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CHAPTER XII - ENERGY

INTRODUCTION

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5 The purpose of the Energy Chapter is to provide a framework for understanding energy issues
6 and why New London should consider them as it plans for its growth and development. The
7 recommendations of this chapter are designed to promote energy conservation, encourage energy
8 efficiency, reduce energy costs, improve New London's energy infrastructure, increase the use of
9 local and sustainable energy resources, enhance environmental quality and develop both a better
10 framework and baseline of understanding for energy planning in the community. Additionally,
11 this chapter is intended to highlight how other town policies, zoning ordinances, development
12 patterns and other rules and regulations can affect energy consumption, so this chapter will also
13 make recommendations for changes and/or consistency in other chapters to reflect the energy
14 principles set forth in this chapter.

15

HISTORICAL PERSPECTIVE

16
17 Early in its history, New London and most of New Hampshire were built on a sustainable but
18 subsistence economy where water power, wood, manual labor and vegetation-fed animals
19 enabled residents to be nearly energy independent of the rest of the world. Wanting more from
20 life, the descendants of these settlers and the people who joined them soon became part of a
21 global economy, using still abundant natural resources to provide the world with wool, scythes,
22 and then dairy products while importing foreign-made goods in exchange.

23 The discovery of cheap fossil fuels and the development of an electric grid stimulated a
24 significant transformation of the economy. The flexibility of the energy sources, in addition to
25 their low cost relative to the traditional sources of energy, helped to enable a more than 50-fold
26 increase in worker productivity over the course of the 20th century. This increase in value

1 created per worker afforded a significant increase in the quality of life for the people of New
2 London. It also led to a significant transformation of New London's economy—an economy
3 which is, now, almost entirely dependent on imported energy.

4 Currently, nearly all of New London's energy needs are imported from beyond the town's local
5 economy. In fact, the energy fuel is mostly imported from beyond the state of New Hampshire.
6 This means that almost all of the money spent on electricity and petroleum flows out of our local
7 economy, and outside of the state. By reducing the amount of money spent on imported energy,
8 New London can re-direct more money back into the growth and prosperity of its local economy
9 and citizens. By encouraging energy conservation and cost-effective investments in energy-
10 efficiency—in other words, by improving the productivity of its energy expenditures—New
11 London can improve its prosperity.

12 Recently, the pollution associated with combusting today's primary energy fuels have been
13 shown to cause harm to both our health and our environment. Unfortunately, the costs of this
14 harm are not covered by those generating the pollution, although measures are being taken to
15 significantly reduce the pollution emitted. New London can support the reduction of the harm
16 caused by the combustion of these fuels by encouraging the installation and consumption of
17 sustainable, non-polluting (or, at least, less-polluting) energy sources.

18 As New London has grown, its patterns of development—the way land has been used for various
19 purposes—have created a geographic layout and building infrastructure with built-in energy
20 requirements. Whether it is the number of people able to live or work in a building, the distance
21 the people must travel to commute to work or meet their personal needs, the types of
22 transportation available, or the amount of energy required to operate the buildings they inhabit,
23 the policies and regulations that guide New London's development have a significant impact on
24 the amount of energy that will be consumed in New London. These same policies also help
25 determine whether certain sustainable energy generation systems can be installed. New London
26 has a responsibility to consider the energy implications of these decisions, and this Energy

1 Chapter will begin to establish a framework for how to include energy consumption issues in the
2 town's decision making.

3 As New London's citizens became more aware of the costs and potential harms associated with
4 energy consumption, it adopted a warrant article in 2007 to establish the New London Energy
5 Committee as a group of advisors on energy issues to support the town and the community in
6 their efforts to conserve energy, pursue energy efficiency and consider sustainable energy
7 generation. Even more recently, the decision by the Planning Board to include an Energy
8 Chapter in its Master Plan, which will guide the development of the community over the next 5-
9 10 years, is recognition that New London has grown more aware of and concerned about the
10 consequences of its decisions that affect energy consumption. Until the habit of thinking about
11 energy becomes instilled in New London's development decision making, the New London
12 Energy Committee offers this Chapter to the Master Plan as a resource to help guide the town's
13 decision making regarding the future development and prosperity of our town. We hope you
14 find it useful, and that the energy we put into authoring it helps to make you more productive!

