



Greetings,

With great excitement, the Merrimack Valley Planning Commission (MVPC) presents you with the “Merrimack Valley Clean Energy Action Plan”. Funding assistance provided by the United States Economic Development Administration and District Local Technical Assistance funds from the Commonwealth of Massachusetts has made it possible to develop this Plan.

The development of this Plan initiated from ideas first discussed in preparation of MVPC’s 2008 Comprehensive Economic Development Strategy and its stated goal of seeking to advance opportunities for low impact development, green building, and alternative energy uses. MVPC’s Merrimack Valley Mayors and Managers Coalition, which has established a robust regional energy management program, then became the driver for this regional opportunity.

As with all of MVPC’s planning documents, the Energy Plan is an action oriented document, developed with advice and guidance from our communities, and offers specific recommendations for each city and town in the region to help them advance their energy goals.

To becoming a designated “Green Community” through the Massachusetts Department of Energy Resources, to putting an infrastructure improvement and modernization plan in place to reduce energy consumption, to building solar farms on closed landfills - the Merrimack Valley Clean Energy Action Plan has ideas and solutions for the largest city in our region to the smallest town.

We graciously thank our Commissioners and all the people from our member communities who assisted in development of this Plan. Please contact us with any comments or question you may have. Thank you.

Dennis DiZoglio

Executive Director



Merrimack Valley Clean Energy Action Plan

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Merrimack Valley Planning Commission— 160 Main St., Haverhill, MA 01830

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The Merrimack Valley Planning Commission
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I - Executive Summary

When the Merrimack Valley Comprehensive Economic Development Strategy (CEDS) was updated in 2008 over 30-community leaders from across the region assembled over a six-month period and discussed ways of making the Valley competitive in the 21st Century. It was a diverse set of leaders ranging from local and state elected officials, to appointed municipal officials, to planning directors, to workforce developers, to chambers of commerce executives, to financial institution presidents, to real estate developers, to quasi-public officials, to university professors, and a Community College President. They asked themselves “what are the challenges to economic growth and what can we do to best prepare us for the new realities of the 21st Century?” Prominently mentioned as part of the economic development vision for the Merrimack Valley was the need to identify and support the Region’s growth areas and in particular the energy needs of the communities. The CEDS action plan encouraged:

- *Reduce the region’s carbon footprint*
- *Encourage the creation of alternative energy facilities*
- *Pursue renewable energy projects*

- the Municipalities in the Region to develop plans to reduce the region’s carbon footprint;
- the creation of bylaws/ordinances to guide the development of alternative energy facilities, and
- the Municipalities to pursue renewable energy projects.

This Merrimack Valley Clean Energy Action Plan has been developed to address this economic development vision. It identifies the energy challenges the communities in the region face. It provides resources and suggestions on how to make the valley truly “Green”. It develops an energy strategy for each community in the region. And it creates an action plan on how the communities can work together to advance their individual strategies.

As the communities move forward to implement this strategy the Merrimack Valley Planning Commission will provide the forum for collaboration, administrative support for implementation and the focus to ensure success.



II - The Energy Challenge

In 2007 several Merrimack Valley Planning Commission (MVPC) member communities formed the Merrimack Valley Mayors & Managers Coalition (MVMMC) to collaborate and develop regional solutions to municipal issues and discuss common governmental challenges. The five Mayors from Amesbury, Lawrence, Haverhill, Methuen and Newburyport and the three Town Managers from Andover, North Andover and Salisbury meet on a monthly basis to discuss their common challenges. Currently, the MVMMC membership represents over 85% of the region's population.

One of the first actions taken by the Coalition was to analyze their municipal budgets and attempt to identify common trends and so called "Budget Busters". What was discovered is that over a 5 year period from fiscal years 2004 to 2009, energy costs were the second major cost driver behind employee benefit expenditures. In fact, during this time frame energy costs increased by approximately 63% among the communities surveyed. Methuen saw a 76% jump in their energy costs as did Lawrence. Haverhill experienced a 72% increase and Amesbury had a 31% increase. Clearly energy costs were a common challenge the communities faced.

