

TOWN OF NORTH HAMPTON, NH

Master Plan

Chapter - Energy Efficiency and Sustainable Development

Prepared by the
North Hampton Planning Board
and
North Hampton Energy Committee
with assistance from the Rockingham Planning Commission

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MASTER PLAN
CHAPTER: ENERGY EFFICIENCY AND SUSTAINABLE DEVELOPMENT
Town of North Hampton, New Hampshire

1.0 INTRODUCTION

1.1 Purpose

The purpose of this Chapter is to provide guidance and tools, identify strategies and actions, and provide a vision for achieving energy efficiency and conservation, and sustainable growth and development in North Hampton. The interconnected relationship between rising costs of energy and the environmental and economic implications of climate change have raised serious concerns about what communities can do to protect their future interests. Reduction in energy consumption provides both economic and societal benefits including reduced energy costs, reduced greenhouse gas emissions and improved air quality. Energy efficiency and conservation strategies should target all municipal and private facilities, infrastructure and systems that use energy such as buildings, homes, transportation, lighting, water, sewer, emergency services, public spaces and recreation.

Ultimately, implementation of sustainable development practices can help provide a balance between environmental protection, economic benefits, and equity in the community. This can be achieved by removing obstacles from planning and regulation, creating opportunities for energy efficiency, renewable energy generation, and permitting compact land use patterns.

1.2 What is Energy Efficiency and Conservation

Energy efficiency and conservation focuses on one main objective - reducing overall energy consumption across all sectors thus reducing energy costs and environmental pollutants. Communities can achieve reductions in energy consumption by addressing the following:

- Efficiency for both existing and new buildings
- Community awareness and participation
- Transportation systems, choices and alternatives
- Access to clean fuel choices
- Street and outdoor lighting
- Recycling, composting and reuse programs
- Consumerism of local products and services
- School and classroom education programs

1.3 Rational for Energy Efficiency and Conservation

Cost and Efficiency

Statewide trends in energy consumption, translated to the regional level, reveal that the average resident in New Hampshire consumes 9% more energy in 2004 than they did in 1990. From 1990 to 2004, the major economic sectors experienced growth: commercial by 74%, transportation by 50%, and residential by 26%. However, in 2004, the residential sector was the second largest energy consumer exceeded only slightly by the transportation sector. Petroleum was by far the highest consumptive fuel source across all sectors, followed by nuclear power, and electric power fuel source.

Alterations to our climate could result in adaptive changes or decline in certain sectors of the regional economy, including winter tourism, agriculture, maple syrup production, coastal real estate values (due to sea level rise and increase in storm intensity), and health costs associated with respiratory health and heat related illnesses.

Land Use and Planning

The infrastructure for energy use and delivery can influence land use decisions about where growth occurs and where we live, work and recreate. NH State law encourages energy efficient patterns of development through zoning that does not unreasonably limit development of alternative and renewable sources of energy. Reductions in energy consumption can also be achieved through implementation of conservation measures, smart growth, and development of alternative transportation systems. These concepts are described in the table below.

Table 1. Summary of implementation strategies to reduce energy consumption.

Conservation Measures	<ul style="list-style-type: none">▪ Energy efficiency in buildings, fixtures and infrastructure▪ Behavioral changes including trip consolidation, ride sharing, reduction in lighting and appliance use, efficiency in equipment and other purchases
Smart Growth	<p>Principles</p> <ul style="list-style-type: none">▪ Incorporate a mix of uses to provide a variety of housing, employment, shopping, services, and social opportunities for all members of the community.▪ Preserve working landscape by sustaining farm and forest land and other rural resource lands to maintain contiguous tracts of open land and to minimize land use conflicts.▪ Provide choices and safety in transportation to create livable, walkable communities that increase accessibility for people of all ages, whether on foot, bicycle, or in motor vehicles.▪ Protect environmental quality by minimizing impacts from human activities and planning for and maintaining natural areas that contribute to the health and quality of life of communities.▪ Involve the community in planning and implementation to ensure

	<p>that development retains and enhances the sense of place, traditions, goals, and values of the community.</p> <ul style="list-style-type: none"> ▪ Manage growth respecting the local community tradition, but work with neighboring towns to achieve common goals and address common problems more effectively.
Alternative Transportation	<ul style="list-style-type: none"> ▪ Public transit including buses, vanpools, rideshare programs, and park and ride facilities ▪ Accommodations for bicycles and pedestrians

