TEEC
Temple Eco Energy Committee

3rd QUARTERLY REPORT

TO

PUBLIC UTILITIES COMMISSION

From: Temple, NH

Date: August 31, 2010

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

The Process:

The energy efficiency retrofit for three of Temple's municipal buildings got underway with shovels to the ground on July 5 and is still in progress. Expectations are that the project will be completed by the end of September. Just as the contractual and planning stages were managed in a thoughtful, careful and exacting manner, the retrofit itself is being executed in the same way.

The Building Committee for this project consists of two members of the Select Board, John Kieley and Mike Darnell, and two members of the Energy Committee, the chair, Beverly Edwards, and Dr. Rob Wills who is an alternative energy engineer with expertise in renewable sources of energy, building science and energy conservation. The Building Committee has met with the architect, construction manager, on site supervisor, and head of the Highway Department every other Tuesday since the actual work began to discuss the progress of the work and whatever questions may arise. On alternate Tuesdays, there have been additional meetings with the construction manager, site supervisor and members of the Building Committee to discuss any issues or considerations that need attention. The schedule for all those meetings has been posted and the public invited to attend. Throughout July and August there have been separate meetings held with the Fire Chief and members of the Volunteer Fire Department, as well as the librarians and the members of the municipal office staff. These meetings focused on clarifying the work and timing of what would be taking place in their respective buildings and discussing some of the details that would or may impact them in various ways. As the work was about to begin, the first Building Committee meeting included Tom Hartman, the architect, the construction manager, site supervisor, and several of the subcontractors, including the heads of the siding, mechanical and insulation crews. Tom Hartman used a flip chart as well as live demonstrations to instruct and educate the team on how to properly perform air sealing, teaching everyone about its critical value and the degree of its importance to the whole project. It was made clear that if the air sealing is not performed adequately or completely, it would show up when the fog tests and blower-door tests are conducted and the crews would have to do the work all over again at their own expense. Since then, along with utilizing the infra-red photographs from the original energy audit, fog testing has been conducted three times and one blower-door test conducted, all to determine where there might still be air leaks anywhere in the buildings. Another blower-door test is scheduled for August 31. These have all been conducted by the architect and/or a crew from his firm. But the final one will be conducted for all three buildings on September 7 by Margaret Dillon, Temple's energy auditor and consultant to the retrofit from the start.

Tuesday, August 24, the Board of Selectmen met with the Building Committee,

Architect, Construction Manager, Site Supervisor, and Head of the Highway Department to go over all the progress so far, evaluate the financial status of the project and discuss options for completing the work most effectively. It was determined at that meeting that the money that had been held in a contingency fund to handle unforeseen problems had not been needed and was not anticipated to be used during the remaining scheduled work. With support from the Energy Committee members and the architect, the Selectmen voted unanimously to move forward with an option to remove the antiquated and inefficient burner in the library and replace it with a high-efficiency, sealed-condensing propane burner. This was a tremendously favorable decision. It will add significantly to the energy efficiency of the library well into the future.

Another priority for the retrofit has been to recycle as much of the material being removed from the buildings as possible. One way or another, this is taking place. In part, by locating companies that will pick up and recycle various types of the materials and also by offering them to residents and local businesses for their use. Almost nothing is going to landfills. The few windows that have been removed and are not being requested by our residents will be used in training sessions by the volunteer Fire Department. The large FD overhead doors that are being replaced are being offered to townsfolk for use in their barns. If they are not requested, they will be sold or offered to the public on Craig's List.