In 2008 the Commonwealth approved the Green Communities Act, legislation that encouraged communities across the State to reduce energy consumption and costs, reduce pollution, facilitate the development of renewable and alternative energy resources, and create local jobs related to the building of renewable and alternative energy facilities and the installation of energy-efficient equipment. If communities were successful in these efforts they would be eligible to receive grants and loans to advance their energy programs. Clearly the Green Communities Act offered opportunities to the communities in the region but it did not come without its challenges.

There are many challenges:

"How do we get started to understand our opportunities?"

"What should be our energy policies directives?"

"Which buildings should we focus on?"

"What energy efficiency activities should be undertaken?"



“What improvements should we do first?”

“How do we reduce demand?”

“Which improvements will give us the *biggest bang for our bucks*?”

“How do we measure the effectiveness of our actions?”

“Where are we going to get funds to implement our energy saving ideas?”

“What does a municipality know about renewable energy?”

“Which sites in a community lend themselves to renewable energy projects?”

“What are the impacts of a renewable energy project?”

“How do we permit, monitor, serve and tax a renewable energy project?”

Questions facing the communities were universal, all the communities needed expertise to develop a strategic energy action plan, they needed administrative capacity to develop, prioritize and manage an energy program, they needed creative funding options to implement improvements, and they needed to understand the nuances, potential and demands of renewable energy projects.

To react to these challenges the Coalition, working through MVPC, established a number of regional energy programs. The first program established, and the effort that has set the stage for all the Coalition’s energy related efforts, was the creation of a Regional Energy Manager Program. The purpose of the Program was to bring on the expertise needed to assist the communities develop strategic energy conservation and generation plans. As part of this effort the manager would monitor energy use and expenses for the participating communities, recommend behavioral changes to reduce energy use, recommend capital equipment upgrades to reduce energy and be the point person for the community and contractors for energy matters. MVPC procured the services of Peregrine Energy Group. Peregrine provides strategic and technical services and support to public and private organizations and institutions, on a broad range of energy supply and demand issues.



Peregrine is under contract with MVPC to provide the following services as requested for the municipalities in the region:

- meet with local officials and their Energy Commissions, Committees or Boards to become familiar with current efforts, goals and initiatives;
- identify energy audit programs most suited for each community, including no-cost or low cost audits offered through state and federal programs, utility companies and/or energy services companies;
- assist communities with implementation of energy audits, including coordinating between auditor and Municipalities, assisting in data gathering or organization, and submission of information;
- perform energy audit on all energy bills and other available information in order to develop benchmarks, and comparative analysis with information available through Energy Star, Department of Energy Resources and other sources;
- act as owners agent for communities in the management of ESCO Energy Services Agreements;
- working with community leaders to develop short and long term goals for energy savings and efficiencies;
- develop action plan for community including identifying policies, capital investments and funding opportunities to achieve goals. Opportunities may include federal and state funding, energy service contracting companies, utility company rebates, and other programs;
- develop an energy management and conservation plan for municipal buildings. The proposed plan shall produce anticipated savings that can be reliably measured with accepted engineering methods over the life of the conservation measure;
- attend the Energy Committee meetings to discuss the project and methodology to be used, progress updates, presentation of the final report to the Mayor/Manager, as necessary, and
- where desired, assist the Municipality in developing the technical specifications for the bid packages needed to implement action plan.

One of the early action items conducted by Peregrine was the development of a tactical plan as the first step in the planning process. From this work, Peregrine learned that most of the communities were interested in identifying and implementing energy saving improvements in their older municipal building. Peregrine's recommendation was for these communities to consider using Energy Performance Contracting to address this need.

Energy Performance Contracting is a special procurement tool that allows Massachusetts cities, towns, school districts, and other public agencies to purchase a bundle of energy management services through a one-time offer from qualified energy



vendors (ESCO). These agreements are called “performance contracts” because the selected energy vendor guarantees that implemented projects will result in specified, measurable savings. The savings can then be used to finance the cost of the project.

