ENERGY

For the Town of Allenstown

Vision and Mission Statement of the Chapter

Allenstown recognizes both the need and the opportunity to identify and support energy alternatives that result in both a clean environment as well as economic efficiency. Clean and sustainable energy approaches enhance the quality of life for Allenstown residents now and in the future.

Energy and its impact on our communities in areas such as municipal expenditures, economic development, land use planning, and transportation is increasingly of interest to residents, local officials and business owners. Reliable, affordable sources of energy are critically important to our quality of life and the stability of the economy.

This Energy Chapter presents a framework that can be used to support Town efforts in the areas of energy use, efficiency and planning. The use of energy for electricity, heating, and transportation is tied to community planning, individual lifestyles, natural resource conservation, and environmental quality. The purpose of this Chapter is to provide some background on energy usage and issues and to identify strategies and tools for energy conservation, energy efficiency, and efficient development. After a brief introduction to the role of energy in planning, there is a summary of New Hampshire's energy profile and sources as well as a series of recommendations for achieving the overall vision of a resilient, efficient community through programs, operational practices, ordinances and regulations. There is also limited data on Allenstown's energy profile, municipal energy consumption and an overview of potential opportunities for usage and cost savings, energy efficiency improvements and renewable energy options.

Many municipalities in New Hampshire, including Allenstown, are taking action to reduce energy consumption, improve energy efficiency, and investigate renewable energy sources by developing energy chapters in the master plan. New Hampshire **RSA 269:1(n)**

was adopted in 2008, authorizing municipalities to incorporate an energy section into their master plan that "includes an analysis of energy and fuel resources, needs, scarcities, costs, and problems affecting the municipality and a statement of policy on the conservation of energy."

In 2011, Allenstown also participated in several energy projects that that became available from federal funding through the Office of Energy and Planning (OEP). These projects were funded through OEP's Energy Technical Assistance Program (ETAP) and included energy assessments of municipal buildings and a series of recommendations for energy efficiency improvements.

THE ENERGY LANDSCAPE

Energy efficiency and renewable sources of energy continue to emerge as topics in discussions of energy usage and costs. Many view them as solutions to high energy costs and supply concerns as well as a response to environmental sustainability.

An important concept to remember is that New Hampshire is part of a region and really a world market when it comes to energy. Since 1997, ISO-NE (Independent System Operator of New England) has been managing the regional electricity demand and supply in New England; what we can do as a state and region is influence overall use and fuel choice.

Energy is a very broad topic and also has some specific terms that need to be understood, particularly in the area of renewable energy. Below is a list of definitions that clarify some of the terms used in this Chapter.

1. ***Energy conservation*** means reducing the overall use of energy, particularly wasted energy (such as installing programmed thermostats that turn on the heating or cooling only when a building is occupied).

2. ***Energy efficiency*** refers to the ability to produce the same output or benefit using less energy in the process (such as replacing an incandescent light bulb with a fluorescent one). Anywhere energy is used, there are opportunities to increase efficiency.

3. ***Renewable energy*** describes energy sources and systems that produce power from sources that are unlimited or can be cyclically renewed, such as solar, wind, geothermal, or biomass. Non-renewable energy sources are those with a finite supply, such as oil, natural gas, or coal.

4. ***Renewable Portfolio Standard (RPS)*** was established in May 2007 as RSA 362-F and requires the state's electricity providers -- with the exception of municipal utilities -- to acquire by 2025 renewable energy certificates (RECs) equivalent to 24.8% of retail electricity sold to end-use customers. The RPS includes four distinct standards for different types of energy resources; these are classified as Class I (largest class and includes new and existing renewable facilities), Class II (solar), Class III (existing biomass and landfill gas facilities) and Class IV (existing, small hydro with certain restrictions). See www.puc.gov for a detailed explanation of the classes. What an RPS does is establish a base level of demand but allows the market to determine which renewable energy resources will meet that demand. Initially proposed as a mechanism to support renewable energy

development in competitively restructured electricity markets, the RPS model today is now seen to serve other functions such as encouraging fuel diversity and economic development.

5. ***Renewable Energy Credits or Certificates (RECs)*** – are sold separately from the underlying physical electricity and are tracked, traded and sold in the market. As renewable generators produce electricity, one REC is created for every 1 megawatt-hour (MWh) of electricity placed on the grid. RECs represent the "attributes" (environmental, social, and other non-power qualities of renewable electricity generation) of renewable electricity generation from the physical electricity produced, serving as "currency" for renewable energy markets. Since RECs only represent the non-power attributes, they are not subject to delivery constraints.

6. ***Alternative Compliance Payments (ACPs)*** are made to the state by utilities for every megawatt hour of energy for if their renewable energy quotas are not met. These alternative compliance payments are essentially an assessed fee to those utilities and competitive electricity providers that have not complied with the RPS. If RECs are not available or prices exceed the alternative compliance price, the electrical supplier will often elect to pay the fee, i.e., the alternative compliance payment.

Typically, it makes sense to strive for energy conservation first as using less energy has minimal costs and is fairly straightforward to implement. Improving energy efficiency can also reduce energy use, although it does not always result in lower consumption (for instance, a person who buys a more fuel efficient car may drive the same number of miles, thereby saving energy and money or he or she may drive *more*, which costs the same but does not reduce the amount of fuel used). Finally, constructing renewable energy systems, particularly those where the energy is used on-site, is a valuable strategy for long term energy cost savings and reduction in pollutant emissions.

STATEWIDE ENERGY USE OVERVIEW

Some Quick Facts from U.S. Energy Information Administration, May, 2015

- Nearly half of all New Hampshire households relied on fuel oil for heat in 2013.
- New Hampshire is second only to Maine in the proportion of its net electric generation that comes from biomass, mainly wood and wood byproducts.
- Seabrook, the largest nuclear power reactor in New England, provided 52% of New Hampshire's 2014 net electricity generation.
- New Hampshire's renewable portfolio standard requires 24.8% of electricity sold in the state to come from renewable energy resources by 2025. Of New Hampshire's 2014 net electricity generation, 17% came from renewable energy.
- Energy use in the Central NH Region parallels patterns throughout the state and the northeast. New Hampshire relies on a number of different types of energy supplies – each with its own unique costs.

- New Hampshire relies on external sources of energy for nearly 90% of its total energy consumption.
- Population growth has slowed but is still increasing. Household changes are also leading to changes in how energy is used – computers, phones, TVs. Any gains in efficiency may be partially offset by the increasing electric demand associated with the number of devices and appliances per household.
- Energy costs and supply are dynamic; costs are not fixed.
- Demand patterns for energy may decrease, BUT expenditures are increasing due to rising fuel prices.
- Decisions concerning energy supply and usage directly impact individual energy bills and the overall economy.