Overall the work has gone surprisingly well. The team had anticipated possible rotting wood here or a mold problem there, etc. But, thus far, the only stressful situation was due to a sudden, ferocious, torrential rain event during the first week in August. This brought some rain into the Municipal Building, causing minor damage. However, it was mitigated through the use of dehumidifiers and fans that ran for a series of days to help the space dry out. To be absolutely certain that there was no moisture damage to the building several squares were cut out of the walls to be able to do some thorough moisture testing with a moisture gauge. This was conducted by two members of the Colham and Hartman Architectural firm two weeks after the rain event to check for any moisture in the walls or studs before moving ahead. Fortunately, the readings were all "dry". As mentioned above, there were several rounds of fog testing and a blower-door test that have already tested the effectiveness of the external air barrier/insulation around the sides and foundation of the Municipal Building and Fire Department and the spray foam insulation where the sides of the building meet the roof and foundation. One entire day of fog testing and photographs of the areas still in need of more air sealing in the Municipal Building/FD took place August 20. The same fog testing to see if more air sealing is required for the library took place this last week of August. Once all the air sealing is determined to be complete, there will be another blower-door test conducted on August 31. If it determines that the buildings are well sealed, cellulose insulation up to R 50 will be blown in the FD and library attic areas, the new siding will be installed around the Municipal Building and Fire Department and the shingles will be installed over the cool-vent roof on the Municipal Building. On September 7, as mentioned above, Temple's energy auditor and consultant, Margaret Dillon, is scheduled to conduct the final blower-door tests for all three buildings to determine whether they have attained the level of tightness and efficiency intended, planned for and committed

to in our grant proposal and contract with the PUC. If they pass, she will give the "green light" to proceed with the final detail work on the buildings. From then on, this project will save Temple energy, reduce green house gas pollution and lower the tax burden for years to come.

Some specifics for the Municipal Building/FD:

During the first week of July, after the construction trailer and supplies were delivered, the shingles were removed from the FD roof and the new shingles were installed. This was followed by the removal of the siding and the installation of an exterior air barrier - 2 thick layers of Vycor-taped polyiso insulation – that was wrapped around the outside of the Municipal Building and Fire Department. Spray foaming of the edges where the insulation meets the roof was then applied. Fog testing was done in many areas at that point to check for the air tightness of the spray foaming and insulation. The crew then dug three feet deep in the ground around the base of the buildings to install Roxul drainboard to the foundation. Spray-foaming was applied along the seams and edges. The old oil burning boiler was removed, and a new high efficiency sealed combustion propane boiler was installed with all necessary piping and components. An ERV (air filtration) system was installed in bathroom exhausts. The propane tank will be installed underground at the town's expense in early September. New energy efficient windows have been installed throughout the Municipal Building, and a new insulated front door will be installed in early September. The plan includes the installation of 4 new insulated Thermacore 591 overhead garage doors in September for the Fire Department. Extensive air sealing has been conducted throughout the buildings. Fog testing and blower-door tests have been performed to check for air leaks. After all the leaks are air sealed, 14ǁ of blown in cellulose insulation will be added in the attic above the FD ceiling. An R 40 cool-vent insulated roof is being installed above the Municipal Building starting August 27. The shingles for that roof will not be installed, however, until the August 31 blower-door test is conducted and the go-ahead is given. The final blower-door test will be performed before the new siding will be installed around the buildings.

Some specifics for Mansfield Library:

A serious moisture problem in the crawl space under Temple's library has caused the librarians to use excessive amounts of energy in the building on a year round basis. They have raised the library's temperature in the winter and used excessive amount of air-conditioning in the summer in an effort to "dry out" the air and counter-act the musty odor and poor air quality. This has finally been addressed by the retrofit. The crawl space has been cleared and leveled as much as possible, Polyethylene floor matting has been installed and sealed to the perimeter with Stego Wrap Vapor Barrier, and the walls have been spray foamed with 2" of CC with thermal barrier compliance. The crawl space air vents, holes in the foundation and exterior hatch are also being sealed. The open and unused fire place with its extremely leaky chimney flue and pilot light that used $300 worth of propane every year has been sealed and the pilot light extinguished. The gas line will be totally sealed. In the North wing and East office, the leaky window frames have all been tightened up and air sealed. The windows have

