McCormick
Facilities Management

Building Energy Assessment

SAU 80 – Shaker Regional School District
Belmont Middle School

Energy Audit Report

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

Presented by: McCormick Facilities Management
8 Main Street
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Energy Assessment and Report

SAU 80 – Shaker Regional School District

SAU 80 Belmont Middle School
38 School Street, Belmont, New Hampshire

Audit Date: December 16, 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 walk through energy audit of the Belmont Middle School located at 38 School Street in Belmont, New Hampshire to determine 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 a middle school educational space and includes classrooms, offices, a multipurpose room, gym, library, music rooms, and kitchen. The building is occupied from approximately 6:00 am to 6:00 pm per day, for at least five days a week for a traditional school year. There are some summer activities. There are approximately 474 student plus staff.

There are approximately thirty classrooms of 800 square feet each, approximately ten offices, a music room, gym, locker rooms, library, several storage closets, and restrooms.

This report details the recommendations and conclusions of an energy audit conducted at the Belmont Middle School located at 38 School Street. The initial site visit was conducted on December 16, 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 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. 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 indentified 32 realistic opportunities to save energy and dollars. Implementing fairly straight forward conservation measures, expenditure on the order of $821,000 would save in access of $120,000 annually in energy costs between electricity and oil costs, with an overall payback of around 7 years.

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

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General Observations

During our review we noted the following:

- little historic energy data is kept;
- computers and office equipment on when not in use;
- several personal appliances that were not Energy Star rated;
- many exterior doors needed weather-stripping;
- many windows were drafty;
- ductwork and filters were very dirty;
- some of the water faucets were leaking; and
- all vending machines cool 24/7 with the light on.

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 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. Adding a vending miser to the vending machines will ensure that they are not running/cooling when not necessary.

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 64,000 square foot building is mostly a metal framed structure with concrete block infill and red brick veneer. It is likely that the block is not insulated. It was originally constructed in 1936 with additions in 1960 and 1972. The building appears to be in less than average repair for a building of this age, condition, and use.

The roofs have metal trusses or wood rafters depending on the building section. They have wood, concrete, or tectum roof decking, depending on the area and construction year of the building. The roof covering is EPDM adhered rubber on the flat roof sections and asphalt shingles on the pitched roof.

The exterior masonry wall construction does not offer an opportunity to easily add insulation. An option would

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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 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.

Generally, the building envelope is not "tight" in regards to air in filtration and out filtration. We observed many areas where the interface between in doors and out doors where day light could be observed and/or drafts could be felt. Examples are doors, windows, eaves, attic spaces, interstitial space between ceilings and floor deck above.

Doors

There are a total of twenty-seven exterior doors on this building. All but two are metal insulated. Sixteen of the doors are 1/2 –glass doors, two doors are full glass. The two remaining doors are metal un-insulated doors which are in poor condition. The rest of the doors are in fair condition; however, we recommend weather-stripping all the doors in the building annually to prevent infiltration/exfiltration of air.

Windows

There are a total of one hundred, ninety-one windows in this facility: The majority of the windows are double-pane, double-hung windows. There are also twenty windows that are double-pane, aluminum frame awning type. There are thirty fixed windows, also aluminum framed, seven hopper type windows, five slider windows, and two skylights. Most windows are drafty and should be replaced.

Electrical

Interior lighting

There are seven hundred, forty-nine light fixtures in this building. There is a mix of T12 and T8 style light fixtures. One hundred, forty-seven of the fixtures have T12 bulbs and should be upgraded to more efficient T8 bulbs. There are also twelve incandescent light bulbs throughout the building that should be converted to CFL to save energy as well. The building also has a mix of LED and florescent exit signs. All florescent signs should be converted to LED type.

Occupancy sensors

There are no occupancy sensors within this building.

Exterior lighting

There are nineteen exterior lights that consist of five low pressure sodium, nine high pressure sodium, three incandescent lights, and two quartz lights. The incandescent lights should be converted to more compact fluorescent type.

Electrical consumption

From January 2008 to December 2008, this facility consumed 377,600 kilowatt hours (kWh). Average monthly usage was 31,467 kWh. During this time period, demand usage ranged from 60 kW to 160 kW with charges from $787 to $2,099 per month. Total cost for these twelve months was $58,555

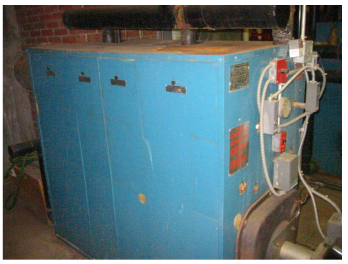
with a monthly average of $4,880. According to data provided by school staff, consumption for FY08 was 383,000 kWh. This consumption in 2008 equals 5.9 kWh/square foot, this compares to your peers average of 5.6 kWh. Cost per square foot was 91 cents. The energy use intensity was 79 kBTU which compares to 99 kBTU for this climate zone.

From January 2009 to December 2009, this facility consumed 385,200 kilowatt hours (kWh). Average monthly usage was 32,100 kWh. During this time period, demand usage ranged from 65 kW to 165 kW with charges from $853 to $2,165 per month. Total cost for these twelve months was $64,362 with a monthly average of $5,364. According to data provided by school staff, consumption for FY09 was 381,600 kWh. This consumption in 2009 equals 5.4 kWh/square foot, this compares to your peers average of 5.6 kWh. Cost per square foot was $1.01. Total energy use intensity is 85 kBTU which compares to 99 kBTU for this climate zone.

Of all the buildings this consumption ranked 4th out of 5 for the January through November, 2009 period.

Mechanical

Heating system(s)



There are two boilers that heat this facility. One is a smaller Burnham unit model V910 sectional boiler rated at 1.184 MMBTU, with a firing rate of 10.2 GPH. It has a Carlin Burner model 701CRD rated at 6-13.2 GPH. The other, larger boiler is a Burnham of unknown model or type. It is rated for 3.099 MMBTU with an unknown firing capacity. It does have a Carlin Burner model 1150FFD with a firing capacity of 20-35 GPH. The smaller unit is used primarily in the summer and shoulder seasons. The larger one carries the load during winter months. Each uses #2 fuel and have no fuel pre-heaters.

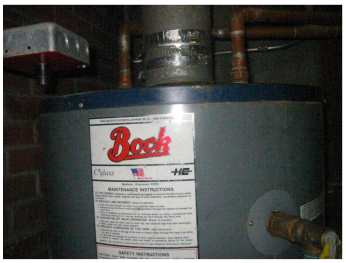
The larger boiler ran through a complete cycle every 4 minutes during our time there. This indicates a system that is running very near its maximum capacity and that there is tremendous heat loss in the building.

There are four single speed circulator pumps of undeterminable HP and GPM. They run 24/7/365, never stopping. Again, this indicates a tremendous heat loss in the building.

HVAC controls

The building controls are pneumatic that are aged and should be replaced. There is a Siemens digital controller that the pneumatics connect to. This allows remote monitoring of the overall system to a limited degree.

Domestic hot water heating timer and insulation



In the boiler room, there is a Bock model 51 E oil fired 50 gallon water heater rated at 379 MBTU. It has a burner firing rate of .9-2.75 GPH. It is not connected to either of the HHW boilers which would be a savings measure during the heating season. A side arm water maker is being recommended.

There are several electric water heaters throughout the building. There are at least three 40 gallon 4500 watt units generally in custodial areas and a 119 gallon one for the kitchen rated at 26,000 watts. It is not on a timer so is assumed to be running 24/7 for at least the school year. Alternatives should be considered for these units, especially the kitchen one which, if left on, is costing $5.25 per day, $1,050 per school year, or $1,916 per year.

Air conditioning

We were not able to conclusively determine all of the air conditioning units on the roof top. The library and

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computer room on the second floor air clearly air conditioned. We believe that the main office area is too. During our visit, the pneumatic air dryer system malfunctioned. When this happens, the default operating mode is to open all HHW valves and supply heat to the entire building. When this occurred, it was very cold outdoors, the air conditioning units for the library and computer room came on to keep the room at the set room temperature. So, while the heaters were heating the room, the air conditioners were in conflict and simultaneously cooling the same space. This is a compete waste of energy and builds a case for removing the pneumatic system and replacing it with DDC.

Air distribution

There are at least five roof top air handling units. A schedule of sizes and types was not readily available. Many, if not all areas of the building are served with fresh air from these units. The air is distributed via metal ductwork.

Fuel consumption

Between FY02 and FY09, the middle school used a total of 258,236 gallons of #2 fuel. The most was consumed during FY04 at 43,323 gallons, but consumption has gone down generally since. During FY08, the middle school consumed 26,951 gallons of #2 fuel. The cost per gallon was $2.195, for a total consumption cost of $59,156 in FY08. This building consumed 29,945 gallons of #2 fuel during the FY09 time period. The average price paid per gallon was $2.887 for a total cost of $86,452. For the last two school years (FY08 and FY09) the middle school has averaged 28,448 gallons per year.

This fuel consumption figures to be .44 gallons per square foot and $1.14 per square foot, ranking the middle school as 5th out of 5 for the SAU 80 buildings. This compares to .33 gallons per square foot with your peers for this climate zone.

Water

There are eighty-eight water consuming devices in the middle school (this does not include sinks located in science labs and art rooms). Devices that were counted include urinals, toilets, sinks, water fountains, and showers. There is a mix of high and low consumption devices. Any high water consumption devices should be replaced with low consumption when possible.

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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 – Lighting - The inefficient T12 lighting that remains throughout the building should be converted to high-performance T8s. There are also incandescent bulbs in the building, as well as on the exterior, that should be changed to compact fluorescents (CFLs). This ECM will cost $11,937 to implement, saving an approximate $13,708 annually. Based on this savings, a simple payback is calculated to be less than 1 year. Incentives and rebates were considered in the installation cost calculations.

ECM 2 – Lighting controls - interior - 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. A total of 111 occupancy sensors should be installed. A breakdown of each location is on the attached lighting sheet. This ECM will cost approximately $3,195, saving $7,538 annually for a payback of less than 6 months.

ECM 3 – Lighting controls – exterior – There are manual timers for exterior lighting. There are no controls for light levels needed (or not) and all exterior lighting must be turned off individually by switches. Consequently, most of the exterior lighting stays on all day, everyday. We are recommending sensors for the exterior of the building so the lights will be turned on and off by time and light intensity. The cost for this installation is $570, with a savings of $2,061 annually, based on our estimated lighting run-time. The payback for this measure is just a few months.

ECM 4 – Replace v-belts – We are recommending replacing the existing v-belts with cog style belts on the air handlers or any equipment that has a v-belt. Cog style belts are more flexible and require less energy from the motor to provide the same function, thus using about 15% less energy. This measure is estimated to cost $350, saving $100 annually. Basing on these figures, the simple payback for this project is 3.5 years.

ECM 5 – Replace transformers – At least two of the transformers are older types and are inefficient. We recommend replacing them with updated, Energy Star models for a cost of $10,000. The savings from this project is estimated to be $3,000 annually, for a simple payback of 3.3 years.

ECM 6 – Timers for DHW – The existing domestic hot water heaters lack timers, so water is being heated when it is not necessary. By installing timers, the water will be heated during occupied building time only. This measure is estimated to cost $200, with a savings of $1,000 annually. The payback based on these figures is just a few months.

ECM 7 – Vending machine miser – The vending machines are not equipped with vending misers and cool 24 hours a day. By installing vending misers, each machine can be controlled to turn on and cool only during school hours. An additional measure would be to remove the bulb in the machine and mark it as “on with bulb removed”. This will save additional energy. The vending miser cost is estimated $450 and should save $450, for a payback of 1 year.

ECM 8 – Replace CRT monitors – There are approximately eighteen CRT computer monitors throughout the building. A typical CRT monitor can consume over 400 kWh per year if left on. By switching the computer monitors to more efficient LCD computer monitors, a significant amount of kilowatt hours can be saved: in some cases almost 200 kWh per year, per monitor. Based on the number of CRT monitors we observed, we estimate an investment of $3,200 will save $2,400 annually and payback in 1.3 years.

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ECM 9 – Exhaust sensor – The exhaust on the kitchen hood typically runs non-stop, even when it is not needed. We are recommended adding an exhaust sensor on the hood so that the fan will run when necessary, but will be automatically turned off when done. The cost for this project is $3,500, with an annual savings of $1,000. The simple payback for this measure based on these figures is 3.5 years.

ECM 10 – Install Airius units - Gym – We recommend installing Airius units in the gym for better air movement. The Airius unit will de-stratify, or move, the warmer air from the ceiling to the floor in a much more efficient manner than other commonly used methods, thus saving energy overall. The cost for this project is $2,000 and is estimated to save $600 annually. Based on these figures, the payback is 3.3 years.

ECM 11 – Balance AHUs – The air handling units throughout the building are out of balance, thus providing unequal amounts of air to different areas of the building. We recommend balancing them to save on wasted energy, but to also increase the occupant comfort in the building. The estimated cost for this measure is $4,500. Savings is approximately $1,568 annually, with a payback of 2.9 years. This measure should be done in conjunction with other AHU projects and the DDC controls.

ECM 12 – Balance HHW system – The heating hot water system in the building is also out of balance, thus providing uneven heating throughout the building. The estimated cost for balancing the system is $3,500. Once this project is complete, a savings of $1,500 should be realized, and a simple payback of 2.3 years.

ECM 13 – Install CO_2 detectors – There are no CO_2 detectors within the building so the air handlers run even when it is not necessary. Installing these detectors will make for a more comfortable environment for the occupants, as well as save energy by shutting down equipment when it is not needed. The estimated cost for the CO_2 detector installation is $9,250, saving approximately $3,920 a year and paying back in 2.4 years.

ECM 14 – Install VFDs on AHUs – The air handling system runs at a constant speed. By installing variable speed drives to the air handling units, there will be more control over air flow. This will allow air to move less frequently and only as needed to specific areas, thus cutting back on the run time of equipment. We are recommending five VFDs. The estimated cost for this measure is $10,000, with an annual savings of $2,750. We estimate a project payback of 3.6 years.

ECM 15 – Wood-pellet boiler – The existing boilers will soon need to be replaced. We are recommending installing a wood-pellet boiler system in the school for better heating and lowered heating costs. The cost for this project is $375,000, with an annual savings of $39,900 and a payback of just under 9.4 years. Furthermore, dependence on foreign oil and the unpredictable prices that accompany it could be avoided.

ECM 16 – Outside compressor air – The HVAC controled air compressor is currently drawing its make-up from the very warm boiler room. Bringing the make-up air from the cold outside air will reduce load and run time on the compressor as cold air compresses easier than warm air. The cost for this measure is $350. The savings is estimated to be $100 annually, with a payback of 3.5 years.

ECM 17 – Clean AHU ductwork – The air handler ductwork is extremely dirty, thus requiring the equipment to run harder in order to function. A regular cleaning schedule should be put in place so this problem does not reoccur. The cleaning of the AHU ductwork will cost approximately $5,000, saving $350 annually. Based on these figures, a payback of 14.3 years is expected.

ECM 18 – Insulate piping – Much of the heating hot water piping is un-insulated, thus wasting heat as it travels through the building. Adding insulation to the piping will help the water to retain its heat and deliver it to the terminal devices where it is intended to be. The estimated cost to insulate the building pipes is $6,000, which will save around $2,500 annually and payback in 2.4 years.

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ECM 19 – 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 $14,000, with an annual savings of approximately $2,168. Based on the savings, this project will payback in 6.5 years.

ECM 20 – DDC controls – The digital controls should be expanded throughout the entire building. This measure will make it easier to control the heat and air conditioning and do so evenly, thus increasing occupant comfort. For this measure, we are estimating a $20,000 expenditure in order to save approximately $2,200. Based on these figures, this measure will payback in 9.1 years.

ECM 21 – Side arm to boiler – We are recommending adding a side arm water maker to the winter boiler that would take advantage of the existing heat from the boiler during the winter to help heat the domestic hot water. An estimated spending of $2,500 would save $1,750 annually, and payback in just under 1.4 years.

ECM 22 – LP DHW – Kitchen – The existing electric domestic water heater in the kitchen should be replaced with an LP water heater. These units are much more efficient to run and cost approximately $4,000. The savings of $1,154 would be realized annually and have a payback of 3.5 years.

