

ENERGY

13. INTRODUCTION

This chapter provides information on current energy consumption and dependencies, and provides a road map to future conservation and efficiency.

13.1 COMMITMENT

Being both environmentally aware and fiscally conservative, the Town of Littleton is committed to maximizing energy conservation and efficiency. Steps have been taken toward this goal, but much more remains to be done that will challenge residents, non-profits, businesses, and municipal organizations to work together in unprecedented ways. There is also significant economic development potential for local entrepreneurs who promote the use of renewable energy from local resources and provide energy efficient products and services.

The science of climate change may be debated, but the economics of energy conservation and efficiency cannot. Some measures, such as replacing light bulbs, result in immediate savings. Others, such as installing a solar heating system, have paybacks measured in years or decades. What is certain is that if nothing is done, no savings or environmental improvements will be realized. Thoughtful, incremental measures are needed through a combination of incentives, voluntary actions, and, where necessary, ordinances.

13.2 BACKGROUND

Littleton has a long, proud history of environmental awareness. Rev. Carleton Schaller headed up the Town's efforts to honor the first national Earth Day in 1970 designed to inspire awareness and appreciation for the environment. Some form of recognition of Earth Day has occurred every year since then with road-side clean up an annual event since 1991.

13.2.1 LITTELTON ENERGY COMMITTEE FORMED

In 2007, Littleton adopted the New Hampshire Climate Change Resolution and established the Energy Conservation Committee (ECC). The purpose of the ECC is to promote energy conservation and efficiency practices, with a local and regional focus, by educating the private sector and advising the public sector in the areas of cost reductions and sustainable, renewable energy sources. The goals of the ECC were established as:

- Reduce energy consumption town wide
- Conserve natural resources
- Save money

Committee goals for the period 2016-2020 include:

- High Priorities: Institutionalize the Energy Management Plan; complete lighting retrofits at municipal buildings; improve the heating system at the fire station; and, conduct energy audits on the fire station and Opera House
- Medium Priorities: Explore solar initiatives; assist in improving efficiency of existing buildings; offer advice on new construction; expand interaction with the school district; and, increase involvement with regional organizations.
- Low Priorities: Promote electrical vehicle charging stations; and, explore major biomass possibilities.

13.2.2 STATE-WIDE STRATEGY AND ROLES

In 2015, New Hampshire approved the State Energy Strategy (SB 191), designed to inform decision makers about the state's energy future. Cooperation amongst legislators, state agencies, municipalities, institutions, citizens, and businesses was stressed if the recommendations of the strategy are to be implemented. The recommendations are organized in four main categories:

- The Electric Grid of the Future
- Fuel Diversity and Choice
- Increasing Investments in Cost-Effective Energy Efficiency
- Increasing Transportation Options

The NH Office of Energy and Planning (OEP), Energy Division, operates several energy programs in partnership with both private and public entities to promote a sustainable, environmentally sound, least-cost energy future for New Hampshire. The Energy Division is tasked with:

- Promoting energy efficiency and reducing energy costs by supporting programs for low-income households, state government buildings, businesses and industry, and schools and towns;
- Exploring opportunities to expand the use of renewable, domestic energy resources such as biomass, wind and solar energy; and,
- Administering state and federal programs related to energy.

13.3 ENERGY CONSERVATION

The objective of conservation is to reduce the current energy load. The traditional three R's of energy conservation are Reduce, Reuse, and Recycle. Whereas most of the emphasis has been placed on recycling, reducing and reusing are perhaps more compelling cases in the area of avoiding costs. All these measures have the additional benefit of reducing the amount, and associated costs, of sending trash to the landfill.

The goal of recycling is to limit the amount of trash by recycling paper, cardboard, glass, plastics, metals, etc. Fortunately, Littleton has a top notch Transfer Station. The Town also has organizations, such as Common Ground, that provide recycling pick-up services at local businesses. Recently, zero-sort collection options have become available.

Littleton Regional Healthcare has an award winning recycling program. The hospital estimates that over a ten-year period, the total weight of recycled items surpassed one million pounds, the equivalent of 40 acres of landfill, with a savings of about \$200,000. Mention should be made of the outstanding recycling efforts at Lakeway Elementary, the Littleton Coin Company, Alburrito's Restaurant, and the Police Department.

