One story recently renovated facilities, covering 5,000 square feet.
- Operates 24/7.
- Heated by oil hot water boiler.
- TTW AC units.
- The lighting is primarily T8s.
- Roughly 1 year old.
- VSDs and EEMs in place.
- Excellent condition.

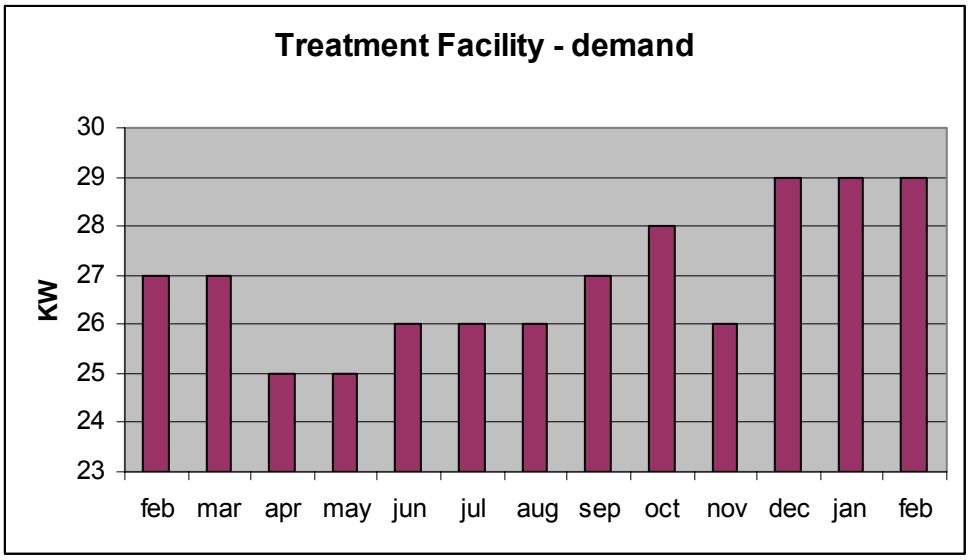
Recommended Energy Conservation Measures:

1. None

Billing Data per Energy Source:

The following graphs indicates energy and demand use.





2.7 PIN Government / Community Building

Address: 12 Wabanaki Way

- One story large shed design facility, basic shed construction, covering 24,400 square feet.
- Normal business hours of operation (roughly 40 hours per week).
- Heated by oil hot water boiler and blowers.
- The Weil McLain boiler is old.
- 2-5HP circ pumps/motors. Standard efficiency.
- AH's for AC. No controls.
- The lighting is primarily T12s and HIDs. No controls.
- Roughly 25 years old.
- Vending Machines – 4.
- Doors and windows in rough shape, leaky and do not close properly.
- The roof leaks and because of this, the insulation is marginal at best.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices and rest rooms.
2. Replace HID fixtures with T5HOs.
3. Replace T12s with HPT8s.
4. Replace exit signs with LED exits.
5. "Mizers" or similar controls on both vending machines.
6. Replace motors with NEMA premium efficiency upon burnout.
7. Setback thermostats.
8. Suggested infrastructure improvements for the future:
   - Roof
   - Insulation
   - Doors
   - Windows
   - AH for ventilation
   - Boiler
   - Ground source heat pump to supplement heat and cooling.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	114	$ -	22164	1.9	$ 13,711	$ 1,710	n/a
2. Replace existing MH fixtures with T5HOs	24	$ -	7488	0.4	$ 4,632	$ 1,800	n/a
3. Replace existing incand exit signs with LED exits	19	$ -	6158	0.2	$ 10,306	$ -	n/a
4. Replace existing incand bulbs with HW-CFLs	19	$ -	3210	2.0	$ 1,986.03	$ 228.00	n/a
Totals:		**$ 17,322**	**39,021**	**5**	**30,636**	**3,738**	**0.44**

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	19	$2,090.00	4446	$ 844.74	$ 950.00	1.3
Totals	19	$2,090.00	4446	$ 844.74	$ 950.00	1.3

Description: There are no controls on vending machines.

