The New Hampshire Municipal Energy Assistance Program

Decision Grade Audit Report

Frost Free Library
28 Jaffrey Road Dublin, NH

Prepared for:

Town of Marlborough, NH

Prepared by:

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Clean Air Cool Planet

Sustainable Energy Resource Group
Efficiency Makes Sense

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1/10/10

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 Marlborough 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 and volunteers. We are grateful for the time provided to us by the Town of Marlborough, without which this report would not be as thorough as it is.

For questions regarding this report, please contact:

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Introduction:

MEAP partners are pleased to provide this Decision-Grade Audit Report for the Town of Marlborough and the Frost Free Library (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 in the facility and examples that illustrate recommended building alterations and improvements that can reduce energy costs and the building's natural resource 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. These funds 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 30th, 2009 Tobias Marquette of SDES Group toured the Marlborough Fire Station, and the Frost Free Library. According to the Town's 2005 Inventory Report, and to data directly retrieved from the Town's Portfolio Manager account, the Fire Station is about 60% larger than the library, however, the library uses slightly more oil and electricity. After visiting both facilities, we discovered ample opportunity to increase energy efficiency at the Library, and decided then that the Library would be most appropriate to receive the audit.

Energy Data Collection:

The inventory process provided 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 an initial walk-through at an additional building to view the building characteristics and make the appropriate selection thereof. The remainder of this report will further explain those building characteristics found at the Frost Free Library.

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

2005 - $0.16/kwh **2008** - $0.16/kwh

As the average shows, the price for your electricity has stayed the same over the two comparative years.

Thermal:

Unfortunately, no prices for the fuel oil have been entered, making it a challenge to evaluate. It is known, however, that heating oil can have significant fluctuations in pricing and is a volatile fuel when attempting to budget energy costs for a facility, not to mention the significant emissions generated from an oil fuel source.

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

Building: Marlborough Frost Free Library
Fuel Type: Electricity, Grid Purchase (kWh (thousand
Space(s): Frost Free Library

Start Date	End Date	Energy Use	Cost - US Dollars
12/1/2008	12/31/2008	1,152.00	$170.83
11/1/2008	11/30/2008	1,116.00	$192.00
10/1/2008	10/31/2008	840	$136.68
9/1/2008	9/30/2008	684	$114.81
8/1/2008	8/31/2008	840	$141.46
7/1/2008	7/31/2008	744	$128.98
6/1/2008	6/30/2008	804	$122.64
5/1/2008	5/31/2008	804	$130.45
4/1/2008	4/30/2008	1,032.00	$163.26
3/1/2008	3/31/2008	1,104.00	$174.88
2/1/2008	2/29/2008	1,236.00	$190.74
1/1/2008	1/31/2008	1,116.00	$170.19
12/1/2005	12/31/2005	1,092.00	$160.71
11/1/2005	11/30/2005	1,044.00	$183.55
10/1/2005	10/31/2005	972	$171.98
9/1/2005	9/30/2005	864	$150.09
8/1/2005	8/31/2005	780	$145.40
7/1/2005	7/31/2005	720	$123.05
6/1/2005	6/30/2005	828	$142.62
5/1/2005	5/31/2005	816	$128.26
4/1/2005	4/30/2005	936	$148.91
3/1/2005	3/31/2005	1,056.00	$153.27
2/1/2005	2/28/2005	1,212.00	$186.06
1/1/2005	1/31/2005	1,140.00	$154.57

Meter: fuel oil
Building: Marlborough Frost Free Library
Fuel Type: Fuel Oil (No. 2), No fuel generation method
Space(s): Entire Facility

Start Date	End Date	Energy	Cost - US
12/1/2008	12/31/2008	259.5	$0.00
11/1/2008	11/30/2008	119.9	$0.00
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	196.8	$0.00
5/1/2008	5/31/2008	0	$0.00
4/1/2008	4/30/2008	0	$0.00
3/1/2008	3/31/2008	329.2	$0.00
2/1/2008	2/29/2008	404.2	$0.00
1/1/2008	1/31/2008	282.8	$0.00
12/1/2005	12/31/2005	0	$0.00
11/1/2005	11/30/2005	218	$0.00
10/1/2005	10/31/2005	577	$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	0	$0.00
3/1/2005	3/31/2005	184	$0.00
2/1/2005	2/28/2005	476	$0.00
1/1/2005	1/31/2005	800	$0.00

