



Building Energy Assessment

*SAU 80 – Shaker Regional School District
Administrative Building*

Energy Audit Report

Presented to: SAU 80 – Shaker Regional School District
58 School Street
Belmont, New Hampshire 03220

Presented by: McCormick Facilities Management
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Building Energy Assessment

SAU 80 – Shaker Regional School District Administrative Building

Table of Contents

Introduction	3
Administrative Building Executive Summary	3
Potential savings, cost and payback	4
General Observations	5
Findings Leading to Potential Energy Conservation Measures (ECMs)	5
Building Envelope	5
Electrical	6
Mechanical	7
Recommended Energy Conservation Measures (ECMs)	8
ECM Chart	10
Financial Analysis	11
ECM Summary	13
Lighting Savings Calculations Charts	14
Energy Graphs	16
Electricity 2008	16
Electricity 2009	19
Alternative Energy Opportunities	22
Lighting Calculation Sheets	23
Lighting Only	23
Lighting Controls	25
Field Inventory Sheets	26
Energy Star Target Finder Rating	33

Energy Assessment and Report

SAU 80 – Shaker Regional School District

**SAU 80 Administrative Building
58 School Street, Belmont, New Hampshire**

Audit Date: December 15, 2009

Introduction

The schools of SAU 80 – Shaker Regional School District, like many consumers of electrical power and heating fuel, have struggled to deal with the increased cost of energy and the budget difficulties that it causes. To help control these costs and to use energy more efficiently, we conducted a detailed energy audit of the Memorial Administrative Building located at 58 School Street in Belmont, New Hampshire to determine how energy is being consumed and potential energy conservation measures. Our survey collected specific information regarding the type of construction, building envelope, lighting and mechanical systems, energy consumption and usage patterns. This analysis enabled us to develop an inventory of energy consuming equipment as well as a list of building components that will be useful in future budget planning and to prioritize implementation of targeted energy performance enhancements.



This building is used by the Shaker School District as administrative and office space, and provides teaching/music rooms and meeting rooms for the staff and students of SAU 80. The building is occupied from approximately 8:00 am to 5:00 pm per day, for at least five days a week with approximately 20 employees, plus occasional students.

Based on the original use of the facility, there are 8-10 rooms of approximately 800 SF (former classrooms), offices, a music room, in-school suspension room, storage rooms and restrooms.

This report details the recommendations and conclusions of an energy audit conducted at the Administrative Building located at 58 School Street. The initial site visit was conducted on December 15, 2009. The audit inventory information was collected by Deirdre McCormick and Michael McCormick, Certified Energy Auditor, from McCormick Facilities Management. At the time of the audit we met on site with Doug Ellis, Facilities Manager for SAU 80, who provided us with information and floor diagrams as needed.

Executive Summary

Energy conservation is a philosophy of effective stewardship of facilities placed in the charge of representatives of the public. It must be a policy of the governing body. There must be an advocate within the administration who:

- leads the energy conservation effort;
- assures that the governing body's energy conservation policies are carried out;
- reports energy conservation actions and results regularly to the governing body;
- identifies ways for each employee and customer to participate in energy conservation;
- maintains a current knowledge in this field; and



- identifies creative ways to address energy conservation.

Effective energy conservation must become a way of life for all stakeholders in the Shaker School District. Although it is not discussed in this report, we would like to point out that there is also a positive long-term impact on the environment when energy savings activities occur that benefit everyone.

The outcome of the audit has provided an opportunity for directed building modifications that we will refer as Energy Conservation Measures or ECM's. The term "energy conservation measure" includes installations or modifications that are primarily designed to reduce the consumption of fuel oil, electricity, propane, water, increase occupant thermal comfort and improve the management of energy demands.

The ECM's we are suggesting are considered with economics based on the walk through inventory of this building. Any estimates of cost of replacement, upgrade or installation are approximated and are for reference purposes only. As ECM's are considered for implementation, detailed specifications, designs and estimates will be required to provide costs at the time the measures will be performed.

Details of these ECM's and our finding and recommendations are contained within this report.

It is our opinion that many opportunities exist within this building to conserve energy, increase thermal comfort, and reduce energy costs. These upgrades and replacements will help to lower the buildings energy burden as well as improve the working environment for personnel working there.

After reviewing this facility we believe this building would benefit by the implementation of a standardized energy policy. This working document should be utilized as an educational tool for the building's operators and occupants to help better manage energy use. It will direct how the building should be operated on a daily and seasonal basis taking into consideration the heating and cooling system usage, temperature settings, lighting utilization, computer and office equipment usage as well as the usage of personal appliances. We encourage involving the users of the building possibly by forming a committee that would work with the SAU 80 energy manager in the development, implementation and use of a policy. This inclusion will bring value as well as harboring ownership that will encourage people to take pride in participating in conservation. Once the policy is implemented it should be revisited and updated on a regular basis especially as technology and building uses change.

An energy manager should be hired or contracted for whose sole responsibility would be to save energy on a continual basis. There is enough energy being consumed, and could be interpreted as being wasted, to pay for this position from the savings and still save the district money. Technologies and purchasing strategies are continually changing yielding continued opportunities for this position to justify the expenditure.

We would also like to strongly recommend the implementation of energy data tracking. In gathering information to complete this report, we found that little historic data was kept in regards to electrical usage at this school. In attempting to set usage trends, it was difficult to make observations based on a limited number of months. For better energy management and for the option of viewing trends and usage, detailed records should be kept for both electrical and fuel usage. This will facilitate better energy management and awareness in the future.

Potential savings, cost, and payback

As will be demonstrated throughout this report, we identified 14 realistic opportunities to save energy and dollars. Implementing fairly straight forward conservation measures, expenditure on the order of \$143,165 would save nearly \$10,000 annually in energy costs between electricity and oil costs, with an overall payback of

around 14 years. Alternative options have been suggested as a second option to implement. If this suggestion is opted for, the overall payback period is much less.

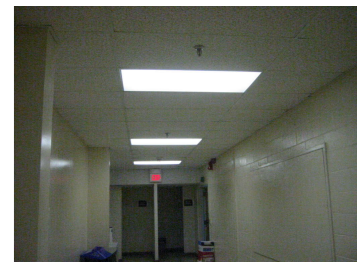
Refer to the ECM chart to follow for specifics on these figures.

General Observations

During our review we noted the following:

- little historic energy data is kept;
- computers and office equipment on when not in use;
- appliances were not Energy Star rated;
- several lights were on in the corridors after hours;

The above listed items, although some are low in consumption, are still wasting energy when left on unattended or are left plugged in when not in use. Utilizing a power strip and turning it off when office items are not in use and turning down lights when the building is unoccupied is a simple measure that can reduce phantom electrical loads and help to save energy and reduce utility costs.



Computers should be equipped with software that shuts them down unless being used. Generally speaking, a typical computer tower that is left on will consume 420 kWh per year whereas the monitor will consume anywhere from 230 – 430 kWh per year (depending if it is a CRT or LCD screen). Other examples of phantom energy hogs in many buildings are computer printers, which consume anywhere from 25 – 250 kWh per year, and photo copiers which can consume close to 1,200 kWh per year when left on. It is good practice to turn office equipment off when not in use. Energy Star rated units should be procured as older units are replaced to gain maximum efficiency.



Appliances should be converted to Energy Star rated appliances when new ones are purchased. Furthermore, it is good practice not to allow individual coffee pots and other appliances in offices. Although one personal appliance may not consume much energy, having an appliance at each desk or in each room can usually cost \$10-30 per year, per appliance. Making use of a common kitchen area will cut down on the number of personal appliances and reduce unnecessary spending.

Findings Leading to Potential Energy Conservation Measures

Building Envelope



The 11,000 square foot building is comprised of a metal frame and block and brick. It was originally constructed in 1956 for use as a school building but has been converted to the administrative office. The building appears to be in poor to average repair for a building of this age. Exterior wall insulation could not be confirmed.

The roofs are flat. Construction type, roof covering, and insulation could not be confirmed.

The exterior masonry wall construction does not offer an opportunity to easily add insulation. An option would be to add Styrofoam insulation panels on the exterior and then cover them with a cement, stucco, or metal siding. Such an application would

be costly and the payback would be long due to material and labor costs. This option was not considered.

Observation of the foundation does not indicate an opportunity to add insulation due to the proximity of exterior finishes and pavement. In new or modified construction it would be recommended to add protected rigid foam insulation around the exposed foundation perimeter and continue it below grade to control foundation and slab heat loss.

Doors

There are a total of five exterior doors on this building. Four are ½ glass, metal insulated doors. The one in the main hallway should be replaced, the other three are in good condition. The last door is a metal, un-insulated door which leads into the boiler room. All doors need new weather-stripping.



Windows



There are a total of ninety-nine windows in this facility. Five windows are double-pane, metal framed, hopper style windows, four windows are double-pane, metal framed fixed windows, and there are forty-five double-pane, metal framed operable windows. All of them should be replaced. They do not have thermal breaks in the frames to keep the cold out and the glass is not a good quality window with good insulating values.

There are forty-five sections of Kal-wal blocks throughout the building. Each section is 26 square feet. Kal-wal in the days of cheap oil was popular. But today they are not good insulators. We are recommending that the Kal-wal be replaced.

Electrical

Interior lighting

There are one hundred, sixty-five light fixtures in this building. Most are T12 fixtures and should be upgraded to more efficient high-performance T8 light fixtures. The building does have twenty-nine existing T8 light fixtures, two CFL bulbs, and twelve LED exit signs.



Occupancy sensors

There are no occupancy sensors within this building.

Exterior lighting

There are three exterior lights. One is an incandescent bulb, one is quartz and the other is a mercury vapor light. The incandescent should be replaced with compact fluorescent, the quartz is fine as is, and the mercury vapor should be replaced with high pressure sodium.

Electrical consumption

From June 2008 to December 2008, this facility consumed 38,199 kilowatt hours (kWh). Average monthly usage was 5,457 kWh. During this time period, demand ranged from 14 kW to 17 kW with charges from \$181 to \$228 per month. Total cost for these seven months was \$5,300 with a monthly average of \$757. According to data provided by school staff, consumption for FY08 was 57,096 kWh. The consumption for 2008 equals 3.47 kWh/square foot. This compares to your peers average of 5.6 kWh. Cost per square foot was 48 cents. The energy use intensity was 43 kBtu which compares to 89 kBtu for this climate zone.