Recommendation: Install Vendor Misers

	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	4	$ 700.00	5376	$ 1,021.44	$ -	0.7
Totals	**4**	**$700.00**	**5376**	**$1,021.44**	**$0.00**	**0.7**

Description: There are automated controls on heating or cooling

Recommendation: Install setback T'stats in each zone

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings Oil	Est Annual Savings $	Rebate $	Simple Payback (years)
	12	$4,200.00	0	2383.1	$ 3,336.34	$ -	1.3
Totals	12	$4,200.00	$ -	2,383.1	$ 3,336.34	$ -	1.3

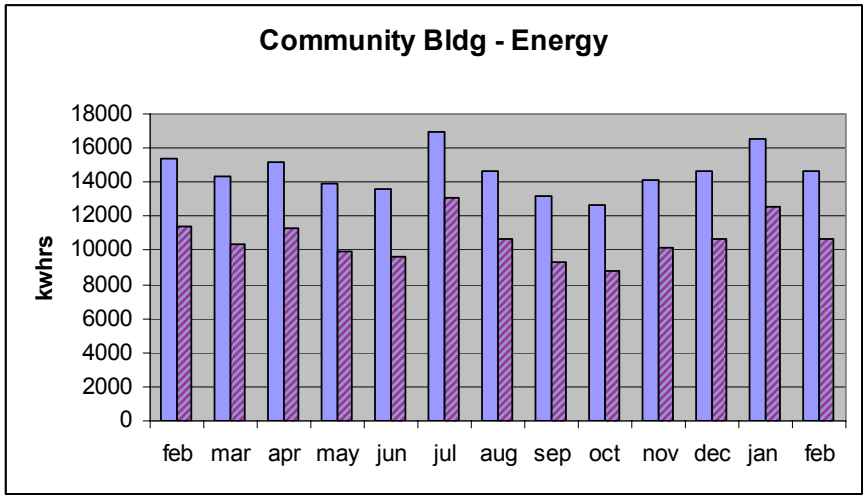
Description: Circ pump motors are standard efficiency.

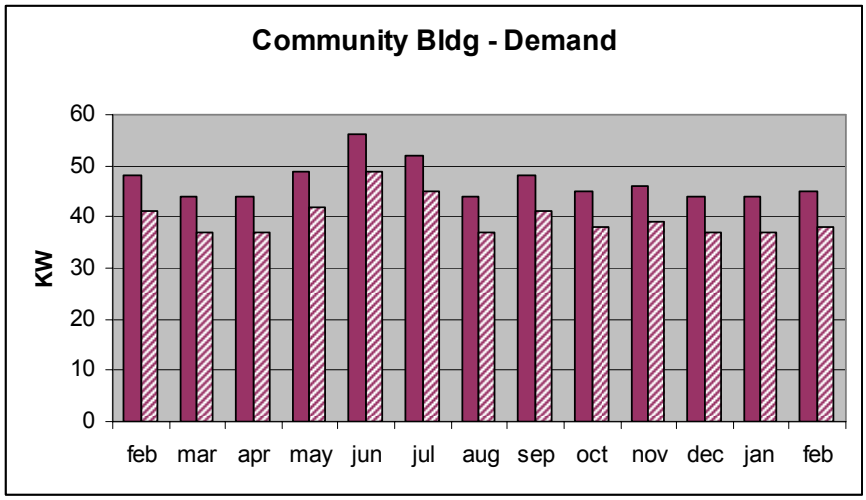
Recommendation: Upon burnout, replace with NEMA premium efficiency

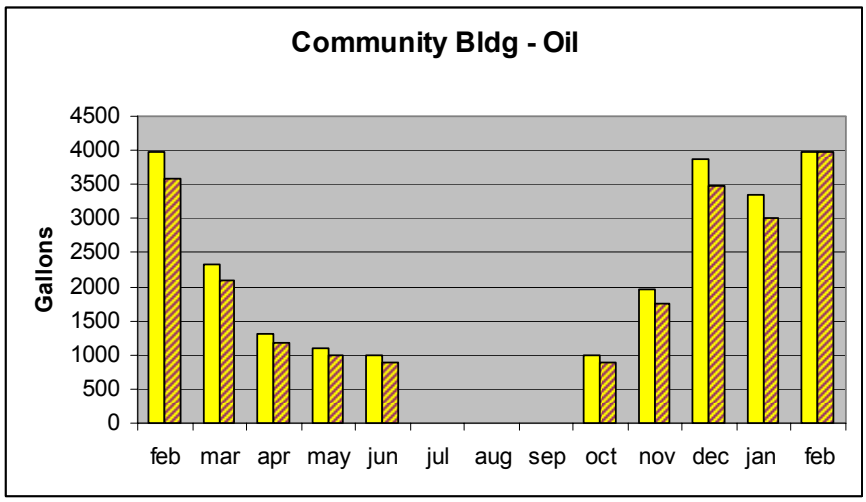
	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	2	$1,268.00	3518	$ 622.00	$ 120.00	1.8
Totals	**2**	**$1,268.00**	**3518**	**$622.00**	**$120.00**	**1.8**

Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.