Name of Building	Energy Use (MMBtu)	Energy %	CO2 emissions (tons)[1]	CO2 %	Energy Cost (US$)	Energy Cost %
Frost Free Library	355	23	31	23	1848	22

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
Frost Free Library	#2	2828	125	104	159	246

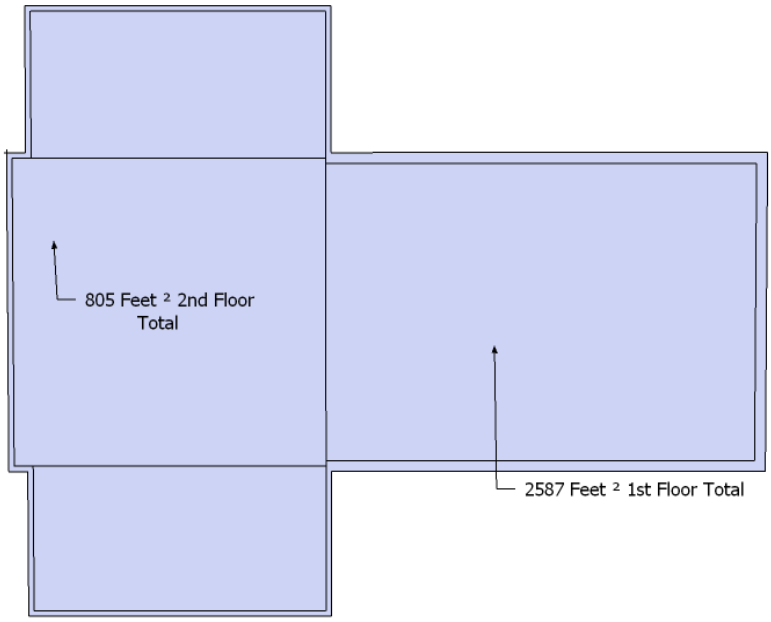
* The above charts were extrapolated from the Marlborough Municipal Greenhouse Gas and Energy Use Baseline Report, originally generated under the Cool Monadnock Project. Energy intensity data generated by EPA Portfolio Manager Program.

[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:

There are two sections of the Library. The first is the original library which was constructed in 1866. This building was constructed almost entirely out of granite.

The newer section of the building was constructed in 1967. This is a slab-on-grade building with 2x4 inch wood stud walls.



Foundations and Basement:

The newer section of the building sits on a slab of concrete, and there is a considerable amount of heat-loss that occurs through this slab. Unfortunately, it would take a great deal of effort to 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 be cost effective only if many other inefficient aspects of the building were dealt with first.

The older section of the building sits on a granite foundation; the floor which separates the basement from the first floor is also made of granite. These two features result in a fair portion of the building's heat-loss.

Insulating above this floor, as with the slab of the newer section, would be a large undertaking. However, it would be very effective, and allow for the historic granite floor to remain viewable from the basement.

Recommendation:

Insulating the floors of this building would be a costly project. This would, however, save a lot of money and carbon emissions over the long term. This is a recommendation that would require a large scale energy/historic renovation, and would coincide with other recommendations of better insulating the walls and ceilings. The feasibility of planning for and implementing a project like this would be completely dependent on the community's goals.

Exterior Walls:

The walls of the original building are constructed out of granite and appear to have wood studs supporting lath and plaster. The cavities between these studs are not insulated.
The walls of the newer section were constructed with 2x4 inch studs, and are insulated with R-11 fiberglass batts.

Recommendation:

Insulating the walls of the original section could be done in a number of ways. The simplest way is to blow cellulose insulation into the empty cavities; however, this would also be the least effective as three inches of cellulose will not provide a substantial R-value, weighted at around R-10. It may also be difficult to access all cavities.

A small renovation of the room would allow for the greatest opportunity for long term savings. Our first recommendation is to super-insulate the walls. This option would require removing the current wall finish, stand an additional 2x4 inch wall against the original, fill all cavities with insulation, put 1 inch of foam board against the new stud wall, seal all seams, and refinish the wall. All original trim could be reinstalled on the new surface. See figure 1 for an illustration of this option. This same option could be applied to the walls of the newer section for a similar result.