From January 2009 to November 2009, this facility consumed 50,601 kilowatt hours (kWh). Average monthly usage was 4,600 kWh. During this time period, demand ranged from 14 kW to 20 kW with charges from \$188 to \$265 per month. Total cost for these eleven months was \$7,480 with a monthly average of \$680. According to data provided by school staff, consumption for FY09 was 58,140 kWh. The consumption for 2009 equals 4.6 kWh/square foot. This compares to your peers average of 5.6 kWh. Cost per square foot was 68 cents. The energy use intensity was 43 kBtu, which compares to 89 kBtu for this climate zone.

Of all the buildings this consumption ranked 3rd out of 5 for the January through November 2009 period.

Mechanical

Heating system(s)

There is a National Steel hot water boiler, model number AC-4275, which was installed in 1950. It is rated at 1,610 pounds per hour or 1,932,000 BTUs per hour. There is also a Carlin burner, model 800CRD with a firing capacity of 11.4 to 19.8 gallons per hour. It was originally a steam boiler but has been converted to produce hot water. It is not efficient due to the conversion and overall size and mass to heat up before being able to supply heat to the building. It should be replaced. There are also two 2-zone circulator pumps.



HVAC Controls

The controls are electro-mechanical type. The temperature varied throughout the building, possibly due to too few thermostats.

Domestic Hot Water Heating Timer and Insulation

There is a 40 gallon, electric water heater which was installed in 2000. It appears to be in good condition. Timers are being utilized for the water heater so that it runs 12 hours per day and is off on the weekends.

Air conditioning

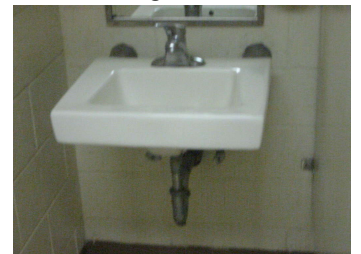
There is no air conditioning in this building.

Air distribution

There are no air handlers in this facility.

Fuel consumption

The fuel usage for this building was included in the usage for the Middle School. It is reported by staff that this building uses approximately 2,000 gallons of #2 fuel per year. If this number is accurate, then the gallons of fuel needed to heat the building per square foot are .19 gallons and the cost to heat per square foot is \$0.52. However, these calculations can not be backed by actual consumption data because it was not provided for this building. Some form of individual fuel metering for this building should be provided so consumption can be tracked.



Water

There are fifteen water consuming devices in this building: three urinals, seven toilets, and five sinks. There is a mix of high and low consumption devices; however, most are high. These devices should be switched to low consumption at the end of their useful life in order to cut back on water consumption.

Recommended Energy Conservation Measures

Important Note about ECM Recommendations: Each ECM annual savings is based on a percentage of savings from the 2009 energy costs. As each ECM is implemented, the savings should be calculated on the newly resulting energy consumption cost.

ECM 1 – Interior lighting – The inefficient T12 lighting throughout the building should be converted to high-performance T8s. There are also incandescent bulbs in the building that should be changed to compact fluorescents (CFLs). This ECM will cost \$7,325 to implement, saving an approximate \$2,468 annually. Based on this saving, a simple payback is calculated to be 3 years. Incentives and rebates were considered in the installation calculations.

ECM 2 – Exterior lighting – The 90 watt incandescent light and the mercury vapor bulb on the exterior of the building should be replaced with more efficient lighting. Replace the incandescent with a 23 watt CFL and replace the mercury vapor with high pressure sodium (HPS) bulb to lower energy consumption. This upgrade will cost approximately \$215, saving \$36 annually. A simple payback was calculated using these figures to be just under 6 years.

ECM 3 – Occupancy sensors – No occupancy sensors existed in the building and we are recommending installing them in commonly occupied spaces. Depending on actual occupancy in each of the rooms, the payback may vary; however, we based our estimations on hours of building operation. Twenty-five occupancy sensors should be installed. A breakdown of each location is on the attached lighting sheet. This ECM will cost approximately \$975, saving \$977 annually for a payback of 1 year.

ECM 4 – Sensors for exhaust fans – The exhaust fans in the restrooms run constantly, even when they are not needed. We recommend adding dual-sensing occupancy sensors on the fans so that they will run when the restroom is occupied and for a short time after occupancy, but will turn off when not needed. This project to install sensors has a cost of \$500, with an estimated savings of \$225 annually, for a payback of 2.2 years.

ECM 5 – Digital controls – The pneumatic HVAC controls should be replaced with a Direct Digital Control System. The cost is estimated at \$10,000 with an annual savings in energy of \$500. Based on these savings, this project will payback in 20 years, however, increased building comfort will be recognized immediately.

ECM 6 – VFD circulator pumps – We recommend replacing the single speed motors with variable speed drives and motors for the heating hot water circulation loops. The project cost is estimated at \$1,600, with an annual savings of approximately \$400. Based on the savings, this project will payback in 4 years.

ECM 7 – Replace boiler – The existing boiler is 60 years old and far beyond its expected life. It should be replaced very soon in order to continue with a reliable heat source. As one option to remedy this issue, we are recommending replacing the boiler with a new one at an approximate cost of \$53,000. The savings will be around \$1,500 annually, for a payback of 35.3 years.

Alternative ECM 7 – Tie boiler into Middle School boiler – As an alternative to replacing the boiler, we are offering the suggestion of tying the heat for the Administrative Building into the boilers at the Middle School. This option would be much more efficient and have a significantly shorter payback. We estimate the cost of tying the heat into the Middle School boilers to be \$11,000, with a savings of \$1,500 annually, for a payback of 7.3 years.

ECM 8 – Replace restroom fixtures – Some of the restroom fixtures in the building are high consumption



devices, which are consuming more water than necessary to function. We estimate ten of these fixtures should be replaced with low flow devices. The cost for this project is approximately \$7,000 and will save \$1,000 in water consumption annually. Based on these savings, this project will payback in 7 years.

ECM 9 – Replacement of exterior doors – Two of the exterior doors were recognized as being in poor condition and should be replaced. Upgrading these doors to insulated ones will reduce the heat loss due to loose door fittings and lack of insulation. The cost for the door project is estimated at \$2,200 with an annual savings of \$150, and paying back in 14.7 years.

ECM 10 – Door seals – We recommend replacing door weather-stripping and seals on a yearly basis, or at least as needed. New caulking and weather-stripping will reduce air infiltration and exfiltration, thus reducing energy spending. For this project, we estimate an expenditure of \$500 will save \$200 annually and payback in 2.5 years.

ECM 11 – Replace Kal-wal – At the time that this building was erected, Kal-wal was a popular design that allowed in more light throughout a building. However, now that fuel is more expensive, the Kal-wal systems have become a huge reason for loss of heat. All of the Kal-wal sections in the building should be replaced with newer, more efficient windows and wall sections. Although the payback for this project is long, the comfort level of the occupants due to this replacement will be recognized immediately. For this project, we estimate a total expenditure of \$38,000 with an annual savings of \$1,000. This project should payback in 38 years.

ECM 12 – Replace windows – The windows in the building are all outdated and inefficient. We are recommending replacing all of them in order to reduce air infiltration and exfiltration. This project will have an estimated cost of \$21,600, for an annual savings of \$1,000. Although the payback is 21.6 years, occupant comfort will be realized immediately upon replacement.

ECM 13 – Close gravity vents – There are gravity vents located throughout the building that do not have a damper and allow a free flow of air to enter and/or exit the rooms. We recommend closing them off by installing a permanent solid stop. The cost for this project is \$250 and will save an approximate \$500 annually, for a payback just 6 months.

The savings estimate for each specific ECM is based on the CURRENT consumption and cost for energy. Actual savings for any specific ECM will vary, depending upon whether any of the other ECM measures have been previously implemented.

Estimated cost savings and costs of energy conservation measures

ECM #	Measure	Annual Energy Savings	Installed Cost	Annual dollar Savings	Simple Payback (Years)
ECM-1	Interior lighting	11,162 kWh	\$7,325	\$2,468	3.0
ECM-2	Exterior lighting	142 kWh	\$215	\$36	6.0
ECM-3	Occupancy sensors	6,599 kWh	\$975	\$977	1.0
ECM-4	Sensors for fans	% of energy	\$500	\$225	2.2
ECM-5	Digital controls	% of energy	\$10,000	\$500	20.0
ECM-6	VFD circulator pumps	% of energy	\$1,600	\$400	4.0
ECM-7	Replace boiler	% of fuel	\$53,000	\$1,500	35.3
Alt ECM-7	Tie heat into MS	% of fuel	\$11,000	\$1,500	7.3
ECM-8	Replace restroom fixtures	% of water	\$7,000	\$1,000	7.0
ECM-9	Replace ext. doors	% of fuel	\$2,200	\$150	14.7
ECM-10	Door seals	% of energy	\$500	\$200	2.5
ECM-11	Replace Kal-wal	% of fuel	\$38,000	\$1,000	38.0
ECM-12	Replace windows	% of fuel	\$21,600	\$1,000	21.6
ECM-13	Close gravity vents	% of energy	\$250	\$500	0.5

*Savings calculated using FY09 energy data.

Note 1.
Door and window upgrades offer a reduction in air infiltration rates, decreased heat loss, and increased thermal comfort for the building occupants. This audit consists of an inventory only. Diagnostic measurements are not included within the scope of work that was to be provided.

Note 2.
Some ECMs would be required as regular capital renewal of expired or inoperable systems regardless of energy savings.



Energy Assessment and Report

SAU 80 – Shaker Regional School District

SAU 80 Administrative Building
58 School Street, Belmont, New Hampshire

Audit Date: December 15, 2009

Financial Analysis

Electrical

Based on the assessment of the Administrative Building, it was determined that the total kilowatt usage for during January through November 2009 was 50,601 kilowatt hours (kWh), averaging 4,600 kWh per month. The total cost was \$7,480 or an average of \$680 per month. Of the total \$7,480, \$2,270 was spent on demand charges during this time period, averaging \$206 in demand charges per month. The building went into demand consumption every month during this time period at the rate of 16 kW monthly, on average.