The biggest challenge in understanding New Hampshire's energy profile is to correctly describe the flow of energy - from its supply, utilization and final usage - as there can often be a misunderstanding of the relationship between energy, generation, consumption, and the final disposition of energy once part of the supply has been converted to electricity and distributed to consumers.

Using 2010 data available from the U.S. Energy Information Agency (EIA), the chart below analyzes statewide energy flow and summarizes the key concepts of New Hampshire's energy profile.

Looking at the column to the left, energy sources, one can see that the largest slice of the energy supply, 38%, came from crude, oil based fuels. The other fossil fuels, natural gas and coal, made up 15% and 8% respectively. Overall, fossil fuels provided 60% of the state's energy sources. Nuclear energy supplied about 28% of the overall total. Renewables – hydroelectric, wood, waste and ethanol in gasoline, represented 11% of the total. It should be noted that a small amount of electricity was purchased from out of state in 2010, but the amount was less than 0.5% and was not included in these figures.

As we follow these arrows for the first two columns, some highlights from the data are:

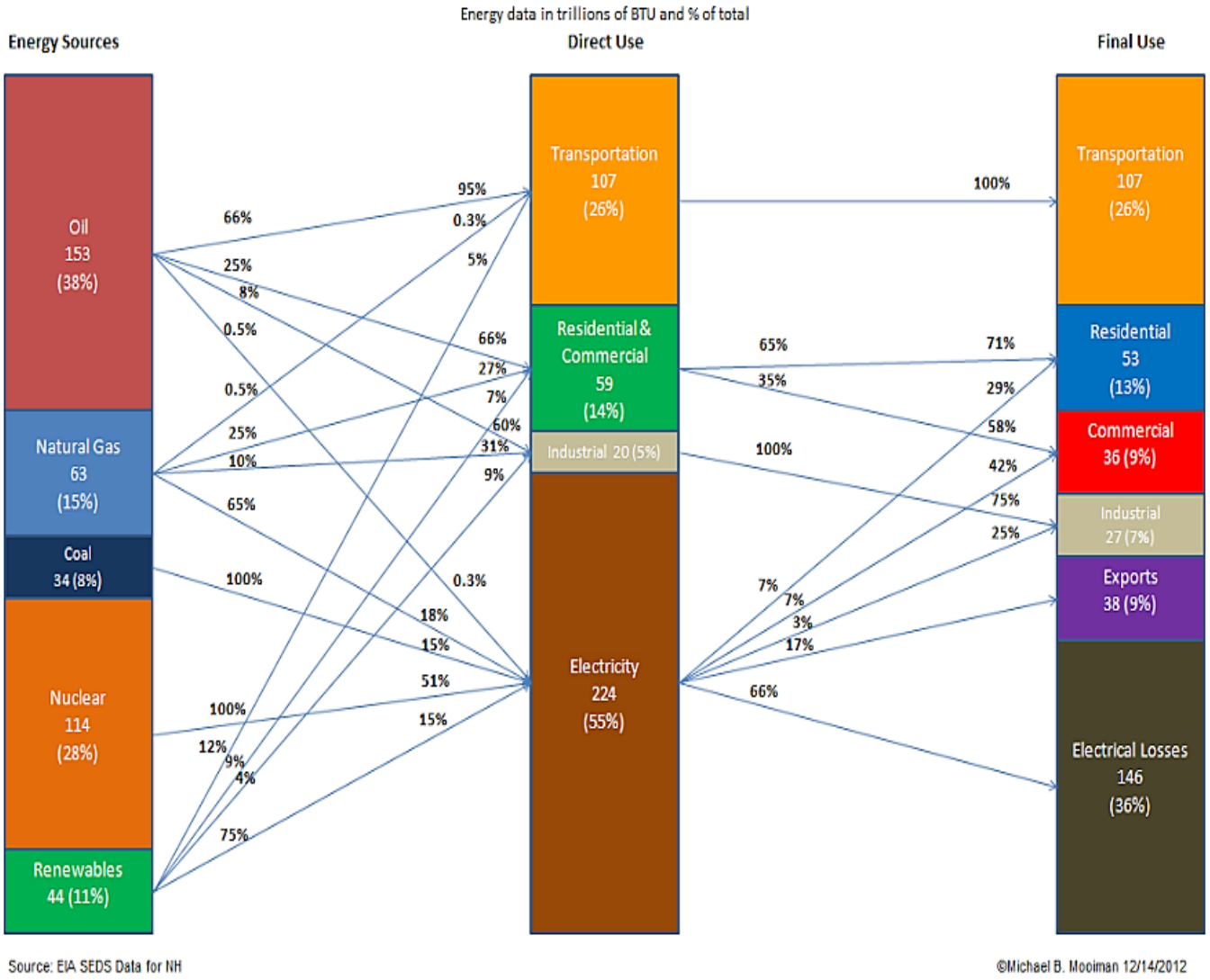
→ 25% of natural gas is used in the residential and commercial sectors.

→ 65% of natural gas supply is used to generate electricity and it represents 18% of the primary energy supply used to generate electricity.

→ 66% of energy usage for heating households and businesses comes from oil.

→ 25% of the oil supply to the state is used to heat these households and businesses.

Figure 1: 2010 New Hampshire Energy Sources and Uses Analysis



Source: Dr. Michael Mooiman, Franklin Pierce University, Energy in NH Blog

→ 15% of the total energy supply for generating electricity is from renewables; 75% of the renewable energy supply is used to generate electricity.

→ 100% of coal and nuclear supply is directed towards electricity generation, making up 15% and 51% respectively of the supply for generating that electricity

The last column of this chart looks at final use or what happened to all the energy. For electricity, it's important to note that two thirds of the energy that went into production was lost as waste heat. It is sometimes a surprise that electricity generation produces so much waste. One interesting note on this last column is that 17% of the electricity generation is actually exported out of state.

Some notable points from this last column are:

→ 71% of energy for our homes came from mostly fossil fuels for direct heating and hot water applications. The remainder of the energy to our homes is from electricity usage.

→ 58% of energy use for businesses was from heating and 42% is electricity.

→ 36% of energy supplied was lost as waste heat during the generation and transmission of electricity, 9% was exported out of state and transportation consumed 26% of the energy supply.

