The New Hampshire Municipal Energy Assistance Program

Decision Grade Audit Report

Town Hall/Fire Station
Alstead, NH

Prepared for:

Town of Alstead, NH

Prepared by:

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The following report was generated as part of the Municipal Energy Assistance Program (MEAP). MEAP is made possible through the New Hampshire Public Utilities Commission and the Greenhouse Gas Emissions Reductions Fund. The program is a collaborative effort to carry out a sequence of greenhouse gas emissions inventories and energy audits for between 24 and 48 geographically diverse communities in New Hampshire, setting the stage for these communities to perform renovations to selected buildings that would reduce energy consumption and greenhouse gas emissions. This report has been generated as a result of the Town of Alstead being selected to participate in this program.

To follow MEAP updates and activities please visit www.nhenergy.org.

Additionally, this report would not be possible without the assistance and input provided by municipal employees. We are grateful for the time provided to us by many of the Town of Alstead staff members and volunteers, without which this report would not be as thorough as it is.

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Introduction:

MEAP partners are pleased to provide this Decision-Grade Audit Report for the Town of Alstead and the Town Fire Station/Meeting Hall (hereinafter "the building"). This report discusses the findings and subsequent recommendations for energy efficiency improvements at the building. Included within this report are details regarding the walk-through and exploration conducted at the facility and examples that illustrate recommended building alterations and improvements that can reduce energy costs and the building's natural resource use and associated footprint. In this report we will provide a set of options that can help achieve real energy savings and carbon dioxide reductions. These recommendations should be viewed as initial avenues to participating in several State level funding opportunities for municipal energy projects, particularly the EECBG opportunity offered through the NH Office of Energy and Planning. These EECBG funds are distributed under the aegis of the ARRA (American Recovery and Reinvestment Act) are targeted specifically to towns and cities.

Prior to the audit process beginning, each selected municipality must carry out the MEAP energy inventory process. The inventory process is required in order to receive an energy audit. This report relied on those initial findings to help determine the most appropriate building to conduct an energy audit for, with the intent of maximizing the potential energy savings.

The Audit

The first stage of any audit process is understanding the nature of the system and the objectives of the audit. The use of the building and the Town's goals and objectives are the foundation of a solid audit. In most cases, these objectives combine environmental and economic goals. In the case of public buildings and facilities, comfort and safety are also primary concerns that help guide our analysis and recommendations.

A decision grade audit involves an inventory of heating systems, quantification of energy usage (electrical and heating fuel), and the process of coordinating this information with the goals and objectives of the Town into a decision tool. Under MEAP we look to provide recommendations that will, if carried out, help the Town achieve at least a 30% reduction in energy consumption. The level of detail provided herein is meant to create the basis upon which investment grade audits and decisions can be made. The decision grade audit is meant to filter options and expectations so that the Town can understand the fundamental building system, how changes to the system can result in economic and environmental benefits and how those changes can interact with other policy and philosophical objectives.

The following information will describe the characteristics witnessed during the walk-through and those areas of the building complex where improvements may be made. The objective of these recommendations is to create a series of options the Town can further explore.
On November 1st, 2009 Tobias Marquette of SDES Group toured the East Alstead Fire Station, Highway Garage, Town Offices, and the Town Hall/Fire Station. According to the 2005 Municipal Greenhouse Gas and Energy Use Baseline Report for Alstead, NH, the obvious first choice would have been the Library; however, this building had already received an energy audit, and was therefore not eligible under MEAP. The next most energy intense building after

that was the Fire Station/Town Hall. With careful thought and consideration, SDES and the community decided to proceed with this building and began collecting data for the purpose of generating this report.

Energy Data Collection:

The inventory process provides an opportunity to collect valuable energy data information for the building and is included to show the witnessed use/consumption over a given timeframe. While this information assisted the audit team in identifying which building to conduct the audit for, the audit team also carried out initial site visits at additional buildings to view characteristics and make an informed decision about the target of the audit. The remainder of this report further explains the building characteristics found at the Alstead Main Fire Station/Meeting Hall.

Electrical:
Electrical data was collected for the years 2005, 2007 and 2008. Based on this information, after totaling the electrical consumption and cost for the three years, the average year's price per kwh of electricity is as follows:

