



TEEC  
Temple Eco Energy Committee

**4th QUARTER REPORT  
TO  
PUBLIC UTILITIES COMMISSION**

**From: Temple, NH  
Date: January 14, 2010**

# Temple's Energy Efficiency Retrofitting Project for Mansfield Library, Municipal Building and Fire Department

## *Overview of the Retrofit - August 31- December 31*

The energy efficiency retrofit for Temple's Municipal Building, Fire Department and Mansfield Library is on course to meet or exceed its intended goals. The level of "tightness" within the Municipal Building rose 87%, as measured by the blower door tests of October 5, conducted by Margaret Dillon, the project's energy auditor and consultant. Its ability to serve the purposes of the NH RGGI program in reducing fuel usage and GHG emissions has been further enhanced through the implementation of a number of changes and additions to the scope of work. The interests of stimulating the NH economy, creating in-state jobs and training tradespeople for jobs in a new clean energy economy have also been served. Moreover, the value of the retrofit to the town of Temple and its residents is immeasurable. Through reducing municipal energy usage, the environment is less polluted and the tax burden will be lowered for years to come.

## *Changes in the Scope of Work*

Alterations were made to the schedule and scope of work for a variety of reasons. Several were guided by reevaluations of how best to address particular items in the scope, upon further review by the architect and energy consultant. Some were additions to the scope, recommended by the project's energy advisors, which became affordable in the latter months of the work as a result of the frugal execution of the project and from not having consumed its "contingency fund."

Several delays in the schedule were due to the need to tackle unforeseen problems that arose during the process. Late in September, the architect made two startling discoveries. One that there was an additional, previously unknown crawl space that existed under the library and the other that there was a 5 ft.x 30 inch hole in the foundation within that crawl space. Both the hole and the crawl space required retrofitting. Since they were discovered under the historical section of the library, built in 1890, a careful and thorough exploration of the crawl space was necessary. Then there needed to be consultations with the Library Trustees and Historical District Commission. Following their approvals for the work to be carried out, the process and oversight of the repair and retrofitting went forward with extreme caution and care. In fact, the final steps for the resolution of the moisture issue in that space is being postponed for a full year to allow time for the building to adjust to the steps that were taken in October, November, and December that were deemed necessary for the retrofit and health of the building, books, staff and visitors to the library. Meanwhile, data loggers to measure the moisture and temperature within both the first and the newly discovered crawl spaces have been installed in order to monitor them throughout the year. \$3,000 is being held to cover the

cost of evaluating a year's worth of readings from the monitors to determine what next steps might be required to safely seal off and fully moisture proof the second crawl space and/or make any adjustments to the work done for either one. Although the solutions for dealing with the second crawl space and the hole became labor intensive, the actual retrofitting of them was not as costly as it might have been. Temple's Highway Department did the exterior drainage work to draw rain water away from the building where it had become evident that it had been seeping into the space creating a considerable amount of the moisture problem. Plus there was an ample quantity of Stego Wrap, left-over from the work in the first crawl space, to do the immediately necessary moisture proofing for the second one, prior to its final seal.

Another change in the scope that involved labor, but had minimal material costs, was the creation of two access hatches, one in each section of the library over the crawl spaces. This work was done after all the exterior openings in the foundation were sealed off. It will allow the data monitors to be easily accessed and the condition of the spaces to be examined at appropriate intervals.

The 5 ft. x 30 inch hole in the foundation was found when the second crawl space was examined. It had been hidden from view from the outside of the library behind wide stone steps to the door of the historical section of the building. A CMU block was made to fill the hole, and the joints in the granite block were then air sealed from the inside with Todol spray foam.

There was one other delay in the progress of the work. It came as a result of a blower door test for the library on October 5. The intended "tightness" of the building had not been attained. It became evident that there was still excessive air leakage through the framing around the 6 newly installed thermal windows and in the framing around the library's front door. Correcting this involved a labor intensive effort to remove the exterior wooden framing from the outside of each window and the old "historic" front door, then thoroughly air seal and insulate the space between the frames and the actual windows and door. Margaret Dillon will conduct a final blower door test for the library in January.