been replaced with high efficiency double hung R3 windows, as approved by our Historic District Commission, Library Trustees and librarians. All the old insulation has been removed from the attic area and air sealing has been conducted throughout the attic. The duct penetrations have been spray foamed and 2 " of closed cell spray foam applied at the top of the wall to the ceiling. After the attic is fog tested once more and either found to be completely free of air leaks or given additional air sealing where required, another blower test will be conducted. If test proves the sealing is complete, the heating ducts in the attic will be sealed and the attic area filled with loose fill cellulose insulation to R 50. A Whisper Green ventilation system will be installed in the bathroom. The recessed can light fixtures which had very noticeable air leaks have been removed and are being replaced with track lighting. All wiring boxes (lights and smokes) have been air sealed. The old, extremely inefficient burner is going to be removed and replaced with a high-efficiency, sealed-combustion propane system. The final blower-door test for the library will then take place on September 7.
We will honor the completion and achievements of the project with a town-wide educational event and celebration!

Temple's Energy Conservation Educational Program

1. TEEC's Educational Website, www.teec.info

During the summer months, TEEC has continued to update the "Activities" and "News and Links" pages of our web site several times a month. This web site has become a more successful educational outreach medium than the committee had even imagined, reaching over 5,000 "hits" since its inception last fall. It is fulfilling its mission to provide energy conservation information and environmental education for the residents of Temple and beyond.

The web site continues to offer the following:

- Weatherization tips and energy reduction information and education for the general public
- Information to help fuel-assistance qualified residents sign up for free home weatherization from TEEC
- Links to tax incentives and rebates for energy efficiency home improvements, purchases of renewables and Energy Star appliances
- Environmental education and updates
- Information about RGGI
- A "Kids Corner" for the students at Temple Elementary School
- A link to the Energy Chapter for Temple's Master Plan—adopted by the Planning Board on May 5
- A link to the NH Climate Change Action Plan

2. Recording the Retrofit, Creating and Using Educational Materials

a) TEEC has been taking some video footage and many photographs of the retrofitting project throughout its process. The images will be used to 1) educate residents and others at the Annual Harvest Festival; 2) educate at events and conferences locally and in the region; 3) show progress on the “Local Energy Committee Newsletter” (bi-weekly newsletter sent to all NH local energy committees); 4) educate and inform the public via TEEC’s web site; 5) educate and inform through newspaper articles and wherever else it is appropriate.

b) TEEC created, printed and has been actively passing out a tri-fold hand-out this summer which explains the funding, the process and the accomplishments of the municipal retrofit. Committee members also made a large, stand-up tri-fold poster display which has been displayed at the Municipal Building, where citizens pay their taxes and conduct other business. It has photographs of the retrofit in process and lists the energy efficiency changes that are taking place at each of the buildings. It also shows the estimated energy savings Temple can expect to gain which will reduce the town’s tax burden. Throughout the summer, TEEC has also set up a table to display these materials at the town’s Sunday Farmer’s Market, at the July 31 Temple Barn Tour (with 430 paying attendees) and the Temple Music Festival on August 22. The stand-up poster has attracted folks to come to discuss the retrofit and energy efficiency measures. This invites conversations about the value of the work in progress and everyone leaves with one of TEEC’s printed hand-outs to read and share with their friends, neighbors, and families.

3. Harvest Festival Booth/Kicking Off Carbon Challenge

TEEC is in the planning stage of its large, active and always vibrant Energy Education booth at Temple’s Annual Harvest Festival, held the last Sunday in September. This yearly festival draws hundreds of visitors from out of town--the region and NH in general—as well as throngs of residents. This year TEEC will showcase Temple’s municipal retrofitting project to illustrate energy efficiency measures and methods which can be translated into residential and business retrofitting projects. Video footage and photographs from the retrofit will highlight the value and necessity of sealing the envelope of buildings to reduce their power load. Additionally, materials and information on the many other steps folks can take to cut their fuel and utility bills will be prominently displayed. The intention is to help them see how they can "take it all home!" Residents will be encouraged to take the next step--take the Carbon Challenge! The Challenge will be kicked off at the festival, with or without participation from another town in a friendly competition.