ECM 23 – LP kitchen equipment – The equipment in the kitchen is mostly electric. LP equipment is much more efficient to work with and will cost an estimated $57,400 to convert. The savings is approximately $6,400 annually, paying the project back in just under 9 years.

ECM 24 – Replace kitchen sprayer – The sprayer in the kitchen is a high flowing device and should be replaced with a low flow to cut down on water used in the kitchen. The estimated cost for this replacement is $450. Savings of approximately $75 annually should be realized, with a payback of 6 years.

ECM 25 – Replace bathroom fixtures – Approximately sixteen of the restroom fixtures in the building are high consumption devices, which are consuming more water than necessary to function. The cost for this project is approximately $13,600 and will save $1,750 in water consumption annually. Based on these savings, the project will payback in 7.8 years.

ECM 26 – Clean AHU units – The air handling units and filters were extremely dirty. A regular cleaning schedule should be put in place so that the units run efficiently and properly. The cleaning of the units is estimated to be $5,000 with an annual savings of $350. The payback for this project based on these figures is 14.3 years. Furthermore, the air quality of the building will be significantly better and occupant comfortably will be increased.

ECM 27 – Solar water heat – greenhouse – The greenhouse would benefit from having its own solar water heater installed. The cost for such a project would be approximately $4,500, saving $300 annually. The payback period for this project is 15 years.

ECM 28 – Replace exterior doors – Two of the doors have been rated in poor condition and should be replaced with newer, metal insulated doors. This measure will reduce heat loss due to loose fittings and lack of proper insulation. Total project cost is $3,000. The savings once this project is complete is estimated to be $300 annually, with a payback of 10 years.

ECM 29 – Reduce window size – Almost all of the windows were observed to be very drafty, causing air infiltration/exfiltration, as well as occupant discomfort. We recommend reducing the window size in the building to remedy this problem and to save energy. The cost of this project is $186,000 and will save $9,000 annually, as well as increase comfort within the building. The payback based on these figures is 20.7 years.

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ECM 30 – Tighten building envelope – The entire building envelope should be tightened. There are many areas of air infiltration and exfiltration. Completing this project will not only save energy, but increase the building comfort. We estimate and expenditure of $5,000 will save $1,568 annually. The payback base on these figures is 3.2 years.

ECM 31 – Add attic insulation – The attic space provides an easy opportunity to add insulation to the building. By doing so, air infiltration and exfiltration will be reduced, as well as occupant comfort levels. This project is expected to cost $52,500, saving $6,980 annually. The payback based on these figures is 7.5 years.

ECM 32 – 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 recommend weather-strips on 27 doors for an estimated expenditure of $2,700, and will save $784 annually and payback in 3.4 years.

ECM 33 – Network software – Install network software that will turn computers on and off based on network settings. This implementation will ensure that equipment is turned down at night and during vacations, based on pre-determine settings. The software will cost approximately $1,800, causing an annual savings of $900. The payback for this project is 2 years.

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.

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Estimated cost savings and costs of energy conservation measures					
ECM #	**Measure**	**Annual Energy Savings**	**Installed Cost**	**Annual dollar Savings**	**Simple Payback (Years)**
ECM-1	**Lighting**	58,816 kWh	$11,937	$13,708	0.9
ECM-2	**Lighting controls - interior**	45,135 kWh	$3,195	$7,538	0.4
ECM-3	**Lighting controls - exterior**	12,347 kWh	$570	$2,061	0.3
ECM-4	**Replace v-belts**	% of electricity	$350	$100	3.5
ECM-5	**Replace transformers**	% of electricity	$10,000	$3,000	3.3
ECM-6	**Timers for DHW**	% of energy	$200	$1,000	0.2
ECM-7	**Vending machine misers**	% of electricity	$450	$450	1.0
ECM-8	**Replace CRT monitors**	appx 200 kWh ea	$3,200	$2,400	1.3
ECM-9	**Exhaust sensor**	% of electricity	$3,500	$1,000	3.5
ECM-10	**Install Airius unit – gym**	% of energy	$2,000	$600	3.3
ECM-11	**Balance AHUs**	% of energy	$4,500	$1,568	2.9
ECM-12	**Balance HHW**	% of energy	$3,500	$1,500	2.3
ECM-13	**Install CO_2 detectors**	% of energy	$9,250	$3,920	2.4
ECM-14	**Install VFDs on AHUs**	% of energy	$10,000	$2,750	3.6
ECM-15	**Install wood-pellet boiler**	% of fuel	$375,000	$39,900	9.4
ECM-16	**Outside compressor air**	% of energy	$350	$100	3.5
ECM-17	**Clean AHU ductwork**	% of energy	$5,000	$350	14.3
ECM-18	**Insulate piping**	% of energy	$6,000	$2,500	2.4
ECM-19	**VFD circulator pumps**	% of energy	$14,000	$2,168	6.5
ECM-20	**DDC controls**	% of energy	$20,000	$2,200	9.1
ECM-21	**Side arm to boiler**	% of energy	$2,500	$1,750	1.4
ECM-22	**LP DHW – kitchen**	% of electricity	$4,000	$1,154	3.5
ECM-23	**LP kitchen equipment**	% of electricity	$57,400	$6,400	9.0
ECM-24	**Replace kitchen sprayer**	% of water	$450	$75	6.0
ECM-25	**Replace restroom fixtures**	% of water	$13,600	$1,750	7.8
ECM-26	**Clean AHU units**	% of energy	$5,000	$350	14.3
ECM-27	**Solar water heater- greenhouse**	% of energy	$4,500	$300	15.0
ECM-28	**Replace exterior doors**	% of fuel	$3,000	$300	10.0

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ECM-29	**Reduce window size**	% of fuel	$186,000	$9,000	20.7
ECM-30	**Tighten building envelope**	% of energy	$5,000	$1,568	3.2
ECM-31	**Add attic insulation**	% of energy	$52,500	$6,980	7.5
ECM-32	**Door seals**	% of energy	$2,700	$784	3.4
ECM-33	**Install network software**	% of electricity	$1,800	$900	2.0

*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.

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Energy Assessment and Report

SAU 80 – Shaker Regional School District

SAU 80 Belmont Middle School
38 School Street, Belmont, New Hampshire

Audit Date: December 16, 2009

Financial Analysis

Electrical

Based on the assessment of the Middle School, it was determined that the total kilowatt usage for during January through December 2009 was 385,200 kilowatt hours (kWh), averaging 32,100 kWh per month. The total cost was $64,362 or an average of $5,364 per month. Of the total $64,362, $21,674 was spent on demand charges during this time period, averaging $1,806 in demand charges per month. The building went into demand consumption every month during this time period at the rate of 138 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 58,816 kW hours will be saved. If all of the suggested upgrades and changes are followed for lighting and lighting controls, it is predicted 116,298 kW hours could be saved.

Based on our calculations, it is determined that the current lighting and controls use 249,047 kW hours or 65% of the buildings' total electrical consumption. The projected annual kilowatt usage, if only the lighting changes are made, is 190,230 kWh. If changes are made for both lighting and controls, the new usage should be 132,748 kWh.

The cost of the electrical recommendations, including currently available rebates from Public Service of New Hampshire, is $31,702. An estimated $31,157 in annual savings should be realized, with a simple payback of 1.0 years.

Lighting Only

	KW Hrs	KW
Current	249,047	81.48
Projected	190,230	56.79
Saved	58,816	24.68

Lighting & Controls*

	KW Hrs	KW
Current	249,047	81.48
Projected	132,748	39.63
Saved	116,298	41.84

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

Mechanical

This facility consumes an average of 28,448 gallons of #2 fuel annually. This is a cost of $1.14 per square foot, putting Middle School as 5th out of the 5 buildings that provided fuel data.

In FY09 this facility consumed 29,945 gallons of #2 heating oil annually. Total annual expenditure was $86,452. This is a cost of $1.35 per square foot, putting the Middle School as the highest consumer of fuel per square

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If all of the mechanical recommendations of this report were implemented, savings of nearly $30,000 could be achieved at an installed cost of $165,000 and a resulting payback of around 5.5 years. If fuel switching to wood pellets were implemented, an additional $40,000 could be saved. The payback on a pellet installation is less than 10 years. Further, annual servicing costs would be reduced, as would dependence on foreign fuel supplies and the budget fluctuations that result.

.

Building envelope and miscellaneous

This building envelope is not as tight as it should be. There is much large glass fenestration, interface between exterior walls and floor connections, and other penetrations that all contribute to the infiltration of cold air and escape of warmed air.

Due to the construction type of the building, 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 $250,000, possibly saving $19,000 a year. The simple payback for these projects is 13 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 over all savings and conservation will be achieved.

Implementing fairly straight forward conservation measures, yields an expenditure of $821,452 and would save $120,124 of energy costs between electricity, water, and heating oil, with an overall payback of 6.9 years.

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ECM SUMMARY

ECM Summary

SAU 80 – Belmont Middle School

Electrical

ECM	ECM Description	Installed Cost	Annual Savings	Simple Payback
ECM 1	T8 & CFL lighting	$11,937	$13,708	0.87
ECM 2	Lighting Controls-Interior	$3,195	$7,538	0.42
ECM 3	Lighting Controls-Exterior	$570	$2,061	0.28
ECM 4	Replace V-belts w/cog	$350	$100	3.50
ECM 5	Replace (2) Transformers	$10,000	$3,000	3.33
ECM 6	Timers for Elec DHW	$200	$1,000	0.20
ECM 7	Provide 3 vending misers	$450	$450	1.00
ECM 8	Replace 16 CRT monitors	$3,200	$2,400	1.33
ECM 33	Network software	$1,800	$900	2.00
		$31,702		

Installed cost is after assumed efficiency rebates.
This building is very near a higher electricity rate structure. These improvements will also prevent rolling into new rate category.

Building & Miscellaneous

ECM	ECM Description	Installed Cost	Annual Savings	Simple Payback
ECM 28	Replace 2 exterior doors	$3,000	$300	10.00
ECM 29	Reduce window size	$186,000	$9,000	20.67
ECM 30	Tighten envelope	$5,000	$1,568	3.19
ECM 31	Add attic insulation	$52,500	$6,980	7.52
ECM 32	Weather strip 27 doors	$2,700	$784	3.44
		$249,200		

Mechanical

ECM	ECM Description	Installed Cost	Annual Savings	Simple Payback
ECM 9	Kitchen hood exhaust sensor	$3,500	$1,000	3.50
ECM 10	Airius equalizers in gym	$2,000	$600	3.33
ECM 11	Balance AHU's	$4,500	$1,568	2.87
ECM 12	Balance HHW system	$3,500	$1,500	2.33
ECM 13	Install (37) CO2 detectors	$9,250	$3,920	2.36
ECM 14	5 VFD's on AHU's	$10,000	$2,750	3.64
ECM 15	Install Wood Pellet Boiler	$375,000	$39,900	9.40
ECM 16	Outside air for compressor	$350	$100	3.50
ECM 17	Clean AHU ductwork	$5,000	$350	14.29
ECM 18	Insulate HHW Pipes	$6,000	$2,500	2.40
ECM 19	VFD's on HHW circulation pumps	$14,000	$2,168	6.46
ECM 20	Expand DDC controls	$20,000	$2,200	9.09
ECM 21	Add side arm to boiler	$2,500	$1,750	1.43
ECM 22	Repl Elec DHW w/LP – Kitchen	$4,000	$1,154	3.47
ECM 23	Replace kitchen elec w/ LP	$57,400	$6,400	8.97
ECM 24	Replace kitchen sprayer	$450	$75	6.00
ECM 25	Replace 16 hi vol toilet fixtures	$13,600	$1,750	7.77
ECM 26	Clean AHU units	$5,000	$350	14.29
ECM 27	Add solar water htr to greenhouse	$4,500	$300	15.00
		$540,550		

Note: Savings are cumulative, Pellet boiler creates a new starting figure.

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.

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Energy Assessment and Report

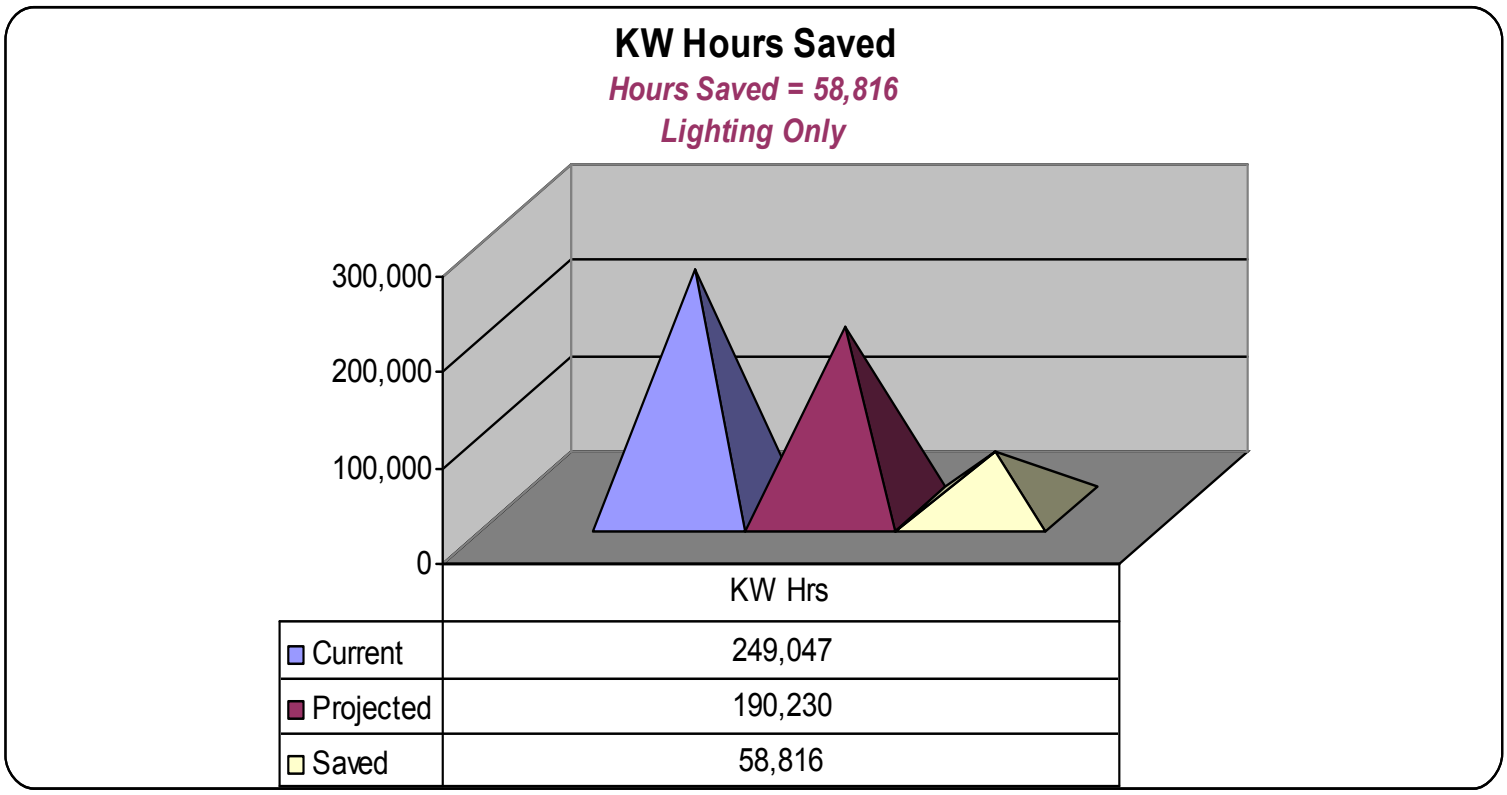
SAU 80 – Shaker Regional School District

SAU 80 Belmont Middle School
38 School Street, Belmont, New Hampshire

Audit Date: December 16, 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.



