Dorchester Master Plan
Energy Chapter

Draft

June 26, 2012

Prepared By:

Upper Valley Lake Sunapee
Regional Planning Commission

I. ENERGY RESOURCES

Introduction

Energy use and energy conservation is an increasingly important topic in New Hampshire Communities. The use of energy for electricity, heating, and transportation is integrally tied to community planning, individual lifestyles, natural resource conservation, and environmental quality. The connection between energy use, rising energy costs, and the implications of global climate change in particular have raised concerns within communities. Many have begun taking action to individually and collectively reduce energy consumption and greenhouse gas emissions. The state adopted RSA 269:1(n) in 2008 authorizing municipalities to include an energy section in their Master Plan that addresses energy and fuel resources, energy needs, and a strategy for conservation of energy. The purpose of this Chapter is to provide some background on energy issues, local energy conservation efforts, and make recommendations for short-term and long-term actions the Town and residents of Dorchester can take to reduce energy consumption and costs.

Community Attitudes

The Dorchester Planning Board collected community feedback through a Community Attitude Survey in late 2011. Principal findings from the Survey regarding land use planning and municipal policies as they relate to energy efficiency and renewable energy practices are below:

- 70% “Agree” or “Strongly Agree” the Town should develop energy efficiency standards municipalities and equipment.
- 71% “Agree” or “Strongly Agree” the Town should encourage alternative energy production.
- 61% “Agree” or “Strongly Agree” the Town should encourage environmentally sensitive, low-impact business and industry development.
- 58% believe the Town should encourage the expansion of high-speed internet access and 66% support expansion of cell phone service
- “Home-based business” (a.k.a. – cottage industries) was the most desired business or service survey respondents want to see more of.
- 80% of respondents “Agree” that the Town should promote access to recycling of a broad range of materials.
- 86% of respondents “Agree” that the Town should promote energy conservation.
- 75% of respondents “Agree” that the Town should promote alternative energy production.

Goals

This chapter serves as an important first step to help the Town begin examining its energy usage and develop implementation strategies to:

- Reduce municipal energy consumption and costs. Pursue energy savings for all municipal facilities, equipment, and vehicles through weatherization and building renovations, operational guidance, and developing purchasing policies in favor of energy-efficient equipment.
- Encourage land use development that provides opportunities for energy conservation practices including energy-conscious site design and building construction.

- Promote energy efficiency practices among Dorchester residents. Encourage energy conservation and use of alternative energy resources and provide educational resources for residents to reduce residential energy consumption.

New Hampshire Statewide Energy Overview

Energy generation, consumption, and conservation are, arguably a statewide, national, and international issue. The statewide approach to energy consumption, conservation, and climate change issues provide context for Dorchester's individual planning efforts. Success in energy conservation and improved air quality must begin at the local level with an understanding of the broader issues in the state.

Statewide Energy Use and Trends

According to the NH Office of Energy and Planning (NH OEP), electricity generation and transportation account for more than half of NH's net energy use. In 2007:

- Petroleum comprised the largest proportion of gross energy use at 38.7%, followed by nuclear at 26.3%, natural gas at 15.1%, and coal at 10.5%.
- Renewable energy sources played a much smaller role, with 4.2% coming from wood and wood waste; 2.9% coming from hydro; and less than 1% coming from solar, wind, or geothermal.
- 55.3% of NH households used oil for home heating. Other heating sources used in the state included natural gas (14%), wood (10.3%), propane (10%), kerosene (5%), and electricity (4.8%).

The U.S. Energy Information Administration, an agency with in the U.S. Department of Energy, collects and disseminates a broad range of energy statistics within the United States. Table 1, below, provides a summary of energy consumption by sector (residential, commercial, industrial, and transportation) for 1990, 2004, and 2009.