4. Preparing for the Carbon Challenge

Throughout the spring and summer, TEEC has reached out to various other local

energy committees with an invitation to join us in a friendly competition for the Carbon Challenge. Competition invites more participation and motivates residents to take more steps to reduce their home energy consumption. There is one town in the process of deciding whether to accept our challenge, but so far has not given a firm commitment. Meanwhile, TEEC is moving ahead. After requesting help from the Carbon Challenge coordinators, TEEC members will be receiving a webinar training to learn how to teach residents to "take the Challenge" on their computers. The committee plans to help residents begin that process at its Harvest Festival booth and later at a kiosk in Temple's library.

5. Weatherization Education for Residents- Button Up NH

TEEC requested the opportunity to have a "Button Up NH" weatherization workshop for residents this year, and the answer has arrived that Temple is now on the list. This will serve to stimulate additional interest in energy efficiency improvements folks can make for their homes and businesses and further encourage residents to take the Carbon Challenge! The committee will actively advertise this in all possible ways.

6. Educating Through the Media

Through articles placed in the July/August and September/October "Temple Newsletters" (mailed to many households and always made available at multiple sites throughout the town) TEEC has continued to educate Temple residents about what is taking place during the retrofit of the municipal buildings, stirring interest and discussion which gradually leads to movement along the learning curve of energy conservation. TEEC reached out to a reporter from the *Monadnock Ledger Transcript* newspaper to write an updated article about Temple's municipal retrofitting project, now that it is in high gear. The reporter came to see the work in action and interviewed TEEC's Chair. As a result of this interview, a glowing front page article was published in the paper's August 10 issue which also included an excellent Editorial about the project. Although there was an erroneous date in the front page article (TEEC subsequently requested a "correction" statement‖), it was a beneficial and informative educational piece on the subject of municipal energy conservation. This follows several previous articles in various local newspapers about Temple's receipt of the RGGI/PUC grant and the town's process of carving a path to energy and tax reduction for its residents.

7. Recycling Program—Education By Example

TEEC continues to teach the value of recycling -- by example. The committee purchased collapsible, easy-to-store recycling containers from NH the Beautiful in 2008 in order to provide the ongoing service of recycling plastic and glass for all major town events. This summer TEEC provided the recycling for the July 4th Celebration, the July Barn Tour, and the Music Festival in August.

8. Reaching Other NH Towns

The NH Community Development Authority (CDFA) invited TEEC's Chair, Beverly Edwards, to speak at its July 28 financial aid training event for municipal officials and municipal energy committee members across the state. She presented Temple's story--the process of municipal energy efficiency progress and success. This was a continuation of her previous and ongoing efforts to help other towns at countless regional meetings and events, including her presentations at four state-wide conferences and a Round Table of the Southern Regional Planning Commission. As noted in the RFP for the RGGI grant, Temple has been singled out for its role as one of NH's leaders in municipal energy conservation. In response to that, the Energy Committee takes responsibility for helping other towns. At each of the events and meetings attended by TEEC's chair, she offers support and shares Temple's story of the process of successfully moving a municipal energy efficiency program forward. She receives frequent calls for advice and responds to requests from other energy committees and municipal officials for copies of items, such as the Energy Chapter the committee produced for Temple's Master Plan. She is dedicated to this effort and to assisting as many towns as possible. One of her principal messages is simply that it is doable...for any town. She emphasizes the fact that Temple's progress is not due to having a charismatic leader, or a professional or highly trained grass-roots organizer. Rather, its process and accomplishments have been largely through simple dogged determination to get things done, one step at a time, using common sense in working with town boards and local towns folk, and by doing it with a flexible mentality. This means that any town can do it!

Temple is also showcased as a model by other presenters and organizations (not from Temple) in their power pt. presentations and/or hand-out material at state-wide conferences and regional meetings. This includes presenting information on areas outside of the projects discussed in this 3rd Quarter Report, such as using the Energy Audit for Temple's Master Plan and Zoning Ordinances as a model for other towns or showing the Energy Chapter for the Master Plan which was written by TEEC and approved by the Planning Board in May. Therefore, the value of Temple's energy efficiency retrofit and educational program will, in part, come from its use as an example for other towns to learn from and improve upon or reflect.

