The New Hampshire Municipal Energy Assistance Program

Decision Grade Audit Report

Chesterfield Town Hall/Annex
520 Route 63Chesterfield, NH 03443

Prepared for:

Town of Chesterfield, NH

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Clean Air Cool Planet

Sustainable Energy Resource Group

Vital Communities

Carbon Solutions New England

This project is made possible with support from the New Hampshire Regional Greenhouse Gas Initiative

1/06/2010

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 Chesterfield 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 the Town of Chesterfield.

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 Chesterfield and the Town Hall/Annex building (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 December 2nd, 2009 Tobias Marquette of SDES Group toured the Chesterfield Town Hall/Annex and the Highway Garage. Of the two buildings, the Town Hall displayed the greatest potential for improvement. Also noting that the Town Hall has the second highest energy cost, carbon emissions, and site intensity, it was an obvious choice 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 below to show the witnessed use 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 Town Hall/Annex.

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 - $0.23/kwh **2008** - $0.24/kwh

Meter: Electricity			
Building: Chesterfield Town 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	612	$146.59
11/1/2008	11/30/2008	546	$186.19
10/1/2008	10/31/2008	318	$76.35
9/1/2008	9/30/2008	330	$66.33
8/1/2008	8/31/2008	270	$72.00
7/1/2008	7/31/2008	336	$94.80
6/1/2008	6/30/2008	318	$83.15
5/1/2008	5/31/2008	390	$97.86
4/1/2008	4/30/2008	528	$149.44
3/1/2008	3/31/2008	528	$91.35
2/1/2008	2/29/2008	690	$109.73
1/1/2008	1/31/2008	678	$136.11
11/3/2005	12/5/2005	546	$139.22
10/4/2005	11/3/2005	486	$155.98
9/2/2005	10/4/2005	300	$67.96
8/2/2005	9/2/2005	264	$61.81
7/6/2005	8/2/2005	228	$57.08
6/3/2005	7/6/2005	366	$79.65
5/4/2005	6/3/2005	324	$101.36
4/4/2005	5/4/2005	366	$94.70
3/3/2005	4/4/2005	552	$133.93
2/2/2005	3/3/2005	492	$91.98
1/4/2005	2/2/2005	588	$103.06
12/2/2004	1/4/2005	846	$149.81

This average is high for the area and it is recommended that the Town further investigate your electric rate with your utility and look for option to lower this rate.

Thermal:

Meter: Heat for Annex			
Fuel Type: Kerosene, No fuel generation method associated with fuel **Space(s):** Town Hall			
Start Date	**End Date**	**Energy Use**	**Cost - US Dollars**
1/1/2008	12/31/2008	0	$0.00
11/1/2005	11/30/2005	0	$0.00
10/1/2005	10/31/2005	104.8	$245.13
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	127.27	$209.86
3/1/2005	3/31/2005	336.6	$555.05
2/1/2005	2/28/2005	185.2	$305.39
1/1/2005	1/31/2005	346.4	$571.22
12/1/2004	12/31/2004	308.1	$508.06

Heat			
Building: Chesterfield Town Hall			
Fuel Type: Fuel Oil (No. 2), No fuel generation method associated **Space(s):** Town Hall			
Start Date	**End Date**	**Energy Use**	**Cost - US Dollars**
1/1/2008	12/31/2008	2,678.00	$8,477.00
11/1/2005	11/30/2005	103.6	$203.99
10/1/2005	10/31/2005	0	$0.00
9/1/2005	9/30/2005	162.1	$319.17
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	0	$0.00
2/1/2005	2/28/2005	315.5	$394.06
1/1/2005	1/31/2005	688.9	$860.56
12/1/2004	12/31/2004	0	$0.00

*Note: The above 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/Annex	393	21	30	19	5409	14

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/Annex	Oil	3000	129	77	144	182

* The above charts were extrapolated from the Chesterfield Municipal Greenhouse Gas and Energy Use Baseline Report

Building Description:

The original Town Hall was built in 1851, and is about 2114 square feet. There is an open space with a stage, one room for storage, and one turned into a boiler room. The annex portion of the building consists of several small wood framed additions, as well as a stone addition to the original structure. This space represents about 2377 ft² of the total 4492 ft².

[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.