Aside from those issues, the retrofit proceeded at a steady pace and was managed with extraordinary cost effectiveness. Several decisions that were made by the architect, Building Committee and Library Trustees resulted in reducing the costs for the library portion of the work. A number of tasks related to exterior work were picked up by Temple's Highway Department. But the generally smooth flow of the retrofit was one of the main factors in reducing costs and enabling most of the built-in "contingency fund" to remain untouched. This provided the opportunity to add several excellent installations to the project which have increased the level of energy efficiency for the buildings, enabling the project to become even more comprehensive in its effort to reduce energy consumption and lower GHG emissions.

### ***Some Specifics on Additions to the Scope of Work***

The Library Trustees decided not to install the glass enclosed gas insert for the library fireplace, rather to seal the flue and eliminate the gas line and pilot light that used \$300 worth of propane every year. Consequently, money was saved that could be used elsewhere in the library. Also, under the guidance of the architect the decision was made not to attempt to insulate the library walls from the inside, as had been planned in the original scope of work. He determined that it would be extremely problematic, questionable in its effectiveness, and not cost effective. This, in turn, freed up funds to cover the cost of removing the old energy inefficient burner in the library and replacing it with the installation of a high efficiency sealed combustion condensing propane burner.

The decision was made to install “cat walks” in the attic spaces above the library and Fire Department garage in order to allow electricians and heating duct repairmen, etc. to have access to the spaces without disrupting the uniform distribution of the insulation. The two main pedestrian access doors in the FD and Municipal Building were able to be replaced with well air sealed thermal doors. New thoroughly air sealed sky lights were able to replace the old, leaky ones in the 2<sup>nd</sup> floor FD meeting room, installed to fit the new height of the R 40 Cool Vent roof. LED lights replaced the less efficient lighting in several locations on the outside of the Municipal Building and Fire Department. Plus a set of Led track lights replaced a set of canister lights that had previously leaked warm air up into the attic area of the library.

Most recently, the Building Committee realized that there was still sufficient grant money remaining to cover the cost of installing a high efficiency, mini split AC system for the Municipal Building first and second floor offices and the FD meeting room. As the architect and energy consultant had both pointed out, having such a system will provide much more energy efficient cooling in the summer, and the old window AC units will not be damaging the air sealing around the window frames of the newly installed thermal windows twice a year as they are installed and removed. Plus more light will come in through the windows in the summer without window AC units blocking it, thus enabling the staff to use fewer electric lights during work hours.

## **Brief Review of the Other Tasks Completed This Quarter**

As a result of numerous checks on the “tightness” of the buildings via fog testing and blower door tests, air sealing continued to “plug holes” throughout the buildings until the end of November. The sub-grade insulation was completed with Roxul drain board. The R40 Cool Vent roof was installed, becoming the insulated top of the Municipal Building’s “envelope”. This was another cost saver, as compared with insulating the top of the building from the inside, through the twists and turns of the problematic, difficult to access areas under the previous roof. The sky lights for the FD meeting room and the

replacement thermal R4-Paradigm windows for the Municipal Building were installed with rebuilt window sills and frames to fit the new size of the building which had resulted from its newly installed 3 inches (double layer) of Vycor taped 3" of polyiso insulation surrounding the sides of the buildings and the additional height from the insulated roof. Four Thermacore 591 overhead garage doors were installed in the Fire Department Garage.

The old inefficient oil burner and oil tank in the Municipal Building were removed and a propane tank was installed a safe distance from the buildings in order to not interfere with any FD activities. A new Buderus high efficiency sealed combustion condensing propane boiler was installed in the Municipal Building. The pipes in the boiler room and into the FD garage were insulated and the mechanical and electrical work completed for the boiler and its distribution mechanisms. Following the October blower door test for the buildings, and some subsequent additional air sealing in the Municipal Building and FD meeting room, the wood and vinyl siding were installed around the exterior of the complex. In November, cat-walks were built in the FD and library attic spaces. In December, after the cracked heating ducts were repaired and sealed and the electrical and mechanical work was completed to hook up the new propane system in the library, 14 inches (to R 50) of loose fill cellulose insulation was blown in. Then 14 inches of loose fill cellulose was blown into the FD attic area to insulate the "top of the envelope" for the FD garage.

Given the extensive "tightening" of the buildings, the issues of vapor control needed careful attention. This was addressed through the conscientious installment of vapor barriers throughout the insulation of the buildings and the installation of new ventilation systems with 7 day timers.