2.8 Public Safety Facility

Address: 25 Wabanaki Way

- One story wood frame facility covering 5,460 square feet.
- Housing the police and fire departments, it operates 24/7.
- Heated by oil hot water boiler.
- TTW AC units.
- The lighting is primarily T12s
- Roughly 15 years old.
- Vending Machines – 2
- Poor ventilation and minimal insulation.
- New roof needed as soon as practical.
- Wiring suspect.
- No controls.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace T12s with HPT8s.
3. Replace exit signs with LED exits.
4. “Mizers” or similar controls on both vending machines.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	16	$ -	6517.44	0	$10,847.63	$ 240.00	n/a
2. Replace existing incand exit signs with LED exits	3	$ -	972.36	0	$ 1,618.40	$ -	n/a
3. Replace existing incand bulbs with CFLs	6	$ -	2260.08	0	$ 3,761.68	$ 72.00	n/a
Totals:		$3,002.00	9749.88	0	$16,227.70	$ 312.00	0.17

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	4	$ 440.00	1576.8	$ 299.59	$ 200.00	0.8
Totals	4	$ 440.00	1576.8	$ 299.59	$ 200.00	0.8

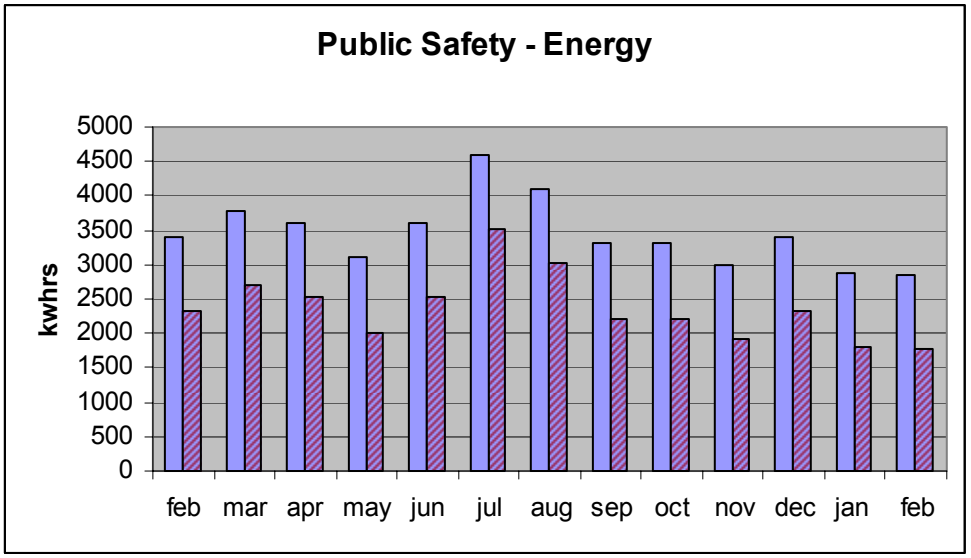
Description: There are no controls on vending machines.

Recommendation: Install Vendor Misers

	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	4	$ 700.00	5376	$1,021.44	$ -	0.7
Totals	**4**	**$700.00**	**5376**	**$1,021.44**	**$0.00**	**0.7**

Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.



2.9 Human Services Facility

Address: 9 Wabanaki Way

- One story wood frame facility covering 2,200 square feet.
- Operates 40 h/wk.
- Heated by oil hot water boiler.
- TTW AC units.
- The lighting is primarily T12s
- Roughly 20 years old.
- Vending Machines – 1
- Electric hot water. Minimal use.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace T12s with HPT8s.
3. Replace exit signs with LED exits.
4. "Mizers" or similar controls on both vending machines.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	16	$ -	1532.64	1.9459	$ 659.78	$ 240.00	n/a
2. Replace existing incand exit signs with LED exits	3	$ -	972.36	0.24827	$1,627.33	$ -	n/a
3. Replace existing incand bulbs with CFLs	6	$ -	531.48	1.95261	$ 228.80	$ 72.00	n/a
Totals:		$3,002.00	3036.48	4.14678	$2,515.91	$ 312.00	1.1