Our firm has made several suggestions for lighting, fixtures, and control upgrades. If only the lighting changes are made, it is predicted 11,304 kWh will be saved. If all of the suggested upgrades and changes are followed for lighting and lighting controls, it is predicted 17,902 kWh could be saved.

Based on our calculations, it is determined that the current lighting and controls use 32,793 kWh. The projected annual kilowatt usage, if only the lighting changes are made, is 21,489 kWh. If changes are made for both lighting and controls, the new usage should be 14,891 kWh.

The cost of the electrical recommendations, including currently available rebates from Public Service of New Hampshire, is \$8,515. Each recommendation has a projected savings and payback, however, the occupancy sensor ECM assumes the upgrades to the lighting also take place. If all the electrical ECMs were completed at the same time, the savings would be approximately \$3,481 and payback in 2.5 years.

	Lighting Only		Lighting & Controls*	
	KW Hrs	KW	KW Hrs	KW
Current	32,793	14.77	32,793	14.77
Projected	21,400	9.50	14,891	6.58
Saved	11,304	5.28	17,902	8.19

**Assumes upgrades to lighting have already been implemented.*

Mechanical

In FY09 this facility consumed a reported 2,000 gallons of #2 heating oil. Total annual expenditure was \$5,774. This is a cost of \$0.52 per square foot, putting the Admin building at 1 out of the 5 buildings.

If the mechanical recommendations of this report were implemented, savings of nearly \$3,625 could be



achieved at an installed cost of \$72,000 and a resulting payback of around 19 years. It should be recognized that the aged boiler replacement is actually a capital renewal issue with little savings, thus increasing simple payback. We have offered a suggestion as an alternate to replacing the boiler. This alternate involves tying the heating system of this building into the heat at the Middle School. If this ECM is implemented, payback will be over less than half the time.

Building envelope and miscellaneous

Due to the construction type of the building and the nature of building ECMs, it is difficult to suggest realistic improvements that are justifiable. Further, it is difficult to determine a savings as a result of what may appear to be obvious inefficient building systems. As such, we recommend the more obvious opportunities with costs we can comfortably determine be considered and likely savings will result.

The installed cost of the suggested improvements to the building is \$62,550, possibly saving \$2,850 a year. The simple payback for these projects is 21.5 years. It should be noted that the Kal-wal is inefficient but also expensive to replace, thus increasing the simple payback years.

Grand total

As a part of this scope of work, we are recommending that all items in this report be implemented. Generally, we would suggest items with a payback of 10 years or less. Though some of our suggestions are greater than 10 years, by combining them all, greater overall savings and conservation will be achieved.

Implementing fairly straight forward conservation measures, yields an expenditure of \$143,165 and would save nearly \$9,956 of energy costs between electricity and oil.

Alternatively, if the boiler were tied into the Middle School boiler versus a boiler replacement, the total expenditure would be lowered to \$101,165 and the simple payback would be 10 years.

ECM SUMMARY

ECM Summary

SAU 80 – Memorial Administrative Building

Electrical

<i>ECM</i>	<i>ECM Description</i>	<i>Installed Cost</i>	<i>Annual Savings</i>	<i>Simple Payback</i>
ECM 1	T-8 lights and CFL	\$7,325	\$2,468	2.97
ECM 2	Upgrade exterior lights	\$215	\$36	5.97
ECM 3	Add occupancy sensors	\$975	\$977	1.00
		\$8,515		

Installed cost includes efficiency rebates.
 Replace non energy star 16 CF fridge with a rated one, 20% more efficient.

Mechanical

<i>ECM</i>	<i>ECM Description</i>	<i>Installed Cost</i>	<i>Annual Savings</i>	<i>Simple Payback</i>
ECM 4	Sensors for exhaust fans	\$500	\$225	2.22
ECM 5	Add digital controls	\$10,000	\$500	20.00
ECM 6	VFD circulator motors	\$1,600	\$400	4.00
ECM 7	Replace boiler	\$53,000	\$1,500	35.33
Alternate –				
7*	Tie to MS boilers	\$11,000	\$1,500	7.33
ECM 8	10 new water fixtures	\$7,000	\$1,000	7.00
		\$72,100		

Building & Miscellaneous

<i>ECM</i>	<i>ECM Description</i>	<i>Installed Cost</i>	<i>Annual Savings</i>	<i>Simple Payback</i>
ECM 9	Replace 2 ext door	\$2,200	\$150	14.67
ECM 10	Add doors seals	\$500	\$200	2.50
ECM 11	Replace Kal-wal	\$38,000	\$1,000	38.00
ECM 12	Replace windows	\$21,600	\$1,000	21.60
ECM 13	Close gravity vents	\$250	\$500	0.50
		\$62,550		

***Alternate – Mechanical**

If alternate is implemented instead –
 Total for Mechanical \$30,100

Note: Boiler is sixty years old and very unreliable and inefficient. Consideration should be taken to tying this into the boiler at the Middle School. Payback will be much less than replacement.

Please Note: Each ECM annual savings is based on a percentage of savings from the 2009 energy costs. As each ECM is implemented, the savings should be calculated on the newly resulting energy consumption cost.

Energy Assessment and Report

SAU 80 – Shaker Regional School District

SAU 80 Administrative Building
 58 School Street, Belmont, New Hampshire

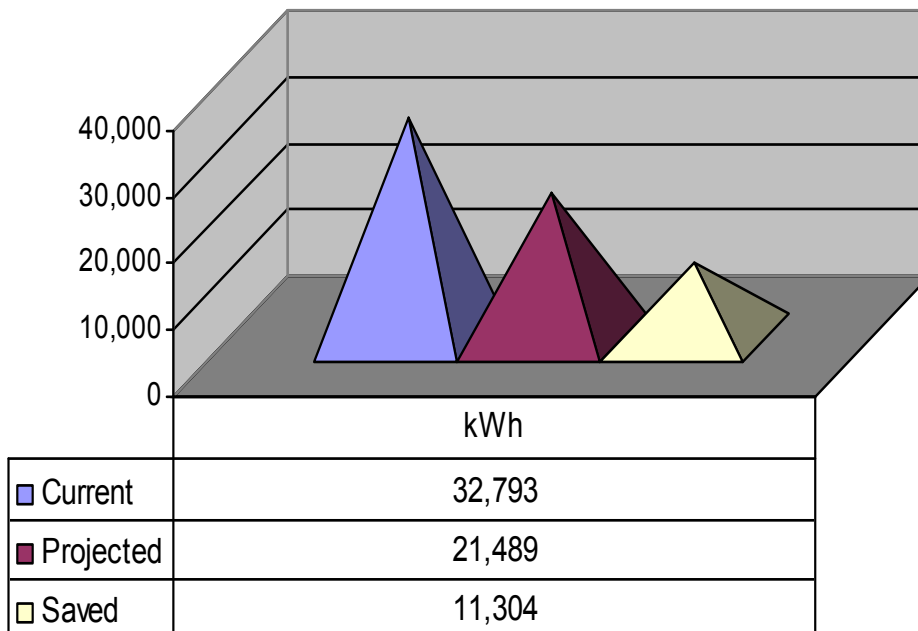
Audit Date: December 15, 2009

Lighting Savings Calculations

Information has been included as part of this report to breakdown light savings calculations by room. The following chart is a summary of the findings and displays the current estimated kilowatt hour (kWh) usage from the lighting only. Based on our recommendations for lighting upgrades, the following projected kWh usage is foreseen, along with the total kWh savings.

KW Hours Saved - Memorial Administrative Building

*kWh Saved = 11,304
 Lighting Only*



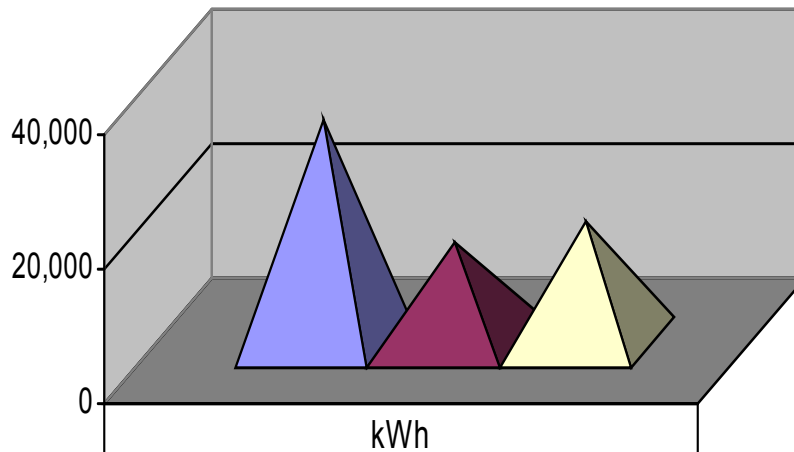
The following chart displays current usage and projections if both the lighting and lighting controls are implemented.