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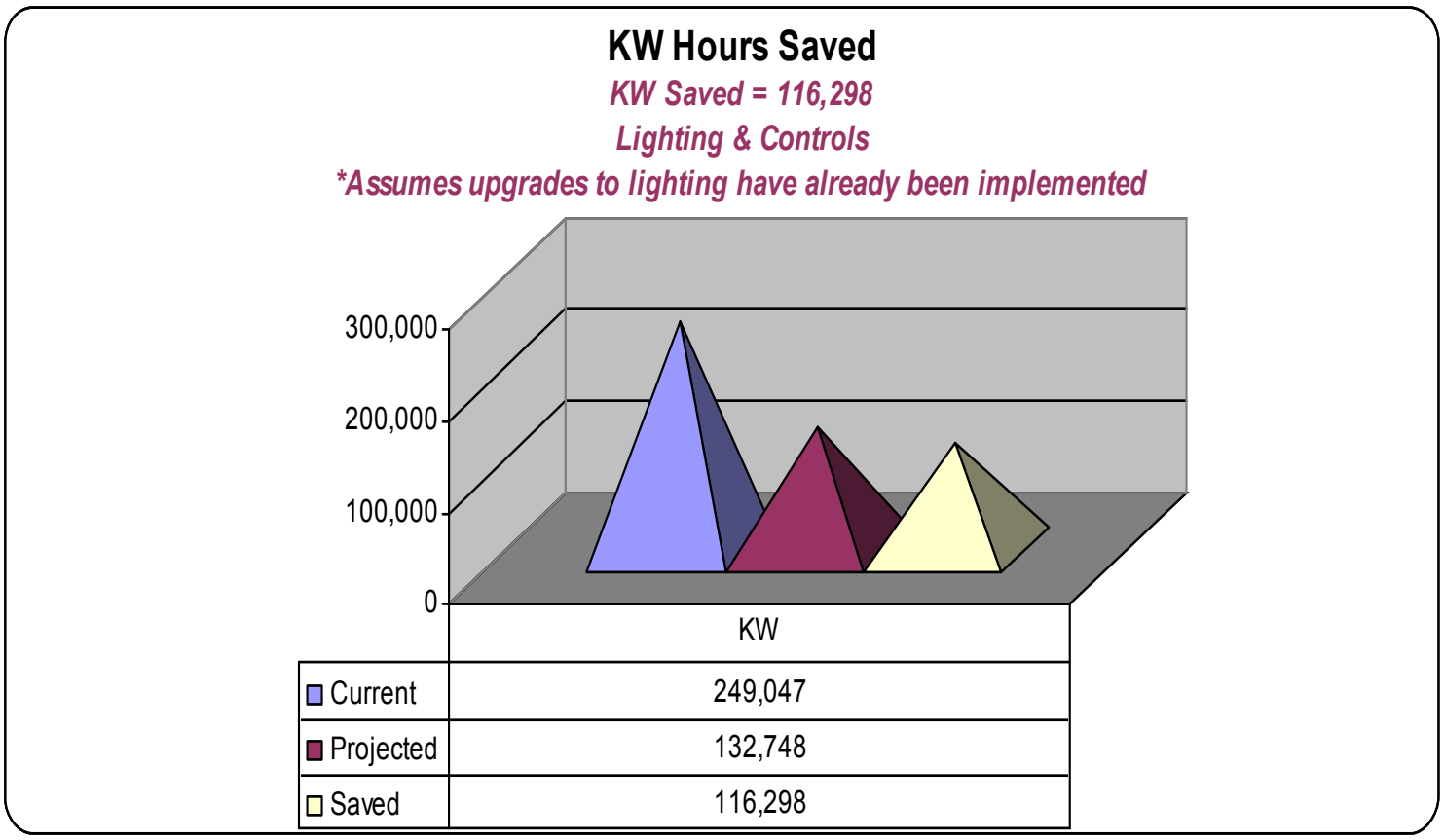
The following chart displays current usage and projections if both the lighting and lighting controls are implemented.



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Energy Assessment and Report

SAU 80 – Shaker Regional School District

SAU 80 Belmont Middle School
38 School Street, Belmont, New Hampshire

Audit Date: December 16, 2009

Energy Graphs – Electricity 2008

Belmont Middle School					
Electricity Usage - 2008					
Source: PSNH					
		kWh	Cost	Demand kW	Demand Cost
2008	Jan	29,600	$4,612	146	$1,916
2008	Feb	32,000	$4,908	146	$1,916
2008	Mar	34,000	$5,186	158	$2,073
2008	Apr	34,400	$5,152	160	$2,099
2008	May	30,800	$4,610	138	$1,811
2008	Jun	38,400	$5,416	141	$1,850
2008	Jul	22,400	$3,920	128	$1,679
2008	Aug	17,600	$2,944	60	$787
2008	Sep	32,400	$5,099	133	$1,745
2008	Oct	34,400	$5,500	143	$1,876
2008	Nov	36,000	$5,557	136	$1,784
2008	Dec	35,600	$5,652	141	$1,850
	Total	377,600	$58,555	1,630	$21,386
Mo	Avg	31,467	$4,880	136	$1,782
Avg	$/kW		$0.1551		

kWh/SF 5.90 Cost/SF $ 0.91
Public Service of New Hampshire
Acct # 8000565-01
General Service

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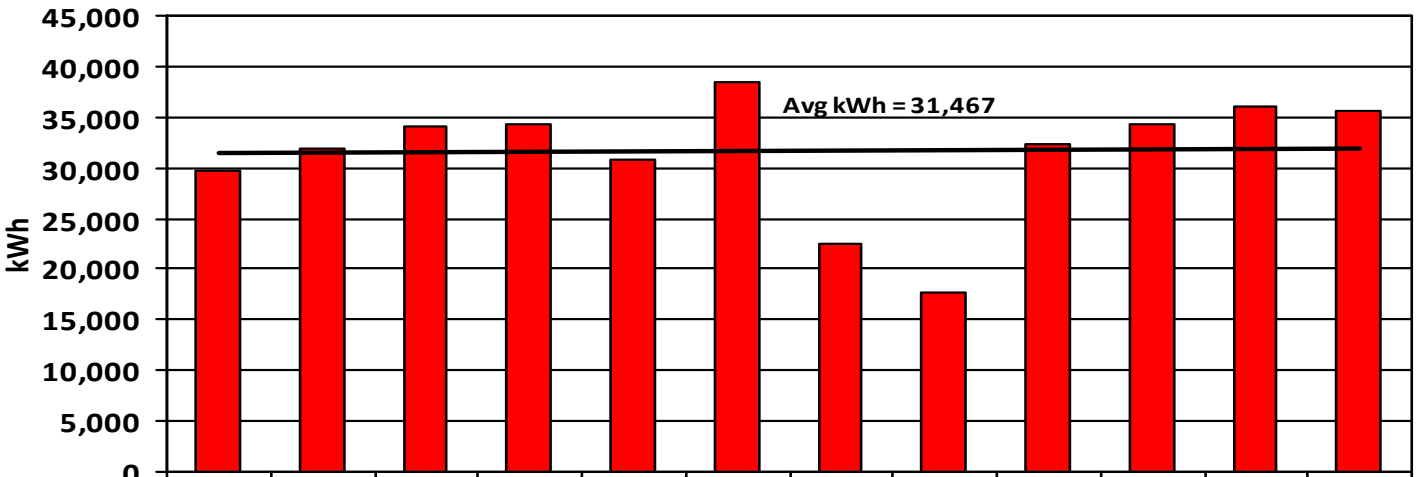
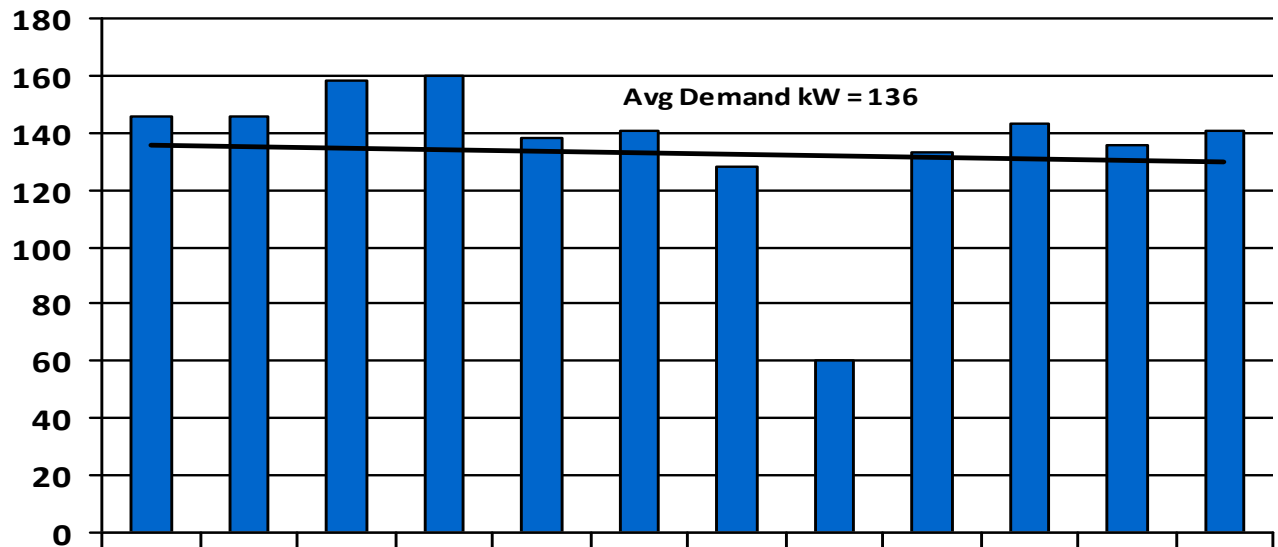
Belmont Middle School kWh Usage - 2008
Source: PSNH



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
KWH	29,600	32,000	34,000	34,400	30,800	38,400	22,400	17,600	32,400	34,400	36,000	35,600

Belmont Middle School Demand kW Usage - 2008
Source: PSNH



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand KW	146	146	158	160	138	141	128	60	133	143	136	141

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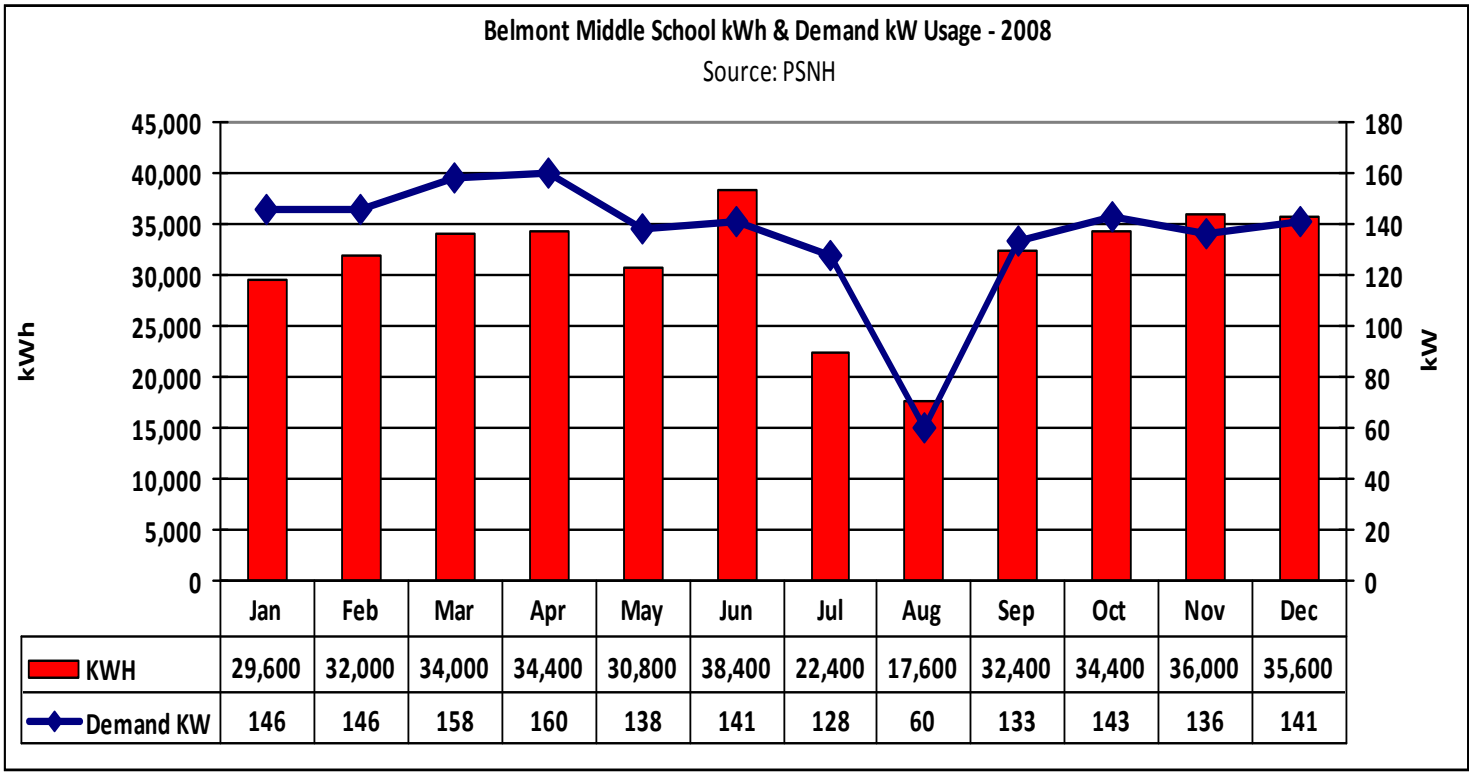

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
KWH	29,600	32,000	34,000	34,400	30,800	38,400	22,400	17,600	32,400	34,400	36,000	35,600
Demand KW	146	146	158	160	138	141	128	60	133	143	136	141

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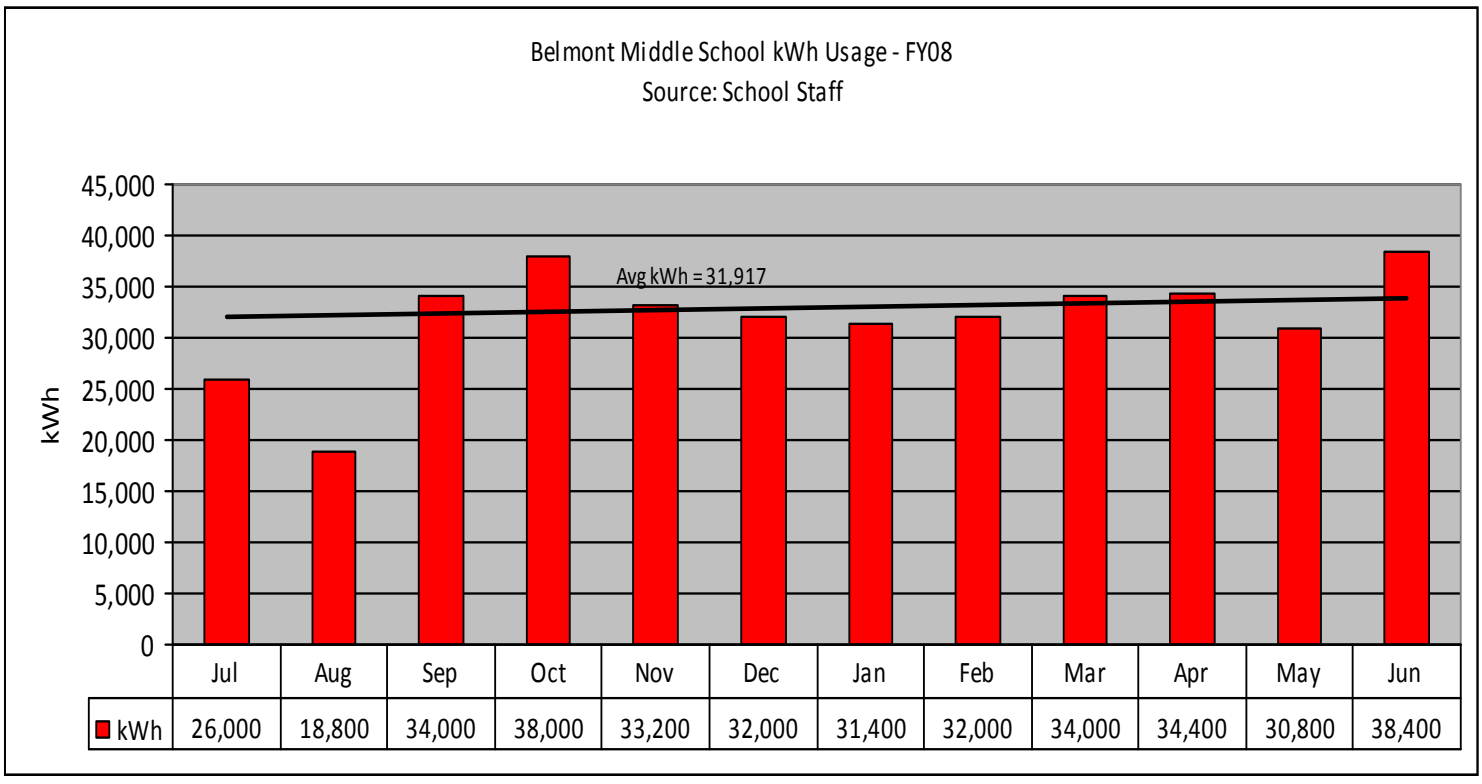
Belmont Middle School		
Electricity Usage-FY08		
Source: School Staff		
		kWh
2007	**Jul**	**26,000**
2007	**Aug**	**18,800**
2007	**Sep**	**34,000**
2007	**Oct**	**38,000**
2007	**Nov**	**33,200**
2007	**Dec**	**32,000**
2008	**Jan**	**31,400**
2008	**Feb**	**32,000**
2008	**Mar**	**34,000**
2008	**Apr**	**34,400**
2008	**May**	**30,800**
2008	**Jun**	**38,400**
	Total	**383,000**
Mo Avg kWh - FY08		**31,917**
FY08 kWh / SF		5.98