New Hampshire Climate Action Plan

Assigned by Governor Lynch, the Climate Change Policy Task Force developed in 2008 the New Hampshire Climate Action Plan. The Plan aims at achieving the greatest feasible reductions in greenhouse gas emissions while also providing the greatest possible long-term economic benefits to the citizens of New Hampshire. The most significant reductions in both emissions and costs will come from substantially increasing energy efficiency in all sections of the economy by continuing to increase sources of renewable energy, and designing our communities to reduce reliance on automobiles for transportation. The Climate Action Plan recommends that New Hampshire strive to achieve long-term reduction in greenhouse gas emissions of 80 percent below 1990 levels by 2050. The Climate Change Policy Task Force also recommends 67 specific actions to achieve the following goals:

- Reduce greenhouse gas emissions from buildings, electric generation, and transportation;
- Protect natural resources to maintain the amount of carbon sequestered;
- Support regional and national initiatives to reduce greenhouse gases;
- Develop an integrated education, outreach and workforce training program; and
- Adapt to existing and potential climate change impacts.

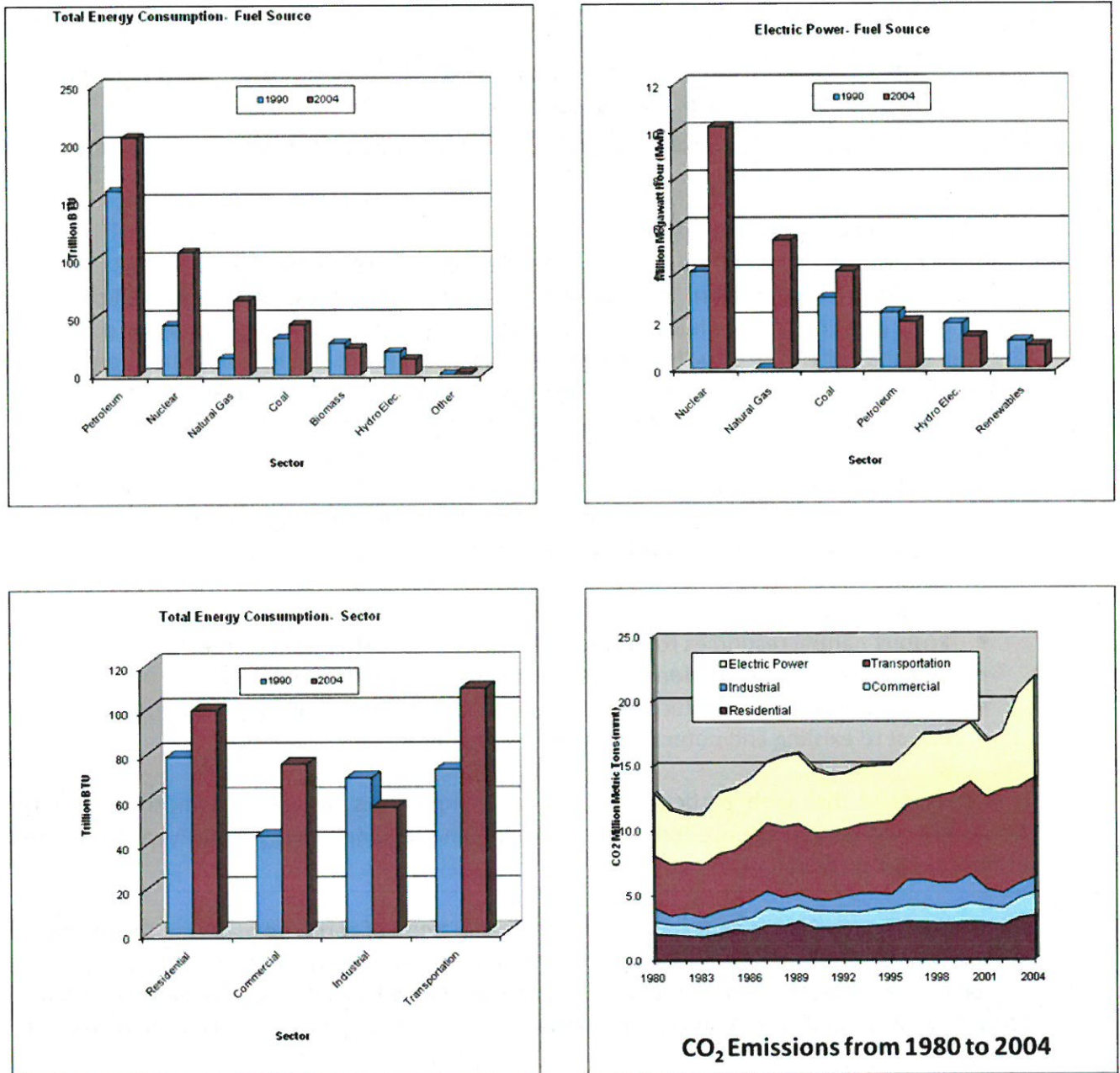
It is envisioned that with participation from all communities, the New Hampshire Climate Action Plan will benefit the economy, increase state and regional energy security, and improve environmental quality.