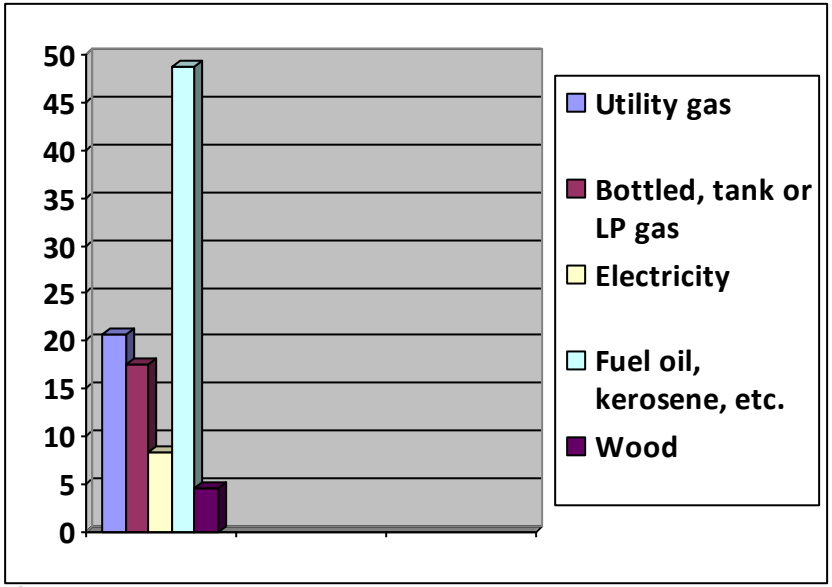
Now that there is a clearer view of energy flows in New Hampshire, a brief discussion of some of the sources follows.

Table 1: 2009 – 2013 House Heating Fuel, by Type, Allenstown

House Heating Fuel		
Type	Number of Households	Percentage
Utility gas	354	20.7
Bottled, tank or LP gas	302	17.6
Electricity	144	8.4
Fuel oil, kerosene, etc.	836	48.8
Wood	78	4.5
Total # of Units	1,714	

Source: American Community Survey

Figure 2:



Source:

PLANNING POLICY CONTEXT

Energy planning continues to receive increasing attention at the policy level due to rising energy costs and the relationship between energy use, economic activity, and environmental impacts. The principles of "smart growth" support energy conservation and efficiency through thoughtful community design. Compact development patterns, open space preservation, and multi-modal transportation options are core elements which contribute to energy-conscious development while preserving traditional rural character.

When communities are designed so that residential areas are convenient to businesses, services, and amenities, residents are able to complete daily tasks in fewer trips and using less fuel. Compact development allows for greater density while reducing the miles of roadway, water and sewer lines, and other infrastructure needed to serve homes and businesses. Providing pedestrian, bicycle, and ride sharing facilities means that people have less energy-intensive options for getting around town. Efficient building construction can significantly reduce energy use and operating costs for the life of the building. Finally, local renewable energy production puts property owners in direct control of their electricity, heating, and hot water generation without consuming additional non-renewable fuels. Local regulations can support, encourage, or require any of these elements to create a more energy-conscious community.

At the state level, energy planning is tied both to land use planning and to expected changes in our climate. A Climate Change Policy Task Force was convened in 2008 and developed a statewide Climate Action Plan in 2009.[1] According to the New Hampshire Climate Action Plan,

> *The most significant reductions in both emissions and costs will come from substantially increasing energy efficiency in all sectors of our economy, continuing to increase sources of renewable energy, and designing our communities to reduce our reliance on automobiles for transportation. In essence, a response to climate change and our economic future are inextricably tied to how we produce our energy and how much energy we use. Future economic growth in New Hampshire as well as mitigation of, and adaptation to, a changing climate will depend on how quickly we transition to a new way of living that is based on a far more diversified energy mix, more efficient use of energy, and development of our communities in ways that strengthen neighborhoods and urban centers, preserve rural areas, and retain New Hampshire's quality of life.*[2]

The Plan calls for long-term reductions in greenhouse gas emissions of 80% below 1990 levels by 2050, with an interim goal to reduce emissions by 20 % below 1990 levels by 2025. A total of 67 specific recommendations are made to achieve that goal. They include: direct energy savings in buildings, transportation, and electricity generation; natural resource protection; supporting regional

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[1] *The New Hampshire Climate Action Plan: A Plan for New Hampshire's Energy, Environmental and Economic Development Future*, March 2009, available at http://des.nh.gov/organization/divisions/air/tsb/tps/climate/action_plan/nh_climate_action_plan.htm.

[2] Ibid., p. 1.

initiatives; public education and workforce training; and adaptation to existing and potential climate impacts.

To complement the Climate Action Plan, in 2012 the NH Energy and Climate Collaborative published New Hampshire's Energy, Environmental, and Economic Development Benchmark Report.[3] This report evaluates baseline conditions and trends relating to the energy, economic, and environmental goals enumerated in the Climate Action Plan, using benchmark data from 2005-2009. Data was collected on twenty-four specific indicators in six categories (economy, jobs, and emissions; efficient buildings; sustainable energy; smart growth; government leadership and action; and adaptation). This will be used in the future as periodic Report Cards are issued with comparisons to the baseline data.

Also in 2012, the New Hampshire Office of Energy and Planning issued the New Hampshire Building Energy Code Compliance Roadmap.[4] This document outlines the steps required to achieve the national and state goal of 90% compliance with the energy code by 2017. The Roadmap calls for actions on a number of levels, including:

- leadership and policy;
- outreach and education;
- resources and funding;
- verification and enforcement; and
- measurement and evaluation.

An Energy Code Collaborative has been formed to implement the Roadmap and act as a resource for communities.

Locally, many New Hampshire communities have taken steps to reduce energy use, improve energy efficiency, and take advantage of renewable energy sources. The Innovative Land Use Planning Techniques Handbook, available on the NH Department of Environmental Services website,[5] contains model ordinance and regulatory language for municipalities to implement a variety of measures addressing sprawl, environmental, and energy concerns. As well, nearly 100 communities have formed local energy committees (LECs) to advise municipal officials and educate the public about energy issues. Many communities have undertaken municipal building energy assessments, master plan energy chapters, energy-related capital improvement planning, and other actions to achieve energy savings.

STATEWIDE ENERGY USE OVERVIEW

Statewide, 38.8% of energy use is for electricity, while 33.8% is for transportation and 27.4% goes toward heating buildings. Figure 3 shows the breakdown by sector from 2009. For heating, residential

[3] *New Hampshire's Energy, Environmental, and Economic Development Benchmark Report*, June 2012, available at http://nhcollaborative.org/benchmarkreport/.

[4] *New Hampshire Building Energy Code Compliance Road Map,* April 2012, available at http://www.nhenergycode.com/live/index.php?go=roadmap.

[5] Available at http://des.nh.gov/organization/divisions/water/wmb/repp/innovative_land_use.htm.