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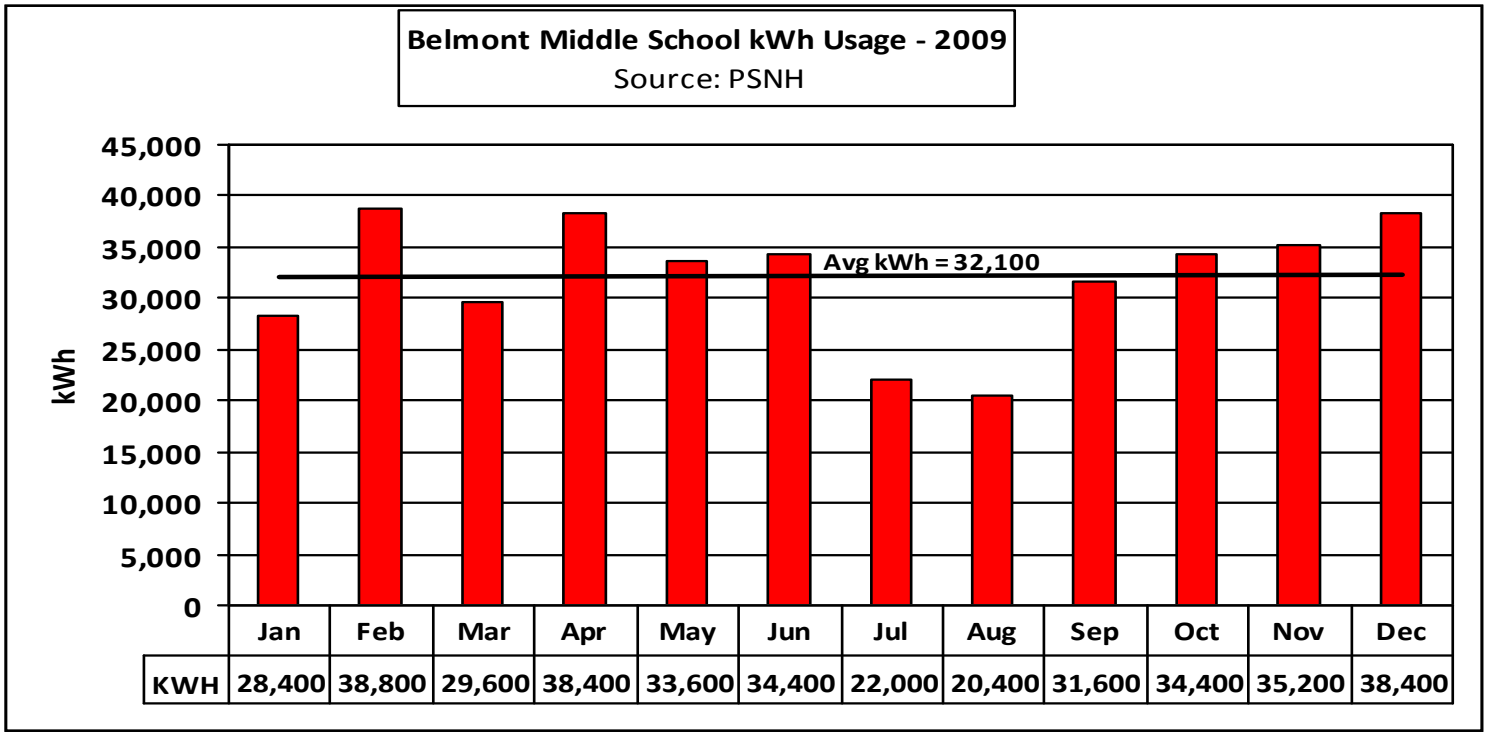
Energy Graphs – Electricity 2009

Belmont Middle School					
Electricity Usage-2009					
Source: PSNH					
		kWh	Cost	Demand kW	Demand Cost
2009	Jan	28,400	$4,846	136	$1,784
2009	Feb	38,800	$6,297	148	$1,942
2009	Mar	29,600	$5,154	138	$1,811
2009	Apr	38,400	$6,119	144	$1,889
2009	May	33,600	$5,640	146	$1,916
2009	Jun	34,400	$5,585	139	$1,824
2009	Jul	22,000	$4,013	123	$1,614
2009	Aug	20,400	$3,374	65	$853
2009	Sep	31,600	$5,531	165	$2,165
2009	Oct	34,400	$5,769	155	$2,034
2009	Nov	35,200	$5,843	143	$1,876
2009	Dec	38,400	$6,192	150	$1,968
	Total	385,200	$64,362	1,652	$21,674
Mo	Avg	32,100	$5,364	138	$1,806
Avg	$/kW		$0.1671		$13.12

kWh/SF 5.42 Cost/SF $ 0.91
Public Service of New Hampshire
Acct # 8000565-01
General Service



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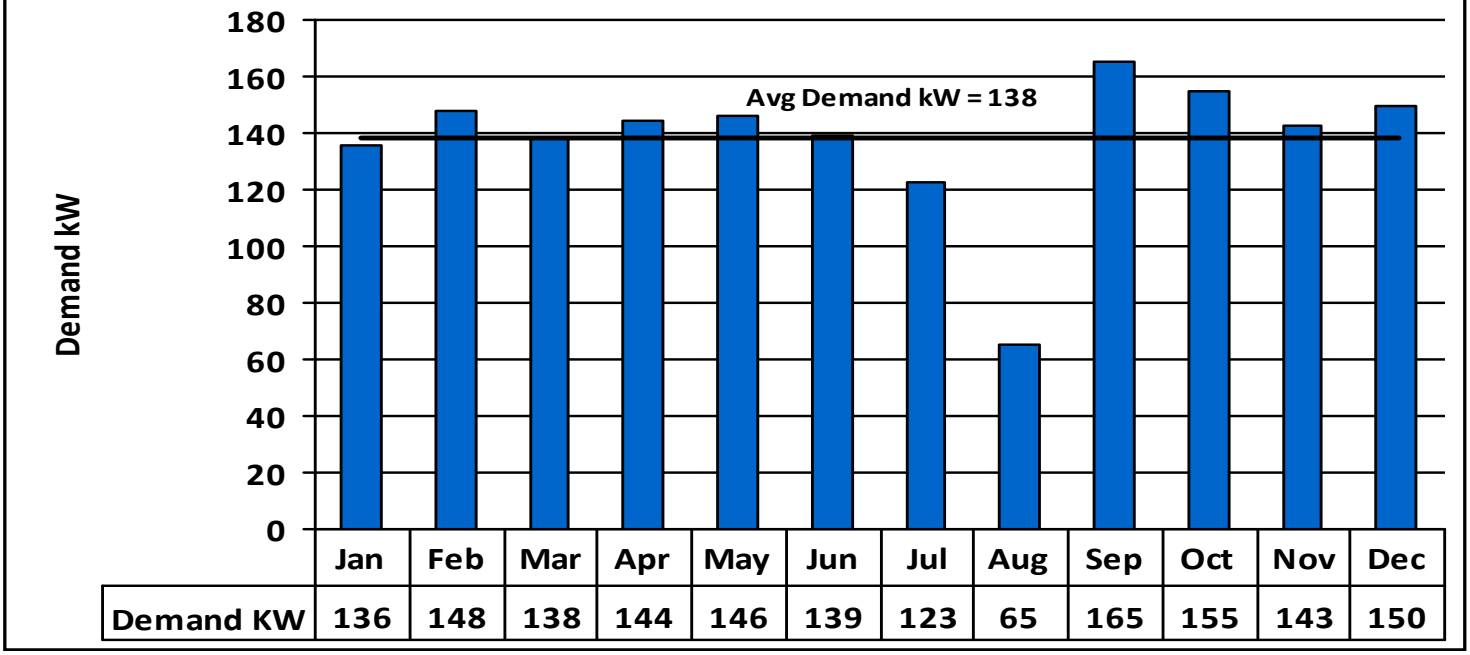
Belmont Middle School Demand kW Usage - 2009

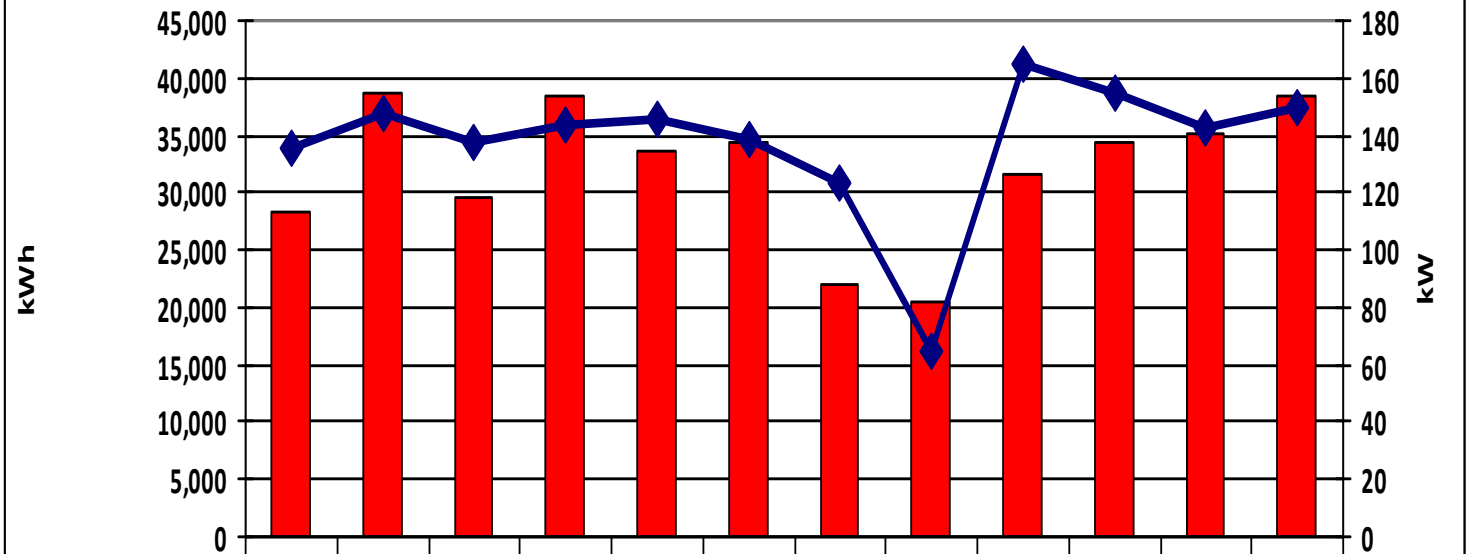
Source: PSNH



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand KW	136	148	138	144	146	139	123	65	165	155	143	150

Belmont Middle School kWh & Demand kW Usage - 2009

Source: PSNH



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
KWH	28,400	38,800	29,600	38,400	33,600	34,400	22,000	20,400	31,600	34,400	35,200	38,400
Demand KW	136	148	138	144	146	139	123	65	165	155	143	150

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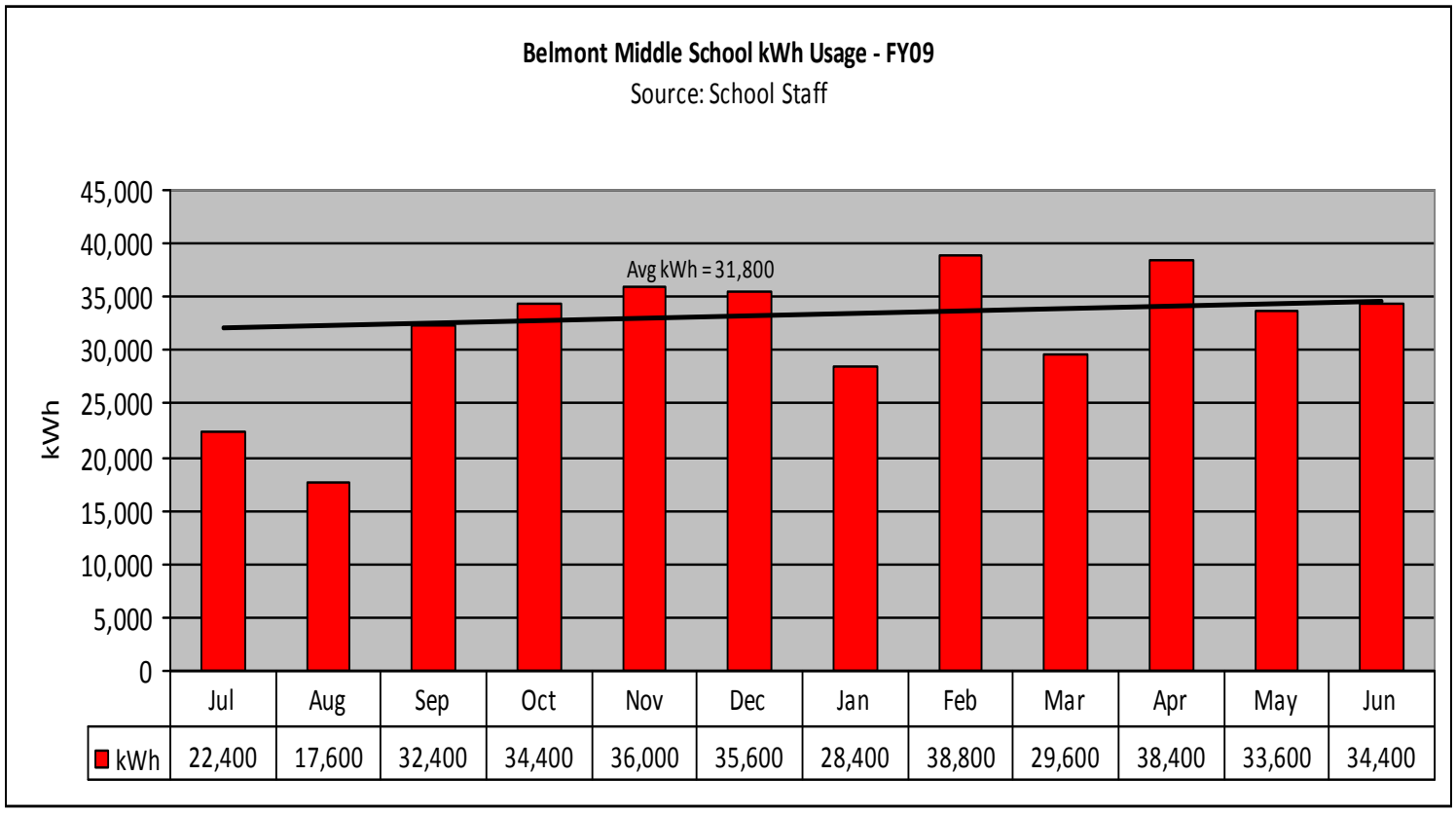
Belmont Middle School		
Electricity Usage-FY09		
Source: School Staff		
		kWh
2008	**Jul**	**22,400**
2008	**Aug**	**17,600**
2008	**Sep**	**32,400**
2008	**Oct**	**34,400**
2008	**Nov**	**36,000**
2008	**Dec**	**35,600**
2009	**Jan**	**28,400**
2009	**Feb**	**38,800**
2009	**Mar**	**29,600**
2009	**Apr**	**38,400**
2009	**May**	**33,600**
2009	**Jun**	**34,400**
	Total	**381,600**
Mo Avg kWh - FY09		**31,800**
FY09 kWh / SF		5.96