Energy performance contract engagements are phased, beginning with preliminary assessments that determine the range of opportunities with costs and savings and followed by detailed investment grade engineering and ultimately project construction. Contracts are also phased, with the contracting parties working through the details of potential projects and coming to agreement about a final scope.

Qualified energy vendors are secured through competitive solicitations. As part of its ongoing commitment to providing regional services, MVPC offered economies to members by issuing a regional solicitation for energy management services on behalf of municipalities, school districts, and other qualified government entities within the 15 community MVPC territory. Participating parties were then able to enter into contracts with the selected vendor if they choose to do so and be assured that they have met the Commonwealth’s competitive bidding requirements. Funding one procurement and evaluation process saved the municipalities’ money and time.

Also during the tactical planning phase it was discovered that communities wanted to explore their renewable energy options. A suggestion was made that throughout the region there are over 100 acres of landfills with the potential to be converted into solar farms. The City of Brockton, Massachusetts had retrofitted its landfill into a solar farm in 2002 and termed the effort “Brownfields to Brightfields”.

Although there are a number of potential landfill sites in the region the suitability of the landfills to be used as solar farms needed to be determined. To conduct this analysis MVPC initiated a Brightfields Program - an effort to consider the feasibility of using landfills in the region as solar farms. MVPC hired Meridian Associates, an engineering firm, to conduct a “Fatal Flaw” analysis. Eleven landfills in nine communities (Amesbury, Salisbury, Newbury, West Newbury, Georgetown, Rowley, Haverhill, Boxford and Andover) were evaluated for both solar potential and wind power. Each site was visited to evaluate attributes such as access, fencing, proximity to electrical power lines, slopes, condition of final cap if any, location of cap-related structure including drainage swales and basins and landfill gas vents and piping, other environmental issues and other sensitive receptors that may be impacted by the energy-related development. A summary of the fatal flaw analysis follows.

MVPC Preliminary Evaluation for Potential Renewable Energy Projects

Wind and Solar Projects Preparedness Matrices

Solar PV RFP Preparedness Matrix

	Amesbury			Andover	Boxford	Georgetown	Haverhill	Newbury	Rowley	Salisbury	West Newbury
	Hunt Road	St. Josephs	Titcomb Pit	Ledge Hill	Spofford Road	E. Main Street	Old Groveland Rd	Boston Road	Redgate Road	Old Country Rd	Georgetown Rd
Ownership/Site Ctrl.	Privately Owned	Privately Owned	Privately Owned	Town Owned	Town Owned	Town Owned	City Owned	Town Owned	Town Owned	Town Owned	Town Owned
Capping/Closure	Capped & Closed	Closed	Currently Capping	Currently Capping	Capped & Closed	Capped & Closed	Currently Capping	Capped & Closed	Capped & Closed	Capped & Closed	Capped & Closed
Solar Potential	3.0 MW	600 kW	3.0 MW	1.3 MW	500 kW	1.0 MW	1.9 MW	200 kW	600 kW	1.25 MW	540 kW
Environmental	NHESP	No Fatal Flaw	No Fatal Flaw	No Fatal Flaw	No Fatal Flaw	No Fatal Flaw	NHESP	ACEC	ACEC	No Fatal Flaw	No Fatal Flaw
Interconnect	Pending Nat. Grid	Pending Nat. Grid	Pending Nat. Grid	Pending Nat. Grid	Pending Nat. Grid	Review with GMLD	Pending Nat. Grid	Pending Nat. Grid	Study Req'd (1.5mi)	Pending Nat. Grid	Study Req'd (1.4mi)
Preparedness for RFP	Not Ready	Not Ready	Not Ready	Not Ready	Ready for RFP	Ready for RFP	Not Ready	Ready for RFP	Not Ready	Ready for RFP	Not Ready