2008
Total Consumption – 15,037
Total Cost – $2,306.48
Avg. $/kwh - $0.15/kwh

2007
Total Consumption – 18,044
Total Cost – $2,565.20
Avg. $/kwh - $0.14/kwh

2005
Total Consumption – 16,606 kwh
Total Cost - $1,826.00
Avg. $/kwh – $0.11/kwh

Building: Alstead Main Fire Station / Meeting Hall			
Fuel Type: Electricity, Grid Purchase (kWh (thousand			
Space(s): Entire Facility			
Start Date	**End Date**	**Energy Use**	**Cost - US Dollars**
12/1/2008	12/31/2008	1,512.00	$228.23
11/1/2008	11/30/2008	1,426.00	$216.86
10/1/2008	10/31/2008	1,029.00	$171.36
9/1/2008	9/30/2008	1,020.00	$169.61
8/1/2008	8/31/2008	1,260.00	$208.22
7/1/2008	7/31/2008	1,187.00	$196.47
6/1/2008	6/30/2008	1,051.00	$174.31
5/1/2008	5/31/2008	1,065.00	$174.80
4/1/2008	4/30/2008	1,268.00	$177.56
3/1/2008	3/31/2008	1,432.00	$199.85
2/1/2008	2/29/2008	1,361.00	$190.19
1/1/2008	1/31/2008	1,426.00	$199.02
12/1/2007	12/31/2007	1,677.00	$236.50
11/1/2007	11/30/2007	2,021.00	$276.57
10/1/2007	10/31/2007	1,785.00	$244.94
9/1/2007	9/30/2007	1,253.00	$174.38
8/1/2007	8/31/2007	1,193.00	$167.67
7/1/2007	7/31/2007	1,248.00	$175.12
6/1/2007	6/30/2007	1,841.00	$225.49
5/1/2007	5/31/2007	1,286.00	$194.42
4/1/2007	4/30/2007	1,296.00	$196.94
3/1/2007	3/31/2007	1,507.00	$228.03
2/1/2007	2/28/2007	136	$207.55
1/1/2007	1/31/2007	1,577.00	$237.59
12/1/2005	12/31/2005	1,554.00	$169.00
11/1/2005	11/30/2005	1,232.00	$135.00
10/1/2005	10/31/2005	3,281.00	$358.00
9/1/2005	9/30/2005	1,004.00	$1,123.00
8/1/2005	8/31/2005	1,011.00	$113.00
7/1/2005	7/31/2005	1,052.00	$116.00
6/1/2005	6/30/2005	1,051.00	$115.00
5/1/2005	5/31/2005	1,065.00	$117.00
4/1/2005	4/30/2005	1,174.00	$128.00
3/1/2005	3/31/2005	1,525.00	$164.00
2/1/2005	2/28/2005	1,278.00	$139.00
1/1/2005	1/31/2005	1,379.00	$149.00

*Note: The presented data was extrapolated from energy information entered into the EPA's Portfolio Manager.

Although the consumption of electricity went down by roughly 17% in 2008 compared to 2007, the price for the energy only decreased by roughly 10% - because of the escalation in electric rates. This trend is predicted to continue so taking actions today to reduce consumption and possibly producing some generation onsite will help alleviate this trend.

Thermal:

We have a solid three years of data for the fuel oil burned at the facility. This allows us to understand usage and price impacts for the fuel source over the three year period. When we look at the cost per gallon of No. 2 fuel over the three years we see that the cost of fuel has increased by about 36%. Additionally, the consumption went down about 10% in 2007 compared to 2005 and then went up 28% between 2007 and 2008.

2008
Avg./gal. $2.57
Total Gallons 2064.2
Total Cost $5314.38

2007
Avg./gal. $2.40
Total Gallons 1493.9
Total Cost $3,585.82

2005
Avg./gal. $1.65
Total Gallons 1669.2
Total Cost $2,749.00

As shown above, heating oil experiences significant fluctuations in pricing and is difficult to budget for energy costs in a facility.

Building: Alstead Main Fire Station / Meeting			
Fuel Type: Fuel Oil (No. 2), No fuel generation **Space(s):** Entire Facility			
Start Date	**End Date**	**Energy Use**	**Cost - US Dollars**
12/1/2008	12/31/2008	269.5	$671.06
11/1/2008	11/30/2008	316.1	$948.30
10/1/2008	10/31/2008	0	$0.00
9/1/2008	9/30/2008	0	$0.00
8/1/2008	8/31/2008	0	$0.00
7/1/2008	7/31/2008	0	$0.00
6/1/2008	6/30/2008	428.6	$1,071.07
5/1/2008	5/31/2008	0	$0.00
4/1/2008	4/30/2008	0	$0.00
3/1/2008	3/31/2008	550	$1,374.45
2/1/2008	2/29/2008	0	$0.00
1/1/2008	1/31/2008	500	$1,249.50
12/1/2007	12/31/2007	0	$0.00
11/1/2007	11/30/2007	276.5	$690.97
10/1/2007	10/31/2007	750	$1,908.68
9/1/2007	9/30/2007	0	$0.00
8/1/2007	8/31/2007	0	$0.00
7/1/2007	7/31/2007	0	$0.00
6/1/2007	6/30/2007	0	$0.00
5/1/2007	5/31/2007	0	$0.00
4/1/2007	4/30/2007	0	$0.00
3/1/2007	3/31/2007	0	$0.00
2/1/2007	2/28/2007	467.4	$986.17
1/1/2007	1/31/2007	0	$0.00
12/1/2005	12/31/2005	546.5	$1,115.00
11/1/2005	11/30/2005	0	$0.00
10/1/2005	10/31/2005	0	$0.00
9/1/2005	9/30/2005	0	$0.00
8/1/2005	8/31/2005	0	$0.00
7/1/2005	7/31/2005	0	$0.00
6/1/2005	6/30/2005	0	$0.00
5/1/2005	5/31/2005	0	$0.00
4/1/2005	4/30/2005	225.9	$329.00
3/1/2005	3/31/2005	201.2	$292.00
2/1/2005	2/28/2005	457.1	$666.00
1/1/2005	1/31/2005	238.5	$347.00

*Note: The presented data was extrapolated from energy information entered into the EPA's Portfolio Manager.