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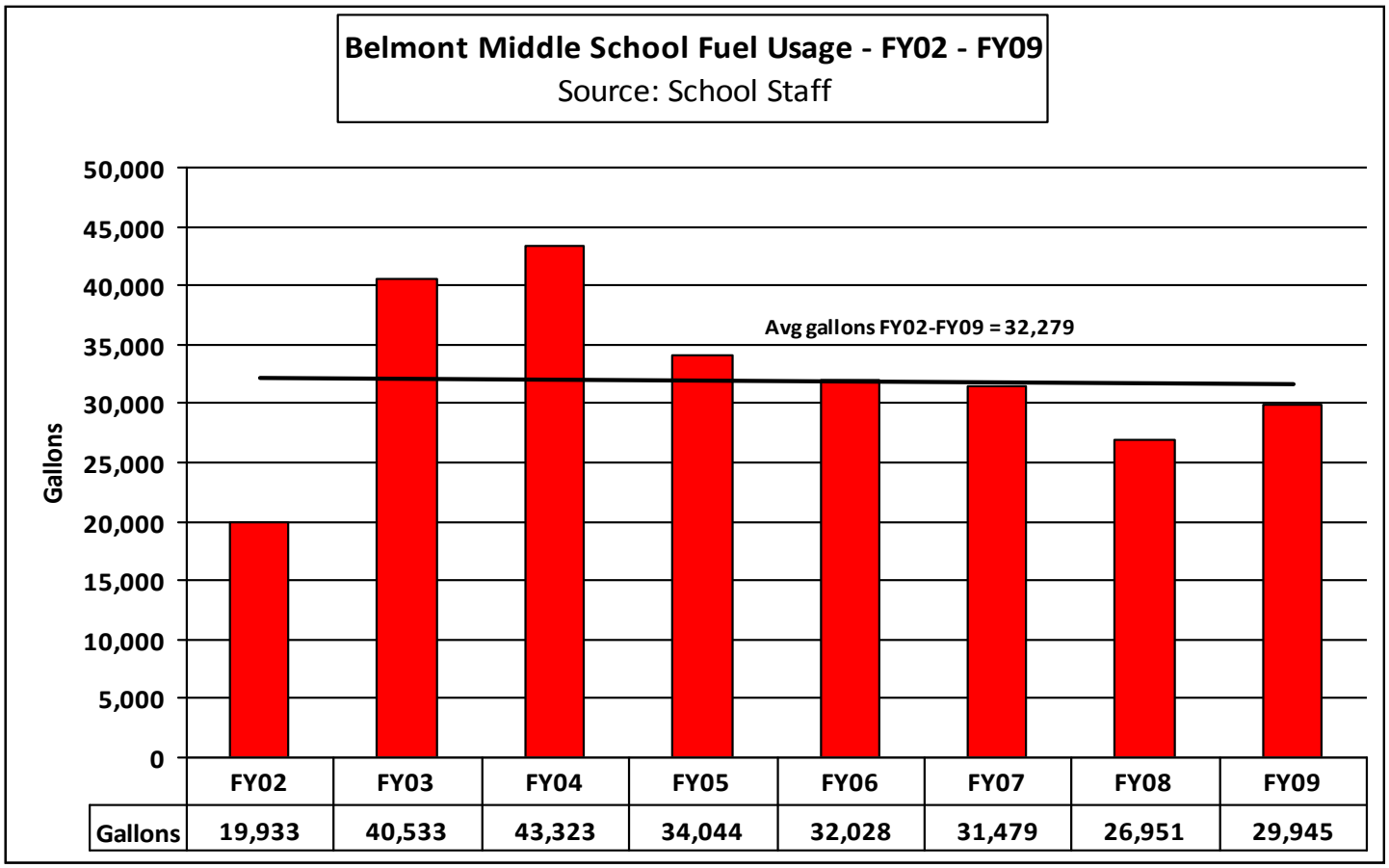
Energy Graphs – Fuel Usage

Belmont Middle School			
Fuel Usage			
Source: School Staff			
		Gallons	**Cost/Gal Cost**
	FY02	**19,933**	
	FY03	**40,533**	**$0.795**
	FY04	**43,323**	**$1.148**
	FY05	**34,044**	**$1.345**
	FY06	**32,028**	**$1.766**
	FY07	**31,479**	**$2.395**
	FY08	**26,951**	**$2.195**
	FY09	**29,945**	**$2.887**
2-year	**Total**	**56,896**	**$145,608**
2-year avg	**Avg**	**28,448**	**72,804**
2-year avg $/gal			**$2.54**

Gal/SF	2-year avg	0.444
Cost/SF	2-year avg	$1.138
Avg Cost		
FY08	$59,156	
FY09	$86,452	
FY02-FY09 Totals		
Total Gal FY02-FY09		258,236
Total Avg gals FY02-FY09		32,279
Total Avg Cost FY03-FY09		$405,268



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Energy Assessment and Report

SAU 80 – Shaker Regional School District

SAU 80 Belmont Middle School
38 School Street, Belmont, New Hampshire

Audit Date: December 16, 2009

Alternative Energy Opportunities

We are recommending the installation of a wood pellet fired boiler system to replace the oil fired system currently in place. Removal of one of the existing boilers would be required to make room for the pellet boiler. The remaining oil boiler would be used for low consumption shoulder seasons, provide peak load during unusually cold/windy days and redundancy for the pellet boiler.

A fuel storage silo would be added near the boiler room and pellets fed to the boiler via a screw auger mechanism.

A larger thermal storage tank would be installed in the boiler room to store energy and act as a buffer between the pellet boiler and heat load of the building.

These systems are becoming very common place in schools and other institutional facilities. Fuel supply and forest sustainability have been thoroughly investigated and found to be adequate for many years.

Other alternative options were explored for this facility such as solar light tubes, geo-thermal, wind, and others but due to the newness of the facility and/or expense, none were found to be viable at this time.

SAU 80 - Shaker Regional School District
Location: Belmont Middle School

Saved KWH - Lighting Only															
Room Name	Hours	QTY	Existing watts	Existing fixture type	Suggested replacement	Replacement watts	KW Hr saved	KW saved	Dollars saved	Cost each	Project cost	Incentive	Payback	KW Hr cost	KW cost
Belmont Middle School															
C1 - Corridor	2250	9	45	8" square CFL										$0.167	$ 13.12
	8736	3	10	Flor exit	LED exit	3	183	0.02	$34	$30	$90		2.65	$0.167	$ 13.12
	2700	8	60	2L4T8										$0.167	$ 13.12
C2 - Corridor	2700	15	60	2L4T8										$0.167	$ 13.12
	8736	4	10	Flor exit	LED exit	3	245	0.03	$45	$30	$120		2.65	$0.167	$ 13.12
C3 - Corridor	2700	10	60	2L4T8										$0.167	$ 13.12
	8736	3	10	Flor exit	LED exit	3	183	0.02	$34	$30	$90		2.65	$0.167	$ 13.12
C4- Corridor	2700	4	204	4L4T12	4L4HPT8	112	994	0.37	$224	$80	$320	$180	0.63	$0.167	$ 13.12
	8736	1	10	Flor exit	LED exit	3	61	0.01	$11	$30	$30		2.65	$0.167	$ 13.12
C5 - Corridor	2700	26	60	2L4T8										$0.167	$ 13.12
	8736	1	3	LED exit										$0.167	$ 13.12
	8736	3	10	Flor exit	LED exit	3	183	0.02	$34	$30	$90		2.65	$0.167	$ 13.12
C6 - Corridor	8736	1	3	LED exit										$0.167	$ 13.12
	2250	10	45	8" square CFL										$0.167	$ 13.12
C7 - Corridor	2700	6	60	2L4T8										$0.167	$ 13.12
	8736	1	3	LED exit										$0.167	$ 13.12
C8 - Corridor	2700	10	88	3L4T8										$0.167	$ 13.12
	8736	3	10	Flor exit	LED exit	3	183	0.02	$34	$30	$90		2.65	$0.167	$ 13.12
C9 - Corrodor	2700	2	60	1L4T12	1L4HPT8	30	162	0.06	$37	$65	$130	$24	2.90	$0.167	$ 13.12
	2700	6	102	2L4T12	2L4HPT8	60	680	0.25	$153	$75	$450	$270	1.17	$0.167	$ 13.12
1- Mrs. Fields	2700	8	88	3L4T8										$0.167	$ 13.12
2 - Room 111	2700	2	88	3L4T8										$0.167	$ 13.12
3 - Office	2700	6	88	3L4T8										$0.167	$ 13.12
4 - Rooms 115	2700	2	88	3L4T8										$0.167	$ 13.12
4A -	1200	1	60	2L4T8										$0.167	$ 13.12
5 - Room 112	2700	8	88	3L4T8										$0.167	$ 13.12
6 - Room 114	2700	12	88	3L4T8										$0.167	$ 13.12
7 - Room 117	2700	9	88	3L4T8										$0.167	$ 13.12
8 - Room 116	2700	6	60	2L4T8										$0.167	$ 13.12
9 - Mr. White	2700	17	88	3L4T8										$0.167	$ 13.12
10 -	800	1	60	1L4T12	1L4HPT8	30	24	0.03	$9	$65	$65	$45	2.29	$0.167	$ 13.12
11 - Boys room	2700	3	60	2L4T8										$0.167	$ 13.12
11A - Girls room	2700	3	60	2L4T8										$0.167	$ 13.12
12 - Gym	2700	20	455	400W MH	6L4T5	188	14418	5.34	$3,249	$225	$4,500	$900	1.11	$0.167	$ 13.12
	160			LED										$0.167	$ 13.12
	8736	2	10	Flor exit	LED exit	3	122	0.01	$23	$30	$60		2.65	$0.167	$ 13.12
14 - Stage	160	14		LED										$0.167	$ 13.12
	160	6	455	400W MH	4L4T5	132	310	1.94	$357	$225	$1,350	$270	3.03	$0.167	$ 13.12
	20	1	60	INCA 60W	CFL 23W	24	1	0.04	$6	$15	$15		2.59	$0.167	$ 13.12
15 -	2700	1	30	1L4T8										$0.167	$ 13.12
16 - Room 109	2700	9	60	2L4T8										$0.167	$ 13.12
17 - Room 107	2700	9	60	2L4T8										$0.167	$ 13.12
18 - Room 105	2700	9	60	2L4T8										$0.167	$ 13.12
19 -	160	7	102	2L4T12	2L4THP8	60	47	0.29	$54	$75	$525	$315	3.88	$0.167	$ 13.12
20 -	160	2	102	2L4T12	2L4THP8	60	13	0.08	$15	$75	$150	$90	3.88	$0.167	$ 13.12
21 - Room 108	2700	9	60	2L4T8			1458	0.54	$329					$0.167	$ 13.12
	1350	1	60	INCA 60W	CFL 23W	24	49	0.04	$14	$15	$15		1.09	$0.167	$ 13.12
22 - Mrs. Leidinger	2700	9	60	2L4T8										$0.167	$ 13.12
23 - Restroom	2700	3	60	2L4T8										$0.167	$ 13.12
24 - Restroom	2700	3	60	2L4T8										$0.167	$ 13.12
25 - Elec closet	160	7	60	1L4T12	1L4HPT8	30	34	0.21	$39	$65	$455	$84	9.59	$0.167	$ 13.12
26 -	160	1	204	4L4T12	4L4HPT8	112	15	0.09	$17	$80	$80	$45	2.07	$0.167	$ 13.12
27 - Cafeteria	2700	49	204	4L4T12	4L4HPT8	112	12172	4.51	$2,742	$80	$3,920	$2,205	0.63	$0.167	$ 13.12
	8736	2	10	Flor exit	LED exit	3	122	0.01	$23	$30	$60		2.65	$0.167	$ 13.12
	8736	1	3	LED exit										$0.167	$ 13.12
	20	5	65	INCA 60W	CFL 23W	24	4	0.21	$33	$15	$75		2.28	$0.167	$ 13.12
27A -Kitchen hall	2700	2	204	4L4T12	4L4HPT8	112	497	0.18	$112	$80	$160	$24	1.21	$0.167	$ 13.12
	8736	1	10	Flor exit	LED exit	3	61	0.01	$11	$30	$30		2.65	$0.167	$ 13.12
28 -Kitchen	2700	18	102	2L4T12	2L4HPT8	60	2041	0.76	$460	$75	$1,350	$216	2.47	$0.167	$ 13.12
29 -Kitchen storage	1350	1	204	4L4T12	4L4HPT8	112	124	0.09	$35	$80	$80	$45	0.99	$0.167	$ 13.12
31 - 101	1350	2	60	INCA 60W	CFL 23W	24	97	0.07	$28	$15	$30		1.09	$0.167	$ 13.12
32 - Office	2700	2	102	2L4T12	2L4HPT8	60	227	0.08	$51	$75	$150	$24	2.47	$0.167	$ 13.12
33 -	2700	8	204	4L4T12	4L4HPT8	112	1987	0.74	$448	$80	$640	$360	0.63	$0.167	$ 13.12
33 A	2700	9	204	4L4T12	4L4HPT8	112	2236	0.83	$504	$80	$720	$405	0.63	$0.167	$ 13.12
35 -	2700	1	162	3L4T12	3L4HPT8	88	200	0.07	$45	$75	$75	$45	0.67	$0.167	$ 13.12

Room Name	Hours	QTY	Existing watts	Existing fixture type	Suggested replacement	Replacement watts	KW Hr saved	KW saved	Dollars saved	Cost each	Project cost	Incentive	Payback	KW Hr cost	KW cost
36 -	2700	2	60	1L4T12	1L4HPT8	30	162	0.06	$37	$65	$130	$24	2.90	$0.167	$ 13.12
37 -	2700	2	102	2L4T12	2L4HPT8	60	227	0.08	$51	$75	$150	$24	2.47	$0.167	$ 13.12
	2700	1	60	1L4T12	1L4HPT8	30	81	0.03	$18	$65	$65	$12	2.90	$0.167	$ 13.12
38 -	2700	2	102	2L4T12	2L4HPT8	60	227	0.08	$51	$75	$150	$24	2.47	$0.167	$ 13.12
	2700	1	60	1L4T12	1L4HPT8	30	81	0.03	$18	$65	$65	$12	2.90	$0.167	$ 13.12
39 - Room 200	2700	5	88	3L4T8										$0.167	$ 13.12
	2700	1	60	1L4T12	1L4HPT8	30	81	0.03	$18	$65	$65	$12	2.90	$0.167	$ 13.12
40 -	2700	2	162	3L4T12	3L4HPT8	88	400	0.15	$90	$75	$150	$24	1.40	$0.167	$ 13.12
41 - Computer room	2700	9	88	3L4T8			2138	0.79	$482					$0.167	$ 13.12
42 - Room 201	2700	24	88	3L4T8			5702	2.11	$1,285					$0.167	$ 13.12
	8736	2	10	Flor exit	LED exit	3	122	0.01	$23	$30	$60		2.65	$0.167	$ 13.12
43 - Room 204	2700	9	88	3L4T8										$0.167	$ 13.12
44 - Mrs. Bengston	2700	20	88	3L4T8										$0.167	$ 13.12
45 - Room 206	2700	9	88	3L4T8										$0.167	$ 13.12
46 - Room 208	2700	9	88	3L4T8										$0.167	$ 13.12
47 - Room 210	2700	9	88	3L4T8										$0.167	$ 13.12
48 - Ms. Morse	2700	9	88	3L4T8										$0.167	$ 13.12
49 - Room 212	2700	1	60	2L4T8										$0.167	$ 13.12
	2700	4	60	2L4T8										$0.167	$ 13.12
50 - Room 201	2700	9	88	3L4T8										$0.167	$ 13.12
51 - Room 214	2700	8	88	3L4T8										$0.167	$ 13.12
52 - Room 209	2700	2	88	3L4T8										$0.167	$ 13.12
53 - Room 211	2700	4	88	3L4T8										$0.167	$ 13.12
54 - Room 213	2700	2	88	3L4T8										$0.167	$ 13.12
55 - Room 215	2700	4	88	3L4T8										$0.167	$ 13.12
56 - Room 215	2700	8	88	3L4T8										$0.167	$ 13.12
56 A	1200	1	88	3L4T8										$0.167	$ 13.12
57 - Room 218	2700	17	88	3L4T8										$0.167	$ 13.12
58 - Room 217	2700	12	88	3L4T8										$0.167	$ 13.12
59 - Room 220	2700	12	88	3L4T8										$0.167	$ 13.12
60 - Room 219	2700	10	88	3L4T8										$0.167	$ 13.12
61 -	1200	1	88	3L4T8										$0.167	$ 13.12
62 -	1200	4	60	2L4T8										$0.167	$ 13.12
	1200	1	60	1L4T12	1L4HPT8	30	36	0.03	$11	$65	$65	$12	4.94	$0.167	$ 13.12
63 -	1200	3	88	3L4T8										$0.167	$ 13.12
64 - Room 222	2700	6	102	2L4T12			1652	0.61	$372					$0.167	$ 13.12
66 - Tech ed	2700	29	88	3L4T8			6890	2.55	$1,552					$0.167	$ 13.12
	8736	1	10	Flor exit	LED exit	3	61	0.01	$11	$30	$30		2.65	$0.167	$ 13.12
68 - Life skills	2700	26	88	3L4T8										$0.167	$ 13.12
	8736	2	10	Flor exit	LED exit	3	122	0.01	$23	$30	$60		2.65	$0.167	$ 13.12
69 - Boys locker	450	10	88	3L4T8										$0.167	$ 13.12
	450	3	120	2-INCA 60W	2-CFL 23W	48	97	0.22	$50	$20	$60		1.19	$0.167	$ 13.12
70 - Boiler room	80	6	102	2L4T12	2L4HPT8	60	20	0.25	$43	$75	$450	$36	9.62	$0.167	$ 13.12
71 - Girls locker	450	6	60	2L4T8			162	0.36	$84					$0.167	$ 13.12
	450	3	102	2L4T12	2L4HPT8	60	57	0.13	$29	$75	$225	$36	6.45	$0.167	$ 13.12
	8736	1	3	LED exit										$0.167	$ 13.12
Subtotal						**2,240**	**57,453.7**	**24.5**	**$13,456**		**$17,640**	**$5,763**	**0.88**	$0.167	$ 13.12
Exterior														$0.167	$ 13.12
	8736	5	190	LPS 150										$0.167	$ 13.12
	8736	1	190	HPS 150W										$0.167	$ 13.12
	8736	3	100	Flood 100W INCA	2-CFL 23W	48	1363	0.16	$252	$20	$60		0.24	$0.167	$ 13.12
	8736	2	1000	Quartz 1000W										$0.167	$ 13.12
	8736	6	295	2-HPS 250W										$0.167	$ 13.12
	8736	2	1085	HPS 1000W										$0.167	$ 13.12
Total						**2,288**	**58,816**	**24.68**	**$13,708**		**$17,700**	**$5,763**	**0.87**		