Recycling expansion and improvements are possible through:

- mobile shredding services
- collection bins on Main Street and other high traffic areas
- encouraging more businesses to recycle
- commercial composting
- accepting more items at the Transfer Station

A fourth "R" – Rethink – has been added to the equation. One might also rethink how the conservation efforts of even one person, one household, or one business can make a difference. At the personal level, this means such things as using products made from recycled materials and purchasing locally produced goods (food, clothing, furniture, etc.). The new Littleton Food Co-op is a leader in the latter area. Another suggestion would be to patronize businesses with high standards for waste reduction in the production and packaging of goods. Many individual efforts will aggregate to a much greater savings. One method to check individual usage and progress is the Kill-A-Watt. This product measures energy used by devices plugged in directly to the meter. The Littleton Public Library has four Kill-A-Watt meters available for loan.

13.4 ENERGY EFFICIENCY

While conservation measures are a great first step, energy efficiency upgrades have even greater savings potential. Investment in efficiency reduces the reliance on imported fuels, boosts the economy by creating in-state jobs, and lowers energy costs for residents and businesses. Upgrades can range from simple insulation of an attic or basement to comprehensive air-sealing measures. The package of upgrades that is right for a building depends on many factors, and the best way to get started is an energy audit.

The NH OEP provides information on how to winterize a home, heating and cooling energy tips, automobile energy tips, equivalent fuel price comparisons, etc. They also have a program to serve low-income households that are most vulnerable to high-energy costs and who have no means of making cost-effective improvements to their homes.

An energy efficient office saves money and helps the environment. The Town of Littleton is strongly committed to good stewardship of its citizens' tax dollars, and energy efficiency at the office is just good business. Accordingly, an energy policy was adopted in 2015 that applies to all departments. The Town also amended the Purchase Policy to require consultation with the ECC before purchasing or replacing equipment.

While Lakeway has a laudable recycling program, more could be done throughout the school district, such as embedding energy conservation and efficiency in the curriculum. This could be spearheaded within the Environmental Studies Program and/or an internship with the ECC.

13.5 BUILDINGS

Typically about 60% of all energy is consumed in buildings, making reduction of this usage a common public and private goal. Efficiencies can be realized through better building envelopes, operating systems, and appliances. Littleton should strive to improve efficiency in existing and new buildings through a combination of audits to identify and prioritize problem areas, and grants, incentives, or low interest loans to remediate inefficiencies. Consideration might be given to adopting voluntary or mandatory energy building codes. The Town might consider contracting a building inspector, whose services could be shared with other towns, to insure compliance with any new state or local codes or ordinances.

Local examples illustrate that energy efficiency makes sense for new construction. One such example is AHEAD's Town and Country affordable housing project that features numerous energy-efficient features: increased insulation, Energy Star lights and appliances, krypton gas-filled windows, and mandatory recycling.

Through the NH Municipal Energy Assistance Program (MEAP), Littleton received an energy inventory, one energy audit, and 25 hours of energy advocacy to help carry out improvements. The MEAP report recommended:

- maintaining the inventory database and software and inputting updates of electricity, fuel, oil, etc. usage as this will, among other things, strengthen future applications for grants;
- reviewing the Master Plan, zoning ordinances, and other Town policies for practices inconsistent with the goal of reducing energy use;
- implementing a strategy to purchase Energy Star equipment and environmentally sensitive office products, and implement consumption awareness campaigns;
- implementing a behavioral change program with municipal employees; and,
- finding alternative energy sources to reduce costs and emissions.

In 2014, the ECC established the Energy Management Plan (EMP) to systematically track energy consumption and efficiency, looking for trends in use, and recommend remedial action when necessary. In the 1st Annual Energy Management Report, published in 2015 and posted to the Town's website, the public library was cited for its outstanding effort at reducing energy use. An associated data base records energy consumption at municipal buildings that includes electricity, water, and all sources of heating and air conditioning. Members of the ECC also periodically visit department heads to track progress. The ECC briefed the Board of Selectmen in 2015 on observations and recommendations that could be implemented immediately or put forward at Town Meeting.

13.5.1 RETROFITS

Converting existing systems to more efficient systems should be encouraged. wood, solar, wind, geo-thermal, and biomass should be considered for all types of existing structures (municipal, school, commercial, and residential).