KW Hours Saved - Memorial Administrative Building

kWh Saved = 17,902

Lighting & Controls

**Assumes upgrades to lighting have already been implemented*



■ Current	32,793
■ Projected	14,891
■ Saved	17,902



Energy Assessment and Report

SAU 80 – Shaker Regional School District

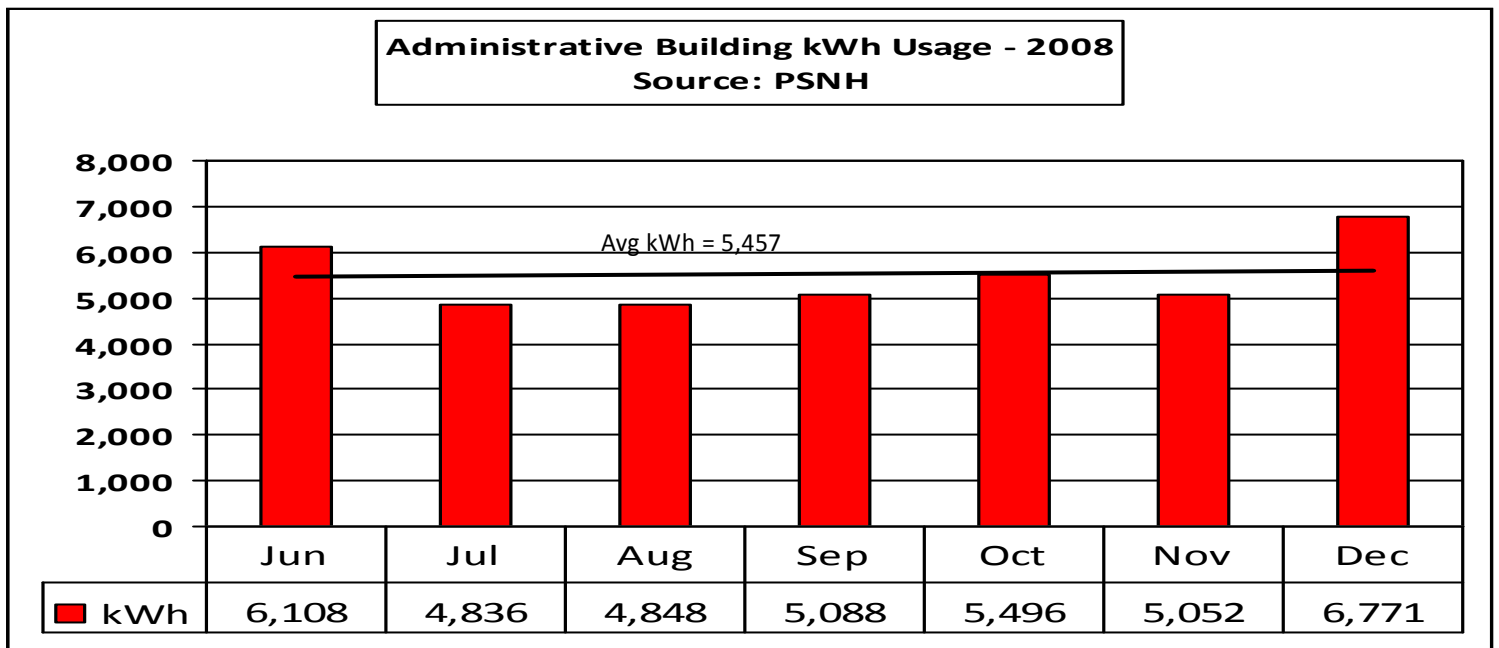
SAU 80 Administrative Building
 58 School Street, Belmont, New Hampshire

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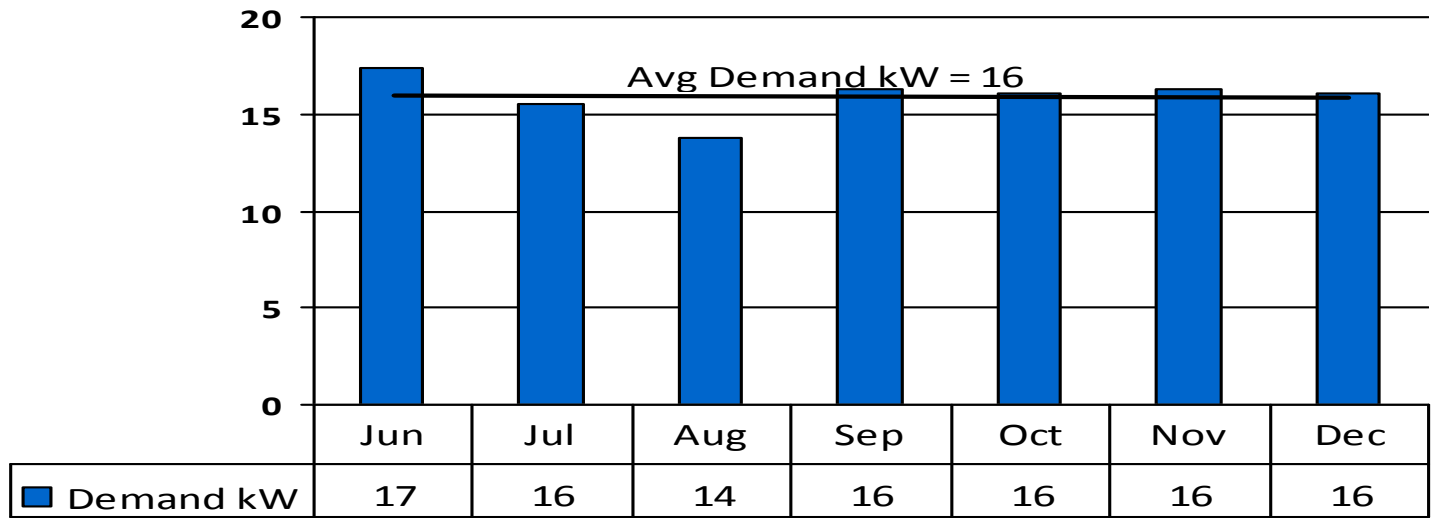
Energy Graphs – Electricity 2008

SAU 80 Administrative Building					
Electricity Usage – 2008					
Source: PSNH					
		kWh	Cost	Demand kW	Demand Cost
2008	Jun	6,108	\$788	17	\$228
2008	Jul	4,836	\$681	16	\$203
2008	Aug	4,848	\$667	14	\$181
2008	Sep	5,088	\$716	16	\$214
2008	Oct	5,496	\$762	16	\$211
2008	Nov	5,052	\$714	16	\$214
2008	Dec	6,771	\$972	16	\$211
	Total	38,199	\$5,300	112	\$1,463
Mo	Avg	5,457	\$757	16	\$209
Avg	\$/kW		\$0.14		

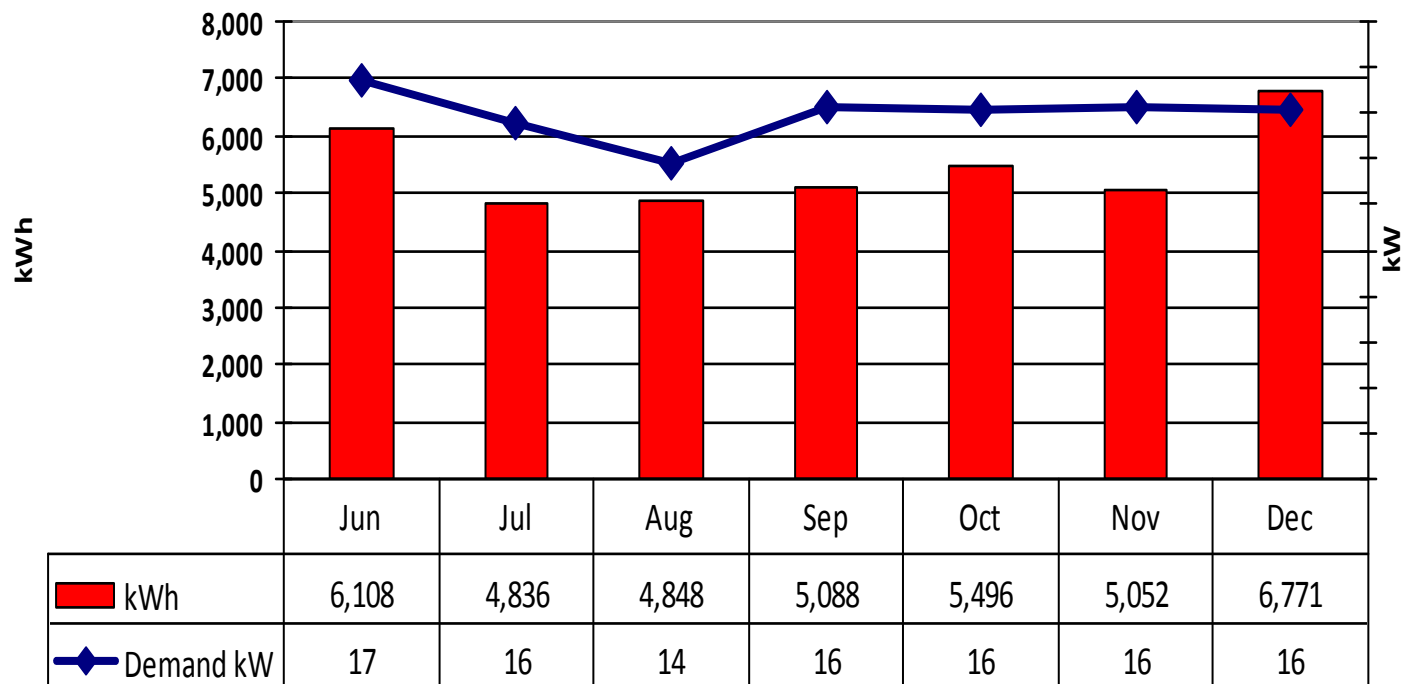
kWh/SF 3.47 Cost/SF \$0.48
 Public Service of New Hampshire
 Acct # 267180008
 General Service 1 Phase