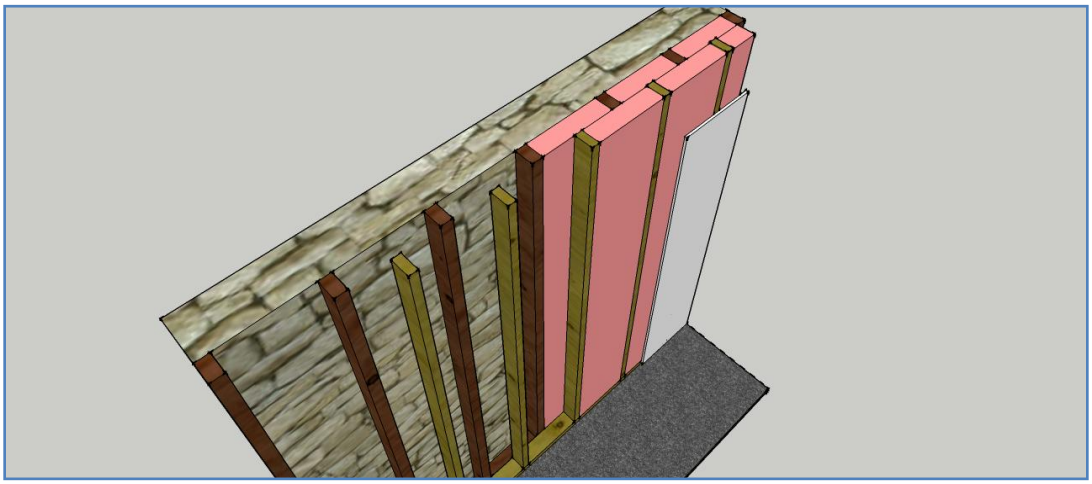


Figure 1

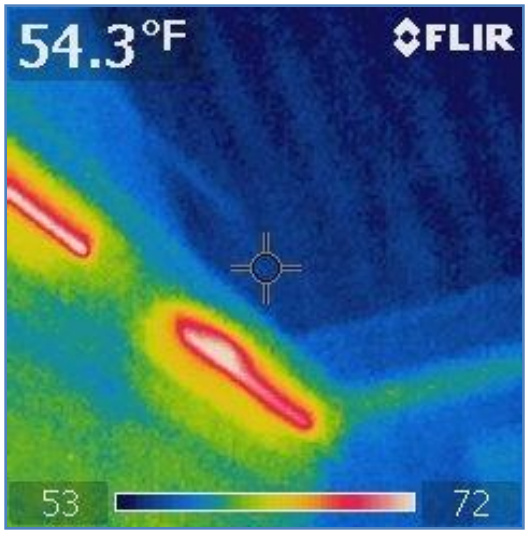


Figure 2

Ceilings:

The ceiling in the original section of the building is vaulted with wooden members to form an arch. Though there is no way of accessing this space, we have good reason, given the year that it was constructed and visuals from the IR camera, to believe that there is no insulation above this ceiling.

Above the second floor of the newer section, there is a suspended ceiling with fiberglass batts stapled to the collar ties. Other than the craft face, there is no air barrier. This is especially concerning because there are only supply air registers in this room. Without return air going back to the furnace, the room is pressurized, pushing the conditioned air out of the building. There is a large gable vent above the insulation, which is good for attic ventilation, however, this is allowing for greater ease of exit for the hot air. Because of all these factors, there is a considerable amount of convective heat-loss occurring from this space.

Figure 3

Recommendation:

Devise a plan for insulating the ceiling of the original building. This could possibly be done by drilling holes in the ceiling and blowing in loose fill insulation. It would be difficult to insure an even spread of the insulation. A borrow scope could be used for inspection, and an infrared camera could also assist in finding thin spots, if the work was done during a period of cold outdoor temperatures. All the holes would have to be patched, and the ceiling would need a fresh coat of paint.
If carefully done, it may be possible to staple a poly air barrier to the collar ties without removing the entire suspended ceiling. With this done, it would be beneficial to blow loose fill insulation on top of the fiberglass. The ductwork in this attic space would have to be air sealed and insulated first, making sure to pile loose fill insulation on top.

Doors and Windows:

Figure 4

There is only one door to the exterior of the original section. This is a double door built from wood, and has a lot of historic importance. If these are not to be replaced with more efficient replicas, it is very import to take very good care of these doors, and find unobtrusive ways of making sure they are sealed well.
On the inside of this door are wooden screen doors. Apparent in Figure 4, these doors are not in use during the colder months. Weather stripping these doors, and putting plastic over the screens could also be a good way of improving the performance of this egress during the winter.
There are two other doors which are not performing poorly, but as usual, carefully examining these doors for air leaks, and finding ways to keep a good seal is always important.

