

ENERGY CAPITAL IMPROVEMENTS PROGRAM

2011-2019

TOWN OF LEE, NEW HAMPSHIRE

Prepared by:

**The Lee Energy Committee
for the
Lee Planning Board**

November, 2012

Lee Planning Board / CIP Committee

, Chair

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ENERGY CAPITAL IMPROVEMENTS PROGRAM LEE, NEW HAMPSHIRE

I. INTRODUCTION

The Town officials in Lee, like their counterparts in other communities in New Hampshire, expend a great deal of effort each year establishing a municipal budget. This budget must realistically balance the ever increasing needs and costs of delivering services to their constituents while at the same time staying within the financial constraints mandated by available tax revenues. In an acknowledgment of the precariousness of the annual budgetary process, the General Court authorized the use of a Capital Improvements Program (CIP) to aid town officials in scheduling the investment of Town resources.

New Hampshire RSA 674:5-7 provides legal guidance as to authorization, purpose, description and preparation of the CIP. Undertaking a CIP can only be done after authorization to do so is granted by the local legislative body. This was done by a vote of the residents of Lee at the annual Town Meeting of ____.

NH RSA 674:5--In a municipality where the planning board has adopted a master plan, the local legislative body may authorize the planning board to prepare and amend a recommended program of municipal capital improvement projects projected over a period of at least six years. The capital improvements program may encompass major projects being currently undertaken or future projects to be undertaken with federal, state, county and other public funds. The sole purpose and effect of the capital improvements program shall be to aid the mayor and the budget committee in their consideration of the annual budget.

Although this document must have the authorization of the local legislative body, its use, once completed, is entirely advisory. The document is structured to provide a multi-year (at least six) recommended program of major capital projects and expenditures.

Advantages of a Capital Improvement Program

The adoption and implementation of an ECIP offers many advantages:

1. **Stabilizes year to year variations in capital outlays.** By examining projected operating expenditures and savings generated by upgrades and systems over the ten-year period, available funding can be evaluated and capital projects prioritized and scheduled to temper tax and operational cost impacts.
2. **Make pre-emptive acquisitions more feasible and defensible.** Anticipating and scheduling land purchases municipal facilities that will help ensure that opportunities are taken if they arise.

3. **Facilitates implementation of the Master Plan.** Prioritizing and scheduling of proposed projects over time can eliminate duplication and a random approach to expenditures.
4. **Provides a total picture of Lee's major needs.** Large expenditures will be viewed in the context of other projects, rather than in isolated instances as the needs arise. In this way, activities of municipal departments can be coordinated and piecemeal expenditures discouraged.
5. **Establishes a rational and defensible project schedule.** Needs are evaluated and prioritized in light of anticipated savings generated by the project.
6. **Serves as a public information tool.** The ECIP is prepared in a public forum and provides sound information on the Town's plans for energy-related expenditures.

In a cooperative effort, the Planning Board, Board of Selectmen and Town Administration can review the ECIP and make desired revisions prior to adoption. After a public hearing is held, the Planning Board adopts the ECIP.

Once the program has been adopted, it is reviewed and can be updated as often as annually by the Planning Board in conjunction with the Board of Selectmen. This is especially important when the voters at Town Meeting do not fund all proposed capital projects. The ECIP recommendations for the upcoming year's budget are presented to the Selectmen and Budget Committee. Each annual update adds an additional year to the schedule so that a ten-year program period is maintained.

The ECIP provides Lee with an opportunity to schedule future capital expenditures necessary to support the existing and forecasted population. At the same time the Capital Program Budget process is a means of providing input into the Budget Hearing process and Town Meetings, effectively implementing the Master Plan. A Energy Capital Improvement Program can be utilized to realistically measure public expenditure needs to implement programs provided for in the Master Plan and relate them to the Town's costs for energy, then provide for the scheduling for such improvement.

The Capital Budgeting process affords the ability to stabilize the tax rate by spacing programs and payments gradually over a period of time, thus avoiding peaks and valleys in the appropriations necessary, thus stabilizing the tax rate. It is becoming increasingly important, particularly as state and federal funding programs become less and less available to local communities, that alternate sources of funding are sought and utilized.

II. LEE ENERGY CAPITAL IMPROVEMENT PROGRAM ("ECIP")

The Lee Energy Capital Improvements Program is a budgetary document that schedules energy-related expenditures for a period of eight years. For each expenditure scheduled, the

document includes a fiscal analysis that aids in prioritizing that project and a reasonable projection of the savings accumulated by the project. The program, when adopted and fully utilized, serves to ensure that the services and facilities necessary to meet the community's needs are provided in accordance with the financial capabilities of Lee.

A. Expenditure Projections

For the purpose of this document, the Lee Energy Committee recommends that an energy related capital improvement is to be defined as: generally non-recurring expense of \$5,000 or more, or that has a simple return on investment of 5 years or less, regardless of cost, which falls into one of the following categories:

- The purchase of equipment for public facilities
- The purchase, construction, or rehabilitation of a municipal building, school building, or facility;
- The upgrade or change of existing equipment, or similar projects;
- The preparation of studies or architectural/engineering plans relative to the above;
- The retro-commissioning of existing equipment; and
- The purchase of equipment or upgrades with a life expectancy of over five years

The following table, II-A, shows the scheduled expenditures for energy efficiency upgrades across the Town’s building stock. More detailed breakdowns are available in Appendix B.

Building	Project Description	2011	2012	2013	2014	2015	2016	2017	2018	2019
Town Hall	Efficiency Upgrades									
	Total	\$5,075	\$17,525	\$12,000	\$0	\$0	\$1,000	\$0	\$0	\$0
Town Hall Annex	Efficiency Upgrades									
	Total	\$11,575	\$6,525	\$5,000	\$5,000	\$0	\$0	\$0	\$0	\$0
Library	Efficiency Upgrades									
	Total	\$11,775	\$3,500	\$10,500	\$0	\$5,000	\$13,500	\$10,000	\$0	\$0
Public Safety Complex	Efficiency Upgrades									
	Total	\$3,300	\$13,800	\$11,300	\$10,000	\$15,000	\$2,500	\$2,500	\$0	\$0
Recycling Center	Efficiency Upgrades									
	Total	\$2,250	\$0	\$0	\$0	\$0	\$0	\$0	\$17,500	\$5,000
Total		\$33,975	\$41,350	\$38,800	\$15,000	\$20,000	\$17,000	\$12,500	\$17,500	\$5,000

B. Savings Projections

The following table (II-B) incorporates the annual savings, as projected from the audits and schedules them in time with the improvements. This allows for the Town to compare expenditures to savings.