The data in Table 1 illustrate overall growth in statewide energy consumption of nearly 15% over the nearly 20 years of record, which generally matches the population growth for the same period. While energy consumption increased by nearly 30% between 1990 and 2004 there was a significant a drop in energy consumption between 2004 and 2009. This may be associated with the economic recession of the latter half of the decade. Transportation and residential sectors constitute the major portion of energy consumption for the period of record (64% in 2009).

Renewable Energy Resources

Heavy reliance on nonrenewable, mostly imported energy resources (e.g. petroleum, natural gas, and coal) can introduce some risk to the state's energy supply and overall economic well-being due to price fluctuations from global demand and geopolitical influences. Renewable energy resources, which are often locally or regionally available, are an important long-term consideration to introduce diversity into the array of energy resources for the state. Currently, renewable energy sources comprise a small share of the state's energy portfolio. New Hampshire has abundant renewable energy resources (e.g. biomass, geothermal heat, hydroelectric, wind, solar, etc.), which are becoming more economically viable as technologies progress. By using more of its own renewable energy resources New Hampshire and its communities can decrease vulnerability to energy disruption and keep energy investments in the local economy.

Table 1: Energy Consumption by Use Sector (1990, 2004, 2009)

Category	1990		2004		Percent change '90-'04	2009		Percent change '04-'09	Percent change '90-'09
Population	1,109,117		1,299,169		17.1%	1,316,470*		1.3%	18.7%
Energy Consumption (trillion BTU)	264.6		340.6		28.7%	303.0		-11.0%	14.5%
Per Capita Consumption (thousand BTU/person)	239		262		9.6%	230		-12.2%	-3.8%
By Sector (trillion BTU)	**Usage**	**% Share**	**Usage**	**% Share**	**Usage**	**Usage**	**% Share**		
Residential	78.8	29.8%	99.6	29.2%	26.4%	88.1	29%	-11.5%	11.8%
Commercial	43.5	16.4%	75.6	22.2%	73.8%	69.7	23%	-7.8%	60.2%
Industrial	69.3	26.2%	56.2	16.5%	-18.9%	39.4	13%	-29.9%	-43.1%
Transportation	73	27.6%	109.2	32.1%	49.6%	105.8	35%	-3.1%	44.9%
Total	264.6	100%	340.6	100%	28.7%	303	100%	-11.0%	14.5%

Source: U.S. Energy Information Administration (http://www.eia.gov/state/)

Air Quality and Climate Change

The increase in carbon dioxide emissions, a byproduct of burning fossil and biomass fuels, has caused statewide, national, and international concern about air pollution and impacts on climate conditions. Although this chapter is not specifically about climate change, integrating energy efficiency goals into local land use planning and municipal policy will help reduce consumption of these fuels and impacts on air quality and the climate. Ultimately, these efforts are necessary to maintain the existing quality of life in Dorchester and throughout New Hampshire.

Land Use, Transportation, and Energy

There has been an increased emphasis on the connection between transportation, land use planning, and energy. Statewide planning initiatives are recognizing this connection and seek proactive strategies to minimize the consumption of resources and the long-term costs of development. Small, rural communities like Dorchester, with limited local services and where its residents commute to regional employment centers, will find it challenging to find a simple solution that can address the relationship between transportation, land use, and energy. The Planning Board is encouraged to enquire with the Upper Valley Lake Sunapee Regional Planning Commission and seek peer communities to identify initiatives to implement in Dorchester.

Municipal Energy Efficiency

Overall, municipal operations and energy consumption is a small fraction of the total energy consumption for a typical New Hampshire town. Regardless, it is important for the Town to reduce its energy demands through building weatherization and upgrades and energy efficient operations and procurement guidance for Town Staff and Officials. The Town would lead by example in an effort to reduce the cost of maintaining and operating its facilities and vehicle fleet and saving tax dollars.