Name of Building	Energy Use (MMBtu)	Energy %	CO2 emissions (tons)[1]	CO2 %	Energy Cost (US$)	Energy Cost %
Town Hall/Fire Station	290	20	26	20	5,575	23

Source: Cool Monadnock inventory, 2008

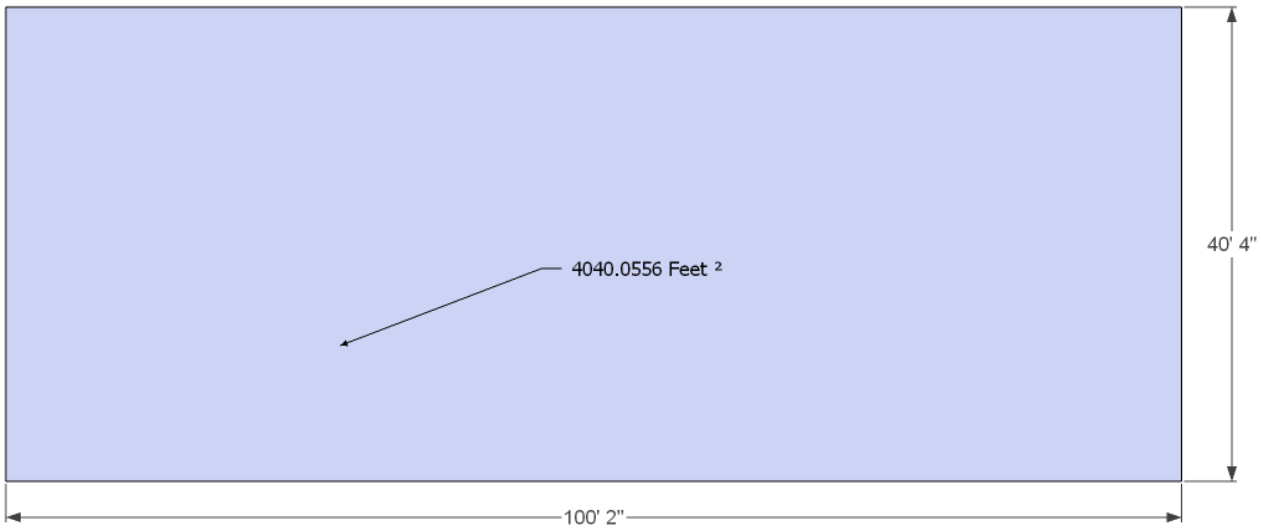
Name of Building	Type(s) heating fuel used	Area (Sq. Ft.)	Site energy intensity (kBtu/sq ft)[2]	Average Site kBtu/sq ft for building type	Source energy intensity (kBtu/sq ft)[3]	Average source kBtu/sq. ft for building type
Town Hall/Fire Station	#2	4,000	73	52	106	102

* The above charts were extrapolated from the Alstead Municipal Greenhouse Gas and Energy Use Baseline Report, originally generated under the Cool Monadnock Project. Energy intensity data generated by EPA Portfolio Manager Program.

[1] Carbon emissions on the EPA Portfolio Manager software are measured as carbon dioxide emissions only and do not include equivalents for other types of greenhouse gas emissions.
[2] Site energy intensity = amount of energy expended per square foot *on site* to heat, cool, and electrify the area. This measure relates to how much is being used on site and fluctuates directly with how much lighting is being used, how thermostats are kept, etc.
[3] Source energy intensity = amount of energy expended per square foot based on the source of energy (hydropower, nuclear, coal, fuel oil, etc) and the efficiency of that fuel type.

Building Description:

The Fire Station/ Town Hall is a steel framed building, slab on grade. It has a brick façade, with corrugated metal siding on the rear gable, south and north sides. Half the building is part of the Fire Department, the other is a town meeting hall.



Floors:

The building sits on an uninsulated concrete slab. As concrete has little to no insulation qualities, there is a considerable amount of heat-loss coming from this slab as seen in figure 1.

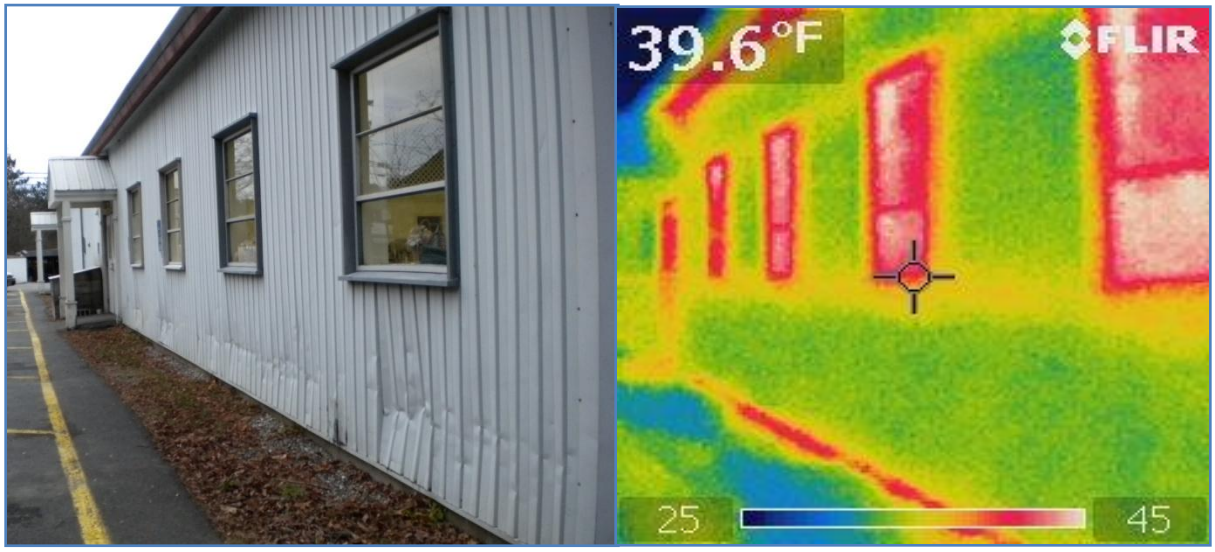


Figure 1

Recommendation:

Unfortunately, it would take a great deal of effort slow the heat-loss from the floor. The most effective way would be to put down rigid foam board on the concrete, and install a new floor system on top of this. Though this would produce long term savings, it would be expensive, and would likely have to be part of a major renovation of the building focused on long term conservation goals of the community. We would strongly recommend this project only if it coincided with further insulating the whole building, with walls and ceilings being the priority.

Exterior Walls:

The exterior walls have wood framing that rises about 8 feet from the floor as seen in figure 2. There is a drywall finish, but no insulation in the wall cavities. It appears that these walls were built to house the windows and doors. Behind these walls, and in the section above, there is about 2 inches if fiberglass insulation which sits against the corrugated metal siding. This insulation may be serving as an R-8 thermal boundary where it is not being compressed between the steel frame and corrugated siding. Where it is compressed, there is very little R-value at all.

Figure 2

Figures 3 and 4 show the amount and location of much of the buildings heat-loss from the exterior. What is seen is a considerable amount of heat-loss coming from the siding in general, with particularly weak spots where there are metal framing members, and where the metal siding is attached.

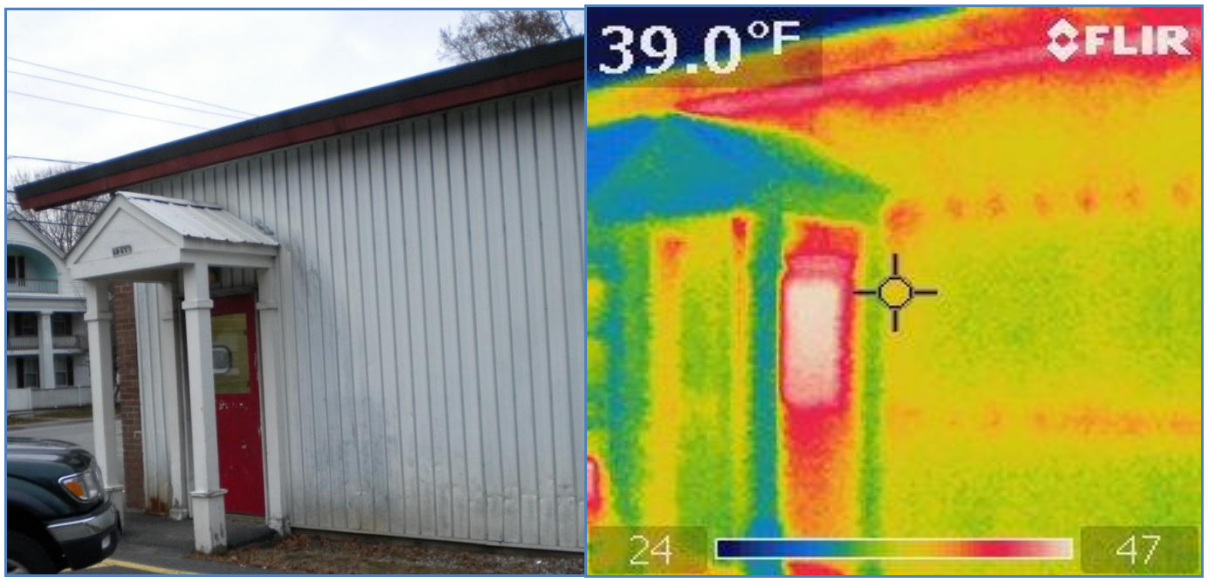


Figure 3

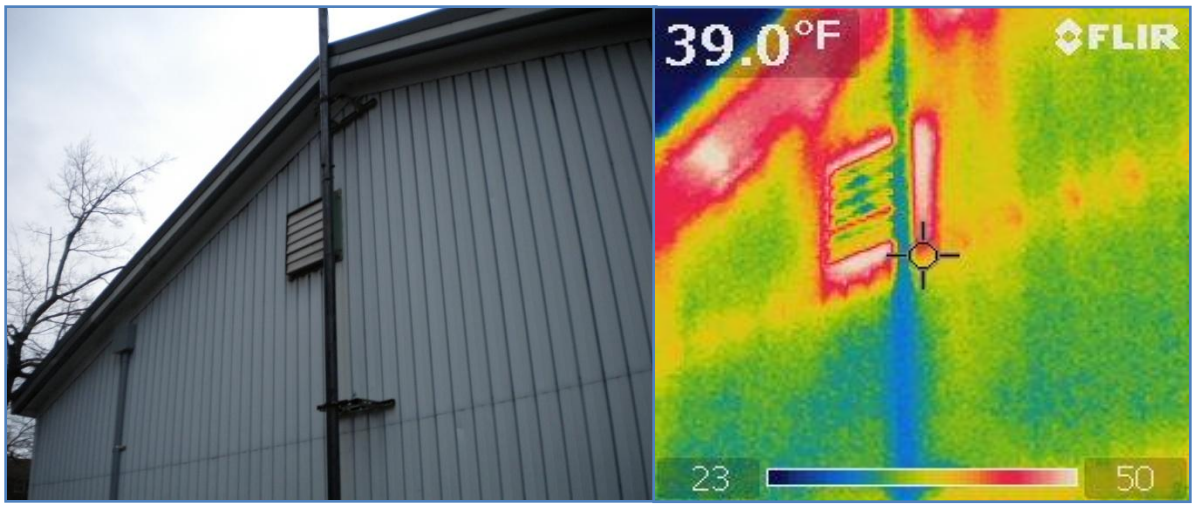


Figure 4

Recommendation:

There are several ways to improve this, and it may be very difficult to decide which is the most appropriate.

Air sealing and insulation can be done in a single step with spray foam insulation. This would likely require taking down the finished wall, removing the fiberglass, and spraying against the metal siding. If this were done, the investment would be married with the metal siding. Therefore, consideration to future renovations of the siding would be needed.

Another option would be to extend the wood framed wall up to the ceiling. The existing wall portion below could be filled with cellulose. The metal beam running along the tops of the walls could be sealed with spray foam, and a number of types of insulation could be used at that point before drywall is applied.

These, and other options, will be discussed upon presentation of this report.

Ceilings:

The ceilings also have a relatively thin layer of fiberglass insulation, corrugated roofing and 2 ½ inches of foam insulation above that. This ceiling, as seen in figure 5, likely has a weighted R-value of around 20.

One good aspect of this ceiling is that the majority of surface area is sealed fairly well. However, around all the eves there is a great deal of convective heat-loss. Also visible in the photo is an exhaust fan that is not sealed in the winter and serves as a large source of heat-loss.