Building	Project Description	2011	2012	2013	2014	2015	2016	2017	2018	2019
Town Hall	Efficiency Upgrades									
	Total	\$652	\$2,555	\$4,804	\$4,948	\$5,097	\$5,501	\$5,666	\$5,836	\$6,011
Town Hall Annex	Efficiency Upgrades									
	Total	\$659	\$947	\$1,485	\$1,751	\$1,803	\$1,857	\$1,913	\$1,970	\$2,029
Library	Efficiency Upgrades									
	Total	\$2,144	\$2,843	\$5,070	\$5,222	\$5,378	\$6,493	\$7,782	\$8,015	\$8,256
Public Safety Complex	Efficiency Upgrades									
	Total	\$1,191	\$2,927	\$10,103	\$11,596	\$12,795	\$13,178	\$14,084	\$14,506	\$14,942
Recycling Center	Efficiency Upgrades									
	Total	\$878	\$904	\$931	\$959	\$988	\$1,018	\$1,048	\$1,746	\$2,847
Total		\$4,646	\$9,272	\$21,461	\$23,517	\$25,073	\$27,029	\$29,445	\$30,328	\$31,238

Impact on the Town's Tax Rate

Taking the expenditures and the savings, the CIP can then project the impact to the tax rate. Since the Energy savings actually offset the impact of the costs, the resulting impact can be balanced to minimize up front expenditures and reach cash-flow positive results more effectively – represented by a negative tax impact in Table II-C.

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Net Annual Capital Expense	\$33,975	\$41,359	\$38,800	\$15,000	\$20,000	\$17,000	\$12,500	\$17,500	\$5,000
Funded by Current Year Property Tax									
Assessed Valuation	\$414,244,978	\$423,565,490	\$433,095,714	\$442,840,367	\$452,804,275	\$462,992,372	\$473,409,700	\$484,061,418	\$494,952,800
On Which Taxes are Raised	\$12,564,227	\$12,846,922	\$13,135,978	\$13,431,537	\$13,733,747	\$14,042,756	\$14,358,718	\$14,681,789	\$15,012,130
Tax Rate For Capital Projects	\$1.03	\$1.25	\$1.18	\$0.45	\$0.61	\$0.52	\$0.38	\$0.53	\$0.15
Compute: (Net Annual Capital Expense/(Assessed Valuation/\$1,000) = Tax Rate Impact Per Thousand Valuation									

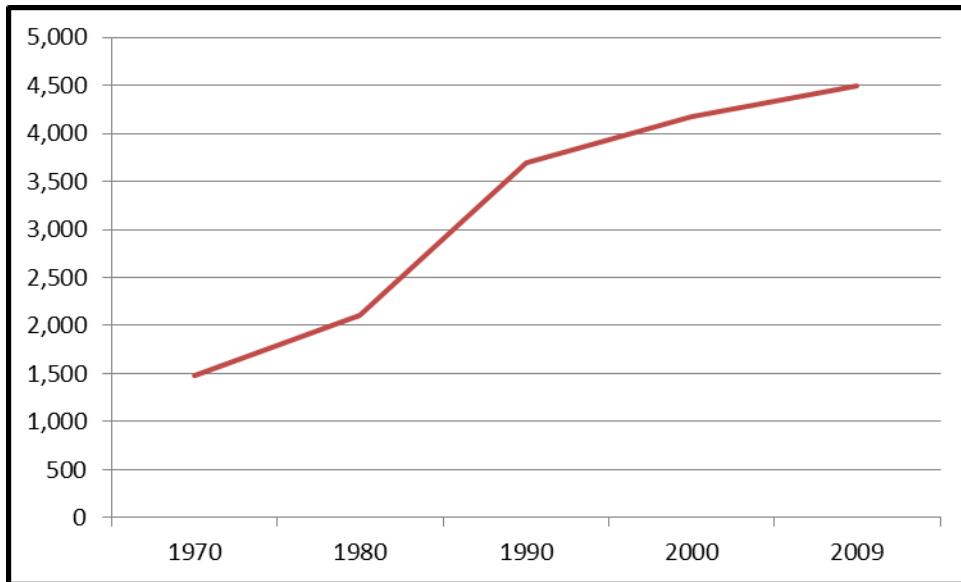
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Net Annual Savings	\$4,646	\$9,272	\$21,461	\$23,517	\$25,073	\$27,029	\$29,445	\$30,328	\$31,238
Funded by Current Year Property Tax									
Assessed Valuation	\$414,244,978	\$423,565,490	\$433,095,714	\$442,840,367	\$452,804,275	\$462,992,372	\$473,409,700	\$484,061,418	\$494,952,800
On Which Taxes are Raised	\$12,564,227	\$12,846,922	\$13,135,978	\$13,431,537	\$13,733,747	\$14,042,756	\$14,358,718	\$14,681,789	\$15,012,130
Tax Rate For Capital Projects	\$0.14	\$0.72	\$1.63	\$1.75	\$1.83	\$1.92	\$2.05	\$2.07	\$2.08
Compute: (Net Annual Capital Expense/(Assessed Valuation/\$1,000) = Tax Rate Impact Per Thousand Valuation									
2011									
Total Impact to Tax Rate	\$0.89	\$0.53	-\$0.46	-\$1.30	-\$1.22	-\$1.41	-\$1.67	-\$1.53	-\$1.93

III. UNDERSTANDING LEE AND IT'S ENERGY NEEDS

A. Population

Lee is a rural and largely agrarian community of 4,330 residents situated in Strafford County in the seacoast region of New Hampshire. Lee's close proximity to the University of New Hampshire has resulted in an engaged community that has a deep appreciation and sense of stewardship for the land. Lee is also a well-educated community with 95% of the residents having a high school degree and 49% receiving a bachelors degree or higher.