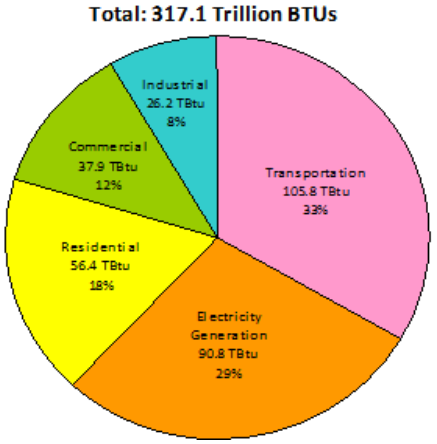
buildings use the largest share of energy, followed by the industrial and commercial sectors. Municipal energy use is included in the commercial sector. New Hampshire's fuel mix is largely imported. Just over half of the energy used in the state comes from petroleum, followed by nuclear energy, natural gas, coal, and wood, as shown in Figure 4.

Per capita energy use in New Hampshire increased in the 1990s and early 2000s;[6] however, 2009 figures from the US Energy Information Administration indicate that energy use had slightly declined, and that New Hampshire residents rank 44th in the nation for per capita energy use, at 229 million British Thermal Units (BTUs) per year.[7] Nonetheless, the national Energy Policy Act of 2005 (EPAct) called for states to set goals for 25% below 1990 consumption levels. On a per capita basis, for example, the 2012 goal would be 178.9 million BTUs, still well below 2009 consumption levels.[8] Based upon this and the New Hampshire Climate Action Plan's reduction goals, there is an immediate need to tackle energy reductions beginning at the local level.

REDUCING MUNICIPAL ENERGY USE

The first step toward reducing municipal energy use is to establish a baseline from which to compare. Allenstown has begun the process

Figure 3: NH Net Energy Use by Sector, 2009



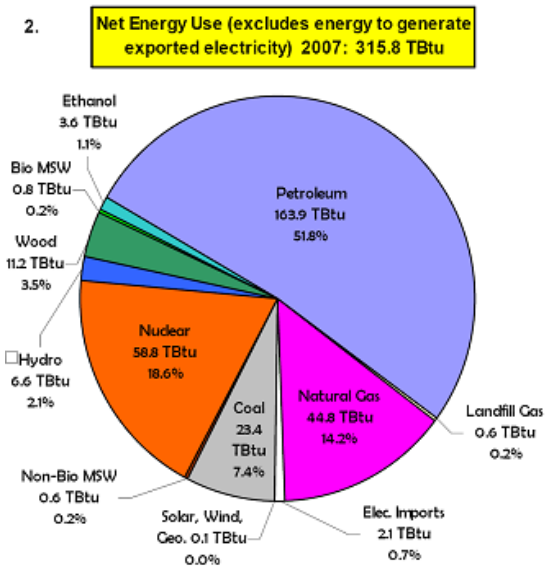
Source: US Energy Information Administration State Energy Data System, ***HTTP://WWW.EIA.GOV/STATE/SEDS/SEDS-DATA-COMPLETE.CFM***

Figure 4: Net Energy Use, 2007

[6] Rockingham Planning Commission, 2008. Regional Master Plan Energy Chapter, Available at http://www.rpc-nh.org/PDFs/projects/energy/Energy%20Chapter%206-4-08.pdf.

[7] US Energy Information Administration, New Hampshire Quick Facts, available at http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=NH.

[8] US DOE Energy Efficiency & Renewable Energy New Hampshire Energy Summary Fact Sheet, available at http://apps1.eere.energy.gov/states/energy_summary_print.cfm?state=NH.



Source: NH Office of Energy and Planning. New Hampshire Energy Facts 2007: Summary and Snapshot. From http://www.nh.gov/oep/index.htm.

of benchmarking its energy use by taking an inventory of lighting, electrical, and heating fuel usage for several key municipal facilities. With these data as a starting point, the Town will be able to measure the effectiveness of future energy reduction efforts. These data are a snapshot of a recent twelve-month period that demonstrates annual municipal energy demand and the cost for energy expended by the Town for these facilities. The buildings used in the analysis were chosen by the Town due to their level of use and availability of data. A complete energy inventory of all facilities, including the wastewater treatment facility, the library, and the schools, is recommended for future benchmarking. Municipal vehicle fuel usage (DPW trucks, police cruisers, fire vehicles, etc.) should also be monitored and analyzed as part of the Town's total energy inventory.

Table 2 displays annual energy costs and Table 3 shows usage and building efficiency. Using the most recent available data over a twelve-month period, the inventory indicates that the Town of Allenstown is currently spending over $18,000 annually to heat and light the targeted municipal buildings and facilities, at a total average cost of $1.61 per square foot. Cost per square foot, or cost use intensity, does not in itself indicate the relative efficiency of the buildings, but rather shows which buildings cost more or less to operate. The Town Hall has a very high cost use intensity ($3.91/sq. ft.) relative to other facilities due to its historic architecture, years of adaptive use, and attendant inefficiencies. According to a building energy assessment by Peregrine Energy Group in 2010, the Town Hall would require major renovations in order to significantly improve its energy efficiency while retaining its historic features.

Table 2: Annual Municipal Energy Costs for Targeted Facilities, 2011

Facility	Electricity Cost	Natural Gas Cost	Total Cost	Sq. Ft.	Cost per Sq. Ft.
Street Lights*	$23,296	N/A	$23,296	N/A	N/A
Fire Station	$4,962	$3,068	$8,570	8,580	$1.00
Town Hall	$3,376	$4,140	$7,516	1,920	$3.91
Police Station	$5,473	$1,673	$7,146	3,580	$2.00
Recreation Center (2 bldgs)	$1,589	$1,627	$3,216	1,456	$2.21
Highway Garage**	$2,380	$0	$2,380	2,592	$0.92
Highway Dept. Office	$563	N/A	$563	764	$0.74
Old Allenstown Meeting House	$166	N/A	$166	1,505	$0.11
Gazebo	$161	N/A	$161	N/A	N/A
Total:	$18,670	$11,048	$29,718	18,477	$1.61

Table 3: Annual Municipal Energy Use for Targeted Facilities, 2011

Facility	Electricity Use (KWh)	Natural Gas Use (Therms)	Total Use (MMBTUs)	Sq. Ft.	kBTU per Sq. Ft.
Fire Station	52,277	3,176	496	8,580	58
Highway Garage**	17,829	2,500 (gal)	436	2,592	168
Town Hall	26,223	3,380	427	1,920	223
Police Station	61,193	1,092	318	3,580	89
Recreation Center (2 bldgs)	10,627	1,014	138	1,456	95
Highway Dept. Office	3,134	N/A	11	764	N/A
Old Allenstown Meeting House	50	N/A	N/A	1,505	N/A
Total:	171,333	8,662	1,826	20,397	126