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	4	$ 440.00	370.8	$ 70.45	$ 200.00	3.4
Totals	4	$ 440.00	370.8	$ 70.45	$ 200.00	3.4

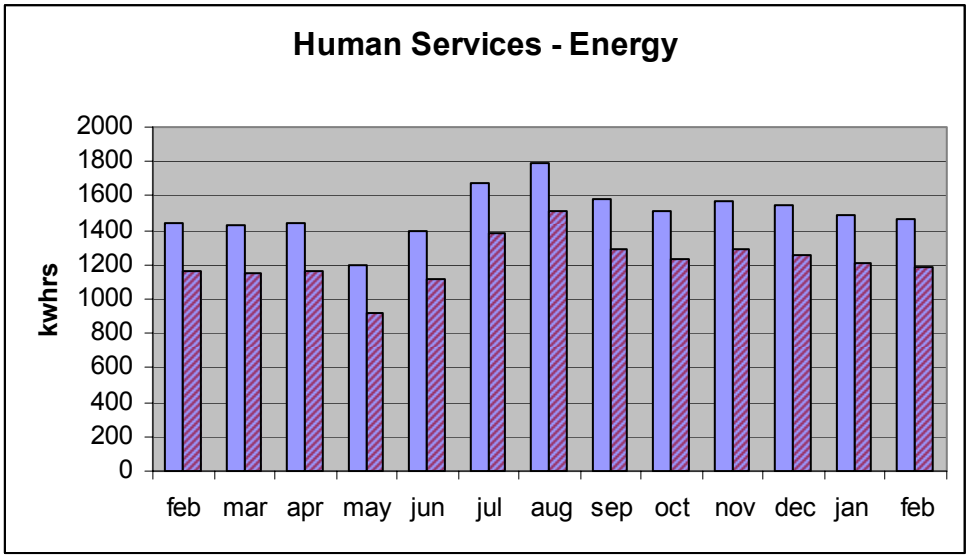
Description: There are no controls on vending machines.

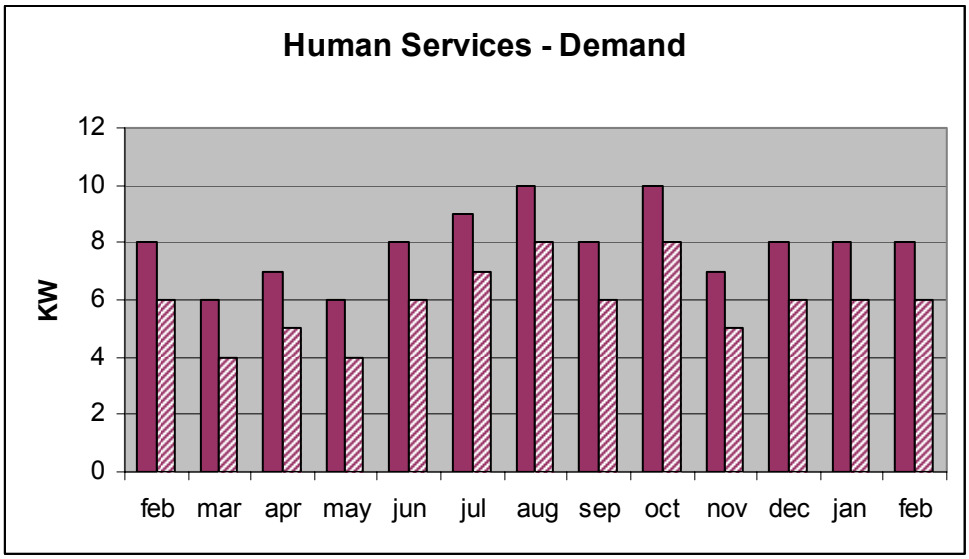
Recommendation: Install Vendor Misers

	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	1	$ 175.00	1344	$ 255.36	$ -	0.7
Totals	**1**	**$175.00**	**1344**	**$255.36**	**$0.00**	**0.7**

Billing Data per Energy Source:

The following graphs indicate energy and demand use before and after proposed ECMs.