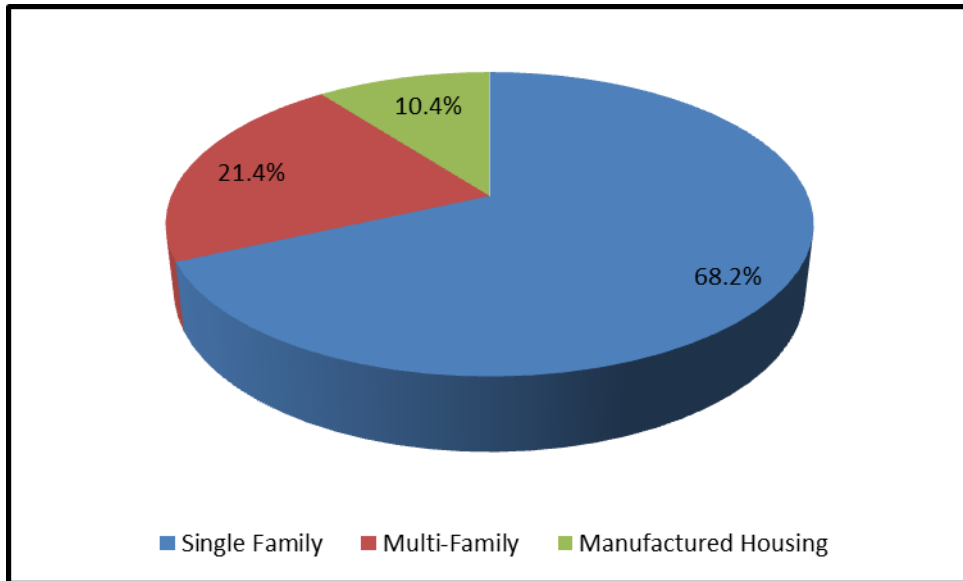
When census was first taken in 1790 Lee had 1,029 residents. Lee has seen extensive growth in the last fifty years, from only 575 residents (less than a third than when census was first gather) in 1950 to 4,169 in 2000. Coincidentally, it can be inferred that the majority of the housing stock in Lee was constructed after 1950, which experienced 40% growth between 1950-1980. Lee experienced the greatest increase in population of 75% between 1980-1990, so it is a reasonable assumption that a large portion of the housing stock was constructed during that time.



Population of Lee, NH 1970-2009

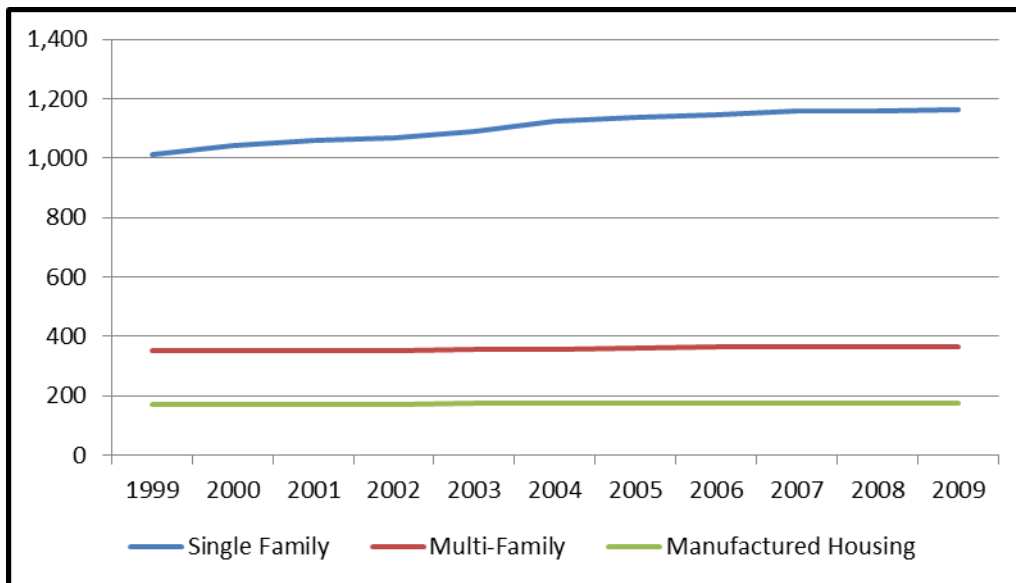
B. Housing

The predominance of homes in Lee are single-family residences, with multi-family residences and manufactured housing constituting about 30% of the housing stock.



Lee's housing stock by type, 2009

Lee continues to see growth in its housing stock, albeit slower than the last 30 years and predominantly in the single family home sector.



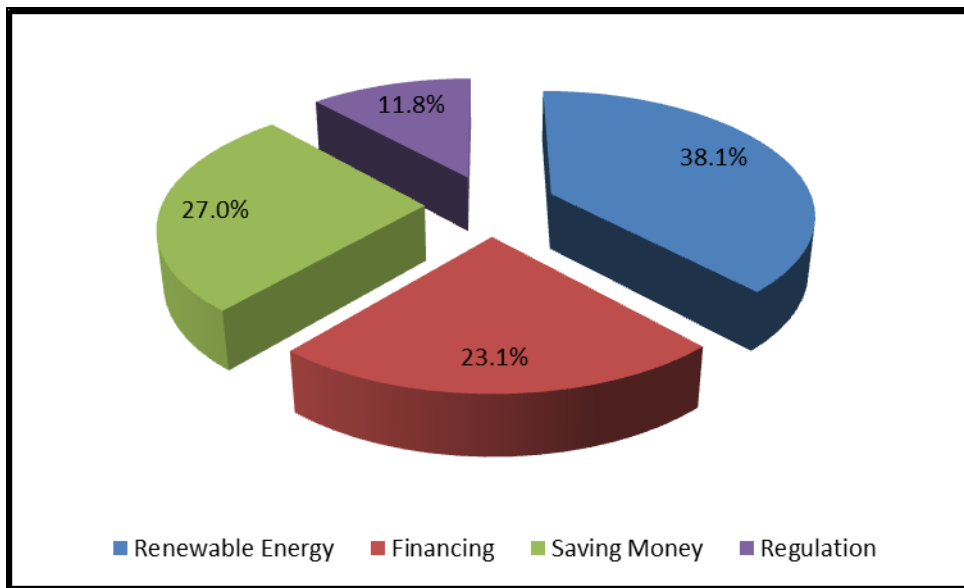
Lee housing stock by sector, 1999-2009

IV. ENERGY SURVEY

The Lee Energy Committee was formed in 2009 with a goal to interact with local citizens, to determine their energy goals and needs for their community and to inform, educate and enthuse the local population around energy security, energy efficiency and renewable energy. The Lee Energy Committee is an all-inclusive group that encourages local residents to become active in determining Lee's Energy future. The Lee Energy Committee hosted the first annual Lee Energy Fair in April 2011, inviting local residents to meet with local sustainable contractors and business, attend lectures from leaders of green industry and talk about their energy goals, both for themselves and the community. The fair was a resounding success, with over 20 local businesses represented, over a hundred residents in attendance and several dozen door prizes given out including energy audits, electricity monitoring equipment and many more. To be entered into the drawing for door prizes, each resident was asked to fill out a short survey about energy, their primary concerns and their goals for the community. The survey itself provides excellent insight and will serve as guidance for the Lee Energy Committee and community moving forward. The following is a discussion of the results of the Energy Survey and its broader implication.