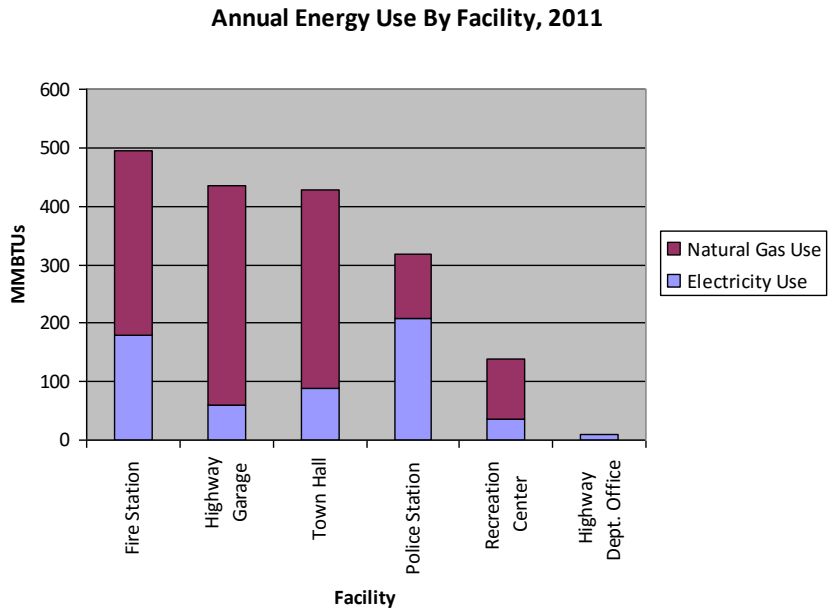
Source: *Town of Allenstown and Peregrine Focus Energy Inventory Tool*
**Street light data for calendar year 2010. All other data for calendar year 2011.*
***Highway Garage heated with waste oil – figures are approximate. N/A = Not applicable. MMBTU = Million British Thermal Units, a common unit of energy measurement. kBTU = Thousand British Thermal Units. Note: Gazebo and Street Lights are billed as outdoor lights by PSNH, and usage is not readily available.*

Table 3 and Figure 5 compare energy use by facility. Energy use is displayed both in native units (kWh, gallons, or therms) and totaled in a common energy unit, million British thermal units (MMBTUs). Site energy intensity is expressed as thousand Btu (kBTU) per square foot. This table illustrates the energy intensity of each targeted facility. The total energy usage for the facilities is 1,826 MMBTU, which, over the total building square footage of 20,397, results in a total average energy intensity of 126 kBTU per square foot. Again, the Town Hall has a very high energy intensity (223 kBTU/sq. ft) due to its historic nature. This is approximately three times the statewide average for municipal administration buildings, at approximately 75 kBTU per square foot.[9] After the Town Hall, the least efficient facility is the Highway Garage at 168 kBTU per square foot. This is higher than average for similar buildings across New Hampshire (which tend to be closer to 85 kBTU/sq. ft.).

According to data collected by Peregrine Energy Group under the Energy Technical Assistance Program (ETAP) in 2010-2011, Allenstown's other targeted facilities have average or below average energy intensity compared to similar municipal buildings in New Hampshire. Additional energy savings are always possible; however, payback periods for improvements may be very long and the investments may not be cost effective if measured in the short term. Peregrine Energy Group completed building assessments for the Town in December, 2010 and August, 2011, and made a number of recommendations for both short- and long-term improvements.

[9] According to Peregrine Energy Group data collected through the Energy Technical Assistance and Planning (ETAP) program in 2010-2011.

Figure 5: Annual Energy Use for Targeted Facilities, 2011



Source: Town of Allenstown and Peregrine Focus Energy Inventory Tool

The Town has already completed most of the short-term and low-cost recommendations. The Police Department in particular has paid close attention to energy efficiency and made numerous improvements. The longer-term improvements, particularly at the Town Hall, would require a major reinvestment in the facilities and would need to be done as part of wholesale renovations. As municipal facilities are maintained, upgraded, or expanded, energy improvements should be considered and total life cycle costs (ongoing operational costs) associated with more efficient systems should be analyzed. Often, new and very efficient systems or equipment may cost somewhat more up front, but savings are paid back over time with the lower energy use associated with their operation.

RECENT MUNICIPAL ENERGY ACTIONS

The Town of Allenstown has already begun to take steps to conserve energy and increase efficiency at municipal facilities. As mentioned above, the Police Department has taken the initiative to make a number of improvements in recent years. Staff there have replaced windows, added insulation, completed lighting changes, and installed programmable thermostats, thus reducing energy costs significantly. Likewise, in other municipal buildings, programmable thermostats have been installed, lighting has been upgraded to more efficient fixtures in recent years through PSNH's retrofit program, windows and doors have been weather sealed.

Allenstown has had its municipal facilities assessed for their potential to incorporate renewable energy systems to supplement energy needs. While the report showed limited opportunities given current system costs and financing options, the economics may change in the future, and this could be an avenue to explore further.

Town officials have begun working with several neighboring towns through the Suncook Valley Association on joint purchasing alternatives and the potential for sharing services. One potential outcome of this initiative could also be a joint energy purchase. By aggregating several municipalities' demand, each Town could realize significant cost savings. While such an agreement would not reduce energy use or increase efficiency, it is one strategy for reducing Allenstown's energy costs in the short term.

On the local policy level, Allenstown has a couple of provisions that support energy conscious development. A Cluster Development option is included in the Town's Zoning Ordinance as a special exception within the Open Space and Farming zone. This allows new subdivisions to be designed so that homes are built closer together and blocks of open space are preserved. With smaller lot sizes and a more compact design, cluster developments can save energy on construction, infrastructure, and service provision. They also result, ideally, in a network of permanently conserved open space that is protected from future development and provides natural ecosystem services necessary for stormwater recharge, floodplain storage, wildlife habitat, and the like.

Second, the Town adopted a Suncook Village Infill Development Overlay District and RSA 79-E, a revitalization tax credit, in 2011. Within the designated area, certain development standards are relaxed to encourage more intensive development in the Village. Historic buildings are encouraged to be revitalized using the tax credit program under RSA 79-E. These ordinances not only support local economic development, but they also promote compact development and the adaptive reuse of buildings, which can reduce energy spent on transportation, construction, and the expansion of public infrastructure.

All of the actions taken to date by the Town and the School District demonstrate Allenstown's interest and commitment to reducing energy use and costs. It is clear that effective facility management and the responsible use of public funds are a priority for municipal managers. With additional energy data benchmarking and continual monitoring, the results of such efforts will be measurable. The Town has also taken steps to encourage energy-conscious development through its Zoning Ordinance.