Energy Cost	$0.167	$/kwhr
Demand Cost	$13.12	$

McCormick Facilities Management

Current KWH								
Room name	Hours	QTY	Existing watts	Existing fixture type	Suggested replacement	Replacement Watts	KW Hrs base	KW base
C1 - Corridor	2250	9	45	8" square CFL			911	0.41
	8736	3	10	Flor exit	LED exit	3	262	0.03
	2700	8	60	2L4T8			1,296	0.48
C2 - Corridor	2700	15	60	2L4T8			2,430	0.90
	8736	4	10	Flor exit	LED exit	3	349	0.04
C3 - Corridor	2700	10	60	2L4T8			1,620	0.60
	8736	3	10	Flor exit	LED exit	3	262	0.03
C4- Corridor	2700	4	204	4L4T12	4L4HPT8	112	2,203	0.82
	8736	1	10	Flor exit	LED exit	3	87	0.01
C5 - Corridor	2700	26	60	2L4T8			4,212	1.56
	8736	1	3	LED exit			26	0.00
	8736	3	10	Flor exit			262	0.03
C6 - Corridor	8736	1	3	LED exit			26	0.00
	2250	10	45	8" square CFL			1,013	0.45
C7 - Corridor	2700	6	60	2L4T8			972	0.36
	8736	1	3	LED exit			26	0.00
C8 - Corridor	2700	10	88	3L4T8			2,376	0.88
	8736	3	10	Flor exit			262	0.03
C9 - Corrodor	2700	2	60	1L4T12	1L4HPT8	30	324	0.12
	2700	6	102	2L4T12	2L4HPT8	60	1,652	0.61
1- Mrs. Fields	2700	8	88	3L4T8			1,901	0.70
2 - Room 111	2700	2	88	3L4T8			475	0.18
3 - Office	2700	6	88	3L4T8			1,426	0.53
4 - Rooms 115	2700	2	88	3L4T8			475	0.18
4A -	1200	1	60	2L4T8			72	0.06
5 - Room 112	2700	8	88	3L4T8			1,901	0.70
6 - Room 114	2700	12	88	3L4T8			2,851	1.06
7 - Room 117	2700	9	88	3L4T8			2,138	0.79
8 - Room 116	2700	6	60	2L4T8			972	0.36
9 - Mr. White	2700	17	88	3L4T8			4,039	1.50
10 -	800	1	60	1L4T12	1L4HPT8	30	48	0.06
11 - Boys room	2700	3	60	2L4T8			486	0.18
11A - Girls room	2700	3	60	2L4T8			486	0.18
12 - Gym	2700	20	455	400W MH	6L4T5	188	24,570	9.10
	160			LED				
	8736	2	10	Flor exit	LED exit	3	175	0.02
14 -	160	14		LED				
	160	6	455	400W MH	4L4T5	132	437	2.73
	20	1	60	INCA 60W	CFL 23W	24	1	0.06
15 -	2700	1	30	1L4T8			81	0.03
16 - Room 109	2700	9	60	2L4T8			1,458	0.54
17 - Room 107	2700	9	60	2L4T8			1,458	0.54
18 - Room 105	2700	9	60	2L4T8			1,458	0.54
19 -	160	7	102	2L4T12	2L4THP8	60	114	0.71
20 -	160	2	102	2L4T12	2L4THP8	60	33	0.20
21 - Room 108	2700	9	60	2L4T8			1,458	0.54
	1350	1	60	INCA 60W	CFL 23W	24	81	0.06
22 - Mrs. Leidinger	2700	9	60	2L4T8			1,458	0.54
23 - Restroom	2700	3	60	2L4T8			486	0.18
24 - Restroom	2700	3	60	2L4T8			486	0.18
25 - Elec closet	160	7	60	1L4T12	1L4HPT8	30	67	0.42
26 -	160	1	204	4L4T12	4L4HPT8	112	33	0.20
27 - Cafeteria	2700	49	204	4L4T12	4L4HPT8	112	26,989	10.00
	8736	2	10	Flor exit	LED exit	3	175	0.02
	8736	1	3	LED exit			26	0.00
	20	5	65	INCA 60W	CFL 23W	24	7	0.33
27A -Kitchen hall	2700	2	204	4L4T12	4L4HPT8	112	1,102	0.41
	8736	1	10	Flor exit	LED exit	3	87	0.01
28 -Kitchen	2700	18	102	2L4T12	2L4HPT8	60	4,957	1.84
29 -Kitchen storage	1350	1	204	4L4T12	4L4HPT8	112	275	0.20
31 - 101	1350	2	60	INCA 60W	CFL 23W	24	162	0.12
32 - Office	2700	2	102	2L4T12	2L4HPT8	60	551	0.20
33 -	2700	8	204	4L4T12	4L4HPT8	112	4,406	1.63
33 A	2700	9	204	4L4T12	4L4HPT8	112	4,957	1.84
35 -	2700	1	162	3L4T12	3L4HPT8	88	437	0.16
36 -	2700	2	60	1L4T12	1L4HPT8	30	324	0.12
37 -	2700	2	102	2L4T12	2L4HPT8	60	551	0.20
	2700	1	60	1L4T12	1L4HPT8	30	162	0.06
38 -	2700	2	102	2L4T12	2L4HPT8	60	551	0.20

Lighting Only

	KW Hrs	KW
Current	249,047	81.48
Projected	190,230	56.79
Saved	58,816	24.68

Lighting & Controls*

	KW Hrs	KW
Current	249,047	81.48
Projected	132,748	39.63
Saved	116,298	41.84

*Assumes upgrades to lighting have already been implemented.

McCormick Facilities Management

Room name	Hours	QTY	Existing watts	Existing fixture type	Suggested replacement	Replacement Watts	KW Hrs base	KW base
	2700	1	60	1L4T12	1L4HPT8	30	162	0.06
39 - Room 200	2700	5	88	3L4T8			1,188	0.44
	2700	1	60	1L4T12	1L4HPT8	30	162	0.06
40 -	2700	2	162	3L4T12	3L4HPT8	88	875	0.32
41 - Computer room	2700	9	88	3L4T8			2,138	0.79
42 - Room 201	2700	24	88	3L4T8			5,702	2.11
	8736	2	10	Flor exit	LED exit	3	175	0.02
43 - Room 204	2700	9	88	3L4T8			2,138	0.79
44 - Mrs. Bengston	2700	20	88	3L4T8			4,752	1.76
45 - Room 206	2700	9	88	3L4T8			2,138	0.79
46 - Room 208	2700	9	88	3L4T8			2,138	0.79
47 - Room 210	2700	9	88	3L4T8			2,138	0.79
48 - Ms. Morse	2700	9	88	3L4T8			2,138	0.79
49 - Room 212	2700	1	60	2L4T8			162	0.06
	2700	4	60	2L4T8			648	0.24
50 - Room 201	2700	9	88	3L4T8			2,138	0.79
51 - Room 214	2700	8	88	3L4T8			1,901	0.70
52 - Room 209	2700	2	88	3L4T8			475	0.18
53 - Room 211	2700	4	88	3L4T8			950	0.35
54 - Room 213	2700	2	88	3L4T8			475	0.18
55 - Room 215	2700	4	88	3L4T8			950	0.35
56 - Room 215	2700	8	88	3L4T8			1,901	0.70
56 A	1200	1	88	3L4T8			106	0.09
57 - Room 218	2700	17	88	3L4T8			4,039	1.50
58 - Room 217	2700	12	88	3L4T8			2,851	1.06
59 - Room 220	2700	12	88	3L4T8			2,851	1.06
60 - Room 219	2700	10	88	3L4T8			2,376	0.88
61 -	1200	1	88	3L4T8			106	0.09
62 -	1200	4	60	2L4T8			288	0.24
	1200	1	60	1L4T12	1L4HPT8	30	72	0.06
63 -	1200	3	88	3L4T8			317	0.26
64 - Room 222	2700	6	102	2L4T12			1,652	0.61
66 - Tech ed	2700	29	88	3L4T8			6,890	2.55
	8736	1	10	Flor exit	LED exit	3	87	0.01
68 - Life skills	2700	26	88	3L4T8			6,178	2.29
	8736	2	10	Flor exit	LED exit	3	175	0.02
69 - Room 12	2700	10	88	3L4T8			2,376	0.88
	2700	3	120	2-INCA 60W	2-CFL 23W	48	972	0.36
70 - Boiler room	80	6	102	2L4T12			49	0.61
71 - Girls locker	450	6	60	2L4T8			162	0.36
	450	3	102	2L4T12	2L4HPT8	60	138	0.31
	8736	1	3	LED exit			26	0.00
Exterior								
	8736	5	190	LPS 150			8,299	0.95
	8736	1	190	HPS 150W			1,660	0.19
	8736	3	100	Flood 100W INCA	2-CFL 23W	48	2,621	0.30
	8736	2	1000	Quartz 1000W			17,472	2.00
	8736	6	295	2-HPS 250W			15,463	1.77
	8736	2	1085	HPS 1000W			18,957	2.17
TOTALS		**749**	**11,922**			**2,222**	**249,047**	**81.48**

McCormick Facilities Management

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 Middle School														
C1 - Corridor	1	2250	9		45	911	0.3	273	$45.65	$75	$75	$45	0.7	$ 0.167
		8736	3	LED exit	3	79								$ 0.167
		2700	8		60	1,296								$ 0.167
C2 - Corridor	1	2700	15		60	2,430	0.3	729	$121.74	$75	$75	$45		$ 0.167
		8736	4	LED exit	3	105							-	$ 0.167
C3 - Corridor	1	2700	10		60	1,620	0.3	486	$81.16	$75	$75	$45		$ 0.167
		8736	3	LED exit	3	79								$ 0.167
C4 - Corridor	1	2700	4	4L4HPT8	112	1,210	0.3	363	$60.60	$75	$75	$45		$ 0.167
		8736	1	LED exit	3	26								$ 0.167
C5 - Corridor	3	2700	26		60	4,212	0.3	1264	$211.02	$75	$225	$45	0.9	$ 0.167
		8736	1		3	26							-	$ 0.167
		8736	3		10	262							-	$ 0.167
C6 - Corridor		8736	1		3	26								$ 0.167
	1	2250	10		45	1,013	0.3	304	$50.73	$75	$75	$45	0.6	$ 0.167
C7 - Corridor	1	2700	6		60	972	0.3	292	$48.70	$75	$75	$45		$ 0.167
		8736	1		3	26							-	$ 0.167
C8 - Corridor	2	2700	10		88	2,376	0.3	713	$119.04	$75	$150	$90	0.5	$ 0.167
		8736	3		10	262								$ 0.167
C9 - Corridor	2	2700	2	1L4HPT8	30	162	0.3	49	$8.12	$75	$150		18.5	$ 0.167
		2700	6	2L4HPT8	102	1,652								$ 0.167
1- Mrs. Fields	1	2700	8		88	1,901	0.3	570	$95.23	$75	$75	$45		$ 0.167
2 - Room 111	1	2700	2		88	475	0.4	190	$31.74	$75	$75	$45		$ 0.167
3 - Office	1	2700	6		88	1,426	0.3	428	$71.42	$75	$75	$45	0.4	$ 0.167
4 - Rooms 115	1	2700	2		88	475	0.4	190	$31.74	$75	$75	$45	0.9	$ 0.167
4A -	1	1200	1		60	72	0.5	36	$6.01	$75	$75	$45	5.0	$ 0.167
5 - Room 112	1	2700	8		88	1,901	0.3	570	$95.23	$75	$75	$45	0.3	$ 0.167
6 - Room 114	1	2700	12		88	2,851	0.3	855	$142.85	$75	$75	$45	0.2	$ 0.167
7 - Room 117	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
8 - Room 116	1	2700	6		60	972	0.3	292	$48.70	$75	$75	$45		$ 0.167
9 - Mr. White	1	2700	17		88	4,039	0.3	1212	$202.36	$75	$75	$45	0.1	$ 0.167
10 -	1	800	1	1L4HPT8	60	48	0.5	24	$4.01	$75	$75	$45	7.5	$ 0.167
11 - Boys room	1	2700	3		60	486	0.7	340	$56.81	$75	$75	$45	0.5	$ 0.167
11A - Girls room	1	2700	3		60	486	0.7	340	$56.81	$75	$75	$45	0.5	$ 0.167
12 - Gym	8	2700	20	6L4T5	188	10,152	0.5	5076	$847.69	$75	$600	$360	0.3	$ 0.167
		160											-	$ 0.167
		8736	2	LED exit	3	52							-	$ 0.167
14 - Stage		160	14										-	$ 0.167
		160	6	4L4T5			0.9						-	$ 0.167
		20	1	CFL 23W	24	0								$ 0.167
15 -	1	2700	1		30	81	0.5	41	$6.76	$75	$75		11.1	$ 0.167
16 - Room 109	1	2700	9		60	1,458	0.3	437	$73.05	$75	$75	$45	0.4	$ 0.167
17 - Room 107	1	2700	9		60	1,458	0.3	437	$73.05	$75	$75	$45	0.4	$ 0.167
18 - Room 105	1	2700	9		60	1,458	0.3	437	$73.05	$75	$75	$45	0.4	$ 0.167
19 - Custodian room	1	160	7	2L4THP8	60	67	0.5	34	$5.61	$75	$75	$45	5.3	$ 0.167
20 -		160	2	2L4THP8	60	19							-	$ 0.167
21 - Room 108	1	2700	9		60	1,458	0.3	437	$73.05	$75	$75	$45	0.4	$ 0.167
		1350	1	CFL 23W	24	32							-	$ 0.167
22 - Mrs. Leidinger	1	2700	9		60	1,458	0.3	437	$73.05	$75	$75	$45	0.4	$ 0.167
23 - Restroom	1	2700	3		60	486	0.7	340	$56.81	$75	$75	$45		$ 0.167