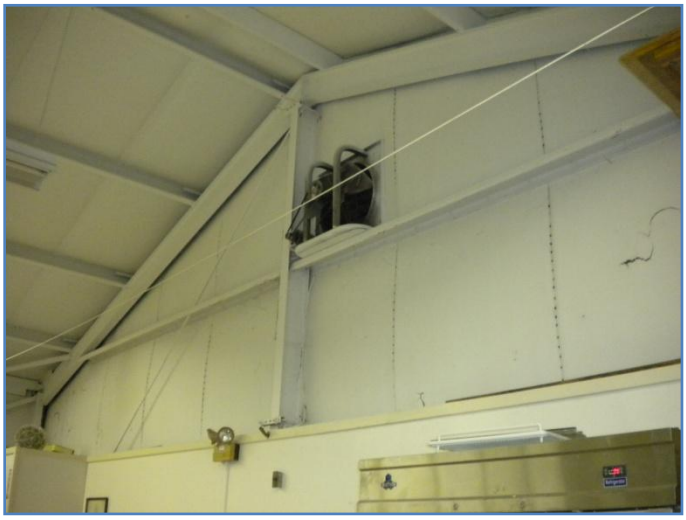


Figure 5

Recommendation:

Sealing around the eves, where the walls meet the roof structure, must be a priority. This could be done in several ways, and would be part of a greater effort to air seal and insulate the walls. Adding additional R-value to the ceiling would be effective, and the long term savings from this action would be substantial. This could be done in a number of ways. Removing the fiberglass and applying spray foam to the metal would likely produce the highest performance. The surface of the spray foam would be uneven, and appear to be bumpy compared to the smooth white

surface currently seen. A way to frame and finish the ceiling could be developed for a more finished look.

Doors and Windows:

Figure 6

The windows are metal, hollow core, single pane, and operable. Not only do they have little to no insulation value, but they serve as a large source of air leakage. Typically, replacing windows does not fall high on a list of recommendations; however in this case, it would be a significant benefit to replace these with more efficient units.

The one door we would recommend replacing in the near future would be the south entrance to the Fire Station. This door is very inefficient, in poor condition, and does not shut very well. The remaining doors could certainly be replaced with more efficient units, however, the greatest benefit would be realized if this were done along with making major improvements to the building envelope. In the interim, making sure that all the doors have a good seal when they are closed is very important. If any of the doors are to be replaced, select new doors that have a foam core, glazing portions that are double pane, Low-e, and gas filled.

Consider constructing a sealed entryway for the main doors to the meeting room. Every time the door opens, a considerable amount of the hot air produced is lost to the outdoors. Creating an insulated buffer zone between the indoors and the outdoors would not eliminate this loss of heat, but dramatically reduce it.

Mechanical:

The building is heated with an oil fired boiler that feeds hot water to two air handlers. One air handler supplies hot air through duct work to the meeting hall, the other to the fire station.

Recommendations:

With the building as is, there is little we would suggest to alter this system. The boiler is of good quality, and is running at about 86% efficient which is about as much efficiency as is possible with a boiler of this type. Installing a modulating aquastat, (outdoor reset) could certainly help gain some efficiency. This should cost about $300 to $500 to install and result in an efficiency gain of about 7 to 10%. Insulating all the copper pipes would also help the distribution of heat function more efficiently. Regularly changing the filters in the air handlers is a good way to maintain the designed efficiency of the system.