Interior and exterior painting and finishes were completed. Advanced programmable thermostats were installed and appropriately programmed in the buildings. Additional electrical work was required for the replacement of less efficient lights with LED installations on the outside of the Municipal Building and FD and the addition of a set of LED track lights for the library. The next and final installation will be the mini-split AC system that has been ordered and is designed by the architect to serve the 2<sup>nd</sup> floor rooms of the FD meeting room, the treasurer's office and the Road Agent's office, as well as the first floor offices in the Municipal Building.

The town will celebrate the completion of the retrofit in the spring.

## **Temple's Energy Conservation Educational Program**

### ***The Educational Program***

From September through December, TEEC's Educational Program was in high gear.

At least twice a month, the **grant-funded web site**, [www.teec.info](http://www.teec.info), was updated with news worthy climate and energy related articles, rebate and tax incentive updates, information on the process of the municipal retrofit, and occasional input from the kids at Temple's Elementary School on its "Kids Corner" page.

The **Recycling Club** at Temple's Elementary School got back to work collecting all the school's paper, plastic, and aluminum cans on a weekly basis. TEEC members then took the recycled cans and bottles to the Wilton Recycling Center, and the students took all the school's paper waste out to the PaperRetriever Dumpsters in the school parking lot. The students have used the Recycling Club meetings to engage in animated discussions of things they can do at school and at home to save energy and protect the earth's air, land and waters. They have decided to set up a composter for their food waste outside the school, which TEEC will help them set up in the spring. They also decided that they would like to gradually change from using all the plastic water bottles they can now see piling up in the recycling container each week at school. They intend to buy refillable aluminum water bottles over time instead.

The students decided that they wanted to show other kids things that can be done to save energy. In December, they worked with a member of TEEC to stage photographs of themselves in the act of doing such things as turning off the lights when they leave a room, using both sides of their paper, collecting the paper to be recycled from the other class rooms, etc. The students chose the actions to be photographed. They will be posted on the "Kids Corner" page of TEEC's web site in January, along with copies of a new set of posters the kids made encouraging people to recycle and care for the earth. They love the idea that they are sharing their ideas and plans with kids from all over the world on TEEC's web site. They also are excited to have their posters on display in public places throughout the town.

## ***Educational Events***

- 1) In September, TEEC focused on preparations for the committee's **Educational Booth for Temple's Annual Harvest Festival**. This event draws thousands of people every year from all over the region. This year, on September 26, the booth was especially exciting because of the educational value of sharing as much information as possible about the retrofitting project for Temple's municipal buildings. The booth stressed the value of conserving energy, both as a town and as residents, as a way of reducing atmospheric pollution and lowering costs. Stating the booth's theme was the 6 ft. long banner that TEEC had designed and hung in front of the Municipal Building during much of the retrofit. For the festival it was hung along the front of the booth. It read, "Lowering Taxes Through Energy Conservation!"

The booth offered the following:

- A 20-minute DVD set to music which TEEC created. The program looped to re-play throughout the day, and highlighted photos of the retrofitting

process interspersed with photos of posters on “Helping the Earth” and “Saving Energy” that were made by the kids in the Recycling Club at Temple’s Elementary School.

- Two vibrant tri-fold displays each 4’ x 4’ in size:
    - The first focused on educating the visitors about the retrofit, using text and photos of the work, then asking folks to” bring it all home” by 1) addressing their own household energy usage, 2) attending the upcoming free “Button Up NH” Weatherization Workshop and 3) learning about the “Carbon Challenge” program in preparation for its winter launch in Temple.
    - The other display was filled with many of the school kids’ posters asking residents to recycle and “Take Care of the Earth”. It drew the students and their parents to the booth where they picked up materials, watched the DVD, and learned more about the retrofit by reading the information on the displays.
  - Informational materials and hand-outs:
    - Reminders of TEEC’s year-round Free Weatherization Program to fuel-assistance-qualified residents;
    - Tips on saving energy, info on renewables, the Carbon Challenge website, rebates and tax incentives, the Button Up NH workshop, and upcoming Temple Carbon Challenge, along with a tri-fold hand-out made by TEEC describing the goals and benefits of the municipal retrofit.
  - Two to three TEEC members were present at the booth throughout the duration of the event to speak with residents and visitors about the retrofiting projects, ways to save energy at home, the “Button Up NH” workshop, and Temple’s Carbon Challenge. The Booth was centrally located and drew an exceptional amount of attention, with many residents coming to express gratitude and interest in the retrofiting work in progress on the town’s buildings.
- 2) On October 10, TEEC created a small event to draw attention to a large issue-- the need to reduce atmospheric pollution while saving the town money through investing in renewables.