CEC Wind Feasibility Study Application Preparedness Matrix

	Amesbury			Andover	Boxford	Georgetown	Haverhill	Newbury	Rowley	Salisbury	West Newbury
	Hunt Road	St. Josephs	Titcomb Pit	Ledge Hill	Spofford Road	E. Main Street	Old Groveland Rd	Boston Road	Redgate Road	Old Country Rd	Georgetown Rd
Ownership/Site Ctrl.	Privately Owned	Privately Owned	Privately Owned	Town Owned	Town Owned	Town Owned	City Owned	Town Owned	Town Owned	Town Owned	Town Owned
Capping/Closure	Capped & Closed	Closed	Currently Capping	Currently Capping	Capped & Closed	Capped & Closed	Currently Capping	Capped & Closed	Capped & Closed	Capped & Closed	Capped & Closed
Wind Potential	1.6 MW	1.6 MW	None (Fatal Flaw)	None (Fatal Flaw)	None (Fatal Flaw)	None (Fatal Flaw)	None (Fatal Flaw)	None (Fatal Flaw)	1.6 MW	1.6 MW	None (Fatal Flaw)
Environmental	NHESP	No Fatal Flaw	No Fatal Flaw	No Fatal Flaw	No Fatal Flaw	No Fatal Flaw	NHESP	ACEC	ACEC	No Fatal Flaw	No Fatal Flaw
Interconnect*	Pending Nat. Grid	Pending Nat. Grid	Pending Nat. Grid	Pending Nat. Grid	Pending Nat. Grid	Review with GMLD	Pending Nat. Grid	Pending Nat. Grid	Study Req'd (1.5mi)	Pending Nat. Grid	Study Req'd (1.4mi)
Preparedness for RFP	Not Ready	Not Ready	Not Ready	Not Ready	Not Ready	DNQ for CEC*	Not Ready	Not Ready	DNQ for CEC*	Ready for CEC	Not Ready



Based on the “Fatal Flaw” analysis it was determined that four communities; Salisbury, Newbury, Georgetown and Boxford and potentially a fifth; Rowley (if the electrical interconnectivity issue can be resolved) are candidates for renewable energy development. Although the potential was confirmed, the communities needed many forms of assistance ranging from assessing the benefits of a renewable energy project, to engaging the public, to preparing a Request for Proposals (RFP), to evaluating the responses to the RFP, to negotiating a Power Purchase Agreement with potential developers, to monitoring the project construction and implementation. Using the successful model of creating the Regional Energy Manager, MVPC developed a Renewable Energy Manager Program to provide the assistance communities desired.

MVPC procured the services of Meister Consultants Group. Meister works with businesses, governments and institutions to create sustainable energy initiatives and strategies.

Meister is under contract with MVPC to provide the following services as requested for the municipalities in the region:

- meet with interested MVPC communities to discuss prospective host community’s goals for renewable energy development, renewable energy options and incentives, the preferred RFP process, identifying and finding resolution to potential challenges/constraints to renewable energy development, potential site opportunities within host community including landfills, Brownfields, municipal buildings and structures, and Greenfield sites, as well as economic, environmental, and educational benefits of renewable energy development;
- assist host community in the Identification and Preliminary Evaluation of Potential Sites for Renewable Energy Development. Perform preliminary investigation of site amenities and constraints. Identify preliminary solar PV array and/or wind turbine layout, as well as electrical interconnection locations. Research environmental and permitting requirements. Perform an interconnection study in cooperation with the local utility. Meet with applicable federal, state and local agencies to gain initial project concurrence. Attend public meetings to present/discuss proposed project development and address public questions and concerns;



- assist host community in preparation of developer RFP. Establish roles of the host community, developer and/or project financier. Lead bid walks and meetings. Respond to developer/financier questions;
- assist host community in evaluation and ranking of developer RFP proposals. Review developer/financier bids. Recommend the most qualified developer and economically beneficial proposal to the host community;
- assist host community in contract negotiations with selected developer and local utility. Draft a power purchase agreement (PPA) or similar contract vehicle, and
- assist with the interconnection application and negotiation process with the local utility. Perform all electrical engineering stability studies.

After the passage of the Green Communities Act of 2008 Governor Deval Patrick issued the following challenge to all at a New England Clean Energy Council meeting.

"I offer the Challenge to everyone to do their part to dramatically reduce their own greenhouse gas emissions through energy efficiency measures, innovative energy technology products, and the use of renewable sources. As in any competition, there will be recognition for extraordinary accomplishment and leadership. But this is a contest in which everyone who participates will be a winner."