Greenhouse Gas Emissions Reductions - The increasing trend of carbon dioxide emissions to our atmosphere in recent decades has caused concern over its effect on environmental ecosystems and climate worldwide. Concentrations of carbon dioxide, a byproduct of the burning of fossil fuels, have increased rapidly in the atmosphere as consumption of fossil based fuels has also increased.

The NH Climate Action Plan calls for a reduction in emissions of 20 percent below 1990 levels by 2025, and 80 percent below 1990 levels by 2050. In order to meet these reduction goals statewide, NH communities must engage in local energy planning that includes strategies for decreasing their emissions overall.

The figure below illustrates energy usage and CO₂ emissions by energy sector in New Hampshire from 1990 to 2004.

Figure 1. Energy use and carbon dioxide emissions by energy sector in New Hampshire from 1990 to 2004 [Source: New Hampshire Climate Action Plan (2008)]



2.0 ROLE OF THE NORTH HAMPTON ENERGY COMMITTEE

2.1 Introduction to NH Local Energy Committees

In 2007, North Hampton was one of 164 municipalities that passed the New Hampshire Climate Change Resolution that calls on the federal government to prioritize climate change policy and enables the formation of a local energy committee (LEC) to address energy efficiency and conservation, emission reductions, and other energy related issues. The generation and use of energy and emissions from energy use - whether for our homes, businesses, transportation or recreation - has a very significant impact on our environment, and the health and welfare of the community. Local energy committees are an important way to help inform decisions makers and residents about how to advance cost-effective strategies that save energy, reduce costs and help protect the environment. Through new initiatives and strong policies, the community with assistance from the LEC can move toward a more sustainable and clean energy future.

2.2 North Hampton's Energy Committee

Mission Statement - *The mission of the North Hampton Energy Committee is to promote energy conservation, energy efficiency, and explore other ways to reduce carbon emissions among the town's residents, businesses, and municipal operations, thus reducing energy expenditures for residents and taxpayers, while improving the quality of living in our community.*

Roles

The role of the North Hampton Energy Committee is to:





- work with the Select Board, town boards and commissions, schools and other organizations to promote and implement voluntary energy efficiency and conservation measures in the community;
- report to the Select Board on energy usage for municipal facilities on an annual basis and as requested; and
- provide information to the Select Board about strategies and improvements to increase the energy efficiency of municipal facilities.

The North Hampton Energy Committee meets monthly or depending upon availability of members and need. The meetings are posted and held at the Town Library and are open to the public.

2.3 Goals of the North Hampton Energy Committee

The North Hampton Energy Committee has identified the following general short term and long term goals relating to energy efficiency, use and conservation.

Table 2. General, short term and long term goals of the North Hampton Energy Committee.

General Goals	Short Term Goals (1 year)	Long Term Goals (2 or more years)
<i>Reduce overall energy use, conservation, and emissions throughout the community</i> 	<ul style="list-style-type: none"> ▪ Complete an energy inventory for municipal buildings and infrastructure and report findings to the Select Board ▪ Audit buildings with highest *EUI and identify potential municipal building energy improvement project(s) ▪ Evaluate and reduce municipal street lighting costs ▪ Encourage community participation in the NH Carbon Challenge 	<ul style="list-style-type: none"> ▪ Complete an evaluation of energy use and savings resulting from improvements to municipal buildings and infrastructure ▪ Establish budget/funding process for municipal projects ▪ Identify outside funding sources for energy efficiency projects ▪ Complete an evaluation of energy use and savings resulting from improvements to street lighting
<i>Provide outreach and raise awareness in the community about energy use, conservation and emissions</i> 	<ul style="list-style-type: none"> ▪ Develop speaker series in conjunction with library ▪ Develop graphic reporting community progress 	<ul style="list-style-type: none"> ▪ Reduce residential and commercial energy use, conservation, and emissions ▪ Develop energy project partnerships with schools
<i>Annual Energy Use Reduction Progress Report</i> 	<ul style="list-style-type: none"> ▪ Complete an annual evaluation of energy use and savings resulting from improvements 	<ul style="list-style-type: none"> ▪ Complete an evaluation of energy use and savings resulting from improvements in the community, as a whole
<i>Increase community participation on the Energy Committee</i> 	<ul style="list-style-type: none"> ▪ Increase EC membership ▪ Develop partnerships with area energy companies 	<ul style="list-style-type: none"> ▪ Conduct ongoing outreach to residents regarding EC activities and events