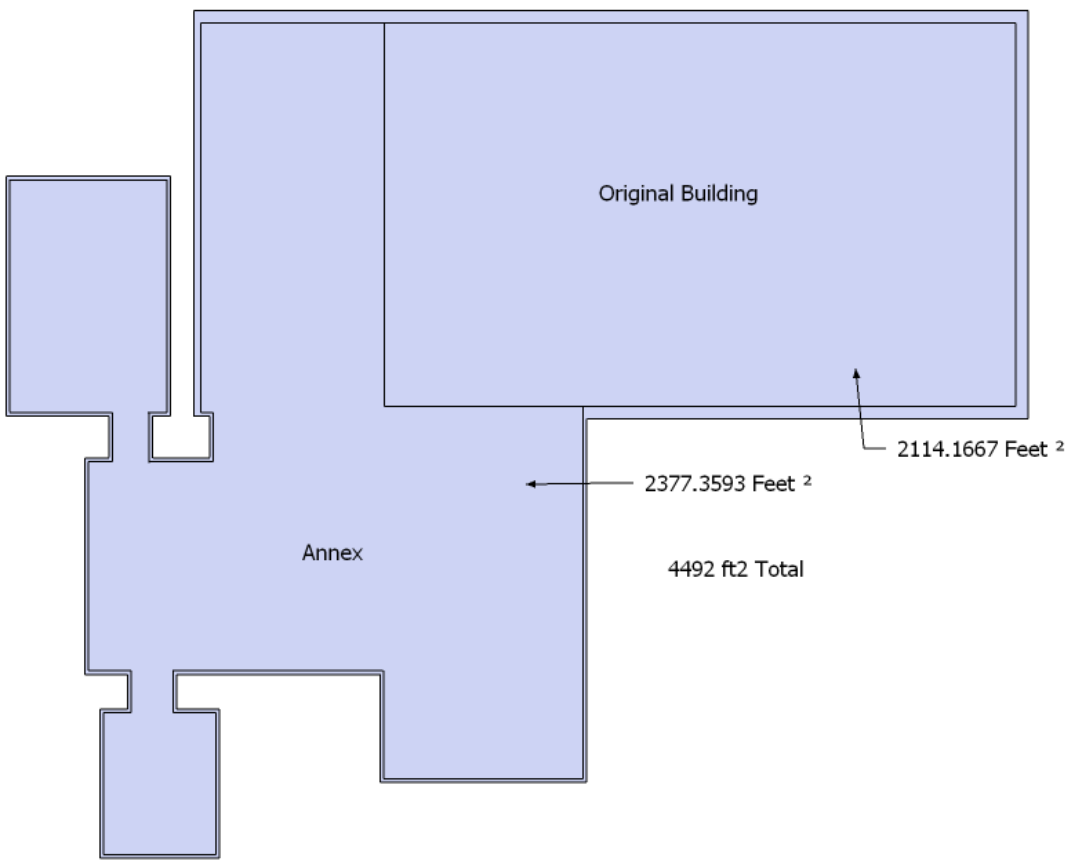
Original Building
2114.1667 Feet ²
2377.3593 Feet ²
Annex
4492 ft2 Total

Figure 1

Crawl Spaces:

All of the space in the building, Hall and additions, sit over crawl spaces. The Hall sits on a stone foundation and has ventilation holes in a few places along the perimeter to allow for air movement. There is no insulation below this space as seen in Figure 2.

Figure 2

The annex additions all sit on stone pilings. The space below is separated from the outdoors by ½ inch plywood. This skirt is well vented, either from gaps along the edge of the plywood, or from the vents seen here in Figure 3. Not only is this space in direct contact with outdoor air, but there is no insulation below these floors a seen in Figure 4. Also note the unsealed, uninsulated duct work. A tremendous amount of air infiltration and heat-loss is occurring through all the floors. Correcting this is paramount to reducing heating demand in the building.

Figure 3

Figure 4

Recommendation:

Air-seal and insulate the floors under all sections of the building. This would be best done with a closed-cell spray foam. We would recommend 4 inches of foam against the sub floor, with at least 1 inch of foam covering joists and beams.

Exterior Walls:

The walls of the Hall are stone with 3 inch studs on the interior, lath and plaster, with a drywall finish that was added at some point. The exterior wall cavities are empty.

Recommendation:

Insulate the walls of the Hall. This could be done in a number of ways. The simplest way is to blow cellulose insulation into the empty cavities. 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 would also be very difficult to access all cavities.

A small renovation of the room would allow for the greatest opportunity for long term savings. The radiators could be temporarily removed allowing for the removal of the drywall, lath and plaster. Several types of insulation could be used at this point, as well as a thermal break. This thermal break could be 1-2 inches of foam board fastened to the studs before sheetrock is reapplied. Another option would be to build a second wall, inside of the original, staggering the studs. This would allow for a healthy amount of insulation, while eliminating thermal bridging. See Figure 5 for an illustrated detail.