Administrative Building Demand kW Usage - 2008
Source: PSNH



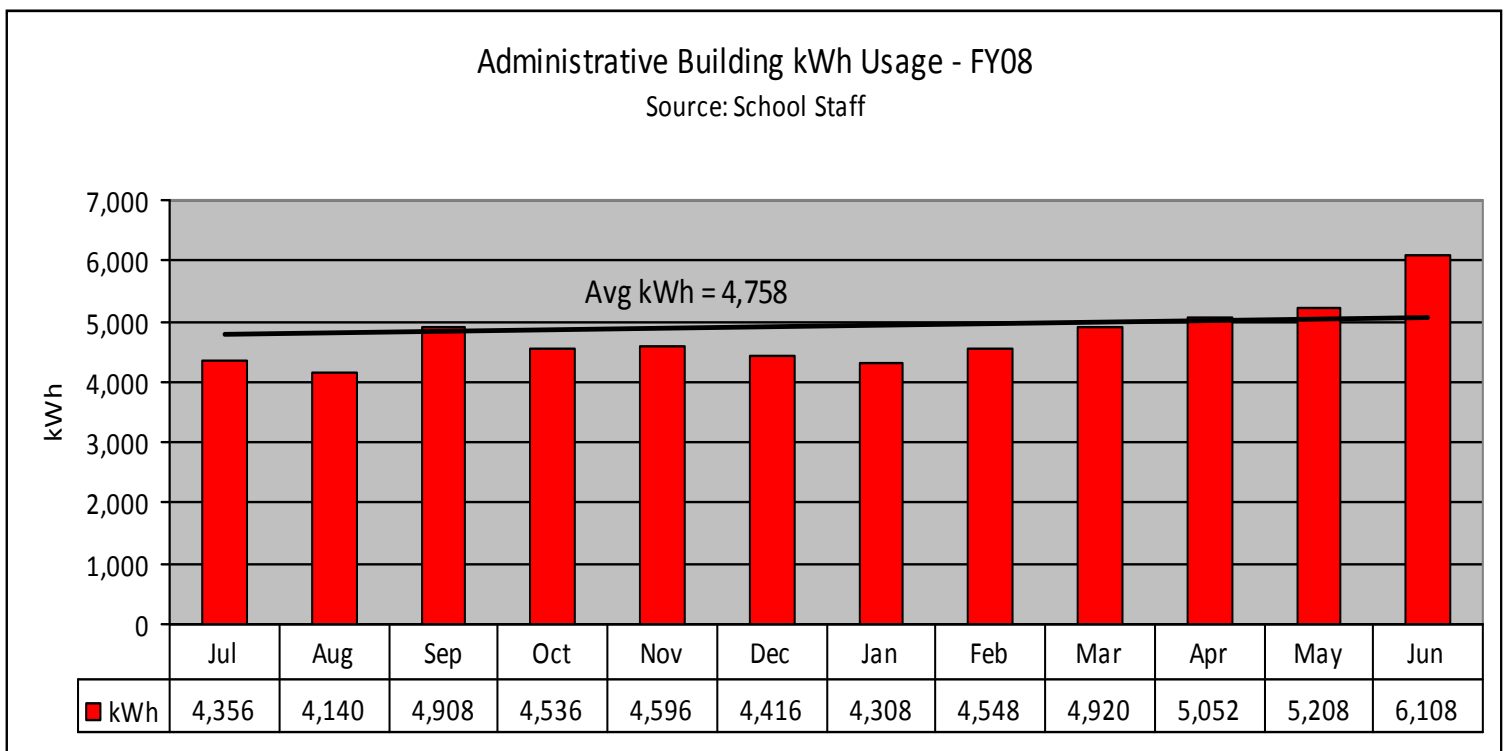
Administrative Building kWh & Demand kW Usage - 2008
Source: PSNH



SAU 80 Administrative Building		
Electricity Usage-FY08		
Source: School Staff		
		kWh
2007	Jul	4,356
2007	Aug	4,140
2007	Sep	4,908
2007	Oct	4,536
2007	Nov	4,596
2007	Dec	4,416
2008	Jan	4,308
2008	Feb	4,548
2008	Mar	4,920
2008	Apr	5,052
2008	May	5,208
2008	Jun	6,108
	Total	57,096
Mo Avg kWh - FY08		4,758
FY08 kWh / SF		5.19

Administrative Building kWh Usage - FY08

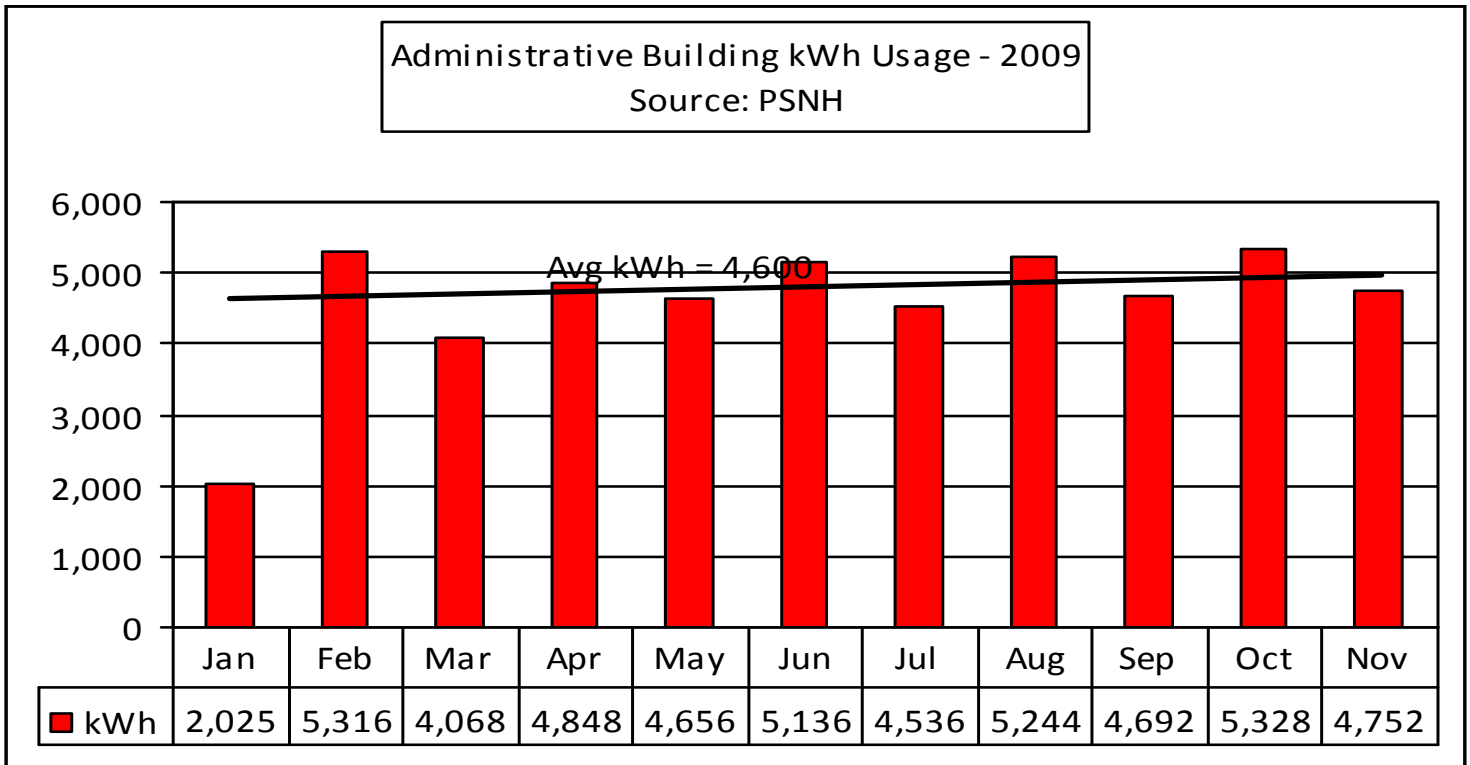
Source: School Staff



Energy Graphs – Electricity 2009

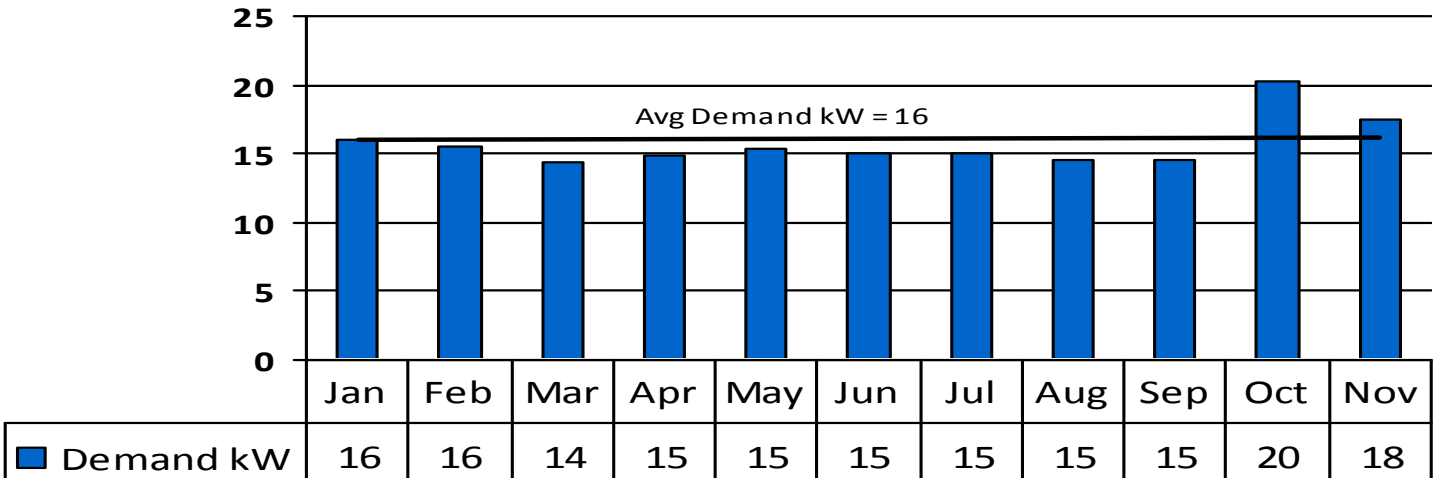
SAU 80 Administrative Building					
Electricity Usage-2009					
Source: PSNH					
		kWh	Cost	Demand kW	Demand Cost
2009	Jan	2,025	\$319	16	\$210
2009	Feb	5,316	\$772	16	\$203
2009	Mar	4,068	\$613	14	\$188
2009	Apr	4,848	\$710	15	\$194
2009	May	4,656	\$693	15	\$202
2009	Jun	5,136	\$747	15	\$198
2009	Jul	4,536	\$675	15	\$197
2009	Aug	5,244	\$747	15	\$192
2009	Sep	4,692	\$678	15	\$192
2009	Oct	5,328	\$810	20	\$265
2009	Nov	4,752	\$716	18	\$230
	Total	50,601	\$7,480	173	\$2,270
Mo	Avg	4,600	\$680	16	\$206
Avg	\$/kW		0.148		

kWh/SF 4.60 Cost/SF \$ 0.68
Public Service of New Hampshire
Acct # 267180008
General Service 1 Phase