EUI = Energy Use Intensity expressed in KBTU's per square foot of building space; KBTU = thousand British Thermal Units

2.4 Energy Inventories and Audits

Inventories and Audits of Municipal Buildings

In 2009, the North Hampton Energy Committee completed an energy inventory for three municipal buildings. The audit involved visual inspections of the Police/Fire/Town Offices Complex, the Tax Collector's Office and the Old Town Hall. The purpose of the audits was to identify energy related opportunities that show immediate potential for improvements.

The Energy Committee completed a report of their audit findings and recommended a wide variety of steps be taken to reduce energy consumption in the buildings. Recommendations included installing energy efficient windows, installing sensors to turn on and off lights inside and outside buildings, and insulating ducts and floor joists. A copy of the report is available from the Town of North Hampton website:

<http://www.northhampton-nh.gov/Public Documents/NorthHamptonNH BComm/Audit Report Final 15JUN2009.pdf>

2.5 Inventory of Municipal Buildings

- Police/Fire/Town Offices Complex
- Tax Collector's Office
- Old Town Hall
- Library
- North Hampton School
- Public Works Building
- Recycling Facility

In 2011, the town of North Hampton participated in the NH Office of Energy and Planning's Energy Technical Assistance Program, known as ETAP. ETAP provided technical services at no cost to the Town. Service providers included Peregrine Energy Group and the Rockingham Planning Commission. The Energy Committee met with staff from Peregrine Energy and the Rockingham Planning Commission in October 2011 to review the 2009 energy inventory and actions that have been taken since the report was completed. Engineers from Peregrine Energy walked through several of the Town's buildings, including the Library, Tax Collector's office, Old Town Hall and the Police/Fire/Town Offices Complex, to obtain a firsthand understanding of the buildings and to identify additional energy efficiency opportunities.

Peregrine Energy identified twenty four “utility reduction opportunities”, 14 of which were categorized as “recommended for immediate implementation”. Table 4 lists Peregrine Energy’s recommendations. A copy of Peregrine’s memo to the Energy Committee is available at the Town’s website:

http://www.northhampton-nh.gov/Public_Documents/NorthHamptonNH_BComm/North%20Hampton%20energy%20findings%20and%20recommendations%2010-19-11.pdf

**Table 3. Utility Reduction Opportunities – Recommended for Immediate Implementation
Peregrine Energy Group, October 2011**

Recommendation	Municipal Building	Approx. Cost	Simple Payback
Replace T12 lamps and ballasts with T8 system	Police	\$1,300	2 – 5 years
Adjust programmable thermostats	Library, Tax Collector’s Office	\$0	Immediate
Install programmable thermostats	Town Offices	\$500	1 – 4 years
Adjust server room temperature to 68F	Town Offices	\$0	Immediate
Install heat trace controls	Library	\$200	3 – 5 years
Update weather seals on front door	Library	\$150	4 – 7 years
Install insulation over boiler room & seal stack	Library	\$1,000	8+ years
Add weather seals on all doors	Tax Collector’s Office	\$250	4 – 7 years
Seal stairwell to attic and add insulation	Tax Collector’s Office	\$1,500	8 – 12 years
Add weather seals on back door	Town Offices	\$50	4 – 7 years
Insulate hot water pipes in boiler rooms	Library, Fire Station	\$1,000	6+ years
Insulate hot water pipe at manifold	Old Town Hall	\$100	6+ years

2.6 Energy Planning for North Hampton’s Municipal Buildings

Benchmarking and the Use of Metrics

To date limited information has been made available to the energy committee regarding energy consumption of the town facilities. In 2009 this was brought before the select board as one of the significant findings that needed to be addressed, and was brought up again before the select board in 2012. As seen in Table 5, much of the recommended work identified in the 2009 audit has already been completed. However the energy savings benefits of these efforts cannot be documented, or applauded, due to the lack of information being supplied to the energy committee.