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
24 - Restroom	1	2700	3		60	486	0.7	340	$56.81	$75	$75	$45		$ 0.167
25 - Elec closet		160	7	1L4HPT8	30	34							-	$ 0.167
26 -		160	1	4L4HPT8	112	18								$ 0.167
27 - Cafeteria	4	2700	49	4L4HPT8	112	14,818	0.4	5927	$989.82	$75	$300	$45	0.3	$ 0.167
		8736	2	LED exit	3	52								$ 0.167
		8736	1		3	26								$ 0.167
		20	5	CFL 23W	24	2								$ 0.167
27A -Kitchen hall	1	2700	2	4L4HPT8	112	605	0.3	181	$30.30	$75	$75	$45		$ 0.167
		8736	1	LED exit	3	26								$ 0.167
28 -Kitchen	2	2700	18	2L4HPT8	60	2,916	0.4	1166	$194.79	$75	$150	$45	0.5	$ 0.167
29 -Kitchen storage	1	1350	1	4L4HPT8	112	151	0.5	76	$12.63	$75	$75	$45		$ 0.167
31 - 101	1	1350	2	CFL 23W	24	65	0.5	32	$5.41	$75	$75			$ 0.167
32 - Office	1	2700	2	2L4HPT8	60	324	0.3	97	$16.23	$75	$75	$45		$ 0.167
33 -	1	2700	8	4L4HPT8	112	2,419	0.3	726	$121.20	$75	$75	$45		$ 0.167
33 A	1	2700	9	4L4HPT8	112	2,722	0.3	816	$136.35	$75	$75	$45	0.2	$ 0.167
35 -	1	2700	1	3L4HPT8	88	238	0.5	119	$19.84	$75	$75	$45		$ 0.167
36 -	1	2700	2	1L4HPT8	30	162	0.3	49	$8.12	$75	$75		9.2	$ 0.167
37 -	1	2700	2	2L4HPT8	60	324	0.3	97	$16.23	$75	$75	$45	1.8	$ 0.167
		2700	1	1L4HPT8	30	81							-	$ 0.167
38 -	1	2700	2	2L4HPT8	60	324	0.3	97	$16.23	$75	$75	$45		$ 0.167
		2700	1	1L4HPT8	30	81							-	$ 0.167
39 - Room 200	1	2700	5		88	1,188	0.3	356	$59.52	$75	$75	$45		$ 0.167
		2700	1	1L4HPT8	30	81							-	$ 0.167
40 -	1	2700	2	3L4HPT8	88	475	0.3	143	$23.81	$75	$75	$45	1.3	$ 0.167
41 - Computer room	1	2700	9		88	2,138						$45		$ 0.167
42 - Room 201	1	2700	24		88	5,702						$45		$ 0.167
		8736	2	LED exit	3	52								$ 0.167
43 - Room 204	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
44 - Mrs. Bengston	1	2700	20		88	4,752	0.3	1426	$238.08	$75	$75	$45	0.1	$ 0.167
45 - Room 206	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
46 - Room 208	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
47 - Room 210	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
48 - Ms. Morse	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
49 - Room 212		2700	1		60	162								$ 0.167
	1	2700	4		60	648	0.3	194	$32.46	$75	$75	$45		$ 0.167
50 - Room 201	1	2700	9		88	2,138	0.3	642	$107.13	$75	$75	$45	0.3	$ 0.167
51 - Room 214	1	2700	8		88	1,901	0.3	570	$95.23	$75	$75	$45	0.3	$ 0.167
52 - Room 209	1	2700	2		88	475	0.3	143	$23.81	$75	$75	$45	1.3	$ 0.167
53 - Room 211	1	2700	4		88	950	0.3	285	$47.62	$75	$75	$45	0.6	$ 0.167
54 - Room 213	1	2700	2		88	475	0.3	143	$23.81	$75	$75	$45	1.3	$ 0.167
55 - Room 215	1	2700	4		88	950	0.3	285	$47.62	$75	$75	$45	0.6	$ 0.167
56 - Room 215	1	2700	8		88	1,901	0.3	570	$95.23	$75	$75	$45	0.3	$ 0.167
56 A	1	1200	1		88	106	0.5	53	$8.82	$75	$75	$45	3.4	$ 0.167
57 - Room 218	1	2700	17		88	4,039	0.3	1212	$202.36	$75	$75	$45	0.1	$ 0.167
58 - Room 217	1	2700	12		88	2,851	0.3	855	$142.85	$75	$75	$45	0.2	$ 0.167
59 - Room 220	1	2700	12		88	2,851	0.3	855	$142.85	$75	$75	$45	0.2	$ 0.167
60 - Room 219	1	2700	10		88	2,376	0.3	713	$119.04	$75	$75	$45	0.3	$ 0.167
61 -	1	1200	1		88	106	0.3	32	$5.29	$75	$75	$45	5.7	$ 0.167
62 -	1	1200	4		60	288	0.3	86	$14.43	$75	$75	$45	2.1	$ 0.167
		1200	1	1L4HPT8	30	36								$ 0.167
63 -	1	1200	3		88	317	0.3	95	$15.87	$75	$75	$45		$ 0.167
64 - Room 222	1	2700	6		102	1,652	0.3	496	$82.79	$75	$75	$45	0.4	$ 0.167
66 - Tech ed	2	2700	29		88	6,890	0.3	2067	$345.21	$75	$150	$45		$ 0.167
		8736	1	LED exit	3	26								$ 0.167

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
68 - Life skills	2	2700	26		88	6,178	0.5	3089	$515.83	$75	$150	$45		$ 0.167
		8736	2	LED exit	3	52							-	$ 0.167
69 - Boys locker	1	450	10		88	396	0.1	40	$6.61	$75	$75	$45	4.5	$ 0.167
		450	3	2-CFL 23W	48	65								$ 0.167
70 - Boiler room		80	6		102	49							-	$ 0.167
71 - Girls locker	1	450	6		60	162	0.1	16	$2.71	$75	$75	$45		$ 0.167
		450	3	2L4HPT8	60	81								$ 0.167
		8736	1										-	$ 0.167
Subtotal	**92**							**45,135**	**$7,538**		**$6,750**	**$3,555**	**0.4**	$ 0.167
Exterior														$ 0.167
	5	8736	5		190	8,299	0.3	2490	$416	$75	$375	$225	0.4	$ 0.167
	1	5110	1		190	971	0.3	291	$49	$75	$75	$45	0.6	$ 0.167
	3	5110	3	2-CFL 23W	100	1,533	0.3	460	$77	$75	$225	$135	1.2	$ 0.167
	2	5110	2		1000	10,220	0.3	3066	$512	$75	$150	$90	0.1	$ 0.167
	6	5110	6		295	9,045	0.3	2713	$453	$75	$450	$270	0.4	$ 0.167
	2	5110	2		1085	11,089	0.3	3327	$556	$75	$150	$90	0.1	$ 0.167

TOTAL	**111**							**57,482**	**$9,599**		**$8,175**	**$4,410**	**0.392**	**TOTALS**

Client Name	SAU 80 - Shaker School	**Field Inventory Sheets**	
Building Name	Belmont Middle School		
Date of field survey	16-Dec-09	Time of day	10:30 AM
Existing weather conditions	sunny, cold		

Lighting

Location by room	Hours per Day	Total Hours	Quantity	Total Watts	Existing Fixture type	Suggested Replacement	Ballast type	Mounting method	Lighting level FC	Occupancy sensors (Y/N)	# of Light Levels
C1 - Corridor	10-5-45	2250	9	45	8" square CFL			Recessed		N	1
	24-7-52	8736	3	10	Flor exit	LED exit		Surface			
	12-5-45	2700	8	60	2L4T8			Drop ins	23	N	1
C2 - Corridor	12-5-45	2700	15	60	2L4T8			Surface	37	N	1
	24-7-52	8736	4	10	Flor exit	LED exit		Surface			
C3 - Corridor	12-5-45	2700	10	60	2L4T8			Drop ins	12	N	1
	24-7-52	8736	3	10	Flor exit	LED exit		Surface			
C4- Corridor	12-5-45	2700	4	204	4L4T12	4L4T8		Drop ins		N	1
	24-7-52	8736	1	10	Flor exit	LED exit		Surface			
C5 - Corridor	12-5-45	2700	26	60	2L4T8			Surface		N	1
	24-7-52	8736	1	3	LED exit			Surface			
	24-7-52	8736	3	10	Flor exit			Surface			
C6 - Corridor	24-7-52	8736	1	3	LED exit			Surface			
	10-5-45	2250	10	45	8" square CFL			Recessed		N	1
C7 - Corridor	12-5-45	2700	6	60	2L4T8			Drop ins		N	1
	24-7-52	8736	1	3	LED exit			Surface			
C8 - Corridor	12-5-45	2700	10	88	3L4T8			Drop ins		N	1
	24-7-52	8736	3	10	Flor exit			Surface			
C9 - Corrodor	12-5-45	2700	2	60	1L4T12	1L4T8	M	Surface		N	1
	12-5-45	2700	6	102	2L4T12	2L4T8		Drop ins		N	1
1- Mrs. Fields	12-5-45	2700	8	88	3L4T8			Drop ins			2
2 - Room 111	12-5-45	2700	2	88	3L4T8			Drop ins		N	2
3 - Office	12-5-45	2700	6	88	3L4T8			Drop ins	75	N	2
4 - Rooms 115	12-5-45	2700	2	88	3L4T8			Drop ins		N	2
4A -	6-5-40	1200	1	60	2L4T8			Surface		N	1
5 - Room 112	12-5-45	2700	8	88	3L4T8			Drop ins		N	1
6 - Room 114	12-5-45	2700	12	88	3L4T8			Drop ins	45	N	1
7 - Room 117	12-5-45	2700	9	88	3L4T8			Drop ins		N	1
8 - Room 116	12-5-45	2700	6	60	2L4T8			Drop ins		N	1
9 - Mr. White	12-5-45	2700	17	88	3L4T8			Drop ins		N	1
10 -	4-5-40	800	1	60	1L4T12	1L4T8		Surface		N	1
11 - Boys room	12-5-45	2700	3	60	2L4T8			Drop ins		N	1
11A - Girls room	12-5-45	2700	3	60	2L4T8			Drop ins		N	1
12 - Gym	12-5-45	2700	20	455	400W MH	6L4T5		Pendant	49	N	4
	4-2-20	160			LED			Scoreboard			
	24-7-52	8736	2	10	Flor exit	LED exit		Surface			
14 -	4-2-20	160	14		LED	4L4T5		Stage			

Lighting

Location by room	Hours per Day	Total Hours	Quantity	Total Watts	Existing Fixture type	Suggested Replacement	Ballast type	Mounting method	Lighting level FC	Occupancy sensors (Y/N)	# of Light Levels
	4-2-20	160	6	455	400W MH			Pendant			
	1-2-10	20	1	60	INCA 60W	CFL 23W		Surface			
15 -	12-5-45	2700	1	30	1L4T8			Surface		N	1
16 - Room 109	12-5-45	2700	9	60	2L4T8		E	Drop ins		N	2
17 - Room 107	12-5-45	2700	9	60	2L4T8		E	Drop ins	54	N	2
18 - Room 105	12-5-45	2700	9	60	2L4T8		E	Drop ins	50	N	2
19 -	4-2-20	160	7	102	2L4T12	2L4T8	M	Surface		N	1
20 -	4-2-20	160	2	102	2L4T12	2L4T8	M	Surface		N	1
21 - Room 108	12-5-45	2700	9	60	2L4T8		E	Drop ins	50	N	2
	6-5-45	1350	1	60	INCA 60W	CFL 23W		Lamp		N	1
22 - Mrs. Leidinger	12-5-45	2700	9	60	2L4T8		E	Drop ins	50	N	2
23 - Restroom	12-5-45	2700	3	60	2L4T8		E	Drop ins		N	1
24 - Restroom	12-5-45	2700	3	60	2L4T8		E	Drop ins		N	1
25 - Elec closet	4-2-20	160	7	60	1L4T12	1L4T8	M	Chain		N	1
26 -	4-2-20	160	1	204	4L4T12	4L4T8	M	Drop ins		N	1
27 - Cafeteria	12-5-45	2700	49	204	4L4T12	4L4T8	M	Drop ins	35	N	4
	24-7-52	8736	2	10	Flor exit	LED exit		Surface			
	24-7-52	8736	1	3	LED exit			Surface			
	1-2-10	20	5	65	INCA 60W	CFL 23W		Recessed		N	1
27A -Kitchen hall	12-5-45	2700	2	204	4L4T12	4L4T8	M	Surface		N	1
	24-7-52	8736	1	10	Flor exit	LED exit		Surface			
28 -Kitchen	12-5-45	2700	18	102	2L4T12	2L4T8	M	Surface	35	N	3
29 -Kitchen storage	6-5-45	1350	1	204	4L4T12	4L4T8	M	Drop ins	21	N	1
31 - 101	6-5-45	1350	2	60	INCA 60W	CFL 23W		Surface		N	1
32 - Office	12-5-45	2700	2	102	2L4T12	2L4T8	M	Surface	57	N	1
33 -	12-5-45	2700	8	204	4L4T12	4L4T8	M	Drop ins	35	N	1
33 A	12-5-45	2700	9	204	4L4T12	4L4T8	M	Drop ins		N	1
35 -	12-5-45	2700	1	162	3L4T12	3L4T8	M	Drop ins		N	1
36 -	12-5-45	2700	2	60	1L4T12	1L4T8	M	Chain		N	1
37 -	12-5-45	2700	2	102	2L4T12	2L4T8	M	Surface		N	1
	12-5-45	2700	1	60	1L4T12	1L4T8	M	Surface		N	1
38 -	12-5-45	2700	2	102	2L4T12	2L4T8	M	Surface		N	1
	12-5-45	2700	1	60	1L4T12	1L4T8	M	Surface		N	1
39 - Room 200	12-5-45	2700	5	88	3L4T8		M	Drop ins		N	1
	12-5-45	2700	1	60	1L4T12	1L4T8	M	Surface		N	1
40 -	12-5-45	2700	2	162	3L4T12	3L4T8	M	Surface		N	1
41 - Computer room	12-5-45	2700	9	88	3L4T8		E	Drop ins	54	N	2
42 - Room 201	12-5-45	2700	24	88	3L4T8		E	Drop ins		N	4
	24-7-52	8736	2	10	Flor exit	LED exit		Surface			
43 - Room 204	12-5-45	2700	9	88	3L4T8		E	Drop ins		N	1
44 - Mrs. Bengston	12-5-45	2700	20	88	3L4T8		E	Drop ins		N	2
45 - Room 206	12-5-45	2700	9	88	3L4T8		E	Drop ins		N	1
46 - Room 208	12-5-45	2700	9	88	3L4T8		E	Drop ins		N	1
47 - Room 210	12-5-45	2700	9	88	3L4T8		E	Drop ins		N	1