If the building were substantially air sealed and insulated, this heating system would be about twice as large as what would then be needed. The next logical step after building envelope improvements would be to look at more efficient ways of creating heat. How the current boiler functions is simple; it is either on or it is off. A modulating/condensing boiler has the ability to ramp-down its BTU output to accommodate the shoulder months when lower temperatures are needed to heat the building. With a non-modulating boiler you are unable to reduce the BTU output and therefore are operating less efficiently during those slightly warmer months. Even adding a modulating aquastat to the existing system would not match the efficiency of a modulating/condensing propone boiler.

Switching to LP gas may not reduce the cost per unit of fuel to heat the building at the current New Hampshire price for a gallon of propane. Nevertheless, the price of heating oil is predicted to increase over the next decade. The fuel cost comparison is difficult to predict, but switching to a high-efficiency propane system would dramatically reduce the environmental impact of heating the building and allow for a more flexible integration of future heating options and technologies. By using a high-efficiency LP system, it is possible to reduce annual CO^2 emissions by substantial amounts per year, as LP gas burns cleaner than oil and produces less particulate matter.

If the building shell was substantially improved, it may be necessary to introduce fresh air mechanically. The best way of doing this would be to install an Energy Recovery Ventilation System (ERV). With much of the necessary duct work already in place, the cost of installing this equipment would be relatively small; about $1,500.00.

Energy recovery ventilation systems are the most efficient way of supplying fresh air to a building. These function by removing a percentage of the stale air from the return plenum, and then introducing charged, fresh air to the return plenum right before the air-handler. In the winter, warm/stale air being removed from the building will charge the incoming fresh air with a heat exchanger located inside the ERV. Conversely, in the summer months the exhausted cool/stale air from the interior will cool down the hot/humid air from the exterior before entering the air-handler. An ERV has a desiccant wheel as well. This allows for the transfer of moisture. In the winter months, moisture in the exhaust air will be transferred to the incoming dry air to help maintain occupancy comfort. In the summer, dry/conditioned air from the interior will remove, at least a portion of, the moisture from the humid incoming air - see Figure 7.

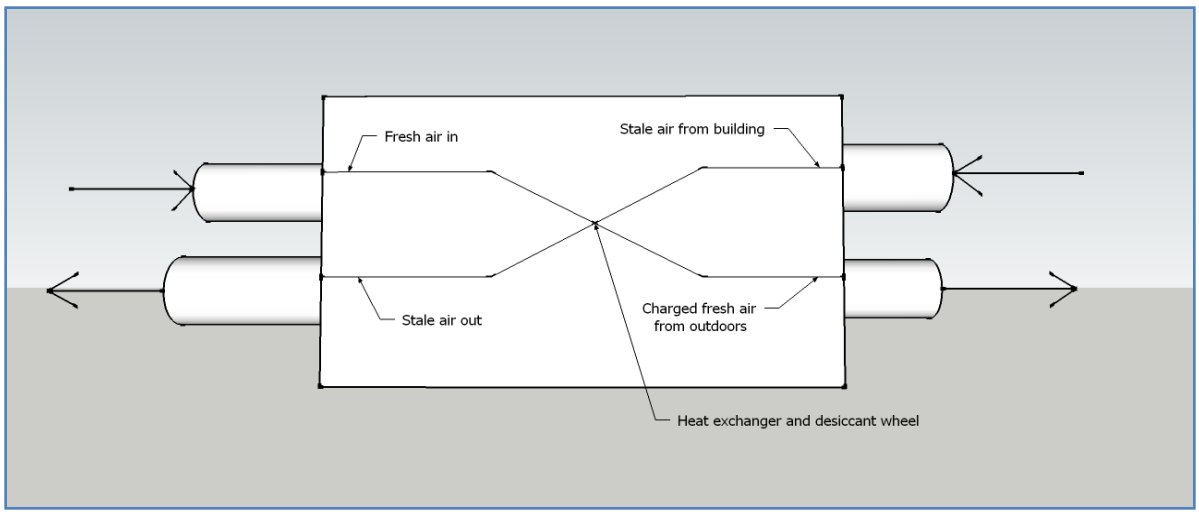


Figure 7

Electric Usage:

A large source of electrical inefficiency in this building is the lighting. We counted 40 – 4 foot T12 florescent tubes in the Meeting Hall, and 41 in the Fire Station.

We also found an old and relatively inefficient refrigerator in the Fire Station office which is also contributing a considerable amount to the electric bill. The efficiency of some of the larger refrigeration equipment in the meeting hall is not known.

Recommendation:

Consult with a lighting specialist, or with an electrician whose focuses on efficiency, to determine the best options for lighting upgrades. A well planned lighting upgrade, the replacement of inefficient equipment such as refrigeration units, and general conservation measures would likely reduce the electrical demand of this facility by as much as 30%. National Grid may have programs to support these upgrades and should be accessed for guidance and potential rebates – currently there are no specific programs listed on the National Grid website, but program expansion is possible.

Envelope Efficiency:

The single largest area for improvement in building efficiency involves the building envelope. The best ways to increase an envelope's performance is to complete air-sealing and insulation work. Although it would be a major undertaking to air-seal and insulate the building, the resulting benefit would be equally significant.

