

Climate and Energy

A DISCUSSION GUIDE



Nashua Regional Planning Commission

This discussion guide highlights energy efficiency and potential climate change issues relevant in the Nashua region. It focuses on existing efforts to reduce energy costs to communities, increase safety and security, and provides financing ideas for successful implementation.

Examples of Climate and Energy Related Projects:

Increased energy costs and the magnified frequency and severity of storm events, have consequences for many facets of life. They can affect municipal costs and operations, influence job growth and the local economy, and impact the natural resources and quality of life that are so important to New Hampshire. NRPC and communities across the region have started addressing climate and energy issues by taking action to improve energy efficiency and reduce energy demand including:



Commute Green New Hampshire and the Nashua Regional Rideshare Program are designed to help people who live, work, or commute through New Hampshire to start saving money by carpooling, walking, biking, using public transportation, and telecommuting.

Local Hazard Mitigation Plans document and map the existing essential facilities, special needs populations, and areas in danger of hazards. Inventories of past disasters and potential hazards are also gathered. The Plan provides recommendations for enhancement and protection of these facilities, sites, and areas in the event of a disaster.

Energy Action Plans have been developed by the towns of Hollis, Lyndeborough, Mason, Milford, Pelham and SAU 41 (Hollis-Brookline School District). Communities have organized energy data and conducted energy inventories, develop procurement policies, perform energy assessments, identify and prioritize energy reduction opportunities, and determine potential cost savings programs.

Communities can also adopt **Energy Efficient Development** zoning ordinances, land use regulations and more stringent building codes.

Financing:

Often projects and studies necessary to improve energy efficiency and reduce climate event risks are not easily funded. The funding for the many Energy Action Plan projects in NH was provided by a grant from the Environmental Protection Agency's Healthy Communities Program. In the past the Nashua Regional Planning Commission has received money from the Energy Technical Assistance and Planning Program to provide support to the municipalities in the region. The [Database of State Incentives for Renewables and Energy](#) is a comprehensive source of information on incentives and funding opportunities that support energy efficiency related projects. [NH Local Energy Solutions](#) website includes current funding opportunities in addition to data and resources for municipalities.



Implementation:



Public education is essential to gain community support for any new initiative or project. While implementation of emergency plans before the emergency arrives will save lives, time and money, so can implementing climate and hazard mitigation projects. Schools throughout New Hampshire are creating programs to help educate students of the importance of energy efficiency. Key factors to successful implementation of projects include careful consideration of funding, public participation and time from staff and volunteers. Staff and volunteers can support the project by joining local energy committees.²

¹ 2013-2014 CORE New Hampshire Energy Efficiency Programs (2012)

² NH Climate Action Plan (2009)

Hollis Energy Action Plan

Hollis conducted an energy inventory of the town's municipal buildings, vehicles, and streetlights using the Small Town Carbon Calculator and EPA's Portfolio Manager. Vehicle fleet represents the majority of energy expenditures and costs for the town and will equally as important to address energy use in the future.



CONSUMPTION

2008: 8,339 MMBTU's* of energy

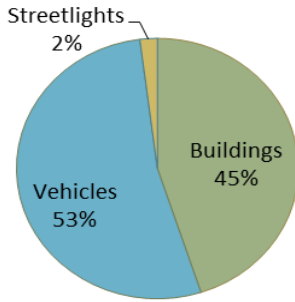
2015: 7,088.15 MMBTU's of Energy

GOAL

Reduce municipal energy consumption by **15% (1251 MMBTU's)** below 2008 levels by 2015

* MMBTU = 1 million British Thermal Unit

Total Energy Use (Million BTUs)