ADDITIONAL ENERGY OPPORTUNITIES

There are a number of actions that Allenstown can take to monitor and trim energy use and costs, promote energy-conscious development, and educate the public about energy savings and renewable energy systems. A comprehensive strategy could include municipal policy and operational changes, land use regulation revisions, and concerted outreach efforts. A wealth of informational resources and model programs exist around the state which can be readily tailored to suit the Town of Allenstown's desires and objectives. A resource summary is provided at the end of this Chapter.

The community's land use regulations should also be reviewed for their adaptability and sensitivity to the effects of climate change. The Suncook River region and the state of New Hampshire have already seen an increase in severe weather events in recent years, and scientific evidence indicates that severe storm events will become more frequent over the coming decades. Infrastructure and land uses should be designed to handle such events to minimize damage and as part of the Town's hazard mitigation strategy.

The following recommendations list ideas for actions the Town could consider in its continuing efforts to reduce energy consumption and promote clean energy alternatives. Recommendations address actions both within the municipal government and within the wider community.

Municipal Operations: The Town has already taken steps to reduce energy consumption and costs; however, additional strategies could include:

- Regularly track and monitor energy consumption and report annually in the Town Report
- Purchase of more fuel efficient vehicles, or conversion to cleaner burning fuels such as biodiesel where possible
- Streetlight retrofits and removal of unnecessary lightposts
- Purchase of most energy efficient equipment when replacing appliances or systems
- Reduction of solid waste through purchasing choices (choosing less packaging, reusing items, etc.), recycling, and composting
- Establishment of a town-wide no-idling policy to reduce vehicle emissions, and/or purchase of technology such as idling retrofits that provide auxiliary power while engines are off to reduce emissions
- Installation and promotion of pedestrian, bicycle, carpooling, and public transportation facilities, in coordination with state and regional programs (such as NH Rideshare, PATH, and Safe Routes to School)
- Installation of renewable energy production systems (solar, wind, geothermal, biomass) at municipal facilities, if they become cost effective

Policy: If the Town wishes to go further, certain revisions or additions to Allenstown's existing ordinances and regulations could strengthen the Town's approach to energy and development. For example:

- Consider changing the cluster subdivision to a permitted use in the Open Space and Farming District, rather than allowing them only by special exception; and consider revising the ordinance to provide some density incentive OR consider requiring it within the district for all subdivisions over a certain size
- Consider allowing accessory dwelling units in all residential districts (currently only allowed in the Infill Development District), including free-standing accessory dwelling units to accommodate above-the-garage apartments or separate cottages, as a way to increase residential density without additional land development
- Consider adopting a Dark Skies ordinance for outdoor lighting that includes standards for energy efficient fixtures
- Consider adopting RSA 72:61-72 to offer tax exemptions for renewable energy installations
- Consider modifying the Subdivision Regulations to require energy efficient building siting and design for passive solar gain, wind protection, and appropriate landscaping (see Innovative Land Use Planning Techniques Handbook)
- Consider adopting a comprehensive Green Building Ordinance which sets energy performance standards for new and

substantially improved construction (see Innovative Land Use Planning Techniques Handbook)

- Consider establishing the Town as a Property Assessed Clean Energy (PACE) District, in accordance with RSA 59-F, to pave the way for future PACE programs
- Include energy improvements for municipal buildings and vehicle fleets in long-range capital improvements planning discussions, and prioritize such improvements during the annual budgeting process

Public Outreach: In order to effectively share energy information resources with the public and encourage reductions in private energy use, there are several steps that the Town of Allenstown could take:

- Establish a Local Energy Committee made up of volunteers who would advise municipal leaders and work on public outreach efforts
- Develop a page on the Town website for energy-related information, including energy saving tips, tax incentive information, guidance on Dark Skies outdoor lighting, water-saving landscaping, available financing and rebates, and other resources
- Place informational materials in a central location, such as at the Town Library, where residents may pick up hard copies of fact sheets and brochures
- Organize periodic public workshops or events where residents and business owners can learn about topics such as weatherization, renewable technologies, and financing mechanisms
- Participate in regional energy committee meetings, workshops, and events to share knowledge and collaborate with counterparts in nearby communities

This is not intended to be an exhaustive list. No single strategy will lead Allenstown to achieving its energy goals. The pursuit of both small and large changes will be necessary to reach the desired level of savings. It is also important to note that policy shifts, planning considerations, and behavioral changes are just as important as making system or equipment improvements.

SUMMARY

The overall goal of this chapter is to provide a general analysis of Allenstown's municipal energy use and to identify strategies for the Town to pursue energy conservation, efficiency, clean energy options, and energy-conscious development. The Town has already begun to take steps toward reducing energy consumption and costs. Additional opportunities exist for the Town to continue its efforts, including changes to land use policy documents, municipal operations, and public outreach. By implementing such changes, Allenstown can save energy and taxpayer dollars, reduce pollutant emissions, and create an even more livable community.

As global energy costs continue to rise and clean energy technology options become more feasible, both the private and public sectors

will find energy-saving options more plentiful. A wide range of financial and informational resources exist to help municipalities, business owners, and residents make changes in their energy consumption. Taken together, these actions will contribute to statewide energy reduction goals and increased energy independence, while creating economic and environmental benefits.

OBJECTIVES AND RECOMMENDATIONS

OBJECTIVE 1

To reduce municipal energy usage and costs and improve energy efficiency in municipal operations.

→ Actively monitor municipal energy usage and costs to track progress resulting from energy saving initiatives and produce an Annual Energy Use Reduction progress Report for the Board of Selectmen and SAU.

→ Develop departmental energy policies to save energy through behavioral changes (such as programming thermostats, turning out unnecessary lights, and turning off electronic equipment when not in use).

→ Develop building improvement plans to increase the energy efficiency of municipal buildings, and incorporate planned improvements into the municipal budgeting process.

OBJECTIVE 2

To encourage and support energy-conscious development throughout the Town of Allenstown.

→ Create Zoning Ordinances that address the installation and operation of wind, solar, external wood burning stoves and other energy/heating methods.

→ Review and revise existing land use regulations as necessary to provide for energy-conscious development, such as outdoor lighting and incentives for green building design.

→ In accordance with the Transportation Chapter Objectives and Recommendations, prioritize development projects with options for energy efficient transportation modes, such as bicycle and pedestrian facilities, access to public transportation, ride sharing, proximity to community amenities, shared parking and driveways, and a highly connective road network.