From a building efficiency standpoint, air-sealing and insulating can be thought of as a different species of project and investment when compared to items like heat systems, appliances, and alternative energy systems. In the case of the latter, these types of energy investments have a

shelf life. A boiler may only last 20 years, or 40 years before possibly needing to replace a PV array, but building envelope efficiency has a lasting positive impact long after equipment needs to be replaced. This is an important consideration when factoring in the true life cycle cost of the implemented solution.

Insulation and other building envelope projects are investments that are permanent, require little or no active maintenance, and will stand with the building during its lifetime. These investments secure baseline improvements that in turn provide a foundation for other investments. Lowering the amount of heat needed for a building is the best way to insure that a new and efficient heating plant provides the most savings.

Blower Door Test Results:

CFM50 = 9920 (the amount of air infiltration measured in cubic feet per minute while the building was under un-natural negative pressures)

ACH50 Pa = 9.9 (9920 divided by the building's volume)

CFM50/ft² = 2.5 (9920 divided by the square footage of floor space)

MLR = 1.27 (9920 divided by the square of all the surface space of the building envelope; floors, walls and ceiling)

This is baseline data that will not only help track improvements to the building envelope, but also help us create a baseline energy model of the structure. CFM50 is the standard measure of air infiltration which needs to be reduced. The following figures help normalize the data in a way that is useful to compare with other buildings.

What these figures show is that considerable improvements can be made to the structure in regards to air leakage.

Summary of Recommendations:

1. Building Envelope:
    - There are significant opportunities for improving the building envelope. Some of the recommendations in this report would require a large amount of renovation work. This type of building is not well suited for New England winters, but could be transformed accordingly. The first step to improving the building envelope is reducing the amount of convective heat-loss. That is, air flowing in and out of the building. After this has been dealt with, increasing the R-value with more insulation would be the next step. In some circumstances, as with the use of spray

foam, air sealing and insulation happen in one step. As mentioned earlier in this report, there are several ways to go about transforming this building. It will up to the Town, with the community's goals for this building in mind, to determine what the most appropriate path is. SDES can assist in the decision making process, and will be able to discuss the different air seal and insulation methods in greater detail during the presentation of this report.

2. Windows and Doors:
    - Replace the old inefficient windows and doors. This action by itself would reduce energy consumption in the building. However, the effectiveness of a project like this would be much greater with an air seal and insulation upgrade to the building envelope.

3. Mechanical:
    - Insulate all the pipes in the mechanical system.
    - Install a modulating aquastat (outdoor reset).
    - Consider upgrading to a smaller high-efficiency boiler after the air sealing and insulation recommendations are carried out.

4. Electric use:
    - Consult with a lighting specialist to develop a lighting upgrade project. Look towards the highest efficiency florescent and LED options.
    - When replacing any equipment, always look for the most efficient products on the market. Spending a little more upfront will certainly pay in the long run.
    - We would also recommend a further investigation into the feasibility of installing a photovoltaic system onsite. After the electrical consumption is better controlled through conservation and efficiency, onsite production of electricity is always a great option.

Financial Considerations and Options:

A common occurrence across many communities within New Hampshire is the challenge of obtaining the necessary capital funds to carry out the recommended retrofits found within the audit. The following information is an attempt to provide some assistance with understanding some concepts and pathways to acquiring public or private funds to carry out an energy efficiency or generation project. Also, portions of the following information have been taken from the New Hampshire Handbook on Energy Efficiency and Climate Change – Volume II.

Life Cycle Costing –

The National Institute of Standards and Technology (NIST) Handbook 135, 1995 edition, defines Life Cycle Cost as "the total discounted dollar cost of owning, operating, maintaining, and disposing of a building or a building system" over a period of time. Life Cycle Cost Analysis is

an economic evaluation technique that determines the total cost of owning and operating a facility over period of time.

Since municipal buildings are funded in their initial year through bonds and/or capital outlays, they generally fall victim to an inordinate focus on the bottom line cost of construction instead of the lifetime cost to operate the building. This is a critical misstep in particular with energy concerns for municipal buildings because they are placed in service for a significant period and are subject to extended energy pricing. A more efficient building could save the costs of initial investments several times over during its lifespan.

Energy Price Stability –

The second most important concern about energy costs is the volatility. Municipalities budget on a yearly cycle and must predict energy costs over the year – sometimes over pricing the cost in the case of high lock in prices or subjecting the municipality to risk where a cost (+ some percentage) contract is used for the year. When prices go up budgets go up, when the go down, budgets tend to go down. Changes result is wide variation in predictability and thus lead to fund shortages or balances, and general frustration on all sides of the discussion.

The concept of stability in the context of energy prices is achieved through on-site distributed generation with effective predictive modeling and most importantly, efficiency. The cheapest energy available is the energy you don't need. The less you buy the less amount of appropriations are subject to the price swings.

"Green" Building Cost Myths –

A perception that all energy-efficient construction costs more than conventional construction persists. We have been unable to find valid research that supports this conclusion - especially where choices made about efficiency are evaluated in a realistic context considering the life cycle cost to operate the facility. To the contrary, we have found several sources, from government facility agencies, that show not only that in most cases costs are in fact lower but that any increased cost is almost immediately realized through lower operating expenses.

State Grant Program under American Recovery and Reinvestment Act (ARRA)

A significant opportunity that the town should consider looking into that is coming up very shortly is opportunities to acquire funding through the New Hampshire Office of Energy and Planning (OEP) The following information can be found on the OEP's website at the following link - http://www.nh.gov/oep/recovery/news/122309.htm#sa1. The site discusses the announcement of available funding to municipalities under the Energy Efficiency and Conservation Block Grant program.