Baseline Inventory and Long-Term Monitoring

It is important, as part of a long-term energy efficiency program, to track energy usage and costs. The Town should begin developing an inventory of energy consumption for its buildings and vehicle fleet using the U.S. Environmental Protection Agency's secure Portfolio Manager online program. Portfolio Manager is free to use and provides summary statistics to track usage over time. The first step in this process is collecting and entering one to two years of historic energy use information. This 'baseline inventory' will help Dorchester Staff and volunteers track future energy savings as they continue to enter energy use information over time.

Opportunities for Increasing Municipal Energy Efficiency

Dorchester can continue to improve upon municipal energy efficiency through monitoring energy use, setting energy efficiency goals, and identifying new projects. Opportunities include:

- Engage the electric utility company or an independent contractor to conduct energy audits of municipal buildings to identify opportunities for improved weatherization or equipment improvements.
- Purchase energy efficient items when replacing equipment, appliances or mechanical systems.
- Establish a no-idling policy to reduce vehicle emissions and fuel consumption. Consider idling retrofits that provide auxiliary power while engines are off to reduce emissions.
- Installation of renewable energy production systems (solar, wind, geothermal, biomass) where appropriate and when cost effective.
- Coordinate energy efficiency programs with the local schools to maximize potential community savings.

Formation of a Local Energy Committee

The generation and use of energy and emissions from energy use – whether for homes, businesses, or transportation – has a significant impact on the environment, and the health and welfare of the community. Local energy committees are an important way to help inform decision makers and residents about how to advance cost-effective strategies that conserve energy, reduce costs, and help protect the environment.

An Energy Committee in Dorchester, if formed, could have the following roles:

- Advise the Planning Board on regulatory and planning strategies relative to energy efficiency and conservation;
- Coordinate with boards, commissions, schools and other organizations to promote and implement energy efficiency and conservation measures in the community and surrounding towns;
- Conduct public outreach and education efforts to help residents reduce household energy use and costs;
- Report to the Board of Selectmen on energy usage for municipal facilities on an annual basis and as requested; and
- Provide information to the Board of Selectmen about strategies to reduce municipal energy use in municipal facilities.

Recommendations

Energy planning is integral to Dorchester's long-term municipal and land use planning efforts. The following recommended actions are all steps to achieving a more sustainable energy economy. By promoting energy conservation behaviors and the employment of energy efficient measures Dorchester can do its share to minimize undue municipal costs and community-wide demand for carbon-based energy sources and greenhouse gas emissions.

Provide Municipal Energy Efficiency Leadership

The Town of Dorchester can establish itself as a leader in energy conservation and efficiency.

- Form a Local Energy Committee and adopt an energy action plan to reduce energy consumption in Dorchester.
- Develop a Portfolio Manager account to track municipal energy use on an ongoing basis. Designate an individual in Town (e.g. a member of the Energy Committee once it is formed) to report energy use trends to the Board of Selectmen.
- Pursue grant and loan funding whenever possible to effectively leverage Town funds for energy improvement projects.
- Create new policies for Town Staff regarding equipment use and purchasing practices that will reduce energy use and costs.
- Establish and promote a community park and ride facility on municipal land for commuters traveling to regional employment centers.
- Conduct educational events on energy issues. Work with local and regional organizations and community groups to provide information to residents on ways to reduce energy consumption.

Adopt Regulations and Ordinances to Promote Energy Efficient Development Practices

Dorchester can encourage energy efficient development practices for new development. The following recommendations would help promote energy efficiency in local development projects.

- Provide incentives in regulatory review processes that encourage voluntary implementation of energy efficiency practices, innovative land use techniques, or mixed use development proposals (where appropriate).
- Evaluate whether there are areas in Dorchester where it would be appropriate to encourage an appropriate mix of building uses (e.g. residential and small-scale commercial and retail) to give residents the opportunity to live close to services and drive shorter distances.
- Adopt land use regulations that allow the development of renewable energy production for private residential use or small-scale commercial use.
- Consider property tax exemptions for the installation of renewable energy facilities on existing properties to encourage use of renewable energy resources.