9. Educating a Construction Company and Subcontractors Through On-the-job Training in an Energy Conservation Retrofitting Project

This was not a planned part of the educational program, but definitely deserves to be acknowledged and celebrated. It is exciting and rewarding to watch the leaps along the learning curve that are taking place and are benefiting all the participants in the project here in Temple, including the construction company, the subcontractors and vendors. The original choice of a "green" construction company did not work out for legal reasons (the company was not sufficiently bonded), and the only other company that had accepted Temple's invitation to bid was a company without sufficient experience in

energy efficiency retrofitting to responsibly take on the project. Therefore, the Building Committee interviewed 5 experienced architects for the job of planning, leading, teaching and overseeing the retrofit. Tom Hartman of Coldham and Hartman Architects was chosen. He has subsequently been teaching the Construction Manager, Site Supervisor, vendors, and subcontractors how (and why) to conduct energy efficiency retrofitting. His demeanor and easy manner has helped him to lead and teach the crews with a team mentality and without the slightest arrogance. Over the two months of the project so far, the site manager, in particular, has gone through a transformation in his thinking and in his skills. Ingram Construction Company will come out of this experience with a whole new skill set and be in a much improved position to assist other towns, businesses and homes to reduce their energy loads through energy efficiency retrofitting. It is inspiring to observe.

Free Weatherization Program for Qualified Residents

TEEC's Free Weatherization Program for fuel-assistance qualified residents is now ongoing, not seasonal. One household received a deep weatherization this August. TEEC is advertising the program with posters placed in conspicuous places around the town, notices in Temple's Newsletters and on its web site. Additionally, contact is kept up to date with the regional fuel-assistance program coordinators to remind them to encourage Temple residents applying for fuel assistance to contact TEEC for free weatherization help. A deeper level of weatherization has also been made available with the help of a local carpenter who is paid for his services and necessary supplies through the generosity of the Benevolent Committee of the Congregational Church of Temple, whenever that level of work is determined to be needed following a home evaluation and is then authorized by the TEEC chair. It takes a village.

Recycling Club for the Temple Elementary School

After the Recycling Club finally got off the ground last spring at TES, there were two things the students were most interested in accomplishing in June, before the end of the school year: 1) to make posters to advertise their paper collection campaign and 2) to establish their own "Kids Corner" page on TEEC's web site. Dedicated TEEC members helped them do just that. The third and fourth graders worked in pairs to make 14 posters that asked the residents of Temple to "Take Care of the Earth" and "Recycle" -- to bring all their recyclable paper to the PaperRetriever dumpsters located in the school's parking lot. The students spent one Club meeting taking turns presenting and explaining their posters to the class. They then asked TEEC to put up their posters around the town. The posters are now displayed in 7 different public places throughout the town. The kids were thrilled to have their posters up in public and delighted to go on a treasure hunt with their parents to find where their own poster was displayed. Then TEEC helped the kids create their own web page where they also wanted their posters

displayed. So before putting the posters up around town, the posters were scanned so they could be transferred to the students' web page. When the kids saw their own posters on their web page they were jumping for joy, especially knowing that thousands of people from all over the world will be able to see them, as the site is visited by folks from Temple to San Francisco, Paris and Hong Kong! TEEC has also placed articles in the July/August and September/October "Temple Newsletter" in behalf of the Recycling Club, appealing to residents to recycle their paper at the school's paper dumpsters year round to help the kids raise money for the school by the amount of tonnage they collect. The kids have already been planning for the Club's next year!

Conclusion

In summary, Temple received RGGI funds from the PUC with the promise to meet RGGI goals and objectives. TEEC is pleased to have reported that the third quarter stage of the retrofitting project is attaining many of the goals set by the PUC as specifically described in this report:

- Promote innovative technologies;
- Promote economic development;
- Provide services to low-income households
- Promote energy cost savings;
- Promote collaboration and provide useful information to the public.

The fourth quarter is on schedule to include the completion of the building process and on-going educational programs to be used as a model for towns, businesses, and residents throughout the Monadnock region and beyond.

Respectfully submitted by,
Beverly Edwards
Chair, Temple Eco Energy Committee