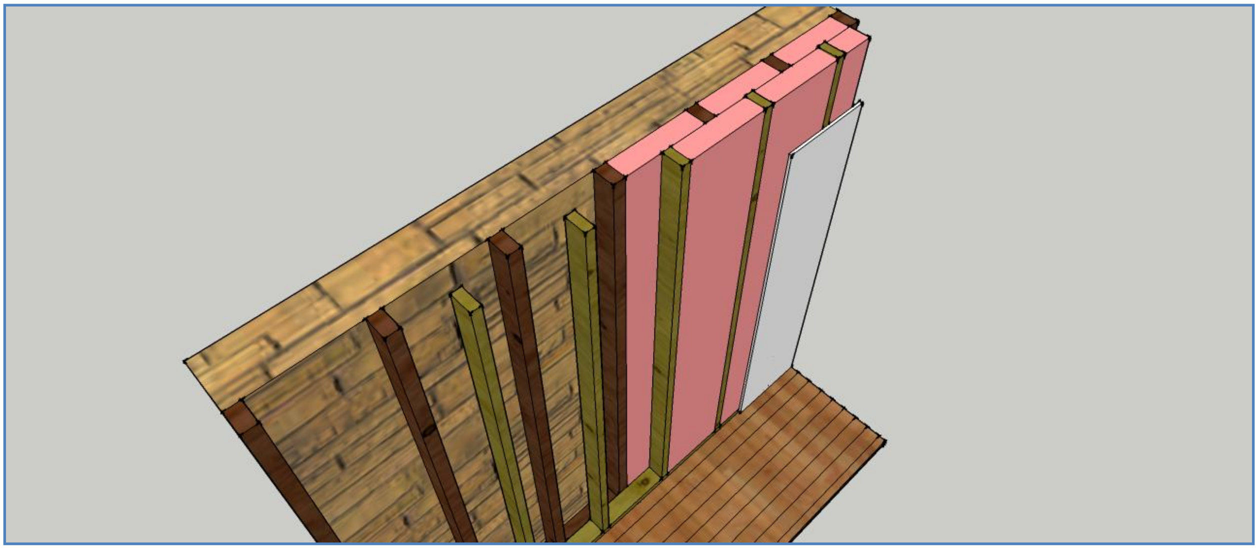

Figure 5

A further explanation of these options will be given upon presentation of this report.

The second exterior wall type, as found in the annex additions, where constructed with true 2x4 studs, and were not insulated in any of the examined areas.

Recommendation:

As recommended with the stone exterior walls, installing insulate in these walls would greatly improve the buildings energy efficiency. This again could be carried out in a number of ways with the easiest option being blown cellulose insulation into the empty cavities. It is, however, recommended that a strategy be developed similar to the one described for the stone Hall walls.

Ceilings:

The ceiling above the Hall has been insulated with loose fill insulation, and likely has a weighted R-value of between R-25 and R-30. See Figure 6. As not to disturb the insulation, we did not search for any major penetrations to the space below. High-efficiency, or super-insulation standards typically call for R-30 walls and R-60 ceilings. Searching for, and sealing any air leaks into the attic, and adding an additional 6-8 inches of insulation would help usher this building into the next generations of energy efficiency, while making the idea of one day heating this building with an alternative heating system a bit more achievable.

Figure 6

The stone/block addition to the original Hall has no insulation in the ceilings, and has many large penetrations from the conditioned space into the attic. See Figures 7-10.

Figure 8

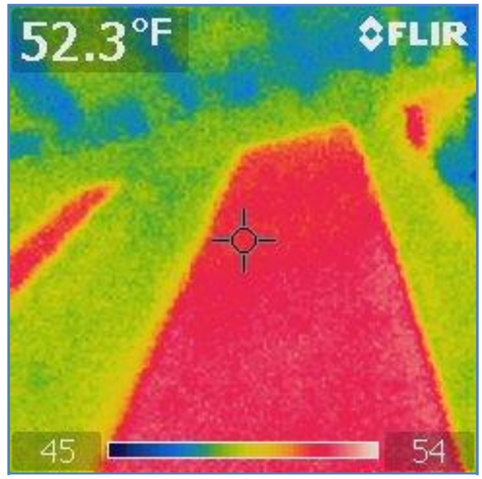

Figure 7

There is a ¼ inch gap along this corner where the drywall has not been finished.