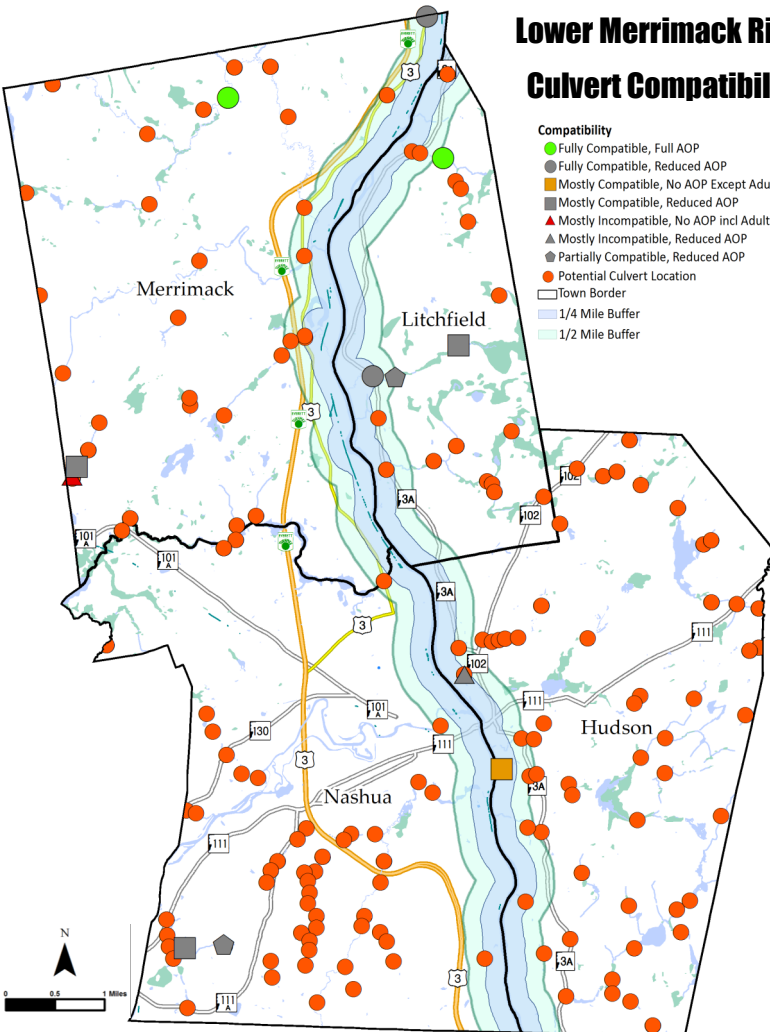
¹¹ Energy Action Plan for the town of Hollis, NH (2009)

RECOMMENDATIONS

- Walk-through building audits to look for easily correctable changes in behavior or easily implemented energy efficiency measures.
- Once energy efficiency measures have been successfully implemented, re-research the feasibility of installing green energy technologies on one or more buildings.
- Maintain town vehicles. A poorly tuned engine can increase fuel consumption by 10-20%
- Establish an anti-idling policy to encourage municipal fleet users and the general public to minimize emissions.

Fluvial Erosion & Culvert Assessment

Lower Merrimack River Culvert Compatibility

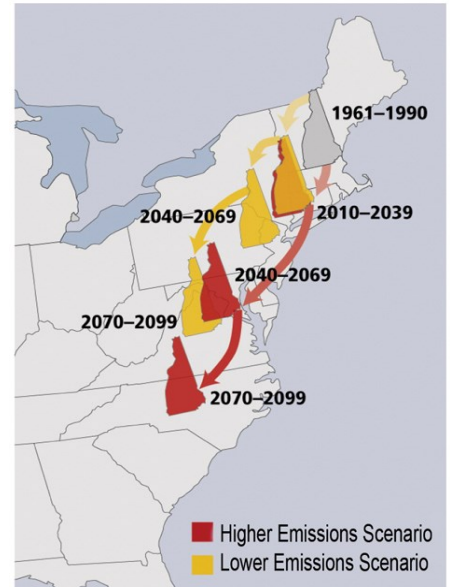


NH has seen increased flooding events in recent years. During these events municipalities often experience failure of undersized or poorly constructed culverts. The Lower Merrimack River Continuity Assessment project evaluated culverts in Lower Merrimack River Corridor to determine their ability to handle river flows and allow for aquatic organism passage. By conducting field assessments of rivers throughout the state, the Fluvial Erosion Hazard (FEH) project will help to gather information on the causes of erosion and other river movements and to identify property and infrastructure that are most at risk. The FEH project will assess how vulnerable river beds and banks are to further erosion and will identify areas where the river channel may move in the future. Field assessments will also help to determine how areas at greatest risk can be targeted for hazard mitigation opportunities such as culvert replacements or bank stabilization projects.¹²