1) In order of importance, what local energy issues are most important to you?

Renewable Energy - 38.1%, Saving Money - 27.0%, Financing - 23.1%, Regulation - 11.8%

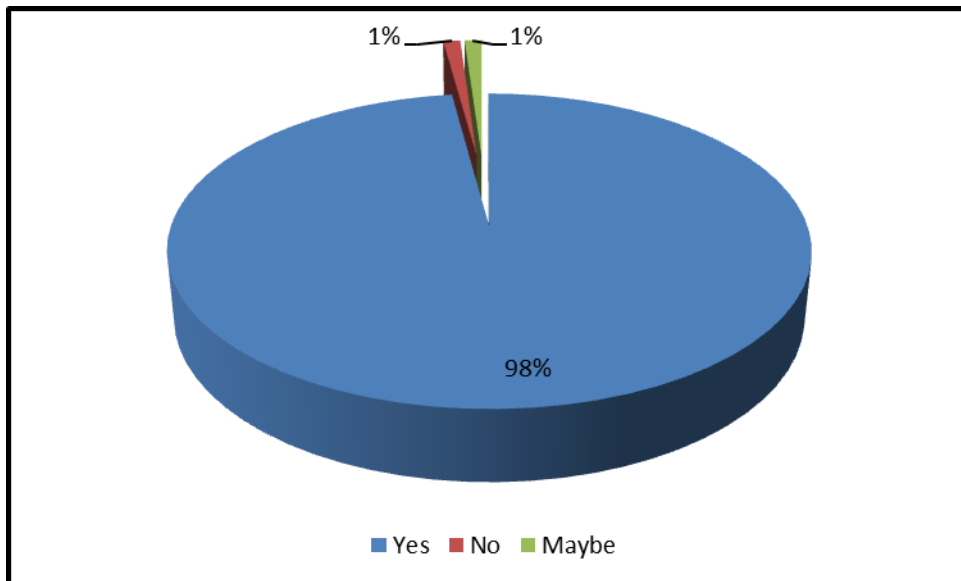


One of the most surprising results of the survey was the Lee community's prioritization of renewable energy over saving money on energy expenses. This demonstrates the progressive nature of the community in regards to its' outlook for future energy projects, especially in a time where energy costs are at all an all-time

high. The ideal situation for Lee residents is to identify renewable energy systems that reduce annual operating expenses immediately, which can often be achieved through third-party power purchase agreements and performance contracts. In a close third to saving money is financing, which may suggest that Lee would be agreeable to municipal alternative energy financing program like the Property Assessed Clean Energy (PACE) program already adopted by neighboring Durham and many other communities in the United States. One of the clearest results from this question is that regulation around energy is the lowest priority and not favorable to Lee Residents.

2) Should energy saving measures be an investment priority for Town and School owned buildings?

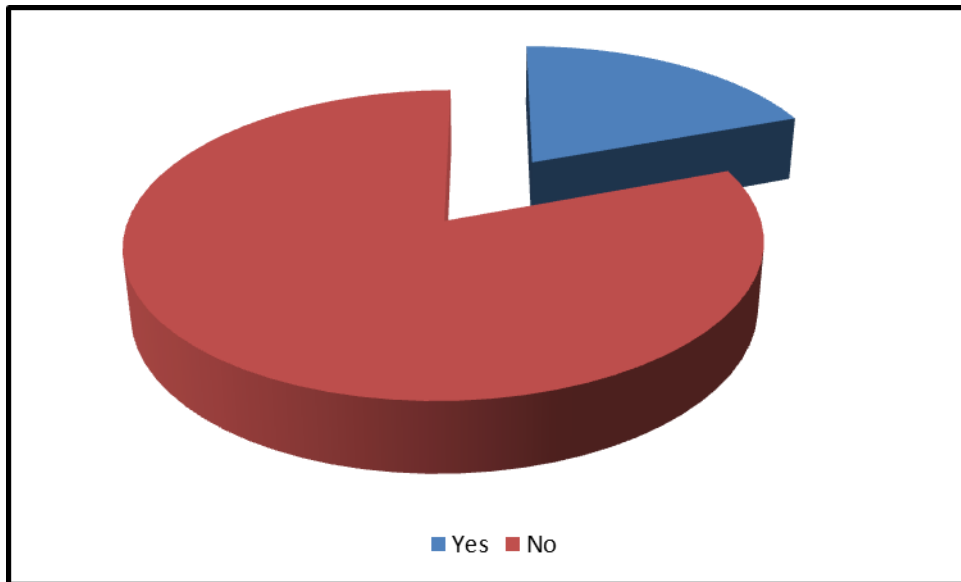
Yes- 98%, No - 1%, Maybe - 1%



The clearest result of the survey was making town-owned and school buildings an investment priority, with 98% of those surveys agreeing with such an initiative. There is a multiplicity of benefits investing in energy saving measures in school and town building, notwithstanding the reduction of operating costs and tax burden of residents, investment into something that has a true payback and educating townspeople and children about the significance of energy reduction through leading by example. Town buildings in particular often have not been winterized in many years despite the need and clear benefit to all residents. There are several energy audits being completed on town buildings and this survey provides a clear indication that townspeople are in support of proceeding with energy saving measures outlined in the energy audit report.