15

16 **WHAT ARE ENERGY CONSERVATION, ENERGY EFFICIENCY AND**
17 **SUSTAINABLE ENERGY?**

18 *Energy Conservation* is used to describe the reduction of wasted energy. In other words, when
19 someone is using energy but not gaining any benefit from it, that person is wasting energy. And
20 for New London, it is like writing a check to someone out-of-state. Leaving the lights on in an
21 unoccupied room is an example of wasted energy, and the corresponding energy conservation
22 measure would be turning out the lights in unoccupied rooms. Energy Conservation solutions
23 typically do not cost anything other than a change in behavior.

24 *Energy Efficiency* is creating the same benefit or output, but with less energy as an input. An
25 example of an energy efficiency solution is a light bulb that produces the same amount of light
26 (sometimes measured in 'lumens') while consuming less energy ('watts'). Every time we buy
27 something that consumes energy to perform its function, it is an opportunity to consider a more

1 energy efficient alternative that may lower the cost of owning it over its useful life. Sometimes
2 the more energy efficient alternative costs more to purchase initially, but costs less to own over
3 its useful life because its energy consumption costs are lower. Government programs and some
4 utilities will often offer subsidies to people who buy more energy efficient alternatives, helping
5 to lower any perceived initial cost premiums and encouraging the selection of more energy
6 efficient items.

7 ***Sustainable Energy*** is used to describe energy generation systems that do not use non-renewable
8 fuel sources (e.g., fossil fuels) and that “meet the needs of current generations without
9 compromising the needs of future generations.” Examples include solar hot-water and
10 photovoltaic systems, wind energy systems, bio-mass heating and co-generation systems, and
11 hydroelectric systems. When such systems are located near the point of consumption (e.g., in the
12 yard of a residence), they are considered to be “distributed” energy generation systems vs.
13 centrally operated systems. As distributed systems, they do not require an electric distribution
14 utility to transmit the power from its centrally located power plant to the point of consumption
15 (e.g., at the resident’s home). This not only reduces the costs of maintaining the distribution
16 grid, but also reduces the consumption of fossil fuels required to generate the electricity at the
17 power plant. Various government and utility programs provide subsidies to make energy
18 produced by these systems more cost-competitive with traditional energy sources, and the costs
19 for many of these systems are declining. Within 10 years, distributed wind and solar electric
20 systems, when installed in advantageous locations, are expected to produce electricity over their
21 useful lives at a cost that is equal to or less than the price of electricity from the electric
22 distribution utility.

23 By encouraging and promoting energy conservation behaviors, the selection of energy efficient
24 alternatives and the investment in cost-effective, sustainable energy systems, New London can
25 mitigate the negative effects of power consumption, benefiting the local community. The easiest
26 and least costly approach to reducing energy consumption is to conserve energy—that is, to stop
27 wasting energy that is of no value. Energy efficiency measures generally provide the next best
28 return on investment in terms of both time and money. Indeed, many replacement decisions can

1 be financially attractive based on expected energy savings even before the item being replaced
2 has exhausted its current useful life—the replacement measures literally pay for themselves
3 through reduced energy expenses and other operating costs. Finally, New London can encourage
4 and facilitate investments in local, sustainable energy generation systems, which are becoming
5 more cost-competitive relative to traditional sources of energy, even today, thanks to various
6 government and utility incentives.

7

8 **NEW LONDON’S PRIMARY AREAS OF ENERGY CONSUMPTION**

9 In order to better understand how to affect New London’s energy consumption, it is helpful to
10 examine its consumption through four primary areas of energy consumption in the community:
11 buildings, transportation, electricity and commercial & industrial uses.

12 **Buildings** are responsible for about 40% of energy consumption in the United States, and more
13 than 70% of electricity consumption. Nearly 30% of New Hampshire’s total energy
14 consumption is used for heating buildings. Approximately 75% of New London’s households
15 are heated buy combusting fossil fuels.

16 **Transportation** accounts for 70 percent of U.S. oil consumption, and it accounts for nearly one-
17 third of the state’s net energy use. Most vehicles use gasoline; less than 15% burn diesel; a
18 growing number of hybrids can be seen driving around town. The town was one of the first
19 municipalities in the state to convert its diesel fleet to bio-diesel.