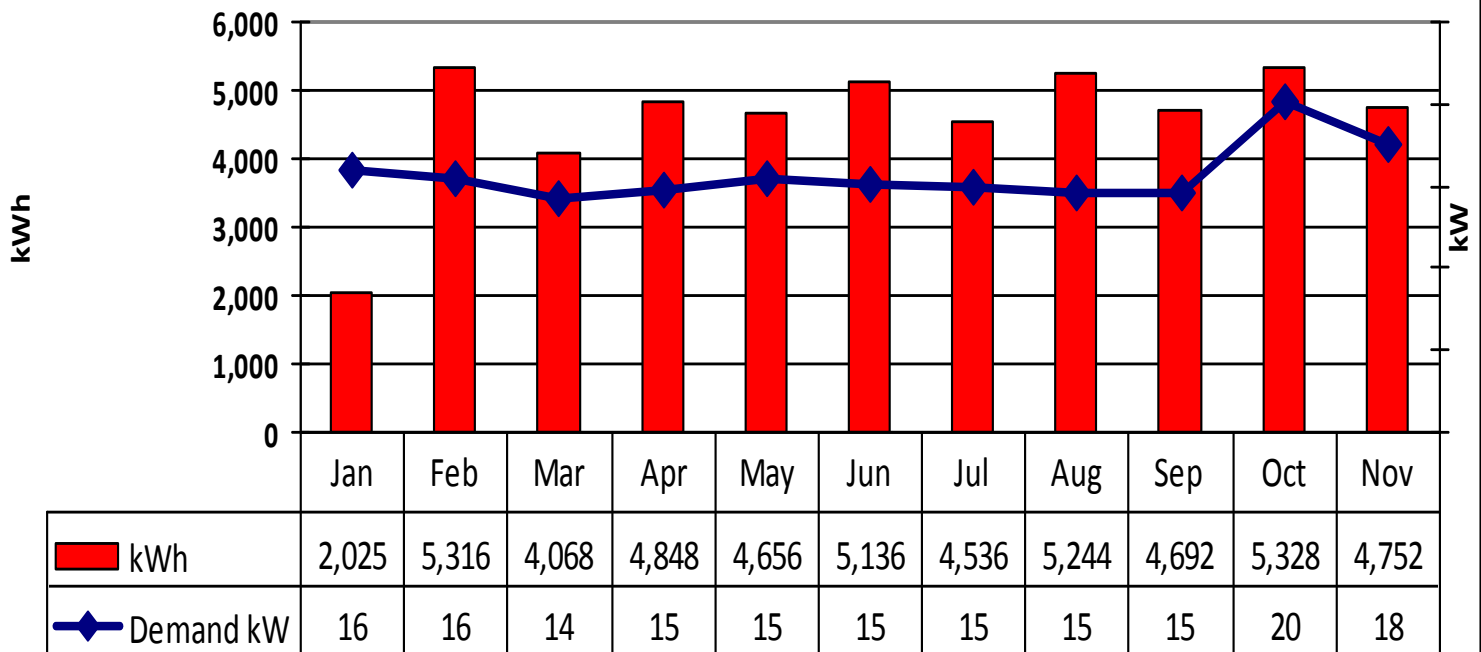
Administrative Building Demand kW Usage - 2009

Source: PSNH

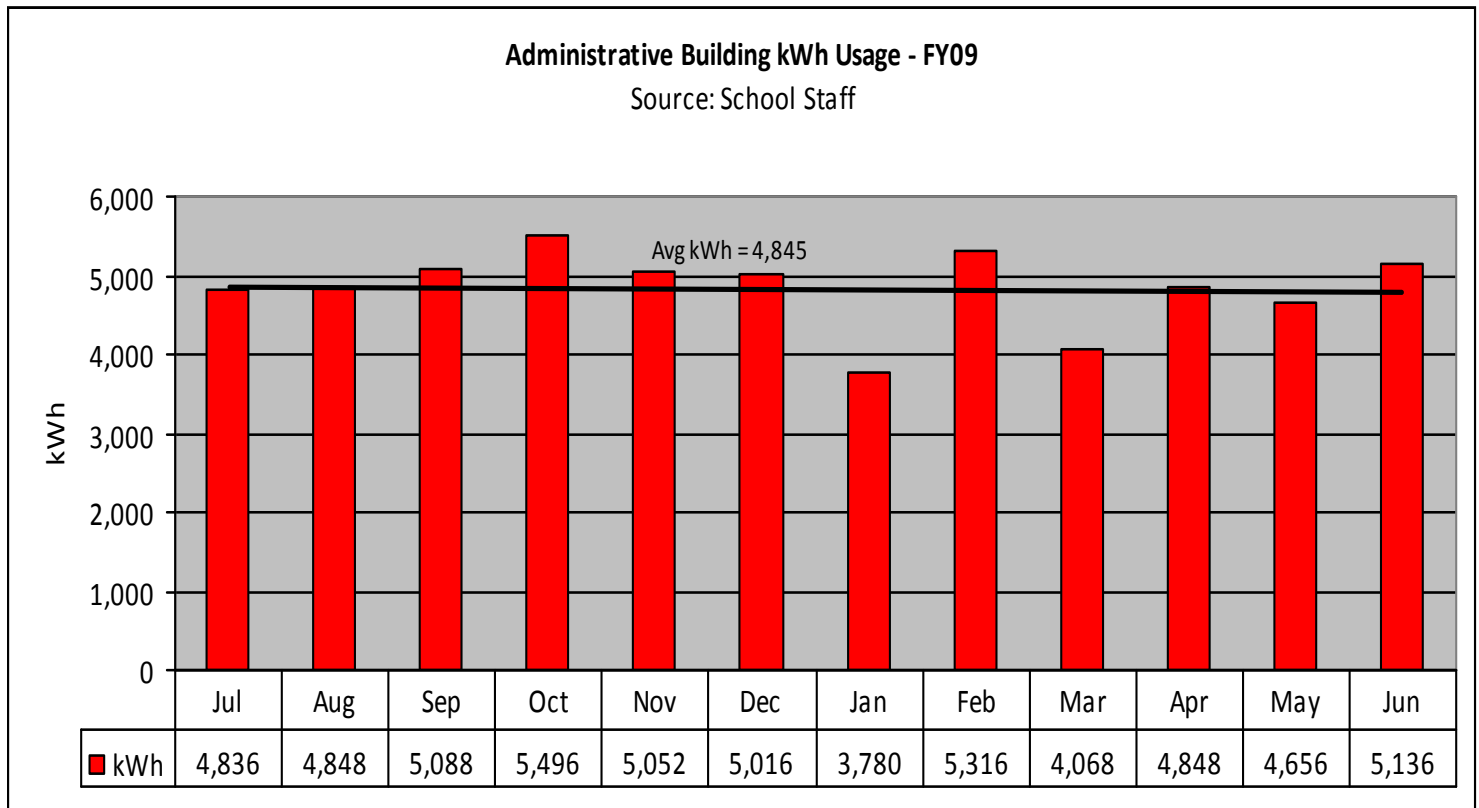


Administrative Building kWh & Demand kW Usage - 2009

Source: PSNH



SAU 80 Administrative Building		
Electricity Usage-FY09		
Source: School Staff		
		kWh
2008	Jul	4,836
2008	Aug	4,848
2008	Sep	5,088
2008	Oct	5,496
2008	Nov	5,052
2008	Dec	5,016
2009	Jan	3,780
2009	Feb	5,316
2009	Mar	4,068
2009	Apr	4,848
2009	May	4,656
2009	Jun	5,136
	Total	58,140
Mo Avg kWh - FY09		4,845
FY09 kWh / SF		5.29





Energy Assessment and Report

SAU 80 – Shaker Regional School District

**SAU 80 Administrative Building
58 School Street, Belmont, New Hampshire**

Audit Date: December 15, 2009

Alternative Energy Opportunities

Alternative energy options were reviewed for this facility. A wood fired pellet could be installed, but tying the Administrative building to the Middle School makes more sense, regardless of the fuel source for the Middle School.

Solar, wind, geothermal were also considered but are generally expensive resulting in payback years of 20 years and greater. Insulating blanket type curtains could be utilized instead of replacing the Kal-Wal but requires a human involvement each day to open or close them in order to save energy.

The best alternative option is to create a philosophy and atmosphere that fosters energy conservation. It has little costs and great results.

Saved KWH - Lighting Only																
Room Name	Hours	QTY	Existing watts	Existing fixture type	Suggested replacement	Replace - ment Watts	KW Hr saved	KW saved	Dollars saved	Cost each	Project cost	Incentive	Payback	KW Hr cost	KW cost	
Belmont Administrative Building																
1 - Main hallway	2500	3	60	2UTube												
	8736	1	3	LED exit			26	0.00	\$4							
2 - Boiler room	100	2	23	CFL 23W			5	0.05	\$8							
3 - Boys room	2500	1	102	2L4T12	2L4THP8	60	105	0.04	\$22	\$75	\$75	\$45	1.35			
4 - Girls room	2500	2	102	2L4T12	2L4THP8	60	210	0.08	\$44	\$75	\$150	\$90	1.35			
5 - Debbie's office	2500	4	88	3L4T8												
6 - Vault	450	6	102	2L4T12	2L4THP8	60	113	0.25	\$56	\$75	\$450	\$72	6.70			
7 - Hallway	2500	5	88	3L4T8												
	8736	2	3	LED exit												
8 - Conference room	2500	6	88	3L4T8												
9 - Server room	2500	16	102	2L4T12	2L4THP8	60	1680	0.67	\$354	\$75	\$1,200	\$192	2.84			
10 - Doug's office	2500	14	60	2L4T8												
11 - Personnell	2500	4	102	2L4T12	2L4THP8	60	420	0.17	\$89	\$75	\$300	\$48	2.84			
12 - Superintendent	2500	4	102	2L4T12	2L4THP8	60	420	0.17	\$89	\$75	\$300	\$48	2.84			
13 - Reception	2500	6	102	2L4T12	2L4THP8	60	630	0.25	\$133	\$75	\$450	\$72	2.84			
14 - Copy room	2500	2	102	2L4T12	2L4THP8	60	210	0.08	\$44	\$75	\$150	\$24	2.84			
	1250	1	90	INCA 90W	CFL 23W	24	83	0.07	\$23	\$15	\$15		0.66			
15 - Stairwell	2500	1	90	INCA 90W	CFL 23W	24	165	0.07	\$35	\$15	\$15		0.43			
	2500	3	60	1L4T12	1L4THP8	30	225	0.09	\$47	\$65	\$195	\$36	3.35			
	8736	1	3	LED exit												
16 - Upstairs hallway	2500	6	102	2L4T12	2L4THP8	60	630	0.25	\$133	\$75	\$450	\$72	2.84			
	8736	2	3	LED exit												
17 - Chorus	2500	14	102	2L4T12	2L4THP8	60	1470	0.59	\$310	\$75	\$1,050	\$168	2.84			
18 - Upstairs storage	1250	14	102	2L4T12	2L4THP8	60	735	0.59	\$201	\$75	\$1,050	\$168	4.38			
19 - Band room	2500	16	102	2L4T12	2L4THP8	60	1680	0.67	\$354	\$75	\$1,200	\$192	2.84			
20 - Servers	1250	2	102	2L4T12	2L4THP8	60	105	0.08	\$29	\$75	\$150	\$24	4.38			
21 - ISS	2500	16	102	2L4T12	2L4THP8	60	1680	0.67	\$354	\$75	\$1,200	\$192	2.84			
	1250	1	90	INCA 90W	CFL 23W	24	83	0.07	\$23	\$15	\$15		0.66			
22 - Custodial closet	1250	2	102	2L4T12	2L4THP8	60	105	0.08	\$29	\$75	\$150	\$24	4.38			
23 - Custodial closet 2	1250	1	90	INCA 90W	CFL 23W	24	83	0.07	\$23	\$15	\$15		0.66			
24 - Boys room	2500	2	60	1L4T12	1L4THP8	30	150	0.06	\$32	\$65	\$130	\$24	3.35			
25 - Girls room	2500	2	60	1L4T12	1L4THP8	30	150	0.06	\$32	\$65	\$130	\$24	3.35			
Subtotal - Interior Lights		162	2,489				1,086	11,162	5	\$2,468	\$1,380	\$8,840	\$1,515	2.97		
Exterior	1560	1		Quartz												
	1560	1	90	INCA 90W	CFL 23W	24	103	0.07	\$26	\$15	\$15		0.59			
	1560	1	175	MV150	HPS150	150	39	0.03	\$10	200	\$200		20.60			
TOTALS		165	2,754				1,260	11,304	5	\$2,504	\$1,595	\$9,055	\$1,515	3.01		