Figure 9

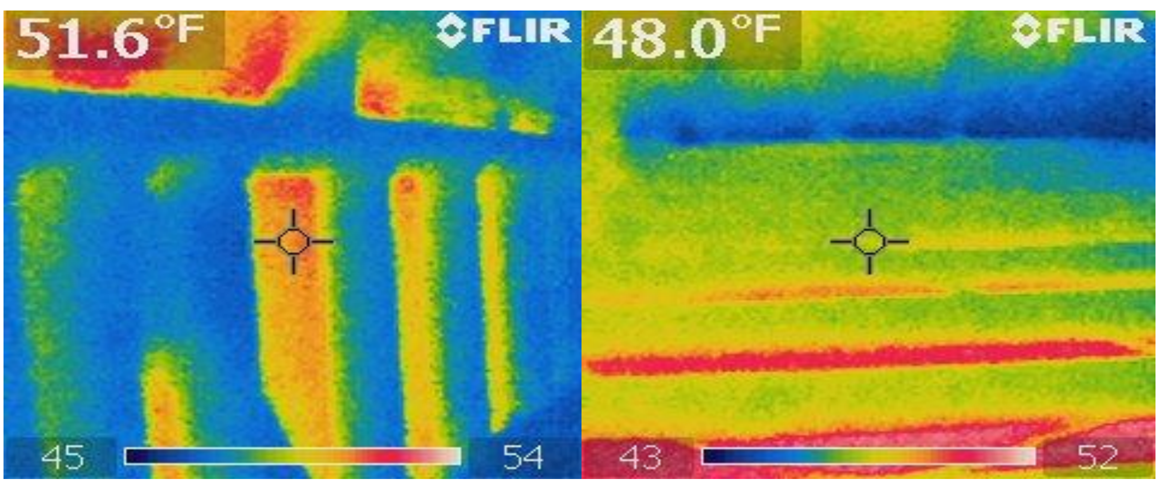

Figure 10

Some sections above the annex additions have a thin layer, about 1.5 inches, of fiberglass insulation. This insulation is so ineffective, that for measuring purposes, it should hardly be considered present. See Figures 11 and 12.

Figure 11

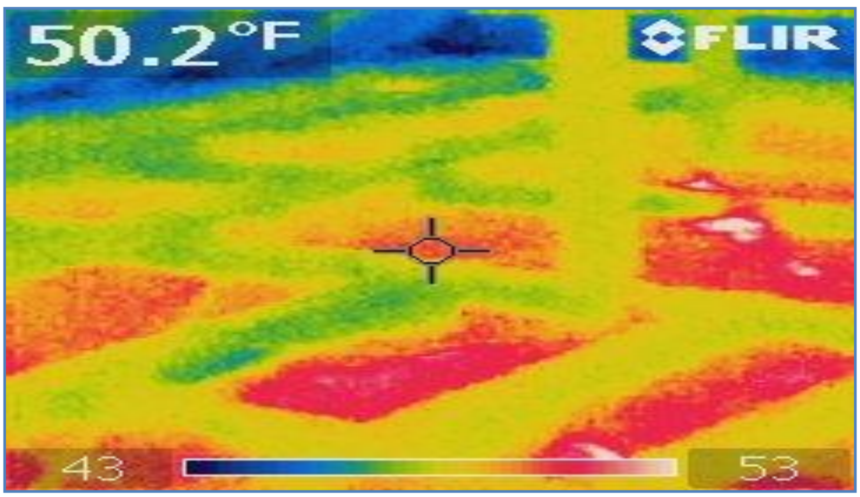

Figure 12

<u>Recommendation:</u>

Remove and dispose all of this old fiberglass insulation. Seal any penetrations to the spaces below. Blow loose fill insulation into all of the attic spaces to achieve an R-value of 30-60. It is very important to have adequate ventilation in the attic. Because of the slate roofs, and the amount of wind exposure on this site, there will most likely be no issues with moisture in the attic. Installing gable vents would be more than adequate if a change in moisture levels occurred from insulating.

Doors and Windows:

Figure 13

All of the windows in this 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.[4] The gaps visible in Figure 13 could be sealed temporarily with rope caulking. Also visible in this photo are wood frames with screens. Other windows of the building had wood frames with glass which were in disrepair. Wood frames with glass, such as this, could be crafted and screwed/sealed to the exterior during the cold months. A less attractive option would be to plastic the windows during heating months. In any case, more could be done to preserve these windows, while saving on energy cost.