All of the windows of the original building are old single pane windows. While it is possible to get replacements which would look very similar to these originals, we understand that maintaining the historic features of this building is a priority. If the windows are not to be replaced, we would recommend sealing them as much as possible during the colder months. Any gap needing to be maintained for operability could be sealed temporarily with rope caulking.

Mechanical:

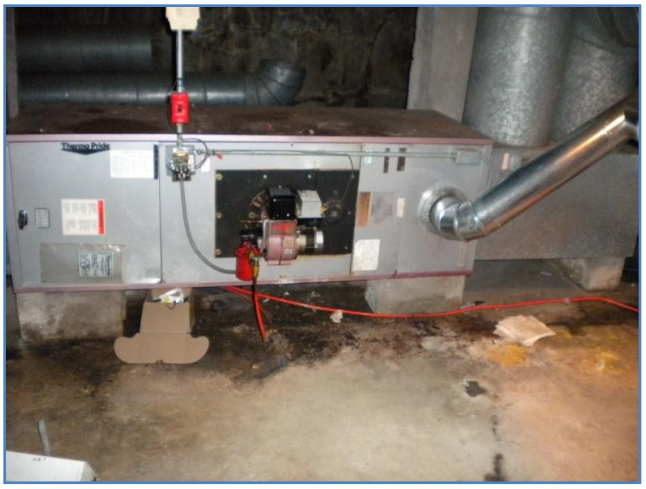


Figure 5

The building is heated with two oil fired furnaces that supply hot air to the building through a series of ducts. See Figure 5. One of the units supplies the original section of the building, but indirectly supplies the first floor of the newer section as both areas are open to each other.
A similar scenario is true for the other furnace. It has supply ducts with one return to the 1st floor of the new section, and supply only ducts to the 2nd floor. Both Furnaces are burning at about 80% efficiency according to their service tags. Relative to the various furnaces available on today's market, these furnaces do not function very efficiently.

None of the duct work in this building is sealed or insulated. This means that a good deal of the heat produced is lost before it gets to where it needs to be delivered.
These sections of duct work seen in Figure 6 are radiating heat in all directions because they are surrounded by cold granite. Furthermore, because they are not sealed, hot air is escaping into the basement.

Figure 6

Figure 7

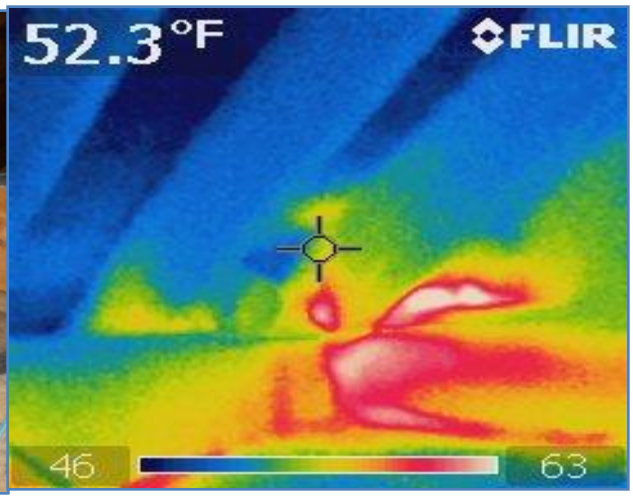


Figure 8

Figures 8 reveals duct work in the attic above the second floor that has been boxed in with pine. There is fiberglass insulation around the ducts, but as Figure 7 shows, fiberglass insulation does little to nothing for stopping air flow, and once again, hot air in the ducts is escaping before it reaches its intended destination.

Recommendation:

The easiest inefficiency to improve upon with the heating system is air sealing and insulating all duct work, even of it runs within the thermal boundary. This should be done by sealing all seams with mastic, and insulating with R-8 fiberglass duct insulation.
Find a route for a return duct from the second floor to the furnace. If properly designed and installed, it would allow for balanced pressure in the second floor, greatly reducing the amount of convective heat loss.

If the recommended air-seal and insulation work is completed, it may be necessary to provide fresh air to the building. A blower would determine how tight the building is as a result of the efficiency upgrades, if there is a need for fresh air, and how much air to introduce per hour. The most efficient way to provide fresh air in this case would be with an energy recovery ventilator (ERV). An ERV functions 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 9.