OBJECTIVE 3

To educate Allenstown residents and business owners on energy conservation, efficiency, and renewable energy topics.

→ Provide information on the Town of Allenstown website and at the library for residents and business owners on home energy saving strategies, renewable energy system installation, business energy programs, available financing, tax credits, and green building design.

→ Sponsor periodic public workshops or events on energy conservation, efficiency, and renewable energy, and/or notify the public of regional events.

→ Consider establishing an Energy Committee to advise the Town on energy matters and provide resources to residents and business owners relating to energy improvements.

RESOURCES

In making energy improvements, Allenstown will need to access a variety of funding resources. Broadly speaking, funding sources can come from 1) grants, 2) incentives, 3) loans, or 4) municipal appropriations. Grant programs are occasionally available through state or federal funding sources, typically through the Office of Energy and Planning (OEP).

Incentive programs are typically offered by utility companies. For example, Unitil offers rebates and incentives for energy efficient equipment and lighting replacement to municipal and commercial customers. Installed products are typically paid for on monthly energy bills over time with the savings realized by the improvements. Other incentives (for the private sector) include rebates, in-home energy audits and tax breaks, and can be available at the federal or local level.

Loans can be obtained from public, private, and non-profit institutions. For example, the New Hampshire Community Development Finance Authority (CDFA) provides very low-cost loans to municipalities through its Municipal Energy Reduction Fund (MERF) which are structured out of energy savings. Private banks may also offer loans that can be used for energy upgrades, and may be the best option available when grant-backed public or non-profit loan programs expire.

Finally, municipalities may choose to raise funds for energy improvements through one-time appropriations, the establishment of capital reserve funds, or the issuance of bonds. Allenstown could consider the establishment of a capital reserve fund to pay for municipal energy projects. The Capital Improvements Program (CIP), which is updated annually, should incorporate anticipated upgrades, improvements, and new facilities when necessary and feasible that will result in energy conservation, increased efficiency, and sustainable energy generation.

ADDITIONAL REFERENCE MATERIALS

The resources listed below provide additional information guidance on model ordinance language, design standards, and other concepts of energy conscious development. This list was largely drawn from one developed by the Rockingham Planning Commission, which is available on their website at http://www.rpc-nh.org/energy-resources.htm.

ENERGY RESOURCES FOR COMMUNITIES

INNOVATIVE LAND USE PLANNING TECHNIQUES HANDBOOK

The Innovative Land Use Planning Techniques Handbook provides background information, legal references, and model ordinance and regulation language for a number of innovative land use tools available to communities. Model language for energy efficient development, stormwater management, infill development, agriculture incentive zoning, access management, and landscaping is included in the guide. Produced by the NH Department of Environmental Services, in cooperation with the NH Association of Regional Planning Commissions, NH Office of Energy and Planning, and the NH Municipal Association.

NH Climate Action Plan

Released in 2009, the New Hampshire Climate Action Plan was developed by the statewide Climate Change Policy Task Force in coordination with the NH Department of Environmental Services. The Plan sets a long-term goal for the state to reduce greenhouse gas emissions to 80 percent below 1990 levels by 2050, and an interim goal of 20 percent below 1990 levels by 2025. The Plan focuses on economic opportunities, increasing energy security, and improving environmental quality. A total of 67 recommendations are made in order to achieve the reduction goals.

NH State Energy Plan

In 2002, the Governor's Office of Energy and Community Services, now known as the Office of Energy and Planning, drafted the 10 year State Energy Plan. It identified the concerns of a growing population, increasing energy demand and the need for affordable energy to expand the economy. The plan addresses electricity and natural gas while excluding deliverable fuels such as home heating oil (No. 2), propane and kerosene despite them being noted as important. The single most cost effective means identified in the plan to address energy concerns is to improve energy efficiency. It also serves as a great guide for municipalities to follow in addressing their energy concerns.

New Hampshire Guidebook on Energy Efficiency and Climate Change

The "New Hampshire Guidebook on Energy Efficiency and Climate Change" was developed in spring 2007 by the NH Carbon Coalition, a nonpartisan organization focusing on global warming solutions. The plan is largely based off of the Vermont Energy and Climate Action's excellent Town Energy and Climate Action Guide. This first volume serves as an aid to fledgling energy committees to help them get started. Subsequent volumes of the guidebook will focus in greater detail on energy audit software, establishing reduction targets, highlight successful projects, identify funding sources, and discuss the technological changes.

ICLEI

ICLEI- Local Governments for Sustainability is the foremost organization offering structured programs that can be customized to individual community needs. They offer guidance for communities to inventory current energy use, adopt an emissions reduction target, draft an action plan, implement the plan and evaluate the progress. Their Clean Air and Climate Protection (CACP) software tool is useful to conduct a community wide energy audit. It reviews transportation, residential, commercial, and industrial energy use.

EPA Energy Star Program

The US Environmental Protection Agency (EPA) offers municipal services through their Energy Star Challenge. Their focus is on the energy consumption of buildings and they have developed the Portfolio Manager software package to conduct energy audit. The software assigns buildings into one of five classes, analyzes historical energy use and normalizes the data to allow buildings to be benchmarked or compared to one another. Through their Energy Star Community Challenge, communities can sign on to the campaign to reduce the energy consumption by 10%. The EPA Region 1 offices in Boston are coordinating the community programs and as of fall 2007, four New Hampshire communities including Dover, Rochester, Somersworth and Nashua have signed onto the program along with the NH state government.

Sierra Club-Cool Cities

The Sierra Club has adjusted their focus towards combating global warming. Through this change they have created the Cool Cities Campaign. Municipalities who adopt the U.S. Mayors Climate Protection Agreement can become members of Cool Cities. The campaign provides guidance on what municipalities and residents can do to reduce their greenhouse gas emissions.

US Mayors Climate Protection Agreement

US Mayors Climate Protection Agreement began in 2005 by Mayor Greg Nickels of Seattle Washington. The mayor urged mayors from around the country to take local action to reduce global warming pollution. Since 2005, over 680 mayors representing 3 provinces and all of the 50 states have signed on to the agreement. The agreement has spurred the US Mayors Climate Center in 2007 to oversee the coordination of ICLEI with the Agreement and municipalities who have adopted the agreement. In New Hampshire the cities who have adopted the resolution include Dover, Hanover, Keene, Manchester, Nashua, Portsmouth and Rochester.

NH Energy Committee

Internet portal to facilitate the interaction between Local Energy Committees across New Hampshire. Website is Wiki based and Local Energy Committees are encouraged to update information on the website pertaining to their committees. Website address is www.nhenergy.org.