20 **Electricity** accounts for a growing percentage of New Hampshire’s total energy use, currently
21 estimated at about 40% of its net energy consumption. Almost none of this energy is generated
22 in New London, although distributed, sustainable energy generation systems could change that.

23 **Commercial & Industrial** consumption of energy is used to measure how energy inputs are used
24 to create the products and services that companies provide. New London does not have much
25 industry that requires lots of energy to help transform raw materials into finished goods, but its
26 commercial businesses often require energy beyond basic occupancy energy uses (e.g., for

1 lighting, heating and electrically powered office equipment) in order to provide their services
2 (e.g., power equipment such as refrigeration, air compressors and pumps).

3 From a power sources or generation viewpoint, New Hampshire currently generates about 8-9%
4 of its energy from domestic, renewable energy sources, mostly generated from hydro and wood,
5 split about evenly. The only material renewable energy generation in New London is the use of
6 wood for heating. Wood burning appliances in New London represent an area of opportunity for
7 the town: today's advanced combustion stoves and fireplaces burn up to 90% cleaner and one-
8 third more efficiently than conventional appliances.

9

10 **DOES NEW LONDON CARE, AND WHAT DOES IT VALUE MOST?**

11 The community survey conducted by the Planning Board to provide community input into the
12 shaping of the Master Plan provided clear support for New London to amend its regulations to
13 encourage sustainable practices within its own operations and to promote sustainability
14 throughout the region (84% of participants supporting the issue; second only to their desire to
15 conserve land areas significant to the character of New London). Support for alternative energy
16 sources on residential and commercial property was close behind, with 81% and 73% supporting,
17 respectively. There was not a question, explicitly, on their support for New London's
18 encouraging energy conservation and efficiency. Given the high level of support for
19 sustainability and alternative energy, however, the Local Energy Committee believes that it is
20 highly correlated, and, thus, quite strong.

21 Survey participants also believe that village centers with New England charm are significantly
22 important (93%). Fortunately, this view supports many Smart Growth community development
23 principles, as does their support for scenic areas and open spaces (98%). More compact
24 communities require less energy for transportation, and the "carbon sinks" of preserved open
25 space and forests helps to offset some of the pollution caused by fossil fuel combustion. More
26 directly, 65% of the survey participants indicated a preference for more concentrated residential
27 development within or adjacent to village centers with outlying areas remaining low density.

1 Increasing the “productivity” of our built environment can also generate energy savings. More
2 people living in the same residence, and more workers in the same office reduce energy costs per
3 square foot and per capita. One means of achieving this higher utilization of existing space is by
4 allowing accessory dwelling units (“in-law apartments”), which 72% of survey participants
5 support. Additional measures that could improve building utilization were favored by a majority
6 of survey participants: denser workforce housing (50%), more rental unit opportunities (56%),
7 conversions of large single family houses into multiple units near the town center (53%), and
8 housing units over businesses in the commercial district (55%).

9 Reducing energy consumed through transportation can also be achieved if people can accomplish
10 more from their place of residence. Development of a regional fiber optic network has been
11 proposed. The network would not only benefit residents with increased online and
12 communication capabilities, but also the businesses in the area. In fact, it could help to attract
13 the types of businesses survey participants would like to see expand, such as professional
14 services (81%), medical offices (80%), Inns and B & B’s (67%), and home-based businesses
15 (60%). More than two-thirds of the survey participants support New London’s investing in such
16 a project, and while lower transportation costs were not highlighted as a potential benefit, it is
17 one of the expected benefits, especially with a growing percentage of people working from their
18 homes or telecommuting.

19 While a majority of survey participants (52%) supported development of public transportation
20 within the region, a full two-thirds of survey participants were supportive of expanding public
21 transportation to major regional transportation hubs. Additionally, there was strong support for
22 additional sidewalks, bike lanes and multi-use paths along the major transportation corridors
23 around New London, which would make it safer and easier to walk or ride a bike instead of
24 driving short distances around town. The announced Elkins renovation, which received a lot of
25 community input during its design, will also improve the walkability and safety of the Elkins
26 Village District. Clearly, New London’s citizens want to make the option of not driving around
27 town—or to regional transportation hubs—an easier and safer alternative to using their
28 petroleum-fueled cars.