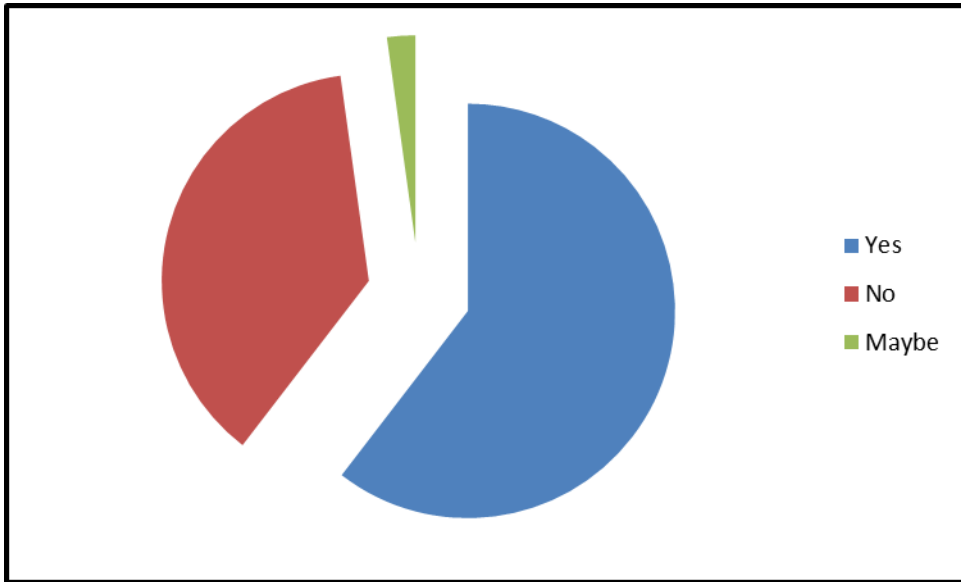
3) Has your home or business had an energy audit?

No - 80.6%, Yes - 19.4%



This question demonstrates a significant opportunity for the Town of Lee to reduce overall energy consumption in local residences and businesses by developing an education and outreach program to encourage residents to conduct an energy audits. Energy audits are the single best way to reduce energy use by modifying behavior and identifying aspects of the building envelope that are most in need of improvement. Extensive information on energy audits, including a simple walk-through you can complete yourself is included in this handbook.

4) Would you like to have an energy audit?



Yes - 60.4%, No - 37.4%, Maybe - 2.2%

The responses to this question demonstrates two things; that the majority of Lee residents are receptive to having an energy audit conducted for their home and that roughly a fifth of residents haven't had an energy audit and don't want to have one conducted. This reticence could be for a number of reasons including a sense of individuality and self-reliance or a reluctance to having strangers inspecting their home. Either way the question demonstrates that energy audit resources would be both beneficial and of interest to most Lee residents.

5) What is the number one issue the Lee Energy Committee should address?

This question was an open written response question on the survey and the results have been transcribed directly to serve as a qualitative guidance for the committee moving forward.

- where fiscally appropriate, renewable energy should be used
- affordable, bringing solar/renewable energy to all
- carpooling
- retrofitting buildings w/insulation etc
- solar and wind
- waste
- prepare for peak oil and peak water, energy and food scarcity

- town buildings, include school
- renewables for town and school buildings
- saving money
- renewable energy
- heating efficiency of town buildings
- renewable energy for buildings
- residential involvement and participation - individual education
- energy conservation and renewable energy
- giving tax credits to town residents for renewable energy installations
- air quality from inefficient wood burning stoves, I like wood but it should be clean burning
- efficiency
- renewable energy possibilities
- renewable energy
- become a leader in solar, wind, water power - for our town
- green energy
- insulating town buildings
- cost savings with renewable energy
- education, outreach, encouraging homeowners to reduce energy
- full assessment of the externalities of choices - worried about greenwashing
- solar hot water
- sustainable agriculture
- Information
- conservation
- what can I do at home today to save energy without installing a new system
- encouraging audits
- public building energy audits
- renewable (non-nuclear!) energy = solar and wind
- waste in public buildings
- saving money
- renewable energy - residential and town buildings
- renewable energy
- energy efficiency mortgage
- making lee residents aware of energy and money savings
- Improved solar energy in future for town buildings, solar panel hot water
- insulation

- breaking dependence on oil
- energy retrofits
- town and school energy efficiency
- improving energy efficiency of town and school buildings
- adopt energy saving measures in public buildings
- saving the town money
- town and school energy use
- help people weatherize
- town center - heating and cogeneration
- use solar energy
- making town buildings energy efficient
- alternative and renewable energy
- planning
- ROI only spend money to save money

Appendices: CAPITAL PROJECTS

This section identifies the capital expenditures anticipated over the next six years. Within this time frame (2011-2018), other projects will be identified which will be of high priority and warrant immediate inclusion in the Town's capital spending plan. It is highly unlikely that all such expenditures can be readily identified six years in advance. Thus, spending priorities identified in this plan for the year 2018 may not remain the same ten years into the future, although every effort should be made to adhere to the plan.

Likewise, the plan has been designed to be as realistic, practical and feasible as possible. The ECIP should not, and does not, constitute a "wish list" of desirable but unlikely spending and improvements. In preparing and accepting this document the Planning Board accepts the responsibility and obligation of making all good faith efforts to see that the plan is adhered to. It should, however, be recognized that the plan does not have the force of law and cannot commit or bind future administrations or officials of the Town of Lee to the long range spending plans of their predecessors.

Appendix A. Financial Capacity and Method of Financing

Town expenditures can be grouped into two broad categories -- operating and capital. Operating expenses, as previously noted, include such items as salaries, utilities, insurance, rent, equipment purchases under \$1,000, etc. Capital expenses are restricted to land, vehicles, buildings, equipment that lasts more than 5 years, building renovations and repairs, and road projects which result in long term improvements.

Capital improvements are generally funded in five ways that are explained below: 1) current revenue, 2) general obligation bonds, 3) revenue bonds, 4) capital reserve funds and 5) special revenue sources.