Energy Cost 0.1480 \$/kWhr
 Demand Cost \$13.12 \$/kW



Current KWH								
Room name	Hours	QTY	Existing watts	Existing fixture type	Suggested replacement	Replace - ment Watts	KW Hrs base	KW base
1 - Main hallway	2500	3	60	2UTube			450	0.18
	8736	1	3	LED exit			26	0.00
2 - Boiler room	100	2	23	CFL 23W			5	0.05
3 - Boys room	2500	1	102	2L4T12	2L4T8	60	255	0.10
4 - Girls room	2500	2	102	2L4T12	2L4T8	60	510	0.20
5 - Debbie's office	2500	4	88	3L4T8			880	0.35
6 - Vault	450	6	102	2L4T12	2L4T8	60	275	0.61
7 - Hallway	2500	5	88	3L4T8			1,100	0.44
	8736	2	3	LED exit			52	0.01
8 - Conference room	2500	6	88	3L4T8			1,320	0.53
9 - Server room	2500	16	102	2L4T12	2L4T8	60	4,080	1.63
10 - Doug's office	2500	14	60	2L4T8			2,100	0.84
11 - Personnell	2500	4	102	2L4T12	2L4T8	60	1,020	0.41
12 - Superintendent	2500	4	102	2L4T12	2L4T8	60	1,020	0.41
13 - Reception	2500	6	102	2L4T12	2L4T8	60	1,530	0.61
14 - Copy room	2500	2	102	2L4T12	2L4T8	60	510	0.20
	1250	1	90	INCA 90W	CFL 23W	24	113	0.09
15 - Stairwell	2500	1	90	INCA 90W	CFL 23W	24	225	0.09
	2500	3	60	1L4T12	1L4T8	30	450	0.18
	8736	1	3	LED exit			26	0.00
16 - Upstairs hallway	2500	6	102	2L4T12	2L4T8	60	1,530	0.61
	8736	2	3	LED exit			52	0.01
17 - Chorus	2500	14	102	2L4T12	2L4T8	60	3,570	1.43
18 - Upstairs storage	1250	14	102	2L4T12	2L4T8	60	1,785	1.43
19 - Band room	2500	16	102	2L4T12	2L4T8	60	4,080	1.63
20 - Servers	1250	2	102	2L4T12	2L4T8	60	255	0.20
21 - ISS	2500	16	102	2L4T12	2L4T8	60	4,080	1.63
	1250	1	90	INCA 90W	CFL 23W	24	113	0.09
22 - Custodial closet	1250	2	102	2L4T12	2L4T8	60	255	0.20
23 - Custodial closet 2	1250	1	90	INCA 90W	CFL 23W	24	113	0.09
24 - Boys room	2500	2	60	1L4T12	1L4T8	30	300	0.12
25 - Girls room	2500	2	60	1L4T12	1L4T8	30	300	0.12
Exterior	1560	1		Quartz				
	1560	1	90	INCA 90W	CFL 23W	24	140	0.09
	1560	1	175	Mercury vapor	HPS150	150	273	0.18

TOTALS	165	2,754				1260	32,793	14.77
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Lighting Only

	KW Hrs	KW
Current	32,793	14.77
Projected	21,489	9.50
Saved	11,304	5.28

Lighting & Controls*

	KW Hrs	KW
Current	32,793	14.77
Projected	14,891	6.58
Saved	17,902	8.19

*Assumes upgrades to lighting have already been implemented.

Saved KWH - Lighting Controls

Room Name	Number of controls	On hrs	Fixture Quantity	Suggested Replacement	Watts	On KW Hrs	Est off	KW Hrs saved	Dollars saved	Cost each	Project cost	Incentive	Payback years	KW Hr cost
Belmont Administrative Building														
1 - Main hallway	1	2500	3		60	450	0.3	135.0	\$19.98	\$75	\$75	\$45	1.5	\$ 0.148
		8736	1		3	26							-	\$ 0.148
2 - Boiler room		100	2		23	5							-	\$ 0.148
3 - Boys room	1	2500	1	2L4THP8	60	150	0.7	105.0	\$15.54	\$75	\$75	\$45	1.9	\$ 0.148
4 - Girls room	1	2500	2	2L4THP8	60	300	0.7	210.0	\$31.08	\$75	\$75	\$45	1.0	\$ 0.148
5 - Debbie's office	1	2500	4		88	880	0.3	264.0	\$39.07	\$75	\$75	\$45	0.8	\$ 0.148
6 - Vault		450	6	2L4THP8	60	162								\$ 0.148
7 - Hallway	2	2500	5		88	1,100	0.3	330.0	\$48.84	\$75	\$150	\$45	2.1	\$ 0.148
		8736	2		3	52							-	\$ 0.148
8 - Conference room	1	2500	6		88	1,320	0.6	792.0	\$117.22	\$75	\$75	\$45	0.3	\$ 0.148
9 - Server room	1	2500	16	2L4THP8	60	2,400	0.1	240.0	\$35.52	\$75	\$75	\$45	0.8	\$ 0.148
10 - Doug's office	1	2500	14		60	2,100	0.1	210.0	\$31.08	\$75	\$75	\$45	1.0	\$ 0.148
11 - Personnell	1	2500	4	2L4THP8	60	600	0.3	180.0	\$26.64	\$75	\$75	\$45	1.1	\$ 0.148
12 - Superintendent	1	2500	4	2L4THP8	60	600	0.3	180.0	\$26.64	\$75	\$75	\$45	1.1	\$ 0.148
13 - Reception	1	2500	6	2L4THP8	60	900	0.1	90.0	\$13.32	\$75	\$75	\$45	2.3	\$ 0.148
14 - Copy room	1	2500	2	2L4THP8	60	300	0.5	150.0	\$22.20	\$75	\$75	\$45	1.4	\$ 0.148
		1250	1	CFL 23W	24	30							-	\$ 0.148
15 - Stairwell		2500	1	CFL 23W	24	60								\$ 0.148
	2	2500	3	1L4THP8	30	225	0.7	157.5	\$23.31	\$75	\$150	\$45	4.5	\$ 0.148
		8736	1		3	26							-	\$ 0.148
16 - Upstairs hallway	2	2500	6	2L4THP8	60	900	0.3	270.0	\$39.96	\$75	\$150	\$45	2.6	\$ 0.148
		8736	2		3	52							-	\$ 0.148
17 - Chorus	2	2500	14	2L4THP8	60	2,100	0.5	1050.0	\$155.40	\$75	\$150	\$45	0.7	\$ 0.148
18 - Upstairs storage		1250	14	2L4THP8	60	1,050	0.1	105.0	\$15.54	\$75	\$75	\$45	1.9	\$ 0.148
19 - Band room	2	2500	16	2L4THP8	60	2,400	0.5	1200.0	\$177.60	\$75	\$150	\$45	0.6	\$ 0.148
20 - Servers	1	1250	2	2L4THP8	60	150	0.1							\$ 0.148
21 - ISS	1	2500	16	2L4THP8	60	2,400	0.3	720.0	\$106.56	\$75	\$75	\$45	0.3	\$ 0.148
		1250	1	CFL 23W	24	30							-	\$ 0.148
22 - Custodial closet		1250	2	2L4THP8	60	150	0.1							\$ 0.148
23 - Custodial closet 2		1250	1	CFL 23W	24	30	0.1							\$ 0.148
24 - Boys room	1	2500	2	1L4THP8	30	150	0.7	105.0	\$15.54	\$75	\$75	\$45	1.9	\$ 0.148
25 - Girls room	1	2500	2	1L4THP8	30	150	0.7	105.0	\$15.54	\$75	\$75	\$45	1.9	\$ 0.148
Subtotal - Interior Lights	25		162					6,599	\$977		\$1,875	\$900	1.00	
Exterior		1560	1										-	\$ 0.148
		1560	1	CFL 23W	24	37							-	\$ 0.148
		1560	1										-	\$ 0.148

	25	97,674	165		1,529	21,286	8	6,599	\$977	1,500	\$1,875	\$900	1.00	TOTALS
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Client Name SAU 80 - Shaker School