1

2 **WHAT IS NEW LONDON DOING ABOUT IT?**

3 New London has continuously examined how to improve the productivity of its municipal
4 operations, and how to reduce the operating costs of its buildings and equipment. Recently, as
5 fuel and energy costs have escalated, after a period of relatively cheap energy, and as New
6 London's understanding of the potential harm combustion can have on both our health and our
7 environment, its attention toward its energy consumption has heightened. New London's
8 citizens have also been active, often volunteering and organizing on their own to identify
9 opportunities to conserve energy, invest in energy efficiency and educate fellow citizens of the
10 benefits of reduced energy consumption and sustainable energy generation. As previously
11 mentioned, a Local Energy Committee was formed in 2007. The following list of recent activity
12 further demonstrates the towns growing interest and commitment to energy issues:

- 13 • Construction of energy efficient garage for Department of Public Works (2004)
- 14 • Lighting retrofit of Tracy Memorial Library (2005)
- 15 • Town diesel fleet converted to bio-diesel (2006)
- 16 • Reduction and retrofit of street lighting (2007)
- 17 • Heating system retrofit for Tracy Memorial Library (2007)
- 18 • Evaluation of micro-hydro power generation, Pleasant Lake (2007)
- 19 • Energy audit of Tracy Memorial Library (2008)
- 20 • Kill-a-Watt Energy Meters and Energy Reference Material Available at Library (2008,
21 ongoing)
- 22 • Evaluation of wind turbine with Colby-Sawyer College (2008/9, ongoing)
- 23 • No Idling Policy established; signs erected around town (2008/9)
- 24 • "Lights Out" New London (evening without using electric lights, 2008/9)
- 25 • "Energy Matters" series of articles published by NLEC in local paper (2008/9, ongoing)
- 26 • Installation of Bicycle Racks around town (2008/9)
- 27 • Attic insulation improvement for Tracy Memorial Library (2009)
- 28 • Adoption of Small Wind Power Ordinance (2009)
- 29 • Expanded Park-and-Ride Lot at I-89 Exit 12 (2009)
- 30 • Constructed efficient roundabout to address traffic delays and safety concerns (2009)
- 31 • League of Women Voters Lecture Series (2009, 8 Speakers on EE and RE)

- 1 • Hosting the Inaugural “Button-Up New Hampshire” Work Shop (2009)
- 2 • Lighting audit of all municipal buildings (2009)
- 3 • Master Plan Energy Chapter (2009/10, currently being drafted)
- 4 • Participation in the NH Municipal Energy Assistance Program (2009/10)
- 5 • Measuring and Benchmarking Total Municipal Energy Consumption (2010)
- 6 • Auditing the Least Energy-Efficient Municipal Building for Remediation (2010)
- 7 • Building shell and window improvements for Tracy Memorial Library (Planned, 2010)
- 8 • Over the last several years, a number of town representatives have attended training and
- 9 informational workshops to build local capability in the areas of EE and RE

10

11 **WHAT MORE CAN NEW LONDON DO? - RECOMMENDATIONS AND**

12 **PRIORITIES**

13 Within each category, the recommendations are listed in priority order.

14 **MUNICIPAL FACILITIES AND ENERGY USE**

- 15 1. When the town considers the purchasing of new equipment, it should consider the energy
- 16 costs of operating that equipment to determine the full life-cycle costs of various
- 17 purchasing options before determining the best and most cost-effective solution for its
- 18 needs.

- 19 2. Pursuant to the audit report created through the New Hampshire Municipal Energy
- 20 Assistance Program (MEAP), New London should invest in the cost-effective retrofit
- 21 recommendations provided by the building auditor for the least energy-efficient building
- 22 in town. The New London Energy Committee (NLEC) should use the retrofit project as
- 23 an opportunity to educate the community on how to identify, evaluate and implement
- 24 energy efficiency initiatives.

- 25 3. New London should maintain its Energy Star Portfolio Manager models of its facilities,
- 26 developed through its participation in the MEAP program, entering its energy
- 27 consumption on a monthly basis or as fuel is delivered, as appropriate, so that it can
- 28 better measure and manage its energy consumption. At least annually, New London

1 should use Portfolio Manager to generate reports that benchmark its facilities against
2 similar buildings to identify high-potential areas for cost-effective energy retrofits.