Table 4 2009 Town Energy Audit Recommendations That Have Been Addressed

Audit Recommendation	Bldg	Completed	Peregrine Recommendation
1. Outdoor Lighting Above Doorway is Constantly On	TO	√	
2. Indoor Light in Stairwell Left On	TO	√	
3. HVAC House Fan Left On	TO		Add Programmable Thermostat
4. T12 Fluorescent Lights - Update to T8	FD	√	
5. Floodlights on During Day	FD	√	
6. Flag Illumination on During Day	FD	√	
7. Cracked Window	TO	√	
8. Fire Department Windows	FD		No Action - Poor Economic Return
9. Fire Department Hose Tower - Replace Window	FD		No Action - Area is Isolated in Winter
10. Fire Department Hose Tower - Limit Operation	FD		No Action - Area is Isolated in Winter
11. Replace Boiler	FD		Solicit Pricing for Propane-Fired Condensing Boiler & New Controls
12. Basement Insulation	TC		No action
13. Insulation Adjustment	TO		Solicit Pricing from Airseal / Insulation Specialist to Solve Ice Dam Issue
14. Computer Server Room Inefficiency	TO	√	Adjust Setpoint to 68 DegF
15. Building Shell Intrusions	TO		Address Roof Leak
16. Building Maintenance & Repairs	ALL		Solicit Pricing from Airseal Specialist to Review All Bldgs
17. Exterior Doors	FD	√	
18. Storm Window on Back Door	TC		Address Frame Issues and Add Weather Stripping
19. Water Heater Too Hot	OTH	√	
20. Water Heater Insulation	OTH	√	
21. Old Inefficient Refrigerator	OTH	√	
22. Incandescent Lights	OTH	√	
23. Refrigerated Vending Machine	FD		Remove unit
24. Office Area Refrigerated Water Dispenser	ALL		No Action

TO = Town Office, FD = Fire Department, TC = Tax Collectors, OTH = Town Hall

When considering the efficiency of any operation a baseline exam of energy consumption is required. The data used in this assessment is known in the world of energy benchmarking as metrics. Once baseline metrics have been determined then the implementation of energy related projects are easily tracked and their impact on energy savings can be quantified. Metrics is one of the most important first steps towards initiating a town energy policy.

Energy data for each building would be entered into the US Environmental Protection Agency's Portfolio Manager Database. Portfolio Manager is an interactive energy management tool that allows you to track and assess energy and water consumption across your entire portfolio of buildings in a secure online environment (<http://www.energystar.gov>). Entering complete energy consumption and cost data (24 months) into this program would allow us to benchmark each town owned and operated building. We would also be able to rate each buildings energy performance relative to similar buildings nationwide. Thus the town's low efficiency, high

energy use facilities could be targeted and given high priority, thus maximizing the efficiency of town operations.

The energy committee is currently entering electricity, fuel oil, propane, and water information into the system for the North Hampton School. Data for the North Hampton School is complete and we have an excellent profile for that building. The school data has been readily available from the annual budget reports and can also be accessed on line at SAU21.org.

The 2009 audit showed an example of how SAU21 complies and distributes this information to all of the schools within their district (Table 6).

Table 5 North Hampton School Electricity Data from SAU21

MONTH							
Month	2006		2007		2008		2009
July	19,979.000 KWH	48.82%	29,733.000 KWH	-5.11%	28,213.000 KWH	-4.82%	26,853.000 KWH
August	28,228.000 KWH	-16.40%	23,600.000 KWH	4.32%	24,619.000 KWH	-6.50%	23,019.000 KWH
September	34,636.000 KWH	-14.77%	29,520.000 KWH	-0.27%	29,440.000 KWH	2.40%	30,148.000 KWH
October	35,919.000 KWH	-0.67%	35,680.000 KWH	-4.26%	34,160.000 KWH	-2.59%	33,276.000 KWH
November	40,168.000 KWH	2.17%	41,040.000 KWH	-6.24%	38,479.000 KWH	-14.97%	32,719.000 KWH
December	33,848.000 KWH	10.85%	37,520.000 KWH	-7.89%	34,560.000 KWH	-3.45%	33,368.000 KWH
January	40,474.000 KWH	-11.25%	35,920.000 KWH	-5.10%	34,088.000 KWH	-14.08%	29,289.000 KWH
February	33,990.000 KWH	27.78%	43,434.000 KWH	-11.96%	38,240.000 KWH	-3.57%	36,874.000 KWH
March	42,702.000 KWH	-20.03%	34,150.000 KWH	-5.86%	32,150.000 KWH	-3.98%	30,870.000 KWH
April	38,293.000 KWH	-1.86%	37,582.000 KWH	8.94%	40,942.000 KWH	-100.00%	0.000 KWH
May	37,971.000 KWH	-8.77%	34,640.000 KWH	-11.16%	30,773.000 KWH	-100.00%	0.000 KWH
June	29,733.000 KWH	23.67%	36,771.000 KWH	-8.48%	33,651.000 KWH	-100.00%	0.000 KWH
Total	415,941.000 KWH	0.88%	419,590.000 KWH	-4.83%	399,315.000 KWH	-30.78%	276,416.000 KWH