There are four main doors in this building, one door not in use. The double doors on the front of the Hall are not sealed well at all. Day light is clearly visible when standing in the entry. The other doors are sealed a bit better, but could use some attention to achieve the most efficiency available. While replacing these doors is not on the top of our list of recommendations, devising non-intrusive ways to air-seal the doors is.

Mechanical:

(Boiler room)

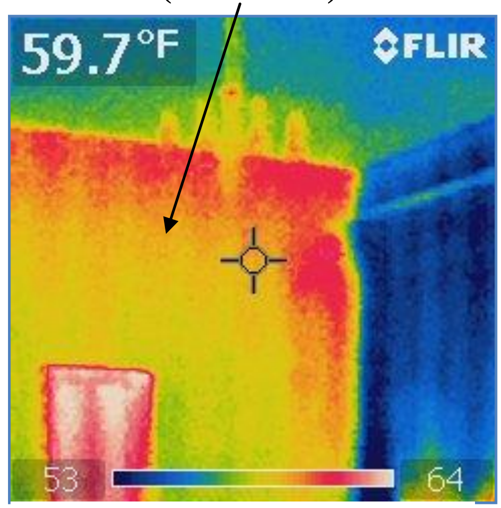

Figure 14

There are two heating systems in this building. The first is an oil boiler that heats only the original Hall. This supplies hot water to radiators which run along either side of the main room. This boiler is fairly old, and is very inefficient to today's standards. The pipes which run to the radiators are sparsely insulated, and rather inadequately so where present. We have strong reason to believe that this boiler is grossly oversized, even for a mostly uninsulated building. An accurate heat-loss study of current conditions would be needed to determine this. Figure 14 displays the amount of inefficiency produced by this boiler, as much of the BTU's generated are lost from the boiler room itself.

[4] For information on how to address attempting to incorporate energy efficiency measures into historic structures while retaining the historic value of the building please see the Clean Air – Cool Planet publication "*Energy Efficiency, Renewable Energy and Historic Preservation: A Guide for Historic District Commissions*".

The radiators themselves are not the most efficient heat distribution system available and could be replaced with new panel radiators. With an improved building envelope, panel radiators could run at lower temperatures during the shoulder months reducing the overall heat demand and amount of fuel needed to meet that demand.

The annex additions are heated with a large furnace which supplies hot air through a series of ducts. This furnace is very old, and very inefficient. However, the greatest aspect of inefficiency is not the furnace itself, but the fact that none of the duct work is air- sealed/ insulated, and is running outside of what little thermal boundary there is. (Refer back to Figure 4 of this report for the first example of this.) The section of duct work seen in Figure 4 is completely exposed to ambient conditions. Figures 15 and 16 show a supply duct running through attic space. Figure 17 shows duct work running completely outside the building.

Figure 15

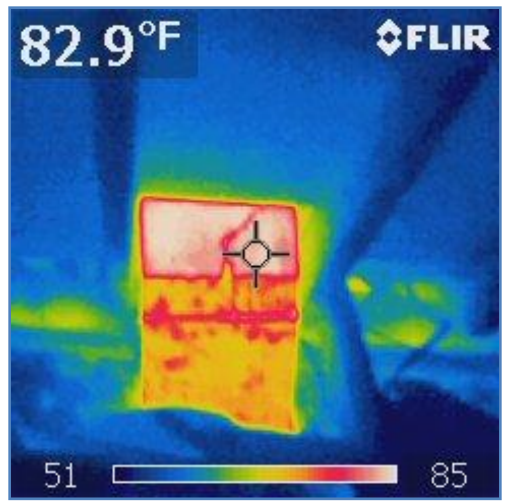

Figure 16

Figure 17

<u>Recommendation:</u>

Replace the boiler with a more efficient system. No oil fired system will perform as efficiently as a system running on liquid propane gas (LP). 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.

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 thousands of pounds, as LP gas burns cleaner than oil and has less particulate matter in the exhaust.

Consider replacing the current radiators in the Hall with more efficient panel radiators. This will allow the space to be heated better with lower temperature water. Also, consider doing away with the hot air system all together, and running hot water to new radiators in the annex. Otherwise, air seal and insulate all duct work. This should be done with great care, using mastic, not foil tape, and insulated with a minimum of R-8 duct insulation. The relocation of some duct work will be necessary. In the case of staying with a forced hot air system, switch to a 95% + efficiency LP furnace. A further explanation of these options will be given upon presentation of this report.