Energy audits are an excellent tool to determine efficiency. Audits come in various grades ranging from residential to industrial, from simple blower test to modern thermal scans. While these can be expensive, grants may be available. In 2016, voters in Littleton appropriated funds for decision-level audits of the Opera House and Fire Station. The resulting report will help the Town prioritize remedial actions.

In 2013, a new distributed biomass (wood pellet) system was installed as the primary heating system for the Fire Station and the existing highway garage. Cost savings over a period of 20 years were estimated to be in excess of \$300K.

In 2014, Littleton Regional Healthcare installed a biomass (wood chips) system as the primary heating source at the hospital. While some oil is used as a supplemental heating source, daily use dropped from 1,200 gallons to 20, and wood chips cost about a third of what was previously spent on oil. The average annual saving is \$400,000 with an excellent payback of 5.4 years. The annual thermal output allows the hospital to sell 6,000 Renewable Energy Credits.

In 2015 and 2016, virtual almost all of the lights at the Fire Station, Opera House, Transfer Station, Waste Water Treatment Plant, and Senior Center were retrofitted to higher efficiency lighting, primarily LEDs. Safety and operational factors were also considered in this major overhaul. Funding from the Town was matched by a NH state rebate program.

Littleton Water and Light has recently decided to accelerate the replacement of streetlights with higher efficiency LED technology.

The Town recently agreed to start providing NH OEP energy consumption data from the Waste Water Treatment Plant. This data will be used to benchmark consumption and to compare the Littleton system with others in the state. Participation in this program could result in funding for a much needed energy audit of the plant.

13.5.2 NEW CONSTRUCTION

New construction should incorporate state-of-the-art energy efficiency and renewable energy sources into the design of the building envelope, operating systems, and energy consuming appliances and devices. As a municipal government, Littleton is the primary authority having jurisdiction over construction in Town. Life safety regulations include fire, plumbing, and structure. Other government responsibilities include location, use, and appearance. Today, many governments regulate construction for to ensure energy

efficiency. For instance, during construction buildings may be inspected for properly installed insulation and heating plants. At a minimum, the Town should certainly consider mandating energy efficiency in all public works.

To this end, Littleton could adopt construction standards. This might include Energy Star, LEEDS, and/or other standards. Cluster developments should be fostered or incentivized because they protect valuable land resources and save energy in transportation. Reinstating site plan review would go a long way in realizing the goal of properly managed growth. Another area to consider would be incentives to reduce or eliminate construction waste, and increase the use of combined heat and power systems.

In 2015, Littleton voters appropriated funding for a new Highway Department garage. Here are some of the energy efficiency features of the new construction:

- Insulation: The walls are rated at R24 and the ceiling at R33.
- Doors: Large, overhead, passive solar doors provide natural light and supplemental heat during the winter months. Using less artificial light will save on electricity.
- Lighting: Highly efficient LED lights, augmented by large solar doors, and occupancy sensors.
- Heating: The existing biomass (wood pellet) system continues to be the primary heating source, supplemented and backed up by a new propane system. Radiant floors work especially well in tandem with the wood-based heating system. Radiant heat also keeps the slab floor dry, a life-safety enhancement.
- Gas Saving: Less idling will be required to warm up vehicles in the winter.

Features such as these should be considered in any new municipal construction, such as a replacement for the Parks and Rec building at Remich Park or a new elementary school.

13.5.3 INCENTIVES

It is recommended that the Planning Board introduce warrant articles to reward the use of green materials in new construction (municipal, commercial, and residential) and builders that reduce or eliminate waste on site. Local tax credits for certain home improvements should also be considered to supplement state and federal programs.

Littleton might consider providing incentives to local businesses that have, or are developing, product lines for builders and homeowners that use natural, sustainable, or recycled materials.

The same principles of efficiency and cost avoidance apply to the construction industry. Projects that use local subcontractors not only bring money into the economy but reduce energy involved in transporting material and products from far away.

13.6 TRANSPORTATION

Updated September 20, 2016

The second biggest consumer of energy is transportation with NH residents traveling 43 million miles per day in cars, trucks, and buses. We need to reduce reliance on automobiles and encourage alternative forms of transportation such as bicycles, walking, and mass transit systems. We should also avoid any negative impact on transportation caused by development. We should promote the use of electric vehicles by establishing charging stations in Town. The Littleton Food Co-op plans to include a charging station as part of its upcoming expansion.