Month	2006	2007	2008	2009
July	\$3,043.00	35.98%	\$4,137.88	-1.78%
August	\$4,221.00	-25.18%	\$3,158.11	5.23%
September	\$4,921.00	-16.75%	\$4,096.65	0.80%
October	\$5,055.00	-4.48%	\$4,828.45	-3.52%
November	\$5,578.00	-3.29%	\$5,394.73	-5.15%
December	\$4,940.00	1.55%	\$5,016.64	-5.61%
January	\$6,391.00	-23.34%	\$4,899.06	-1.28%
February	\$5,527.00	3.15%	\$5,701.23	-8.71%
March	\$6,706.00	-30.57%	\$4,656.11	-2.41%
April	\$6,112.00	-16.90%	\$5,079.34	7.70%
May	\$6,071.00	-22.37%	\$4,713.20	-6.06%
June	\$4,138.00	19.43%	\$4,941.90	-6.80%
Total	\$62,703.00	-9.70%	\$56,623.30	-2.66%

3.0 HOW TO DEVELOP AND GROW WITH EFFICIENCY

3.1 Opportunities for Implementation

Regulatory Measures

Zoning and Ordinances

Many communities are leading by example by adopting innovative zoning and ordinances that promote energy efficiency and sustainable development such as:

- Alternative energy systems (solar, geothermal, wind)
- Mixed use development
- Minimum performance-based building standards
- Conservation subdivisions (60 percent and greater open space)
- Open space and agricultural zones (land preservation and low density)

Subdivision and Site Plan Review Regulations

Subdivision and site plan review regulations can require specific site design elements that achieve energy efficiency and conservation at the site and lot level. Such elements include:

- Maximize benefits of solar heating through building orientation and window placement
- Orient buildings to reduce wind loads
- Maximize benefits of passive cooling with landscaping to provide shading and wind breaks
- Use of native and drought tolerant species to reduce resource demand for maintenance

Voluntary Incentives

Voluntary incentives can be incorporated into development requirements including subdivision and site plan review regulations. Examples include:

- Density bonuses for subdivisions that incorporate renewable energy and energy efficient design and infrastructure
- Zoning that permits renewable energy systems through an expedited review process and adherence to certain site design standards
- Tax credits for installation of renewable energy and energy efficient design and infrastructure

Redevelopment and Infill

Reuse of the built environment helps renew and maintain vibrant communities by generating new economic opportunities, while preserving resources and open space. Restoring idled or abandoned property to productive uses that provide services, jobs and housing in the community can increase land values and property tax revenues and improve quality of life.

Energy Efficiency in New Construction

Leadership in Energy and Environmental Design (LEED) Rating System is a tool created in 2000 by the US Green Building Council (USGBC), a private non-profit organization, to help promote and measure sustainable building design. The LEED Rating System is based on non-prescriptive environmental goals organized into five categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. Each category contains several goals which are assigned a numerical value. Based on the number of goals that a project is able to successfully implement, the building is awarded a LEED rating. LEED offers a wide range of building program requirements for various types of construction including:

- LEED-NC: New commercial construction and major renovation projects
- LEED-EB: Existing building operations
- LEED-CI: Commercial interiors projects
- LEED-CS: Core and shell projects
- LEED-H: Private residences
- LEED-ND: Neighborhood development

Transportation, Land Use and Environmental Planning

In order to achieve energy efficiency and sustainable growth and development, North Hampton will need to integrate its long-term transportation, land use and environmental planning initiatives. This may include an audit of existing zoning, ordinances and regulations to determine whether the goals of this chapter are being implemented adequately and consistently across transportation, land use and environmental planning. In addition, the town's ongoing participation in the Rockingham Planning Commission's Metropolitan Planning Organization (MPO) will be essential to meeting the future transportation and transit needs of the community.