3 **FUNDING, FINANCING AND INCENTIVES**

4 4. The New London Energy Committee and town administrators should identify funding
5 sources for both the town and the community targeted toward investments in energy
6 efficiency and sustainable energy systems, and communicate the availability of those
7 funding

8 5. Energy Committee should identify and provide summaries of and/or links to descriptions
9 of the various energy efficiency and sustainable energy incentives available to the
10 community.

11 6. The Town should consider submitting a warrant article for Town Meeting vote to decide
12 if Renewable Energy Property Tax Exemptions should be made for eligible systems
13 pursuant to NH RSA 72:61-72.

14 **LAND USE**

15 7. New London should revise and/or develop zoning ordinances and regulations, including
16 the appropriate chapters of this Master Plan, to guide and allow for sustainable energy
17 generation, including but not limited to the installation of wind, solar, micro-hydro, bio-
18 mass and geothermal systems.

19 **BUILDING CONSTRUCTION AND RETROFITS**

20 8. New London should both adopt and enforce a building code that meets or exceeds the
21 International Energy Conservation Code 2009, which becomes effective across the State
22 of New Hampshire on April 1, 2010.

23 9. New London should deliberate whether additional green building guidelines should be
24 adopted regarding such issues as site placement, the requirement of an energy rating for
25 all buildings before they are sold, and other green building principles.

1 10. New London and the NLEC should advocate for the upgrading of wood stoves, fireplaces
2 and boilers to EPA-certified appliances, and consider sponsoring a Burn Wise Wood
3 Stove Changeout program for New London residents.

4 **TRANSPORTATION**

5 11. New London should pursue the development of additional sidewalks, bike lanes and
6 multi-use paths to enable and ensure the safety of alternative forms of transportation
7 around town

8 12. New London should study the options and feasibility of expanded public transportation
9 options to major regional transportation hubs and around the community region.

10 **COMMUNITY OUTREACH AND COLLABORATION**

11 13. The New London Energy Committee, in cooperation with other local community groups
12 and advocacy organizations, should continue to host educational and awareness events
13 regarding energy conservation, energy efficiency and sustainable energy systems.
14 Beyond basic education, the NLEC should make available tips and best practice
15 strategies regarding how to pursue various efficiency and sustainable energy initiatives,
16 making it easier for New London's citizens and businesses to pursue these initiatives.
17 The town of New London should consider additional support for the NLEC to help
18 promote and sponsor these outreach initiatives. The NLEC web site, the town offices and
19 town web site, as well as Tracy Memorial Library and its web site should all provide
20 references to the educational materials and resources that are available to New London's
21 citizens and businesses.

22 14. New London should encourage and help support the incorporation of energy and energy
23 issues into the curriculum of the Kearsarge Regional School District.

24 15. New London, through the NLEC, should continue to foster a collaborative effort with
25 Colby-Sawyer College to support the outreach of students into the community regarding

1 energy initiatives, and to collaborate with the college on high-profile speaker visits and
2 potential sustainable energy partnership opportunities.

3

4 **ADDITIONAL RESOURCES**

5 For additional information about New London's energy initiatives, please visit the New London
6 Energy Committee's web site: www.nl-nh.com/energy (this will need updating as the new site is
7 launched)

8 For information about New Hampshire's energy consumption, you can browse the New
9 Hampshire Office of Energy & Planning's Energy Facts:
10 www.nh.gov/oep/programs/energy/nhenergyfacts/

11 For information about United States energy consumption, you can browse the Department of
12 Energy's Energy Information Administration: www.eia.doe.gov/

13 For suggestions on how to reduce energy consumption, you can browse the Department of
14 Energy's Energy Star web site: www.energystar.gov/ and its Energy Efficiency and Renewable
15 Energy Web Site: www.energysavers.gov/

16 To learn more about renewable energy, you can browse the Department of Energy's web site for
17 the National Renewable Energy Lab: www.nrel.gov/learning/

18 To learn more about the Environmental Protection Agency's Wood Stove Changeout program
19 and its Burn Wise campaign, you can visit its web site: www.epa.gov/burnwise/

20 For a summary of the various incentives available to encourage the energy efficiency and
21 renewable energy investments, you can find a good summary at the web site for the Database of
22 State Incentives for Renewables & Efficiency (DSIRE): www.dsireusa.org/