Clean Air-Cool Planet Toolkit

Clean Air - Cool Planet, a non profit organization based in Portsmouth New Hampshire, has created a community program to assist municipalities to reduce their greenhouse gas emissions. One of the highlights of their program is the Community Toolkit. The toolkit is a conglomeration of over 30 success stories of municipalities taking action. Highlighted programs include community owned wind turbines, performance contracting experiences, LED streetlights, expanded alternative transportation, and pay as you throw waste management solutions. They offer communities valuable resources to enable communities to duplicate the successful experiences of others.

Performance Contracting

In 1993, the New Hampshire legislature created RSA 21-I:19-d which allows a municipality to sign a performance contract with an energy service company (ESCO). A performance contract allows costs of energy efficient upgrades to be financed through the ESCO and paid off over time through the energy savings. There is no upfront capital costs associated to the town for such programs. Performance contracts also protect municipalities by requiring the ESCO to meet a certain reduction of energy use. If this level is not reached, the ESCO is required to pay the difference in the energy bill. It is a win-win situation allowing municipalities to become more energy efficient, reduce their energy costs and protect itself from increase costs. The City of Concord, for example, has entered into a performance contract to manage energy services.

Property Tax Exemption

New Hampshire RSA 72:61-72 permits municipalities to offer a Property Tax Exemption on solar, wind, and wood heating systems. These systems include solar hot water, solar photovoltaic, wind turbine or central wood heating systems (not stovetop or woodstoves). Sixty two cities and towns in New Hampshire have

passed an article or resolution permitting the exemption within their locality. A list of communities who have adopted exemptions can be found on the NH Office of Energy and Planning's Renewable Energy Program.

Epping, NH Green Building Ordinance

In 2007, the town of Epping New Hampshire became the first municipality in the state to pass an ordinance often referred to as a Green Building Ordinance. It established a requirement for nonresidential development to be constructed in a manner that increase energy efficiency and utilizes renewable energy. It was largely based off of the NH Office of Energy and Planning's energy efficiency model ordinance and the US Green Building Council's LEED certification criteria.

Community Choice Aggregation

New Hampshire's electric industry functions underneath a deregulated market. This allows the commodity of electricity to be separated from the regulated transmission and distribution services. RSA 53-E allows for residents, business and municipalities to aggregate their electric load together to form a Community Choice Aggregate (CCA). A CCA is a regional entity formed through the legislative body of a municipality, whose purpose is to offer energy services to its members. The Nashua Regional Planning Commission is currently in the process of forming a CCA with over ten municipalities in its planning region. For more details, visit http://www.nashuarpc.org/energy/collaboration.html.

NH Partnership for High Performance Schools

The NH Partnership for High Performance Schools is an initiative within the Jordan Institute whose mission is to enhance the health of people and the environment in ways that make economic sense. The Partnership strives to improve energy efficiency of public schools in the state to increase attendance, improve teacher satisfaction and retention, and reduce operating costs, liability exposure and environmental impacts. With 70% of the NH public schools over 36 years old, many communities can utilize the services of the organization as they build new facilities and retrofit older ones.

NH Carbon Challenge

The NH Carbon Challenge began in 2006 with a purpose to help individual residents reduce their greenhouse gas emissions. Community Energy Programs can utilize their materials, available via internet download, to create a residential campaign. They also have a great speaker series that can help educate the community on what they can do to reduce greenhouse gas emissions.

Building Codes

All of the elements of the New Hampshire State Building Code are available on the NH Department of Safety's State Building Code Review Board website. These include the 2009 codes and amendments adopted by the Review Board.

The International Code Council offers information on the 2012 International Energy Conservation Code (IECC) and the International Green Construction Code (IgCC).

ENERGY STAR for Homes Version 3 Guidelines can be found on the energystar.gov website.

FUNDING SOURCES

UTILITY PROGRAMS

In 2002, the Public Utility Commission began the Systems Benefit Charge (SBC) on electric bills. The SBC is a use based charge on electric bills which funds two energy efficiency programs which are run through the local utilities. The two programs are the Low Income Assistance Program aimed at subsidizing cost for eligible households and Energy Efficiency Programs for residential and commercial customers. They brand their programs underneath the NH Saves name. One of the more notable programs for municipalities is the Smart Start program offered through PSNH and Large Business Services program by Unitil. These programs allow municipalities to upgrade electric lighting to more efficient technology and pay for the upgrades over time through the energy savings.

DATABASE OF STATE INCENTIVES FOR RENEWABLE ENERGY (DSIRE)

DSIRE is a state by state collection of financial incentives and rules/regulations pertinent to renewable energy projects. It lists some of the programs highlighted above such as the property tax exemption and the utility programs, but in greater detail. Additionally, topics regarding NH Renewable Portfolio Standard and US Department of Energy's Alternative Fuels which are not included in the Community Tools are listed on the DSIRE website.

USDA HIGH ENERGY COST GRANT PROGRAM

The US Department of Agriculture (USDA) offers annual grants between $75,000 and $5 million through their High Energy Cost Grant Program. The funding began in 2001 and has gone through four rounds of disbursement. It is open to a wide range of applicants including individual residents and municipalities. The grant is able to pay up to 100% of the costs of the project. Past projects include transmission and distribution upgrades for rural areas but as of FY07 there has been an increase level of renewable energy and energy efficiency projects.

NEW ENGLAND GRASSROOTS ENVIRONMENTAL FUND

The New England Grassroots Environmental Fund is a nonprofit organization helping communities with grassroots environmental initiatives by offering small grants to fund such projects. In the past these projects have included maps for conservation lands, creation of urban gardens and municipal energy efficiency programs. The latter of the three is a relatively knew undertaking and the Fund is encouraging energy committees to seek funding to help in their pursuits.

NH RENEWABLE ENERGY FUND

In 2007, the state legislature passed a Renewable Portfolio Standard (RPS) bill and it was subsequently signed by Governor Lynch. The RPS requires a certain percentage of renewable energy be purchase by electric supply companies. It also created a Renewable Energy Fund. Funds generated by the Renewable Energy Fund are earmarked for the expansion of renewable energy projects within the state.

MUNICIPAL ENERGY REDUCTION FUND

The NH Community Development Finance Authority (CDFA) offers low-cost loans through the revolving Municipal Energy Reduction Fund. This fund is available to help municipalities improve the energy efficiency of their municipal buildings, street lighting, water

and sewer treatment facilities, and where appropriate, electrical distribution systems. The goal is to reduce energy usage and costs.

NH DES Used Oil Management Program

The Used Oil Management Program offers annual grants of up to $2,500 to assist with the establishment of residential used oil collection centers. Such grants may also be used to help fund the installation of a waste oil heating system in a municipality, and annually to help with maintenance costs to service the systems.