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 18.

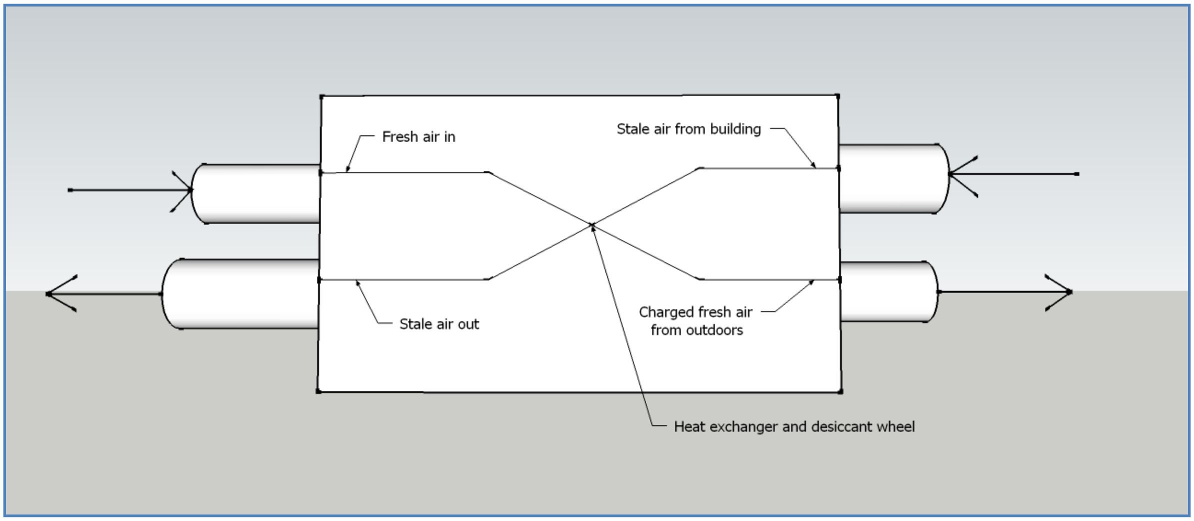

Figure 18

Electric Use:

Though the amount of electric use in this building is far from the most concerning issue when considering the amount to of energy used to heat it, there is still room for improvement.

The lighting in this building could be replaced with much more efficient units. We recommend consulting with an electrical contractor to examine lighting needs and investigating the latest technologies available in florescent and LED lighting.

Depending on the amount of building use, it may be a better option to switch to an on-demand domestic hot water heater as opposed to the current electric hot water heater. This will provide instant hot water and reduce the need to store hot water when there is little use.

Figure 19

Some of the hot water pipes are not insulated and have heat coils to avoid freezing. Insulating the building, the pipes, and possibly relocating these pipes would allow for the discontinued use of these devices.

The refrigerator seen in Figure 18 is very old and inefficient; especially considering that it may not be used very often. We recommend replacing it with a newer/more efficient model. At a minimum, consider unplugging this device when not in use.

The metal box seen in Figure 19 was apparently installed by a nearby power plant. It houses testing equipment which monitors air quality in the area. This unit is plugged into with an extension cord, and is drawing an unknown amount of electricity. We would recommend that you contact the power plant and ask them if it will disturb the unit to unplug it for a moment or two. If not, plug the unit into a watt meter for a good period of time to see how much money it cost to run. It may not be much at all. Regardless, it seems reasonable to ask the power plant to foot the bill.

Figure 20

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. In this building, the only area where any insulation was found is in the ceiling above the main Hall. There is little to no insulation in the rest of the building. 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 need 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.

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 has 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:

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 a 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.

Summary of Recommendations:

1. Develop an air-sealing and insulation strategy and a plan for implementation. This should involve an insulation contractor, a certified Building Analyst Professional and include input from town representatives.
2. Develop a best case scenario for replacing the heating plants and improving or replacing the heat distribution systems.
3. If the air-sealing and insulation is done well it will likely be necessary to introduce fresh air to the building. Using a Heat Recovery Ventilation system will be the most efficient way to accomplish this need.
4. Consider replacing doors and windows. If this is outside the goals of the Town, be sure to carefully maintain these units, and find non-intrusive ways to air-seal the doors and window during cold weather.
5. Follow the recommendations in this report for reducing electric consumption. The price of electricity will inevitably go up. Keeping electric use down will be the Town's best defense against this change.
6. 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.

Conclusion:

As a result of this audit, the Town has several options available to increase the efficiency of the Town 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.