- 1. Current Revenue:** The most commonly used method of financing capital projects is through the use of current revenues. Current revenue is the money raised by the local property tax for a given year. When a project is funded with current revenues, its entire cost is paid off within one year. Projects funded with current revenues are customarily lower in cost than those funded by bonds. If the town has the financial capacity to pay for a project in a given year, the cost to the taxpayer will be less than if bonded because there are no interest payments to be made. However, making capital acquisitions with current revenues does have the effect of scheduling an expenditure into one-year resulting in higher taxes for the year of purchase.
- 2. General Obligation Bonds:** These bonds are used to finance major capital projects. They are issued for a period of time ranging from five years to twenty years, during which time principal and interest payments are made. They are secured by the government's power to tax and are paid for by property taxes. Time payments have the advantage of allowing the capital expenditures to be amortized over the life of the project and of avoiding the property tax peaks that result from capital purchases made from current revenues. On the other hand, they do commit resources over a long period of time, decreasing the flexibility of how yearly revenue can be utilized.
- 3. Revenue Bonds:** These bonds are issued to finance revenue-producing facilities, such as water and sewer services. Revenue bonds differ from general obligation bonds in that, while the town secures them, they are paid for out of revenues generated by the improvement being financed. Thus, a water distribution system improvement, funded through revenue bonds, would be paid for by revenue received from water users. User fees, with no local tax money involved therefore pay for the floating of these bonds.
- 4. Capital Reserve Fund:** Since many capital projects involve very considerable expenditures, it is often advantageous to set aside current revenue over a period of years in order to make a purchase. The resulting capital reserve fund can be for

general purposes, with its use determined at a later date, or specific, with its purpose set out initially. One obvious advantage of a capital reserve fund is that the major acquisition can be made without the need to go into the bond market and without making interest payments. With capital reserve funds, monies are "removed" from the town's budget in the year in which the money is appropriated, not in the year in which the purchase is actually made.

5. **Special Revenue Sources:** This category includes projects financed by user fees, intergovernmental transfers, grants and gift/donations. Intergovernmental transfers, so-called, are highway aid from the NH Dept. of Transportation, the Environmental Protection Agency for sewer projects, the Dept. of Housing and Urban Development for community development projects, and the Dept. of the Treasury for general revenue sharing funds. These programs either provide an out-right grant or provide matching funds to go with locally raised funds.

Appendix B. Proposed Capital Projects

TABLE
LEE ENERGY CAPITAL IMPROVEMENTS SCHEDULE 2009-2014

Building	Project Description	Total Project Cost	Heating Savings %	Kwh Savings %	2011	2012	2013	2014	2015	2016	2017	2018	2019	
Town Hall	Efficiency Upgrades													
	Lighting	\$4,500	3%	15%	\$75		\$4,500							
	Door Weatherization	\$75	3%		\$0									
	Window Weatherization	\$5,000	7%		\$5,000									
	Foam Air Sealing	\$1,000	5%											
	Heat Pipe Insulation	\$25		3%										
	Wrap Hot Water Tank	\$7,500	12%	2%	\$7,500									
	Insulation	\$10,000	12%	3%	\$10,000									
	Boiler Room	\$7,500	5%	2%	\$7,500									
	Total	\$35,675	47%	25%										
Town Hall Annex	Efficiency Upgrades													
	Lighting	\$3,500	3%	15%	\$75		\$3,500							
	Door Weatherization	\$75	8%											
	Replacement Windows	\$4,000	7%		\$4,000									
	Foam Air Sealing	\$6,500	7%											
	Attic Insulation	\$25		3%										
	Wrap Hot Water Tank	\$7,500	12%	2%	\$7,500									
	Boiler Replacement	\$1,500	5%											
	Heat Pipe Insulation	\$28,100	42%	20%										
	Total	\$54,275	51%	20%										
Library	Efficiency Upgrades													
	Insulate Basement	\$4,500	3%											
	Insulate Children's Rm	\$15,000	7%											
	Insulate Exterior Walls	\$3,500	3%											
	Foam Air Sealing	\$75												
	Door Weatherization	\$1,500	3%											
	Window Sealing	\$4,200	10%		\$4,200									
	Replace A/C	\$7,500	12%		\$7,500									
	Furnace Replacement	\$3,000	3%											
	Insulate Ductwork	\$4,000	5%	15%										
Lighting	\$3,500	9%												
Appliances	\$54,275	51%	20%											
Total	\$54,275	51%	20%											
Public Safety Complex	Efficiency Upgrades													
	Heat Recovery Ventilation	\$5,000	5%											
	Attic Insulation and Sealing	\$10,000	7%		\$3,300		\$3,300							
	Fire Garage Insulation	\$12,500	5%											
	Between Buildings	\$7,500	3%											
	Unfinished Space	\$12,500	5%											
	Lighting	\$5,500		20%										
	Basement Wall Insulation	\$5,500	5%											
	Total	\$58,500	30%	20%										
	Recycling Center	Efficiency Upgrades												
Insulate Compressor Area		\$1,000	5%		\$1,000									
Insulate Office Roof		\$7,500	5%											
Insulate/Seal Equipment Rm		\$5,000	5%											
Lighting Sensors		\$750		5%	\$750									
Insulate Maintenance		\$5,000	3%											
Door Weatherization		\$500	3%		\$500									
Lighting		\$5,000	10%											
Total		\$24,750	18%	20%										
Total			\$201,300			\$33,975	\$41,350	\$38,800	\$15,000	\$20,000	\$17,000	\$12,500	\$17,500	\$5,000

Lee Town Hall – Energy Efficiency Recommendations

1) Air sealing and insulation of basement crawl space

- Determine structural of floor prior to all work
- Air Seal the crawl space ceiling / subfloor with expanding foam
- Remove the existing fiberglass batt insulation from the joist bays and install R-30 fiberglass batts between the joist bays (with the vapor barrier facing the subfloor).
- Add 2” of rigid foam board insulation at the bottom of the floor joists, and foam the joints, enclosing the floor’s envelope.
- Install, 6 mil poly sheeting as a vapor barrier over the dirt floor and 1 ft. up the foundation walls.
- Install 2” of Urethane spray foam on the foundation walls from the dirt floor to the subfloor (as an air and vapor barrier, and secondarily as a thermal barrier).
- This method creates a vapor barrier at the dirt floor and along the walls, significantly reducing the moisture level in the crawl space area. The 2” of spray foam on the walls continues the vapor barrier and creates an air barrier, (and provides some additional insulating value). The primary thermal barrier is at the subfloor, continuous with the rest of the building envelope.

Note: An alternative recommendation is:

- Install min. 3” (consider cost/benefit of 4”- 5”) of closed cell spray foam insulation in the joist bays, and cover the remainder of the joists and beams with a 1” minimum.
- This method effectively provides an air and vapor barrier as well as insulation (6.2 R-value per inch).
- Cost and accessibility for spray foam installation is the primary concern. The crawl space ceiling is approximately 1900 sq. ft. versus the crawl space walls at approximately 510 sq. ft. A cost comparison and consultation with the installer regarding installation may be warranted.