2.10 Indian Health Services Facility

Address: 23 Wabanaki Way

- One story wood frame facility covering 18,700 square feet.
- Operates 40 h/wk and in some areas, 24/7.
- Heated by oil hot water boiler.
- TTW AC units.
- The lighting is primarily T12s
- Roughly 25 years old.
- Vending Machines – 1
- Electric hot water

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace T12s with HPT8s.
3. Replace exit signs with LED exits.
4. “Mizers” or similar controls on both vending machines.
5. Change actuators in thermostats.
6. Set back T’Stats for each zone.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	154	$ -	17113.2	1.9459	$ 8,983.90	$2,310.00	n/a
2. Replace existing incand exit signs with LED exits	9	$ -	2917.08	0.24827	$ 4,882.00	$ -	n/a
3. Replace existing incand bulbs with CFLs	4	$ -	551.2	1.95261	$ 289.36	$ 48.00	n/a
Totals:		$10,102.00	20581.48	4.14678	$14,155.27	$2,358.00	0.5

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	39	$4,290.00	6084	$1,155.96	$ 1,950.00	2.0
Totals	39	$4,290.00	6084	$1,155.96	$ 1,950.00	2.0

Description: There are no controls on vending machines.

Recommendation: Install Vendor Misers

	Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
	1	$ 175.00	1344	$ 255.36	$ -	0.7
Totals	**1**	**$175.00**	**1344**	**$255.36**	**$0.00**	**0.7**

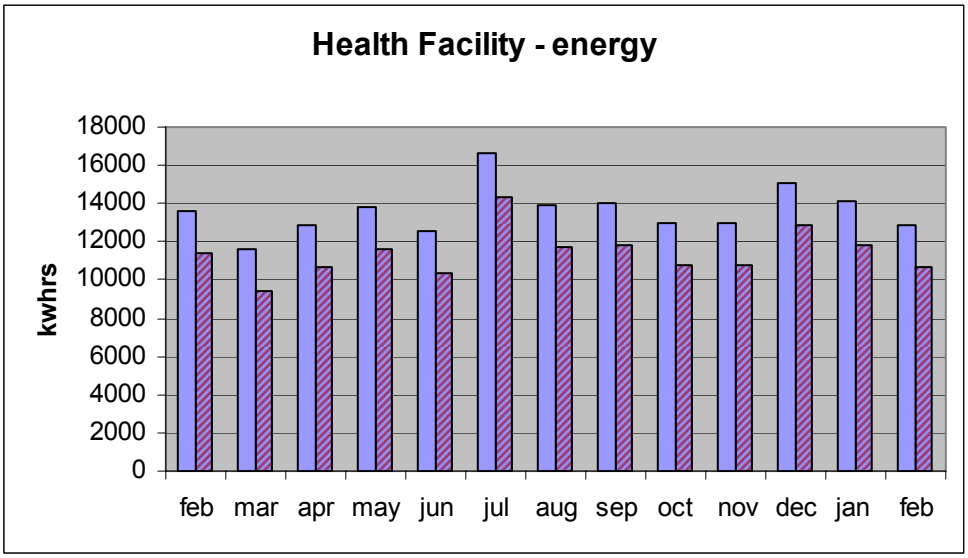
Description: There are automated controls on heating or cooling

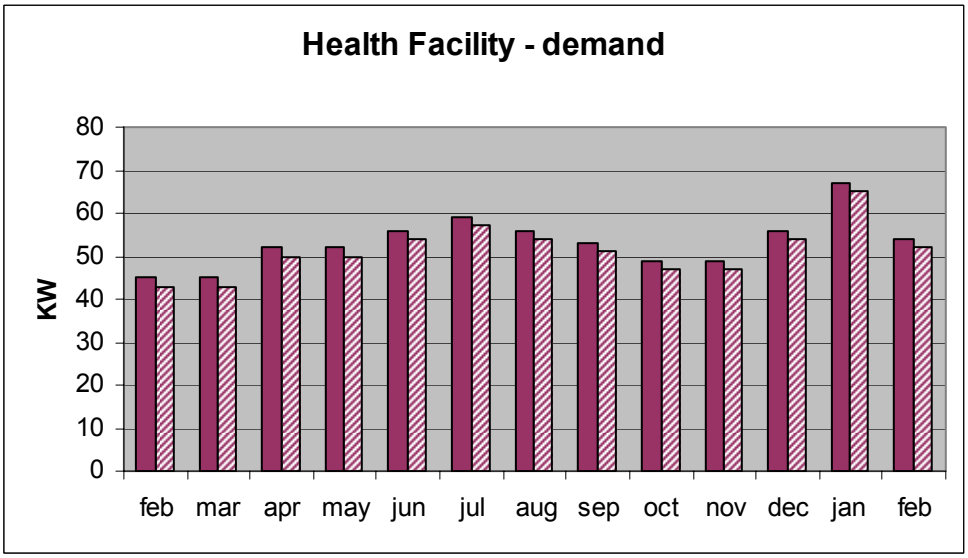
Recommendation: Install setback T'stats in each zone