4.0 SUSTAINABLE GROWTH AND DEVELOPMENT

4.1 What Is Sustainability?

Sustainability is the ability to provide for present needs without damaging the ability of future generations to provide for themselves. The primary philosophy of sustainable growth and development is that new development and redevelopment can be done in such a way that they provide environmental, economic, and quality of life benefits to all members of the community. Without proper attention to the affects of unmanaged growth, communities are at risk of exhausting their environment of what makes them unique and desirable places to live, work and visit.

Table 6. Population History and Projections for North Hampton

Sources: 1990-2010, US Census; 2020-2030, NH Office of Energy and Planning

Year	1990	2000	2010	2020	2030
Population	3,637	4,259	4,301	5,040	5,360

There are several indicators of “sustainability” and a sustainable community is one that is consistent with all of these. Indicators of sustainability are summarized in the table below.

Table 7. Indicators of sustainability.

Sector	Indicators of Sustainability
Environment	Conservation Development Water Resource Protection Sustainable and Natural Landscapes Community Character Historic Preservation Green Infrastructure
Economy	Energy Efficiency and Conservation Renewable and Alternative Energy Recycling and Reuse of Materials Livable Communities Green Building
Equity	Housing Choices Transportation and Mobility Access/Options Open Space, Parks and Recreation

4.2 Rationale for Sustainable Development

The built environment has a profound impact on our natural environment, economy, health and productivity. Sustainable development is a pattern of resource use that aims to meet the needs of the community today and protect its needs of the future, while preserving the environment. Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing individuals and communities. Communities can achieve sustainable development by integrating land use and resource based strategies with economic development approaches that benefit the local environment and quality of life.

In the United States, buildings alone account for:

- 72% of electricity consumption
- 39% of energy use
- 14% of potable water consumption
- 38% of total carbon dioxide (CO₂) emissions
- 40% of raw materials use
- 30% of waste output (136 million tons annually)

Sustainable development provides a framework under which communities can use resources efficiently, create efficient infrastructures, protect and enhance quality of life, and create new businesses to strengthen their economies. Fostering sustainable approaches to community development helps strengthen the capacity of communities to take integrated action toward improving environmental, social, and economic conditions.

4.3 Planning For Sustainable Growth and Development

Planning for sustainability promotes responsible development and includes the following processes, practices, and outcomes.¹

Planning Processes

- Making planning decisions in a holistic and fully-informed manner that involves all segments of the community and the public and private sectors.
- Educating all age groups to raise public understanding of and regard for the future consequences of past and current planning decisions and ultimately change human behavior.

Planning Practices

- Developing a future-oriented vision, looking beyond current needs and recognizes environmental limits to human development.
- Advancing projects and activities that promote economic development that: efficiently and equitably distribute resources, services and goods; minimize, reuse and recycle waste; and protect natural resources.
- Foster a widely accepted ethic of stewardship that strongly encourages individuals and organizations to take full responsibility for the economic, environmental, and social consequences of actions, and balances individual needs with environment and public welfare.
- Take leadership in implementation of local, regional and state policies and engage in inter-municipal and regional initiatives that support sustainability.

Planning Outcomes

- Local and regional development patterns that expand choice and opportunity for all persons.
- Resilient, diverse, and self-sufficient local economies that meet the needs of residents and build on the unique characteristics of the community whenever possible.
- Communities with a healthy environment and social climate that function in balance with natural ecosystems and allow individuals to lead healthy, productive and enjoyable lives.

¹ American Planning Association, *Policy Guide on Planning and Sustainability* (2000)

4.4 Sustainable Development Principles and Practices

Sustainable Principles

Sustainable development principles cut across all dimensions of sustainability: environmental, economic and societal.

Table 8. Summary of sustainable principles and practices.