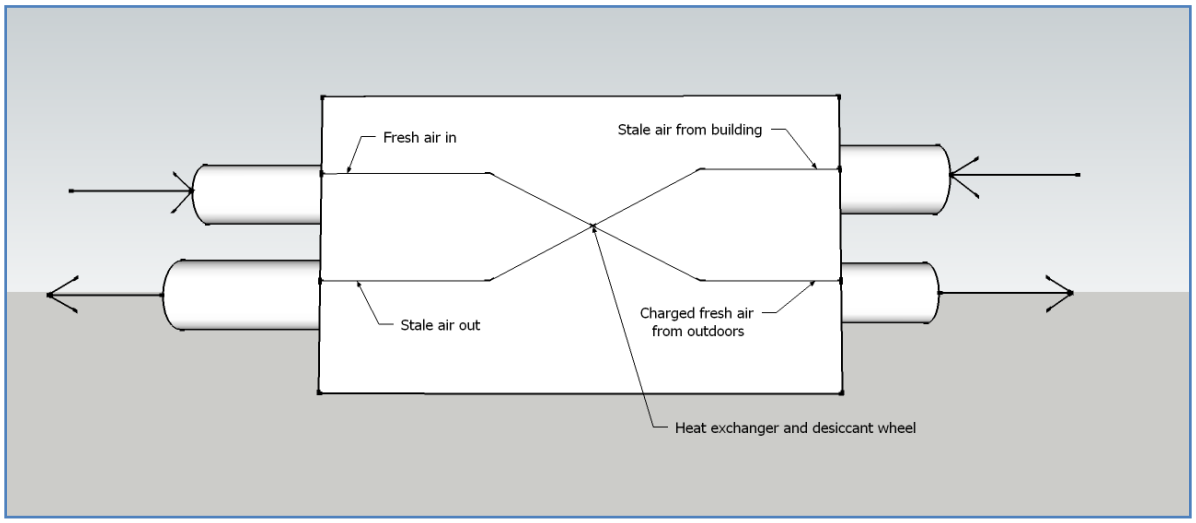


Figure 9

Blower Door Test Results:

- 4,725 - CFM50
- ACH50 Pa = 6.5
- CFM50/ft² = 1.4
- MLR = .51

Electric Usage:

The electric demand from this building is not very high, but there is always room for improvement. We would recommend contacting your utility to inquire about receive any current incentives and/or financial aid for implementing a lighting upgrade.
A couple pieces of electronics, like computer monitors, could be replaced with new/efficient units.
We would like to note that the Librarian seems to be very conscious of electrical usage, and is taking very thoughtful steps to reduce usage in the building.

Summary of Recommendations:

1. Insulate the walls and ceiling of the original building. Improve the thermal boundary above the second floor space. This would include putting a poly air barrier on the walls and ceilings of the storage closets on either side if the room. A better option for the closets would be to fasten rigid board insulation to the studs and rafters, making sure to seal all seams.

2. Air-seal and insulate all duct work. Install a return duct from the second floor to the corresponding furnace.
3. Take measures to improve the efficiency of the windows in the original building. Consider replacing them, or installing high-efficiency storm windows. Make efficiency improvements to the exterior door of the original building.
4. Upgrade to more efficient lighting, looking to the most efficient florescent and LED options.
5. After building envelope improvements are completed, consider replacing the current furnaces with high-efficiency propane furnaces.
6. Insulate the slab of the building. This would be a costly undertaking, but if done in conjunction with well insulated walls and ceilings, would help usher this building into the next generation of energy prices and environmental challenges.
7. Continually revisit the idea of incorporating alternative/renewable energy systems into the operation of this building, and other Town buildings. Such systems may include, but are not limited to, combined heat and power systems, photovoltaic solar panels, and biomass boilers.

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 and a PV system may only last 30 years before it is time to replace them, even with regular maintenance and care. 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.

We understand, and appreciate the historic character of the way in which this building was designed and constructed. The Town will have to consider this before making any alterations to original building materials. We recommend also weighing in the financial costs of keeping this building operable through rising energy prices, and rising carbon emissions.

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) announce 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:

Many utilities provide rebates for various types of efficiency measures that can be carried out at a municipal facility. PSNH offers the Municipal Smart Start Program. This program offers the opportunity for municipalities to go forward with the installation of approved measures at no up front cost to the municipality. A town simply pays for the energy improvements with the savings from reduced energy usage until the project is paid off.

For more information please contact Sue Blothenburg, (603) 357-7309 ext. 5115, or visit http://www.psnh.com/Business/Efficiency/Paysave.asp

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 Library. 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, and identify 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 any needed service under this audit to continue to bring the recommendations outlined in the report to fruition. A further explanation of these additional services will be provided during the audit presentation.