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings Oil	Est Annual Savings $	Rebate $	Simple Payback (years)
	12	$4,200.00	0	1582.2	$ 2,215.08	$ -	1.9
Totals	12	$4,200.00	$ -	1582.2	$ 2,215.08	$ -	1.9

Billing Data per Energy Source:

The following graphs indicate energy and demand use before and after proposed ECMs.





2.11 Housing Department

Address: 1 Nohkomess Street

- One story wood frame facility covering 1,700 square feet.
- Operates 40 h/wk.
- Heated by oil hot water boiler.
- TTW AC units.
- The lighting is primarily T12s
- Roughly 25 years old.
- Vending Machines – 1
- Electric hot water. Minimal use.

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace T12s with HPT8s.
3. Replace exit signs with LED exits.
4. "Mizers" or similar controls on both vending machines.
5. Change actuators in thermostats.
6. Set back T'Stats for each zone.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	16	$ -	1517.76	0	$ 588.28	$ 240.00	n/a
2. Replace existing incand exit signs with LED exits	3	$ -	226.44	0	$ 87.77	$ -	n/a
3. Replace existing incand bulbs with CFLs	6	$ -	526.32	0	$ 204.00	$ 72.00	n/a
Totals:		$3,002.00	2270.52	0	$ 880.05	$ 312.00	3.1

Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
4	$ 440.00	489.6	$ 93.02	$ 200.00	2.6
Totals 4	$ 440.00	489.6	$ 93.02	$ 200.00	2.6

Description: There are no controls on vending machines.

Recommendation: Install Vendor Misers

Count	Total Est Cost $	Energy Savings kwhr	Annual Savings $	Utility Rebate $	Simple Payback (years)
1	$ 175.00	1344	$ 255.36	$ -	0.7
Totals 1	**$175.00**	**1344**	**$255.36**	**$0.00**	**0.7**

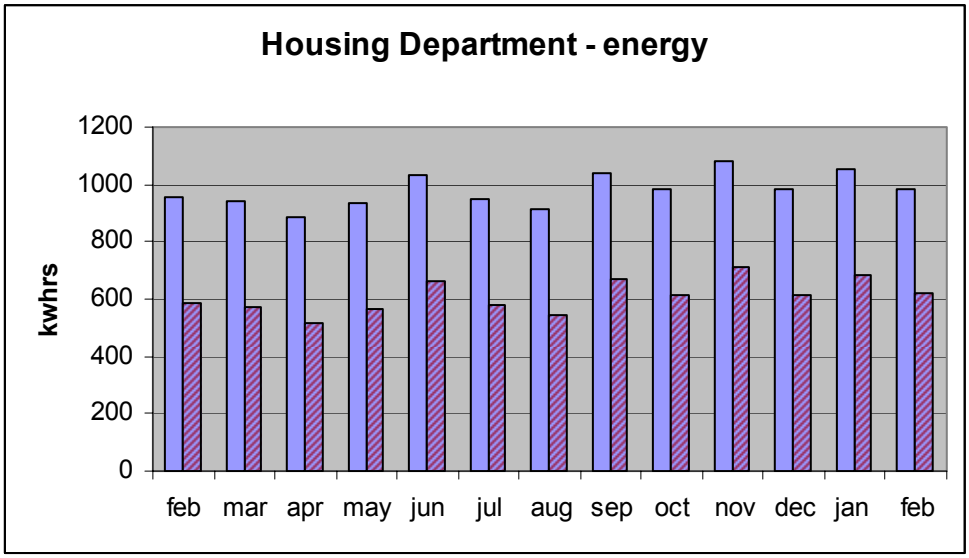
Description: There are automated controls on heating or cooling

Recommendation: Install setback T'stats in each zone

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings Oil	Est Annual Savings $	Rebate $	Simple Payback (years)
	2	$ 700.00	0	263.7	$ 369.18	$ -	1.9
Totals	2	$ 700.00	$ -	263.7	$ 369.18	$ -	1.9

Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.