Principles	Sectors	Practices
Efficient use and production of alternative energy	WATER	<i>Indoor</i> Water Conservation Water Efficient Appliances and Fixtures Water Budget
Efficient use of water and other water resources		<i>Outdoor</i> Pervious Materials Xeriscape Greywater Irrigation Harvested Rainwater
Protect quality of the air, water, land and other natural resources		
Reduce waste, pollution and environmental degradation		<i>Construction</i> Passive Solar Design Solar Hot Water, Heating and Cooling Systems Photovoltaic Systems Programmable Thermostats
Protect human health and safety	ENERGY	<i>Outdoor</i> Energy Efficient Lighting and Landscaping
Minimize impacts on local and worldwide ecosystems		BUILDING MATERIALS Reduce, Reuse, Recycle Purchase local and regional materials
		SOLID WASTE Recycling and Compost Systems Construction Waste Recycling

Many communities have discovered that traditional approaches to planning and development are creating, rather than solving, societal and environmental problems. Where traditional approaches can lead to congestion, sprawl, pollution and resource overconsumption, sustainable development offers real, lasting solutions that will strengthen communities in the future.

Sustainable Practices

Sustainable practices are aimed at guiding how new development is constructed to attain energy efficiency and conservation, and to promote use of sustainable materials and energy.

- Performance based standards and building codes will ensure that all new buildings are constructed to a minimum efficiency level, for example using LEED standards or EPA Energy Star standards.
- Construction standards can ensure energy efficiency, use of products that provide long term durability, and use of sustainable and recycled materials (including salvaged, refurbished or reused materials).
- Site design techniques that take advantage of sun exposure, differences in microclimate, and landscaping reduce a development's energy demand and overall energy consumption.
- Energy efficient planning principles and provisions to allow for renewable energy generation can be implemented through subdivision and site plan review regulations, zoning ordinances and building codes.
- Incentives in the form of tax credits, deferments, deductions or abatements can help lessen the initial cost burden of investing in energy efficient systems.
- Incentives to redevelop brownfields and abandoned sites, and develop infill projects on underutilized sites.

Energy Conservation and Renewable Energy - Energy is central to sustainable development efforts. It affects all aspects of development -- social, economic, and environmental -- including livelihoods, access to water, agricultural productivity, health, population levels, and education. Energy efficient design and planning techniques can be used in constructing housing and non-residential developments, prescribing density limits, integrating land uses, and designing transportation systems and infrastructure.

Environment - Ecologists recognize that there may be limits to sustainable growth and offer the alternative of a "steady state economy" in order to address environmental concerns such as resource consumption, energy production, and land conservation.

Building Efficiency - Green building practices offer an opportunity to create environmentally-sound and resource-efficient buildings by using an integrated approach to design and efficiency. Green buildings promote resource conservation, including energy efficiency, renewable energy, and water conservation features; consider environmental impacts and waste minimization; create a healthy and comfortable environment; reduce operation and maintenance costs; and address issues such as historical preservation, access to public transportation and other community infrastructure systems. The entire life-cycle of a building and its components is considered, as well as the economic and environmental impact and performance.

5.0 RECOMMENDATIONS

The goals of the following recommendations are to achieve energy efficiency and conservation, and foster sustainable growth in the community.

1. Municipal Building Standards - Newly constructed, renovated or expanded municipal facilities must meet energy efficiency standards. For example, U.S. Green Building Council, Leadership in Energy and Environmental Design (LEED) building rating system, standards similar to the Town of Epping Energy Efficiency and Sustainable Design zoning ordinance, or other building performance based system.
2. Minimum Thresholds for Private Development - implement energy efficiency standards for residential and non-residential development. For example, U.S. Green Building Council, Leadership in Energy and Environmental Design (LEED) building rating system, standards similar to the Town of Epping Energy Efficiency and Sustainable Design zoning ordinance, or other building performance based system.
3. Green Building Education - Develop local incentives for and provide outreach and information about implementation of renewable energy systems in the community.
4. Pedestrian and Bicycle Use - Develop a planning policy to make North Hampton a “walkable and bikeable” community by establishing neighborhood connectivity and pedestrian and bicycle accommodations.
5. Open Space Access - Develop a policy and local incentives to encourage preservation of open space and public access to open space to promote alternative transportation and multiple users.
6. Community Energy Policy - Develop an energy policy and long-range plan for the Town of North Hampton. The Plan should incorporate budgetary provisions on the town’s Capital Improvement Plan (CIP) and be consistent with the goals of the Master Plan.
7. Transportation - Continue participation in the Rockingham Planning Commission’s Metropolitan Planning Organization (MPO).
8. Community Outreach and Education - Provide opportunities for residents and business owners to learn about energy efficiency and conservation measures.