13.6.1 RURAL CHALLENGES

We live in a rural area where many people must travel to work. This is inefficient and increases the demands on the family budget. While it is unrealistic to expect a fixed-route transportation system running through every town in the North Country, supplementing what exists today should be a goal. North Country Transit operates the Tri-Town Trolley in Littleton, Whitefield, and Lancaster and Littleton should continue to support this system to help maintain and expand services.

Currently there are no DOT Park and Ride lots in the North Country. Consideration should be given to negotiating with owners of underused retail lots in Littleton for potential Park and Ride sites.

Within Grafton County, Littleton has the highest rate (10.2%) of housing unit occupants with no vehicle. Littleton also has the county's highest rate (11.4%) of individuals living below the poverty level. Workers need inexpensive and easily accessible means of getting to their place of employment. A robust, organized volunteer program is needed to work with businesses to promote transportation alternatives. In a similar manner, expanding broadband access, coupled with employer education might encourage people to work from home and reduce commuting.

13.6.2 ALTERNATIVE TRANSPORTATION

The Town should make every effort feasible to promote walking and biking as an alternative to vehicular travel. Improved sidewalks and crosswalks will encourage bikers and walkers. Eventually we should strive for a non-motorized network "greenway" plan for the entire Town. In addition, the Zoning Ordinance should encourage mixed use development and dense residential development in walking distance to jobs, school, shopping, and services.

13.6.1 CHANGES IN BEHAVIOR

The MEAP report recommended evaluating ways to reduce fuel usage with the Town's vehicle fleet. Energy-saving technologies (such as upgraded, more fuel efficient vehicles) and energy conserving behaviors should be considered. This can be done by analyzing routes, usage, carpooling, and a strict no-idling policy. Other changes to consider are:

- A 4-day work week for certain Town departments or businesses
- Seek auto dealerships in Littleton that specialize in low-emission vehicles.
- Evaluate the potential for using alternate fuels in Town vehicles, and suggest the same be considered by the school bus fleet.

In 2011, the Littleton Police Department enacted a gas-saving, anti-idling policy. As well as limiting idling to only those situations operationally necessary, the policy also encourages the use of walking and biking patrols. This policy is being used as a model in NH.

Another area worth pursuing would be additional means of local public transportation. This would be particularly appealing for moving people to and from the River District.

Also in need of improvement is public parking, particularly for tourist buses. Establishing tiered parking garages should be explored as an allowed use in the zoning ordinance.

13.7 ENERGY SOURCES

New Hampshire has no in-state sources of fossil fuels (e.g., coal, natural gas, oil) or nuclear material. The state imports nearly 90 percent of its energy and exports nearly \$4 billion dollars annually from the economy to pay for this energy.

13.7.1 ALTERNATIVE SOURCES

Renewable energy is an important step toward addressing climate change and can save money on expenses that seem to increase every year. The five most commonly used renewables are:

- Biomass: including wood and wood waste, municipal solid waste, landfill gas, and biogas, ethanol and biodiesel
- Water (hydropower)
- Geothermal
- Wind
- Solar

The most practical alternate systems of harvesting energy available to the North Country are wood, hydroelectric, direct solar collection, and wind (there are no local sources of natural gas). Littleton has made strides to convert from mostly oil to propane and wood in municipal buildings.

13.7.2 BIOMASS

Given that New Hampshire is 84% forest, wood is the best locally available alternative. Wood burning in pellet form for heat is growing in popularity and should be considered for municipal and school applications. We should promote the use of firewood, wood chips, and wood pellets.

One idea worth considering would be a large scale biomass, either just for heating or for cogeneration that could distribute heat and/or power to a number of structures. Two possibilities would be along Main Street and in the River District.

13.7.3 SOLAR

In 2016, the Ammonoosuc Regional Energy Team facilitated a promotion known as SOLARIZE AMMONOOSUC, an effort to make solar more financially attractive by group purchasing. The solar contractor made over 100 site visits with about 15 property owners committing to the project. The project reached Tier IV status (100-120 kW). Relatedly, the NH legislature recently took the positive step of raising the cap on net metering, which is critical if solar is to continue to expand.