2.12 Sarah Springs Nursing Facility

Address: 7 Sara Springs Drive

- One story wood frame facility covering 3,700 square feet.
- Operates 24/7.
- Heated by oil hot water boiler.
- TTW AC units.
- The lighting is primarily T12s
- Roughly 8 years old.
- Electric hot water

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace T12s with HPT8s.
3. Replace exit signs with LED exits.
4. Set back T'Stats for each zone.
5. Change actuators in thermostats.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	38	$ -	15662.88	1.9459	$26,213.27	$ 570.00	n/a
2. Replace existing incand exit signs with LED exits	4	$ -	1296.48	0.24827	$ 2,169.78	$ -	n/a
3. Replace existing incand bulbs with CFLs	12	$ -	4520.16	1.95261	$ 7,564.90	$ 144.00	n/a
Totals:		$6,004.00	21479.52	4.14678	$35,947.95	$ 714.00	0.15

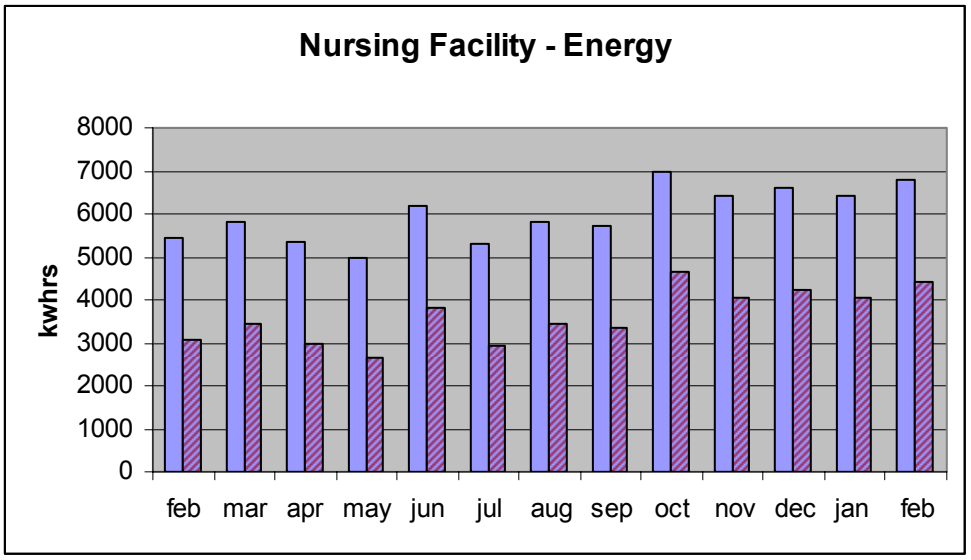
Description: There are no lighting controls.

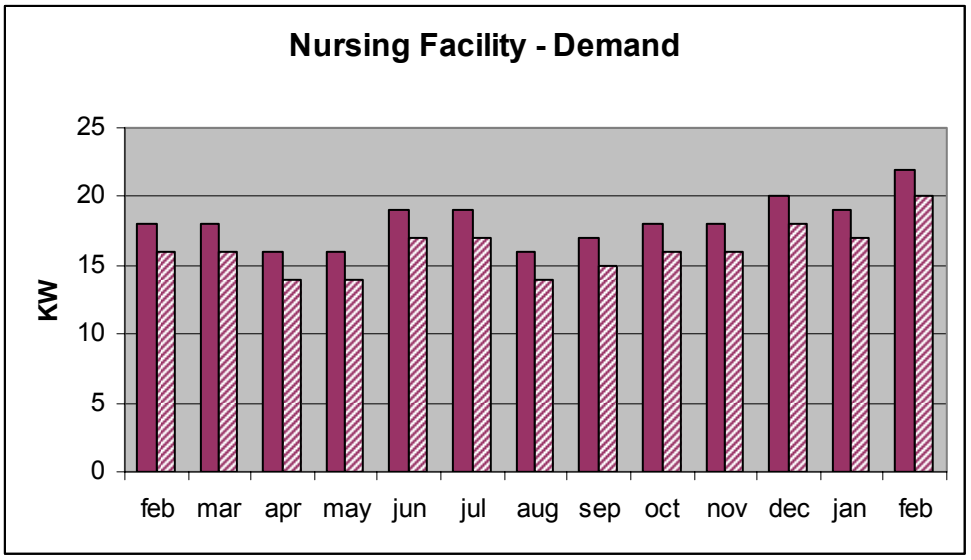
Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	10	$1,100.00	5256	$ 998.64	$ 500.00	0.6
Totals	10	$1,100.00	5256	$ 998.64	$ 500.00	0.6