2) Air seal and insulate attic

- Air-seal penetrations through the second floor ceiling.
- Repair the roof leak at the dormer.
- Create temporary access to the attic area
- Complete framing the attic floor / second floor ceiling in the computer and furnace rooms from the hallway partition wall to the roof slope.
- Remove the 6” fiberglass batt insulation from the rafter bays in the attic area and install at the attic floor.
- Add 8” of blown-in cellulose insulation (R-value 3.7 per inch) on top of the fiberglass batts at the attic floor.

Knee wall space

- Install closed cell spray foam insulation in the 7” rafter bays, from the eaves, closing the soffits, to above the second floor knee-wall through to the floor insulation in the attic area. This reestablishing the thermal boundary from the floor and knee-wall to the roof slope, at an approximate R- value of 6.0 per inch

3) Air seal and insulate Furnace Room and computer room

- Seal all joints in the furnace ventilation pipe, replace the hangers and secure the ventilation pipe.

- Replace the pipe wrap in the furnace room with closed cell pipe wrap and install closed cell pipe wrap on the copper pipes in the computer room and throughout the building where accessible.
- Complete the framing of the second floor ceiling from the hallway partition walls to the roof slope.
- Remove the insulation in the area of the furnace ventilation pipe and install 5/8" fire-rated gypsum board, according to code.
- Urethane spray foam at the eaves, closing the soffits.
- Add 2" Poly-isocyanurate rigid board insulation (R-value 7.0 per inch) to the rafters (in the computer room and furnace room, from the eaves/soffit area to the second floor ceiling, and air seal the joints).

4) *Air seal and insulate windows*

- Air seal and insulate the window opening with the wood panel covering in the front of the building.
- Replace the temporary panel and flex-tube ventilation pipe through the window opening with a permanent hard pipe ventilation through the wall; then air seal and insulate with expanding foam.

5) *Doors*

- Install weatherization door kits at the four doors (front, side, back 1st floor and 2nd floor).
- Remove the mail slot (to the left of the back door – 1st floor), air seal and insulate.

6) *Lighting upgrades*

- Replace all incandescent bulbs with Compact Fluorescent Lights (CFL's) or other high efficiency exterior lights (e.g. LED's)
- Consult with a lighting specialist for high efficiency flood lights.
- Replace all incandescent lighting with Compact Fluorescent Lighting (CFL). There are many new colors and designs that don't flicker or cause headaches!

7) *HVAC maintenance*

- Ensure that floor, ceiling or wall registers are not blocked by furniture or other related items. If they are blocked the heating or cooling system will not function to its peak performance when it was installed.
- Conduct annual heating system inspections and cleanings.

8) *Electrical Machines and Appliances*

- As aging units need replacement, opt for an energy star unit. (Energy Star units are certified by the federal government to have met certain energy reduction criteria.)
- Utilize automatic computer shutdown systems to turn off all computers at the end of each day or when idle.
- Turn off all, printers, cable modems, TVs and other media equipment when not in use.
- Quarterly clean refrigerator coils. This will ensure the appliance is running in its intended condition. Also, fill empty milk jugs to increase the mass inside the refrigerator, it will increase its efficiency and help it maintain a constant temperature.

9) *Walls*

- The greatest benefit per cost is derived from air sealing and insulating at the basement/crawl space and the attic level – where the building pressures and air infiltration and exfiltration are the greatest. The benefit per cost of accessing and installing additional wall insulation is marginal and is not recommended at this time.

Lee Town Hall Annex – Energy Efficiency Recommendations

1) Install Attic Insulation

- Remove storage items from the attic floor.
- Air seal all roof penetrations with expanding foam.
- Temporarily remove one of the gable windows for access to the attic.
- Add 14” of loose-fill cellulose insulation (R-value 3.7 per inch) for an R-value of 50.

2) Install High-efficiency windows

- Consider replacing single pane window(s) on the first floor with double glazed windows, with storm windows.
- Add storm windows to the existing double pane windows (on the first floor).
- Consider replacing one of the gable window at the attic level with an access door (or window) to the attic

3) Walls

- The greatest benefit per cost is derived from air sealing and insulating at the basement/crawl space and the attic level – where the building pressures and air infiltration and exfiltration are the greatest. The benefit per cost of accessing and installing additional wall insulation is marginal and is not recommended at this time.

4) Door weatherization

- Add weatherization kits, including gaskets to all exterior doors.

5) Lighting

- Consult with a lighting expert (e.g. PSNH) for high efficiency replacement fluorescent bulb options. PSNH will also outline available rebates for the town
- Replace all incandescent lighting with Compact Fluorescent Lighting (CFL). There are many new colors and designs that don’t flicker or cause headaches!

6) HVAC maintenance

- Ensure that floor, ceiling or wall registers are not blocked by furniture or other related items. If they are blocked the heating or cooling system will not function to its peak performance.
- Wrap the electric hot water tank with insulation.
- Conduct annual heating system inspections and cleanings.

7) Electrical Machines and Appliances

- As aging units need replacement, opt for an energy star unit. (Energy Star units are certified by the federal government to have met certain energy reduction criteria.)
- Utilize automatic computer shutdown systems to turn off all computers at the end of each day or when idle.
- Turn off all, printers, cable modems, TVs and other media equipment when not in use.

- Quarterly clean refrigerator coils. This will ensure the appliance is running in its intended condition. Also, fill empty milk jugs to increase the mass inside the refrigerator, it will increase its efficiency and help it maintain a constant temperature.

Lee Public Safety Complex– Energy Efficiency Recommendations

1) Heat recovery ventilation

- Ventilation systems should be installed to control vehicle exhaust. Two types of ventilation systems are dilution and local. Local exhaust is preferable because it removes the diesel exhaust at the source
 - Reference: <http://nj.gov/health/peosh/documents/dieselib.pdf>
 - Local Exhaust Ventilation:
 - An exhaust filter hose system is connected to the tail pipe of the truck. It should remain on the tail pipe until the truck has left the building.
 - Make-up air must be supplied to replace exhausted air.
 - The exhaust opening should be situated to prevent re-entry of exhaust through windows or fresh air intakes.
- Install a combination gas Carbon Monoxide (CO) and Nitrogen Oxide (NO₂) detector
 - (e.g. <http://www.braschmfg.com/products/detectors/GSE-ND.htm>).
- Install a heat recovery ventilation (HRV) system in the Fire Station garage, activated with a combination CO and NO₂ Sensor.
 - The HRV provides a balanced exchange of exhaust air and make-up air, and transfers heat from the exhaust air to the make-up air through a radiator/grid system – saving on heating costs.