Potential Climate Change Impacts

Current climate research suggests that New Hampshire will experience an increase in extreme weather due to climate change. Recent research forecasts that by the end of the century New Hampshire will experience climate similar to North Carolina. If these predictions are accurate there will be long term economic and social impacts across the state. Industries such as tourism and forestry will need to adapt to the potential changes. Municipal and state government will need to anticipate increased maintenance and repair costs for damage caused by climate induced extreme weather events.⁷



Source: NH Climate Action Plan. (2008)

Potential Climate Change Impacts on New Hampshire⁴

Change	Weather	Impacted feature
Reduction	Snow fall	Almost eliminated in the southern areas and reduced to fewer than 20 days per year in the northern part of NH.
Increase	Heavy and Damaging Rainfall Events	Economic impacts: clean up, repair, and lost of productivity and economic activity.
Increase	Summer Droughts	Rise in water costs, an impacting NH's agricultural and forestry industries
Increase	Sea Level Rise	Coastal Flooding, erosion, and private and public infrastructure damage
Increase	Extreme Heat, Air Pollution, and Prevalence of Vector Borne Disease	Health impacts
Increase	Temperature	Extinction of forest species and other animals such as the Gray Wolf, Canada Lynx and Blanding's Turtle ⁸

Winter visitors contributes to only **1/4** of New Hampshire's guest, but they **spend almost 19% more** a day.⁷

New Hampshire's ski resorts generate **\$650 Million** annually.⁷

Flooding

New Hampshire had averaged about one major and destructive flood event per decade since the early 20th century, this has however changed in the last 10 years. Within the last ten years there have been 10 major flood events in 2003, 2005, 2006, 2007, 2011, 2013 and 2 in both 2008 and 2012.⁹ Increased development and storm size and frequency of these major flooding events is leading to an increase in storm damages to many communities. Investing in the assessment of existing sources of information and updating and identifying gaps more frequently is extremely important to mitigate future impacts. The development of updated 100-year floodplain maps, which reflect current conditions and potential future flood inundation zones, is helpful for the preparedness of municipalities for these more frequent severe weather events.⁷ Average annual precipitation is projected to potentially increase 17%-20% by the end of the century. Such increase in winter and spring precipitation could exacerbate rapid snowmelt, high peak stream flows and flood risk.¹⁰



⁷ NH Climate Action Plan. (2009)

⁸ NH Fish and Game (2013)

⁹ FEMA Disaster Declarations for New Hampshire (2013)

¹⁰ Climate Change in Southern New Hampshire: Past, Present and Future (2006)

Energy Consumption in NH

11 Million Megawatt Hours

of electricity to light, heat, cool and operate our homes, offices, factories, and schools each year.³

In 2008 NH citizens, businesses and industries

spent **\$6 Billion on energy**

Of this, two thirds is left to the state to pay for imported fuels.⁴

³ NH Climate Action Plan

⁴ Independent Study of Energy Policy Issue

NH citizens travel **43 Million Miles** by car, truck and bus and consume **700 Million Gallons** of gasoline and **200 Million Gallons** of diesel fuel annually. This leads to **15.7 million miles** of wear on our state's roads and bridges per year.³

Energy Consumption in NH

Residential Lighting Products Recommended

Current Bulb	New Bulb	Effective Date of Change
100 watt	72 watts or less	January 1, 2012
75 watt	53 watts or less	January 1, 2013
60 watt	43 watts or less	January 1, 2014
40 watt	29 watts or less	January 1, 2014

Greenhouse gas emissions are projected to **double between 2008 and 2050**, almost entirely due to energy consumption in relation to transportation, buildings and electricity generation.⁵

GOAL

Reduce overall greenhouse gas emissions **80% by 2050** while also spurring economic development, creating jobs, enhancing energy security, and preserving the quality of life for NH.⁶

⁵ NH Climate Action Plan (2009)

⁶ 2013-2014 CORE New Hampshire Energy Efficiency Programs (2012)

Demographics in NH



Average annual household energy expenditures =

\$2,816

GSF Metric Data (2013)

Pictures: NRPC

Energy expenditure for Transportation =

81,000,000 BTU's*



*British Thermal Unit



Per Capita Vehicle Miles Traveled =

9,660 Miles