Lighting

Location by room	Hours per Day	Total Hours	Quantity	Total Watts	Existing Fixture type	Suggested Replacement	Ballast type	Mounting method	Lighting level FC	Occupancy sensors (Y/N)	# of Light Levels
48 - Ms. Morse	12-5-45	2700	9	88	3L4T8		E	Drop ins		N	1
49 - Room 212	12-5-45	2700	1	60	2L4T8		E	Surface		N	1
	12-5-45	2700	4	60	2L4T8		E	Drop ins		N	1
50 - Room 201	12-5-45	2700	9	88	3L4T8		E	Drop ins		N	1
51 - Room 214	12-5-45	2700	8	88	3L4T8		E	Drop ins		N	1
52 - Room 209	12-5-45	2700	2	88	3L4T8		E	Drop ins		N	1
53 - Room 211	12-5-45	2700	4	88	3L4T8		E	Drop ins		N	1
54 - Room 213	12-5-45	2700	2	88	3L4T8		E	Drop ins		N	1
55 - Room 215	12-5-45	2700	4	88	3L4T8		E	Drop ins		N	1
56 - Room 215	12-5-45	2700	8	88	3L4T8		E	Drop ins		N	1
56 A	6-5-40	1200	1	88	3L4T8		E	Drop ins		N	1
57 - Room 218	12-5-45	2700	17	88	3L4T8		E	Drop ins		N	2
58 - Room 217	12-5-45	2700	12	88	3L4T8		E	Drop ins		N	2
59 - Room 220	12-5-45	2700	12	88	3L4T8		E	Drop ins		N	2
60 - Room 219	12-5-45	2700	10	88	3L4T8		E	Drop ins		N	2
61 -	6-5-40	1200	1	88	3L4T8		E	Drop ins		N	1
62 -	6-5-40	1200	4	60	2L4T8		E	Drop ins		N	1
	6-5-40	1200	1	60	1L4T12	1L4T8	M	Surface		N	1
63 -	6-5-40	1200	3	88	3L4T8		E	Drop ins		N	1
64 - Room 222	12-5-45	2700	6	102	2L4T12		M	Surface		N	1
66 - Tech ed	12-5-45	2700	29	88	3L4T8		E	Drop ins		N	1
	24-7-52	8736	1	10	Flor exit	LED exit		Surface			
68 - Life skills	12-5-45	2700	26	88	3L4T8		E	Drop ins		N	2
	24-7-52	8736	2	10	Flor exit	LED exit		Surface			
69 - Boys locker	6-3-25	450	10	88	3L4T8			Drop ins		N	1
	6-3-25	450	3	120	2-INCA 60W	2-CFL 23W		Surface		N	1
70 - Boiler room	2-2-20	80	6	102	2L4T12		E	Surface		N	1
71 - Girls locker	6-3-25	450	6	60	2L4T8			Drop ins	60	N	1
	6-3-25	450	3	102	2L4T12	2L4T8		Surface		N	1
	24-7-52	8736	1	3	LED exit			Surface			
72 - Room 13	6-3-25	450									
Exterior											
			5	190	LPS 150						
			1	190	HPS 150W						
					Flood 100W						
			3	100	INCA						
			2	1000	Quartz 1000W						
			6	295	2-HPS 250W						
			2	1085	HPS 1000W			Pole			

Client Name	SAU 80 - Shaker School		
Building Name	Belmont Middle School		
Date of field survey	16-Dec-09	Time of day	10:30 AM
Existing weather conditions	sunny, cold		

Exterior doors

Location	Quantity	Size	Glazing	Thickness	Description	Condition	Photo #
C1 - Corridor	4	3068	1/2 Glass	1/4"	Metal Insulated	F	
C2 - Corridor	2	3068	1/2 Glass	1/4"	Metal Insulated	F	
	2	3068	Full Glass	5/8"	Metal Insulated	G	Img 11
C3 - Corridor	2	3068	1/2 Glass	1/4"	Metal Insulated	F	
C4- Corridor	2	3068	1/2 Glass	1/4"	Metal Insulated	F	
	1	3068	1/2 Glass	1/8"	Metal Insulated		
C9 - Corrodor							
12 - Gym	4	3068			Metal Insulated	F	
15 -							
27 A	2	2668	1/2 Glass	5/8"	Metal Insulated	F	
33 - Kitchen							
35 -	2	3068	1/2 Glass	1/4"	Metal Insulated	F	
42	1	3068	1/2 Glass	1/8"	Metal Insulated		
44	1	3068			Metal Insulated		
56 - Room 215							
66 - Tech ed	1	3070			Metal Insulated		
69 - Boys locker	1	3068			Metal Insulated		
70 - Boiler room	2	3070			Metal Uninsulated	P	

Client Name	SAU 80 - Shaker School		
Building Name	Belmont Middle School		
Date of field survey	16-Dec-09	Time of day	10:30 AM
Existing weather conditions	sunny, cold		

Windows

Location	Quantity	Description	Size (SF)	Glazing	Thick-ness	Low E Coating (Y/N)	Frame type	Comments	Comfort Issues (Y/N)
C1 - Corridor	2	Fixed	6	Single pane	1/8"		Wood		
C2 - Corridor	2	Fixed	8	Double pane	1/2"		steel		
C4- Corridor	4	Fixed	4	Double pane	5/8"		steel		
C5 - Corridor	2	Fixed	3	Double pane	1/4"		Alum	Replace	
	2	Awning	2	Double pane	1/4"		Alum	Replace	
C6 - Corridor	1	Double Hung	24	pane	5/8"		Alum		drafty
C8 - Corridor	2	Fixed	11	Double pane			Alum		
	1	Hopper	11	Double pane			Alum		
	2	Skylight	25					Replace	
1- Mrs. Fields	5	Double Hung	24	Double pane	5/8"		Alum		drafty
2 - Room 111	1	Double Hung	24	Double pane	5/8"		Alum		drafty
3 - Office	2	Double Hung	24	Double pane	5/8"		Alum		drafty
4 - Rooms 115	1	Double Hung	24	Double pane	5/8"		Alum		drafty

Windows

Location	Quantity	Description	Size (SF)	Glazing	Thick-ness	Low E Coating (Y/N)	Frame type	Comments	Comfort Issues (Y/N)
5 - Room 112	5	Double Hung	24	Double pane	5/8"		Alum		drafty
6 - Room 114	8	Double Hung	16	Double pane	5/8"		Alum		drafty
7 - Room 117	7	Double Hung	24	Double pane	5/8"		Alum		drafty
8 - Room 116	5	Double Hung	16	Double pane	5/8"		Alum		drafty
9 - Mr. White	8	Double Hung	24	Double pane	5/8"		Alum		drafty
11 - Boys room	2	Double Hung	36	Double pane	5/8"		Alum		drafty
11A - Girls room	2	Double Hung	36	Double pane	5/8"		Alum		drafty
16 - Room 109	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
17 - Room 107	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
18 - Room 105	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
21 - Room 108	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
22 - Mrs. Leidinger	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
28 -Kitchen	3	Fixed	3	Double pane	1/4"		Alum	Replace	
	2	Awning	2	Double pane	1/4"		Alum	Replace	
29 - Kitchen storage	1	Fixed	3	Double pane	1/4"		Alum	Replace	
	1	Awning	2	Double pane	1/4"		Alum	Replace	
31 - 101	2	Fixed	3	Double pane	1/4"		Alum	Replace	
	2	Awning	2	Double pane	1/4"		Alum	Replace	

Windows

Location	Quantity	Description	Size (SF)	Glazing	Thick-ness	Low E Coating (Y/N)	Frame type	Comments	Comfort Issues (Y/N)
32 -	4	Fixed	3	Double pane	1/4"		Alum	Replace	
	4	Awning	2	Double pane	1/4"		Alum	Replace	
33 -	2	Fixed	3	Double pane	1/4"		Alum	Replace	
	3	Awning	2	Double pane	1/4"		Alum	Replace	
36 -	2	Fixed	3	Double pane	1/4"		Alum	Replace	
	2	Awning	2	Double pane	1/4"		Alum	Replace	
37 -	1	Fixed	3	Double pane	1/4"		Alum	Replace	
	1	Awning	2	Double pane	1/4"		Alum	Replace	
38 -	1	Fixed	3	Double pane	1/4"		Alum	Replace	
39 - Room 200	3	Awning	2	Double pane	1/4"		Alum	Replace	
41 - Computer room	1	Double Hung	20	Double pane	1/2"		Alum	Fair	
42 - Room 201	4	Double Hung	10	Double pane	3/4"		Alum	Good	
43 - Room 204	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
44 - Mrs. Bengston	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
	1	Fixed	8	Single pane	1/8"				
	1	Fixed	6	Single pane	1/8"				
45 - Room 206	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
46 - Room 208	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
47 - Room 210	2	Double Hung	20	Double pane	1/2"		Alum	Fair	

Windows

Location	Quantity	Description	Size (SF)	Glazing	Thick-ness	Low E Coating (Y/N)	Frame type	Comments	Comfort Issues (Y/N)
48 - Ms. Morse	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
49 - Room 212	1	Double Hung	19.25	Double pane	1/2"		Alum		
50 - Room 201	2	Double Hung	20	Double pane	1/2"		Alum	Fair	
51 - Room 214	5	Double Hung	24	Double pane	5/8"		Alum		drafty
52 - Room 209	2	Double Hung	24	Double pane	5/8"		Alum		drafty
53 - Room 211	2	Double Hung	24	Double pane	5/8"		Alum		drafty
54 - Room 213	2	Double Hung	24	Double pane	5/8"		Alum		drafty
55 - Room 215	1	Double Hung	24	Double pane	5/8"		Alum		drafty
56 - Room 215	4	Double Hung	24	Double pane	5/8"		Alum		drafty
56 A	1	Double Hung	24	Double pane	5/8"		Alum		drafty
57 - Room 218	8	Double Hung	24	Double pane	5/8"		Alum		drafty
58 - Room 217	7	Double Hung	24	Double pane	5/8"		Alum		drafty
59 - Room 220	7	Double Hung	16.5	Double pane	1/2"		Alum		
60 - Room 219	8	Double Hung	24	Double pane	5/8"		Alum		drafty
62 -	2	Double Hung	36	Double pane	5/8"		Alum		drafty
64 - Room 222	1	Double Hung	16.5	Double pane	1/2"		Alum		
66 - Tech ed	6	Hopper	3	Double pane	3/8"		Alum	Replace	
	2	Slider	26	Double pane	3/8"		Alum	drafty	
68 - Life skills	3	Slider	26	Double pane	3/8"		Alum	drafty	

Client Name	SAU 80 - Shaker School		
Building Name	Belmont Middle School		
Date of field survey	16-Dec-09	Time of day	10:30 AM
Existing weather conditions	sunny, cold		

Transformers

Location	Owned (Y/N)	Type	Phase	Voltage	Amp	KW Hours	Photo #	
(5) Transformers 208V/120	Y							
T1			3	480 volt	75 KVA			Replace
T2			3	480 volt	75 KVA			
T3			3	480 volt	25 KVA			Replace
T4			3		75 KVA			
T5			2		45 KVA			

Client Name	SAU 80 - Shaker School		
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Personal appliances

Location	Device type	Watts	Amps	Volts	Hours of usage	Photo #
8	18CF Fridge					
18	Mini fridge Toaster					
19	19CF Fridge					
39	18CF Fridge					

Client Name	SAU 80 - Shaker School			
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Existing weather conditions	sunny, cold			

Water usage

Location	Device type	High or low consumption	Infrared (Y/N)	Other flow control device	Quantity	Photo #	
C2	Water fountain				1		Cools 24/7
C4	Water fountain	Low			1		Cools 24/7
11	Sink	Low			2		
	Urinal	Low			2		
	Toilet	Low			2		
11A	Sink	Low			2		
	Toilet	Low			3		
15	Sink				1		
	Shower				1		
	Toilet				1		
22	Sink	Low			2		
23	Sink	High			3		
	Urinal	High			3		
	Toilet	High			2		
24	Toilet	High			5		
	Sink	High			3		
26	Toilet	Low			1		
	Sink	Low			1		
37	Sink				2		
	Toilet				4		
38	Sink				2		
	Toilet				2		
	Urinal				4		
39	Sink				2		
	Toilet				1		
	Shower				1		
42	Sink				1		
44	Sink				2		

Water usage

Location	Device type	High or low consumption	Infrared (Y/N)	Other flow control device	Quantity	Photo #
49	Sink				1	
62	Sink	Low			2	
	Urinal	Low			2	
63	Toilet	Low			2	
	Sink				2	
68	Sink				5	
69	Urinal				2	
	Toilet				1	
	Shower				5	
71	Shower	Low			5	
	Toilet	Low			2	
	Sink	Low			2	

Client Name	SAU 80 - Shaker School		
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Existing weather conditions	sunny, cold		

Computers & Equip

Location	Equipment type	Quantity	Photo #
* Projectors were often on in empty rooms or left on when not in use			
1	TV	1	
	LCD Monitor	1	
	Computer Tower	1	
2	Laptop	1	
	Printer	1	
3	Copier	1	
	LCD Monitor	2	
	Computer Tower	2	
	Printer	3	
	Fax	1	
4	Laptop	1	
	Printer	1	
4A	CRT Monitor	1	
	Computer Tower	1	
5	TV	1	
	LCD Monitor	1	
	Computer Tower	1	
7	LCD Monitor	1	
	Computer Tower	1	
8	CRT Monitor	2	
	LCD Monitor	1	
	Computer Tower	3	
9	LCD Monitor	1	
	Computer Tower	1	
12	TV	1	
	LCD Monitor	1	
	Computer Tower	1	
	Printer	1	

Computers & Equip

Location	Equipment type	Quantity	Photo #
16	LCD Monitor	1	
	TV	1	
	Computer Tower	1	
	Printer	1	
	Laptop	1	
17	LCD Monitor	1	
	Computer Tower	1	
18	LCD Monitor	1	
	TV	1	
	Computer Tower	1	
21	LCD Monitor	1	
	TV	1	
	Computer Tower	1	
	Printer	1	
22	LCD Monitor	1	
	TV	1	
	Computer Tower	1	
29	CRT Monitor	1	
	Computer Tower	1	
	Printer	1	
32	Laptop	1	
33	TV	1	
	CRT Monitor	1	
	LCD Monitor	1	
	Computer Tower	2	
	Printer	1	
33A	CRT Monitor	4	
	LCD Monitor	2	
	Computer Tower	6	
	Printer	1	
	Copier	1	
39	LCD Monitor	1	
	Computer Tower	1	
41	LCD Monitor	26	
	Laptop	1	
	Printer	2	
	Computer Tower	26	

Computers & Equip

Location	Equipment type	Quantity	Photo #
42	LCD Monitor	10	
	Computer Tower	10	
	Laptop	1	
	Copier	1	
44	LCD Monitor	1	
	Computer Tower	1	
52	LCD Monitor	1	
	Computer Tower	1	
54	LCD Monitor	1	
	Computer Tower	1	
56 A	Laptop	1	
56	LCD Monitor	1	
	Computer Tower	1	
57	LCD Monitor	1	
	Computer Tower	1	
	Printer	1	
58	LCD Monitor	1	
	Computer Tower	1	
	Printer	1	
59	Laptop	1	
	Printer	1	
	LCD Monitor	1	
	Computer Tower	1	
60	LCD Monitor	1	
	Computer Tower	1	
	Printer	1	
64	CRT Monitor	2	
	Computer Tower	2	
	Printer	1	
	Laptop	1	
66	CRT Monitor	6	
	LCD Monitor	1	
	Computer Tower	7	
	Printer	1	
68	CRT Monitor	1	
	Computer Tower	1	
	TV	1	
69	LCD Monitor	1	
	Computer Tower	1	
93	Copier	1	
	LCD Monitor	1	
	Computer Tower	1	

TARGET FINDER

PRINT FREQUENTLY ASKED QUESTIONS CONTACT US HELP

Return to ENERGY STAR Web site > **Target Energy Performance Results**

Target Energy Performance Results

The design **must** achieve a rating of 75 or higher to be eligible for "Designed to Earn the ENERGY STAR".

View Statement of Energy Design Intent

NOTE: Values are 23% Electricity - Grid Purchase and 77% Fuel Oil (No. 2). The Target & Average Building energy use for this facility are calculated based on fuel mix of input estimated energy use.

Target Energy Performance Results (estimated)			
Energy	**Design**	**Target**	**Average Building**
Energy Performance Rating (1-100)	31	83	50
Energy Reduction (%)	N/A	30	0
Source Energy Use Intensity (kBtu/Sq. Ft./yr)	139	82	118
Site Energy Use Intensity (kBtu/Sq. Ft./yr)	91	54	76
Total Annual Source Energy (kBtu)	8,914,198	5,271,452	7,530,646
Total Annual Site Energy (kBtu)	5,793,934	3,426,270	4,894,671
Total Annual Energy Cost ($)	$ 157,645	$ 93,224	$ 133,178
Pollution Emissions			
CO2-eq Emissions (metric tons/year)	493	291	416
CO2-eq Emissions Reduction (%)	-18%	30%	0%

Facility Information Edit

Belmont Middle School
Belmont, NH 03220
United States

Facility Characteristics Edit	
Space Type	**Gross Floor Area (Sq. Ft.)**
K-12 School	64,000
Total Gross Floor Area	64,000

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

Estimated Design Energy Edit			
Energy Source	**Units**	**Estimated Total Annual Energy Use**	**Energy Rate ($/Unit)**
Electricity - Grid Purchase	kWh	385,200	$ 0.167/kWh
Fuel Oil (No. 2)	Gallons	32,279	$ 2.887/Gallons
Liquid Propane	Gallons	31	$ 2.870/Gallons

Source: Data adapted from DOE-EIA. See EPA Technical Description.