> The New Hampshire Office of Energy and Planning (OEP) announces the availability of $6.6 million through the Energy Efficiency and Conservation Block Grant (EECBG) program. This grant program will fund projects that reduce energy use and fossil fuel

emissions, and improve energy efficiency. OEP is currently targeting the following timetable:

- **Grant Application Released: January 8, 2010**
- **Intent to Bid Letter Due: January 15, 2010**
- **Applications Due: February 15, 2010**
- **Grants Awarded: March 10, 2010**

In conjunction with the January 8, 2010 release of the EECBG Subgrant Application, OEP will also release a program guidance document and guidelines for the format of the "Intent to Bid" submission. EECBG will entail a competitive application process and funds will be awarded based on the value of the project and the benefit to the public. Selection criteria include, but are not limited to, projected energy savings, greenhouse gas emission reductions, and the ability to implement projects expeditiously. Eligible applicants are local governments and local government partnerships.

Eligible uses of this funding include projects such as: energy efficiency retrofits; energy audits; transportation efficiency measures; solid waste/wastewater treatment; energy distribution technologies; financial incentive programs; and renewable energy technologies for local government buildings. Each community will be eligible to receive funding up to 100% of the project cost with a limit of $400,000 per applicant.

For more information please contact Dari Sassan, (603) 271-1765, or visit the EECBG Web site.

Additionally, a terrific resource to understand what type of incentives are available for both energy efficiency and generation is the "Database of State Incentives for Renewables & Efficiency", or DSIRE. This site, funded by the US Department of Energy, provides a list of the potential financial incentives found within New Hampshire and the Federal Government. To see what is available within New Hampshire go to www.dsireusa.org and click on New Hampshire.

Utility Programs:

Currently, National Grid does not offer financial incentives/finance options to its municipal customers in NH. Although we hope that this changes in the future, we suggest contacting the utility directly to request support and to learn of any updates to their program offerings.

Third-Party Financing Options

The most important part to understanding the potential in third-party is the ability to address up front capital costs and access tax benefits. Additional benefits are potential operations and maintenance savings where the implementation is owned by a third-party. In the three-party model, new businesses create an income stream and take over the insurance, performance assurance, and maintenance of the renewable energy system. New jobs and local investment

follow. The business secures stable and long-term funding enabling expansion to other facilities for similar projects.

There are several benefits that appear for the municipality that is considering a third-party financing strategy.

Ability to Monetize Federal Tax Incentives. Federal tax incentives for some projects can equal 30% of the installed capital cost. Under the current law, this 30% is payable in the form of a grant from the Department of Treasury. In addition, businesses can accelerate the depreciation of the cost of some systems and installations using a five-year schedule. Together, these two incentives can have a tremendous impact on both the cost of and the financial returns on a project. Local governments, however, cannot directly benefit from these incentives. The third-party ownership model introduces a taxable entity into the structure that can benefit from the federal tax incentives, lowering the overall cost to the non-taxable entity.

*Low/No Up-front Cost*s. Even with programs to provide support to municipalities, such as rebates and grants, the need to reduce this amount, the up-front cost is significant. Given the current economy and budget constraints, a large initial investment is difficult to achieve regardless of the return on the investment. A third-party structure places the responsibility of the increased initial cost on to the investor/developer of the project.
Predetermined Energy Pricing. In a project that involves efficiency or distributed generation, the portion of conservation or generation that is met by the project can be considered "fixed" at a particular price in the terms of the contract. This can be in the form of a fixed-priced power purchase agreement (with a predetermined escalation rate).
This predictability offers stable pricing for the portion of the entity's load served by the project. In most cases, the price of electricity in power purchase agreement is usually set at or below the customer's current retail rate for the first year, and then escalates annually for term of the contract (in a solar PPA, these terms are usually 20 – 25 years). For solar projects, an annual price escalator of 3-3.5% is common.

Operations and Maintenance. Another attractive feature of the third-party ownership structure is the fact that new equipment can result in lower operation and maintenance expenses and in the case of some systems, the entire cost and responsibility can shift to the project developer.

Eventual Ownership. As a final issue, third-party structures can be pre-crafted to permit and even encourage local government buyout provisions. This allows the municipality to consider advanced purchase options if circumstances change in a way that makes this pathway more beneficial. If for instance a grant program becomes available, such funds can be used to accelerate the ownership path and provide for a more immediate "vesting" of full savings opportunities.

Otherwise, these arrangements usually provide for a number of options at the end of the term, the three likely scenarios for the host would be to: 1) extend the arrangement, 2) purchase the facility, or 3) ask that the improvements be removed.

Conclusion:

As a result of this audit, the Town has several options available to increase the efficiency of the Fire Station/Meeting Hall. We highly encourage the that the Town pursue these recommendations described in this report and to utilize the further assistance provided under this program to help develop plans for implementation – including possible identification of contractors who will provide the services needed to carry out the recommendations. SDES Group will provide the Town an additional twenty-five hours of Community Energy Advocate service to assist with further efforts under the MEAP program in an effort to bring the recommendations outlined in the report to fruition. A further explanation of these additional services will be provided during the audit presentation.