2) Address horizontal roof valley at juncture of fire station garage and police station garage

- Consult with an architect and/or builder about creating a new pitched roof plane in the horizontal valley sufficient to drain water toward the eave and off the roof.
- Consider a rain catchment system, including a series of gutters and downspouts, a storage tank or tanks, and an electric pump.

3) Attic Insulation and sealing

Above Main Building

- Air seal attic floor penetrations
- Add proper vents in rafter bays at the eaves
- Close soffits around proper vents with “burrito” fiberglass batts preventing air flow through the attic insulation.
- Add 16” of loose fill cellulose insulation (R-value 3.7 inch) in the places with no insulation; and over the existing fiberglass batt insulation - effectively covering the HVAC ducts and providing an additional R-value of 60.
- Weatherize the attic hatch 4” rigid foam board, door gasket, and hook and eye
- Remove the OSB in the area of the gable vents for proper air flow in the attic

Above Fire Station Garage

- Air seal all wiring chases and penetrations through to the attic space
- Install 4” of blown-in cellulose insulation (R-value of 3.7 / inch) – achieving a combined R-value of 60.
- Removed the OSB in the area of the gable vent.
- Weatherize the attic hatch 4” rigid foam board, door gasket, and hook and eye

Between Main building and Garage

- Air seal all wire, plumbing and vent penetrations through to the attic
- Add 16” of loose-fill cellulose insulation in the areas without insulation (or with minimum insulation) – achieving an R-value of 60.
- Consult with an architect and/or builder about creating a new pitched roof plane in the horizontal valley sufficient to drain water (not necessarily snow) toward the eave and off of the roof.

Unfinished Space

- Air seal and insulate underneath the electrical panel (at the wire chase to the panel) in the gym space.
 - With fire retardant spray foam, according to code.
- Air seal and insulate around the window openings with low-expanding spray foam.
- Tape all fiberglass batt seams and joints for more effective air sealing and vapor barrier.

4) *HVAC maintenance*

- Ensure that floor, ceiling or wall registers are not blocked by furniture or other related items. If they are blocked the heating or cooling system will not function to its peak performance when it was installed.
- Conduct annual heating system inspections and cleanings.

5) *Efficient lighting upgrades*

Fire Station Garage

- Replace the fluorescent light panel motion sensor with a lumen sensor to activate lights based on lighting conditions rather than motion activated.

Main Building

- Install occupancy sensors in rooms without sensors.

6) *Fire Safety*

- Install sprinkler systems throughout the building according to code.
 - Emphasis on the furnace room sprinkler system for fire safety.

7) *Electrical Machines and Appliances*

- Replace the vending machine with an energy efficient LED bulb vending machine
- When replacing appliances and electronic equipment replace with Energy Star rated units.
- Utilize automatic computer shutdown systems to turn off all computers at the end of each day
- Turn off all, printers, cable modems, TVs and other media equipment when not in use.
- Quarterly clean refrigerator coils. This will ensure the appliance is running in its intended condition. Also, fill empty milk jugs to increase the mass inside the refrigerator, it will increase its efficiency and help it maintain a constant temperature.

8) *Wall insulation of basement*

- The greatest benefit per cost is derived from air sealing and insulating at the basement/crawl space and the attic level – where the building pressures and air infiltration and exfiltration are

the greatest. The benefit per cost of accessing and installing additional wall insulation is marginal and is not recommended at this time.

Lee Recycling Center– Energy Efficiency Recommendations

1) Enclose and insulate Compactor Area- Crawl Space

- Add 3” of closed-cell spray foam at the ceiling (R-6.2 per inch) and cover the steel joists and beams with 1” of closed-cell spray foam.
- Frame the generator crawl space side walls with ½ “ plywood to the exterior, and 2 x 3 framing (flush to the interior surface of the pylons).
 - Insulate the stud bays with 2 1/2” spray foam (R-6.2 per inch and air sealing) to the surface of the framing, then 2” rigid foam insulation over the 2x3 framing (creating a more durable surface, with some reflective heat benefit).
- Frame the front wall with 2 x 4’s at the front pylon (& before the container attachment flange), plywood to the exterior and rigid board insulation.

2) Insulate Roof system over office space

- Add a minimum of 4” closed-cell spray foam insulation (R-value 6.2 per inch) providing a minimum aggregate R-value of 30.

3) Insulate and air seal Mechanical and Electric Systems/Pump Room components

- Air seal and weatherize the access hatch to the exterior
- Air seal around the 5” water pipes at the exterior wall.
- Weatherize the attic hatch 4” rigid foam board, door gasket, and hook and eye

4) Lighting sensors modifications

- Change the recycling facility fluorescent panel lighting from occupancy sensors to lumen sensors, each on their own circuit (around 30 units)
 - to provide lighting when necessary, and reduce electric costs.
- Install an override switch at the office.

5) Construct new swap shop and insulate detached Maintenance Building

- The new swap shop is planned to have R-30 walls and R-50 roof insulation
- There is sufficient waste oil to heat both the maintenance building and the planned new swap shop.
- Additional waste oil heating system is anticipated to be paid in part by NH DES grant program.

5) Door weatherization

- Add weatherization door kits to the exterior doors

6) HVAC maintenance

- Install pipe wrap on the water pipes for the safety shower and eye bath
- Spray closed cell foam in the shed area
- Ensure that floor, ceiling or wall registers are not blocked by furniture or other related items. If they are blocked the heating or cooling system will not function to its peak performance when it was installed.

7) *Electrical Office Machines and Appliances*

- As aging units need replacement, opt for an energy star unit. (Energy Star units are certified by the federal government to have met certain energy reduction criteria.)
- Utilize automatic computer shutdown systems to turn off all computers at the end of each day or when idle.
- Turn off all, printers, cable modems, TVs and other media equipment when not in use.
- Consider plugging all appliances into a central power strip and turn off when leaving room.
- Quarterly clean refrigerator coils. This will ensure the appliance is running in its intended condition. Also, fill empty milk jugs to increase the mass inside the refrigerator, it will increase its efficiency and help it maintain a constant temperature.

Lee Library – See attached Municipal Energy Assistance Program DGA Report

Attached.