Townfolk were invited to attend, with a special invitation sent to the members of the Temple Historic District Commission and the members of the Historical Society. They were delighted to be honored and to have Temple’s Historical Society Building receive the gift of a solar powered motion detector. One of TEEC’s members installed the detector while the guests observed the process. It went smoothly and successfully. After the installation, all present joined in an apple cider toast to the building and to the Sun!

- 3) TEEC was also invited to showcase the committee's work and the process of the retrofit at a large (200 people) regional event on the evening of October 10 in Milford, NH. The committee was asked to create a booth illustrating how a local energy committee can be of benefit to its town. The towns of Milford, Amherst, Greenville, Mason, Wilton, Lyndeborough, Bennington, Antrim do not have municipal energy committees. TEEC filled an 8' booth with highlights of the various projects and programs the committee has created to help its residents and town conserve energy and save money.
- 4) On November 20, TEEC sponsored a "Button Up NH" home weatherization workshop for Temple residents and residents from neighboring towns. It was very successful from the perspective of the over 20 participants who attended and participated actively in the discussions during the workshop. Many asked pertinent questions, based on concerns they had in their own homes. Later, many shared with committee members that they appreciated the workshop and had been helped by the suggestions they received from the presenters. The two workshop leaders from the Southern NH Planning Commission were well prepared and came with an excellent packet of materials to hand out on multiple ways to save household energy and lower costs.

TEEC provided a table at the workshop, illustrating what can be done in a deep energy efficiency retrofit with photos from the municipal retrofit in Temple. It also advertised the upcoming Carbon Challenge and what it can offer residents interested in saving energy, trimming their budgets, and reducing atmospheric pollution. Cider and pumpkin bread were also served.

Beyond the workshop itself, all of the advertising that TEEC did beforehand was valuable for raising the awareness of residents regarding the energy efficiency of households. Posters were displayed at numerous sites in three nearby towns, fliers were handed out to over 100 people attending other events in town the week preceding the workshop, posters were up in all the highly frequented places in town. The committee also made enough fliers to have them passed out to all the students at school to take home to their parents. It was advertised in Temple's Newsletter and in an article written for the "Monadnock Ledger Transcript". Presumably, those efforts inspired some to take steps to "button up" their homes, even if they were not able to attend the workshop.

- 5) In December, TEEC focused on taking the necessary steps to get the Carbon Challenge launched. The committee chair took the required webinar training for the program and continued working to enlist several other towns to join in a friendly competition. In late December, the towns of Rindge and Jaffrey both responded in the affirmative and have agreed to engage in a Challenge with Temple during the winter/spring of 2011. Temple's "Energy Challenge" will be launched with a kick off event in Town Hall on the evening of February 9. The event will include a speaker on solar power and one on wood pellet power for appliances and heating. The three towns will declare the winner by comparing

the percentage of households which take the Challenge during a three month period. Stonyfield Farms has given its commitment to providing some of the ice cream for an ice cream social as the winning town's prize.

## Regional Outreach

There are also discussions taking place with other towns in the region from Antrim and Bennington to Milford and Amherst regarding the possibility of extending hands across town lines to work together at the regional level to encourage municipal and residential energy conservation and to assist all the towns to find ways to lower their energy bills.

TEEC's chair has been invited to speak in both Amherst and Antrim during the month of January on how to start a local energy committee and how to engage in a Carbon Challenge.

The photographs taken by TEEC's chair throughout the municipal retrofitting project will be used in various venues to illustrate how municipalities can save energy and lower their tax burden through energy efficiency retrofitting projects..

## The Free Home Weatherization Program

This program is ongoing and has served four more households with free weatherization since September. The carpenter who is doing the work is providing more in-depth weatherization than what was done through the Stay Warm NH program. This has been made possible with the additional financial assistance of the Congregational Church of Temple.

To advertise the program, posters have been displayed in the library, post office, Municipal Building, Temple Store, and Town Hall. Information is posted on TEEC's web site and in the Temple Newsletters. As in 2009, again this fall, TEEC informed the regional office which interviews residents seeking fuel assistance, Southern NH Services, to make certain that they know that the weatherization program is ongoing and is seeking to help residents in need. They have recommended TEEC's program to three Temple residents who then followed through, called for help and received free home weatherization.

Respectfully submitted,  
Beverly Edwards  
Chair, Temple Eco Energy Committee