Field Inventory Sheets

Building Name Belmont Admin

Date of field survey 15-Dec-09

Time of day 3:30 PM

Existing weather conditions Cold, sunny

Lighting

Location by room	Hours per Day	Total Hours	Quantity	Total Watts	Existing Fixture type	Suggested		Ballast type	Mounting method	Lighting level FC	Occupancy	
						Replace ment					sensors (Y/N)	# of Light Levels
1 - Main hallway	10-5-50	2500	3	60	2UTube			E	Drop in		N	1
	24-7-52	8736	1	3	LED exit				Surface			
2 - Boiler room	2-2-25	100	2	23	CFL 23W				Surface		N	1
	10-5-50	2500	1	102	2L4T12	2L4T8		M	Drop in		N	1
4 - Girls room	10-5-50	2500	2	102	2L4T12	2L4T8		M	Surface		N	1
5 - Debbie's office	10-5-50	2500	4	88	3L4T8			E	Drop in		N	2
6 - Vault	2-5-45	450	6	102	2L4T12	2L4T8		M	Surface		N	1
7 - Hallway	10-5-50	2500	5	88	3L4T8			E	Drop in		N	1
	24-7-52	8736	2	3	LED exit				Surface			
8 - Conference room	10-5-50	2500	6	88	3L4T8			E	Drop in		N	2
9 - Server room	10-5-50	2500	16	102	2L4T12	2L4T8		M	Surface		N	2
10 - Doug's office	10-5-50	2500	14	60	2L4T8			E	Drop in		N	2
11 - Personnell	10-5-50	2500	4	102	2L4T12	2L4T8		M	Surface		N	1
12 - Superintendent	10-5-50	2500	4	102	2L4T12	2L4T8		M	Surface		N	1
13 - Reception	10-5-50	2500	6	102	2L4T12	2L4T8		M	Surface	82	N	1
14 - Copy room	10-5-50	2500	2	102	2L4T12	2L4T8		M	Surface		N	1
	5-5-50	1250	1	90	INCA 90W	CFL 23W			Surface			
15 - Stairwell	10-5-50	2500	1	90	INCA 90W	CFL 23W			Surface			
	10-5-50	2500	3	60	1L4T12	1L4T8		M	Surface		N	1
	24-7-52	8736	1	3	LED exit				Surface			
16 - Upstairs hallway	10-5-50	2500	6	102	2L4T12	2L4T8		M	Surface		N	1
	24-7-52	8736	2	3	LED exit				Surface			
17 - Chorus	10-5-50	2500	14	102	2L4T12	2L4T8		M	Surface		N	2
18 - Upstairs storage	5-5-50	1250	14	102	2L4T12	2L4T8		M	Surface		N	2
19 - Band room	10-5-50	2500	16	102	2L4T12	2L4T8		M	Surface		N	2
20 - Servers	5-5-50	1250	2	102	2L4T12	2L4T8		M	Surface		N	1
21 - ISS	10-5-50	2500	16	102	2L4T12	2L4T8		M	Surface		N	2
	5-5-50	1250	1	90	INCA 90W	CFL 23W			Surface			
22 - Custodial closet	5-5-50	1250	2	102	2L4T12	2L4T8		M	Surface		N	1
23 - Custodial closet 2	5-5-50	1250	1	90	INCA 90W	CFL 23W			Surface		N	1
24 - Boys room	10-5-50	2500	2	60	1L4T12	1L4T8		M	Surface		N	1
25 - Girls room	10-5-50	2500	2	60	1L4T12	1L4T8		M	Surface		N	1
Exterior	6-7-52	1560	1		Quartz							
	6-7-52	1560	1	90	INCA 90W	CFL 23W						
	6-7-52	1560	1	150	MV150	HPS150						



Client Name	SAU 80 - Shaker School		
Building Name	Belmont Admin		
Date of field survey	15-Dec-09	Time of day	3:30 PM
Existing weather conditions	Cold, sunny		

Exterior doors

Location	Quantity	Size	Glazing	Thickness	Description	Condition	Photo #
1 - Main hallway	1	4068	1/2 Glass	1/4"	Metal Insulated	Replace	
2 - Boiler room	1	4068			Metal Uninsulated		
15 - Stairwell	2	3068	1/2 Glass	1/4"	Metal Insulated	Good	
16 - Upstairs hallway	1	3068	1/2 Glass	1/4"	Metal Insulated	Good	

Client Name SAU 80 - Shaker School
 Building Name Belmont Admin
 Date of field survey 15-Dec-09 Time of day 3:30 PM
 Existing weather conditions Cold, sunny

Windows

Location	Quantity	Description	Size (SF)	Glazing	Thick-ness	Low E Coating (Y/N)	Frame type	Comments	Comfort Issues (Y/N)
1 - Main hallway	1	Hopper	45	Double pane	3/8"	N	Metal	Replace	
6 - Vault	1	Hopper	3	Double pane	3/8"	N	Metal	Replace	
8 - Conference room	1	Hopper	3	Double pane	3/8"	N	Metal	Replace	
9 - Server room	2	Hopper	3	Double pane	3/8"	N	Metal	Replace	
10 - Doug's office	7	Kal Wall	26					Replace	
11 - Personnell	7	Operable	8	Double pane	3/8"	N	Metal	Replace	
	3	Kal Wall	26					Replace	
12 - Superintendent	3	Operable	8	Double pane	3/8"	N	Metal	Replace	
	3	Kal Wall	26					Replace	
16 - Upstairs hallway	3	Operable	8	Double pane	3/8"	N	Metal	Replace	
	4	Fixed	4.5	Double pane	1/2"	N	Metal	Replace	
17 - Chorus	7	Kal Wall	26					Replace	
18 - Upstairs storage	7	Operable	8	Double pane	3/8"	N	Metal	Replace	
	7	Kal Wall	26					Replace	
	7	Operable	8	Double pane	3/8"	N	Metal	Replace	



Windows

Location	Quantity	Description	Size (SF)	Glazing	Thick-ness	Low E Coating (Y/N)	Frame type	Comments	Comfort Issues (Y/N)
19 - Band room	8	Kal Wall	26	Double pane	3/8"	N	Metal	Replace	
20 - Servers	1	Kal Wall	26	Double pane	3/8"	N	Metal	Replace	
21 - ISS	8	Kal Wall	26	Double pane	3/8"	N	Metal	Replace	
22 - Custodial closet	1	Kal Wall	26	Double pane	3/8"	N	Metal	Replace	
	1	Operable	8	Double pane	3/8"	N	Metal	Replace	

Client Name SAU 80 - Shaker School
Building Name Belmont Admin
Date of field survey 15-Dec-09 Time of day 3:30 PM
Existing weather conditions Cold, sunny

Personal appliances

Location	Device type	Watts	Amps	Volts	Hours of usage	Photo #
9 - Server room	Microwave					
	16CF Fridge					Non E star
13 - Reception	Coffee pot					

Client Name SAU 80 - Shaker School
 Building Name Belmont Admin
 Date of field survey 15-Dec-09 Time of day 3:30 PM
 Existing weather conditions Cold, sunny

Water usage

Location	Device type	High or low consumption	Infrared (Y/N)	Other flow control device	Quantity	Photo #
3 - Boys room	Urinal	High			2	
	Toilet	High			1	
	Sink	High			1	
4 - Girls room	Toilet	High			2	
	Toilet	Low			1	
	Sink	Low			2	
24 - Boys room	Urinal	High			1	
	Toilet	High			1	
	Sink	Low			1	
25 - Girls room	Toilet	High			2	
	Sink	Low			1	

Client Name	SAU 80 - Shaker School		
Building Name	Belmont Admin		
Date of field survey	15-Dec-09	Time of day	3:30 PM
Existing weather conditions	Cold, sunny		

Computers & Equip

Location	Equipment type	Quantity	Photo #
5 - Debbie's office	LCD Monitor	7	
	Computer Tower	7	
10 - Doug's office	LCD Monitor	6	
	Laptop	2	
	Copier	1	
	Computer Tower	6	
11 - Personnell	LCD Monitor	2	
	Computer Tower	2	
12 - Superintendent	Laptop	1	
13 - Reception	LCD Monitor	2	
	Computer Tower	2	
	Fax	1	
17 - Chorus	LCD Monitor	1	
	Computer Tower	1	
21 - ISS	LCD Monitor	12	All on after hours
	Computer Tower	13	
	Printer	1	
	TV	1	
	CRT Monitor	1	



[Return to ENERGY STAR Web site](#) > **Target Energy Performance Results**

Target Energy Performance Results

The design **achieved** a rating of 75 or higher:

APPLY for "Designed to Earn the ENERGY STAR"

NOTE: Values are 42% Electricity - Grid Purchase and 58% Fuel Oil (No. 2). The Target & Average Building energy use for this facility are calculated based on fuel mix of input estimated energy use.

View Statement of Energy Design Intent

Target Energy Performance Results (estimated)			
Energy	Design	Target	Average Building
Energy Performance Rating (1-100)	87	91	50
Energy Reduction (%)	34	40	0
Source Energy Use Intensity (kBtu/Sq. Ft./yr)	86	78	130
Site Energy Use Intensity (kBtu/Sq. Ft./yr)	43	39	66
Total Annual Source Energy (kBtu)	942,723	860,561	1,434,269
Total Annual Site Energy (kBtu)	475,755	434,291	723,818
Total Annual Energy Cost (\$)	\$ 14,367	\$ 13,115	\$ 21,858
Pollution Emissions			
CO2-eq Emissions (metric tons/year)	45	41	69
CO2-eq Emissions Reduction (%)	34%	40%	0%

Facility Information [Edit](#)

Belmont Admin Offices
 Belmont, NH 03220
 United States

Facility Characteristics Edit		Estimated Design Energy Edit			
Space Type	Gross Floor Area (Sq. Ft.)	Energy Source	Units	Estimated Total Annual Energy Use	Energy Rate (\$/Unit)
K-12 School	11,000	Electricity - Grid Purchase	kWh	58,140	\$ 0.148/kWh
Total Gross Floor Area	11,000	Fuel Oil (No. 2)	Gallons	2,000	\$ 2.887/Gallons

* The Average Building is equivalent to an EPA Energy Performance Rating of 50.

Source: Data adapted from DOE-EIA. See EPA [Technical Description](#).