Billing Data per Energy Source:

The following graphs indicate energy and demand usage before and after proposed ECMs.





2.13 Assisted Living Facility

Address: 2 Sarah Springs Drive

- One story wood frame facility covering 2,100 square feet.
- Operates 24/7.
- Heated by oil hot water in radiant floor.
- TTW AC units.
- The lighting is primarily T12s
- Roughly 1 year old.
- Electric hot water

Recommended Energy Conservation Measures:

1. Dual sensing occupancy sensor for offices.
2. Replace T12s with HPT8s.
3. Replace exit signs with LED exits.

Economics of Recommended ECMs:

Scope: Most of the lighting is obsolete and inefficient. Replace as specified.

	Count	Total Est. Cost $	Energy Savings kwhr	Demand Savings KW	Annual Savings $	Utility Rebate $	Simple Payback (years)
1. Replace existing T12 lamps and ballasts with T8HP systems	28	$ -	12228.96	0	$20,353.88	$ 420.00	n/a
2. Replace existing incand exit signs with LED exits	4	$ -	1296.48	0	$ 2,157.86	$ -	n/a
Totals:		$6,004.00	13525.44	0	$22,511.74	$ 420.00	0.25

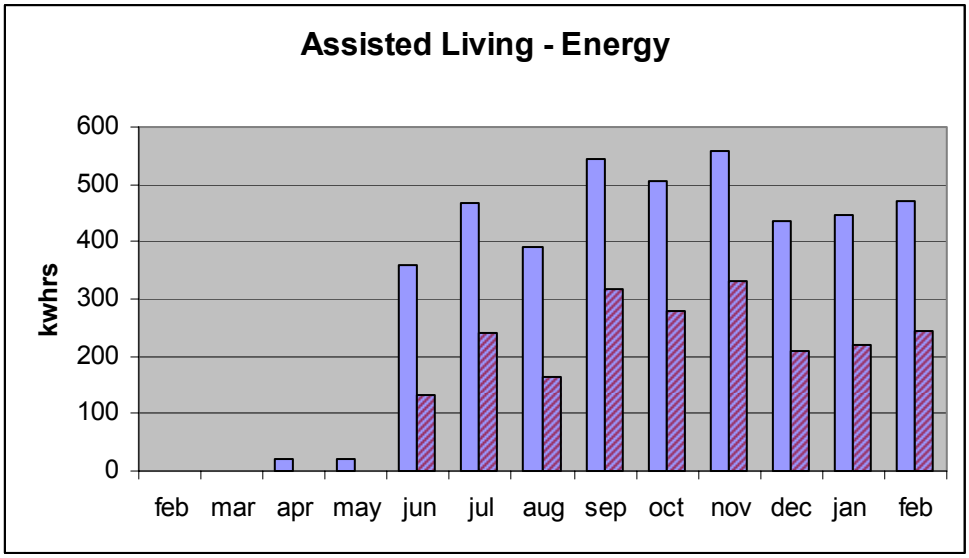
Description: There are no lighting controls.

Recommendation: Install occupancy sensors in offices

	Count	Total Est. Cost $	Est Annual Savings kwhrs	Est Annual Savings $	Rebate $	Simple Payback (years)
	4	$ 440.00	1051.2	$ 199.73	$ 200.00	1.2
Totals	4	$ 440.00	1051.2	$ 199.73	$ 200.00	1.2

Billing Data per Energy Source:

The following graph indicates energy use before and after proposed ECMs.



Appendix*

A. Lighting survey from Climo / WestCo

B. Efficiency Maine Rebate information

C. T5 lighting article

D. Occupancy sensor cut sheets

E. Geothermal Heat Pump information form Turner

F. Motor Up motor comparison savings report

G. School Dude information

H. NEEP BOC information

I. Vendor Miser information

* Appendices not included.