The ECC has been investigating the feasibility of installing a solar photovoltaic system at the retired Littleton landfill.

The Littleton Food Co-op plans to include solar as a primary energy source in the expanded structure.

Direct solar systems can collect heat to supplement building systems and can generate electricity. These systems should be researched for use in all public buildings.

13.7.4 OTHER SOURCES

There may be local opportunities for small scale-hydro power.

A demonstration project could serve to promote wind as an alternative, renewable energy source. A similar case could be made for a solar demonstration project.

The Transfer Station heats the building with used motor oil turned in by customers and the Automotive Technology Department at the Career and Technical Education Center.

Even though a petitioned warrant article was defeated in 2016, Littleton should continue to consider allowing energy-saving additions to homes without increasing local taxes. Property tax exemptions have been adopted in many NH towns, and this is one of the few incentives available to Littleton.

At a minimum, existing zoning ordinances and other policies should be reviewed to make sure they do not limit renewable energy systems.

13.8 LAND USE AND MANAGED GROWTH

The Planning Board should consider ordinances that support the principles of smart growth and innovative land use as these techniques also contribute to energy conservation. This would include, for example, promoting and facilitating higher density,

mixed use developments and associated green spaces. Similarly, the Planning Board should promote cluster housing in rural areas, in-town housing, more mixed use zones, and energy efficient patterns of development. Targeting most growth to already developed areas minimizes the energy usage by local residences, shops, and Town services.

Economic Development

Managed growth communities are more successful at attracting new businesses. These principles relate directly to planning for areas such as the River District.

- Economic development should be directed toward the center of Town
- The focus should be on existing developed areas over new development

Smart Growth

- Create compact development with a mixture of housing and services as envisioned in a Neighborhood Commercial zone
- Encourage the use of renewable sources of energy (RSA 674:17)

Innovative Land Use Planning (RSA 674:21)

- Consider making preliminary review mandatory prior to formal application
- Work with developers to modify plans in the best interest of the community
- Cluster developments
- Site Plan Review
- Impact Fees

The Planning Board should work closely with the Conservation Commission on possible land use ordinances that would enhance the protection of natural resources such as storm water management.

13.9 RECOMMENDATIONS

13.9.1 CONSERVATION

- Expand list of items accepted for recycling at the Transfer Station
- Promote recycling by placing bins in high traffic areas, encouraging businesses to recycle and compost, and establishing a mobile shredding service
- Introduce warrant articles that reward the use of green materials in new construction and companies that reduce on-site waste
- Investigate the feasibility and efficacy of hiring a building inspector, perhaps shared with another town(s)

- Examine the effect that tax benefits or other incentives might have on encouraging ride-sharing programs, mass transportation, working from home, and shuttle services to recreation areas
- Take measures to establish more satellite parking in town
- Promote bicycle and pedestrian traffic, to include: a review of zoning ordinances; bike racks and travel lanes; and, easier biker and walker access within both residential and retail areas
- Evaluate ways to reduce fuel usage by the town's vehicle fleet
- Work with the North Country Council on transportation needs, and with DOT for funding assistance

13.9.2 EFFICIENCY

- Continue energy inventories and audits of municipal buildings, and encourage school, residential, and businesses to do the same
- Assist remediation of low efficiency buildings through grant research and incentive programs
- Promote best practices for energy efficiency at the residential, school, municipal, and commercial levels
- Consider municipal incentives that supplement federal and state programs for winter weatherization
- Adopt local standards for energy-efficient construction
- Consider ways to encourage local business that provide energy efficient products or use natural, sustainable, or recycled materials

13.9.3 RESOURCES

- Promote the use of renewable energy systems through local tax exemptions or other incentives
- Consider small-scale demonstration projects for wind and solar
- Encourage other sources of energy for new construction or retrofits, such as biomass, solar, and geo-thermal

13.9.4 LAND USE

- Explore land use ordinances that might promote energy goals by enhancing protection of natural resources
- Review the Master Plan, zoning ordinances, and other Town policies for any inconsistencies with the goal of reduced energy usage; for example, promote cluster housing in rural areas, and energy conservation patterns in developments
- Consider ordinances that support the principles of managed growth and innovative land-use techniques that also conserve energy