Clearly the energy challenges facing the communities are many. The hope is that this Merrimack Valley Clean Energy Action Plan provides the communities with individual strategies and identifies the tools needed to address their municipal challenges. Once the community action plans have been identified the plan will highlight opportunities the communities can work together to implement their plans. If progress is made in implementing these plans then everyone who participates will be winners!

III - Green Community Designation and Grant Program

The Green Communities Act of 2008 aims to increase energy efficiency across the Commonwealth of Massachusetts. Primarily, it aims to reduce energy demands in municipalities through the implementation of energy efficiency policies including renewable energy siting, research and development, and manufacturing, and energy efficiency improvements to existing municipally owned infrastructure such as town buildings, vehicles, and facilities. Through the approval of the Regional Greenhouse Gas Initiative (RGGI), this funding source provides up to \$10 million annually in grants and loans to qualifying Green Communities. Besides Green Community designation for individual municipalities, the Green Communities Program provides additional services to support municipalities:

- online energy information system for tracking energy consumption and reducing consumption (MassEnergyInsight);
- technical assistance with energy savings performance contracting;
- stimulus grant programs and support;
- energy assessment program in collaboration with investor-owned utilities;
- webinars and guidance documents and tools;
- website and listserv for providing information to the public, and
- four regional coordinators to provide direct support to cities and towns.

The Green Communities Designation and Grant Program, an initiative of the Green Communities Division of the Massachusetts Department of Energy Resources (DOER), works with municipalities to qualify as a Green Community and provides funding to those qualified communities to support energy efficiency and renewable energy initiatives. This Program provides up to \$10 million dollars annually to qualifying communities funded from fees paid to the Northeast Regional Greenhouse Gas Initiative (RGGI). Becoming a Massachusetts Green Community provides funding to a municipality that will support all or a portion of the costs of the following:

- energy efficiency management services;
- adopting energy efficiency policies;
- adoption of demand side reduction initiatives;
- studying, designing, constructing and implementing energy efficiency activities including, but not limited to, energy efficiency measures and projects, and
- siting activities and construction of a renewable energy generating facility on municipally owned land.



Communities that receive Green Community designation receive a \$125,000 base with additional funds based on per capita income and population.

Massachusetts Green Community Designation Requirements:

- 1. *As-of-Right Siting***
- 2. *Expedited permitting process for renewable energy facilities***
- 3. *Establish energy baseline – reduce energy use 20% within 5 years***
- 4. *Fuel-efficient vehicle purchasing plan***
- 5. *Adopt the Stretch Energy Code***

1.) As-of-Right Siting

- adopt a local zoning bylaw or ordinance that allows "as-of-right-siting" of renewable and/or alternative energy Research & Development facilities, manufacturing facilities or generation facilities;
- defined as siting that provides for the allowed use and does not regulate or require a special permit, and
- sites must be viable places for alternative energy to make an impact on energy consumption for the community.

2.) Adopt an expedited application and permitting process related to the as-of-right facilities

- adoption of as-of-right siting permit shall not exceed 1 year from the date of initial application to the date of final approval, and
- applying the expedited permitting process of MGL c 43D to these zoning districts can meet this requirement.

3) Establish a municipal energy use baseline and establishing a program designed to reduce use by 20 percent within five years

- the baseline inventory of energy use is for municipal buildings, vehicles, and street and traffic lighting and is an aggregate across these uses on an MMBTU (million British thermal units) basis;
- after all energy reduction measures have been taken, credit may be given for the addition of renewable energy resources to reach the 20% reduction goal;



- a community can meet this requirement if it has completed an inventory as described above using an already implemented program to reduce the baseline in the past 24 months, and
- acceptable tools for performing the inventory are:
 - EnergyStar Portfolio Manager
 - DOER's MassEnergyInsight
 - ICLEI software
 - Other tools proposed by the community and accepted by DOER

4) Purchase only fuel-efficient vehicles for municipal use, whenever such vehicles are commercially available and practicable

- applicant must provide an inventory of vehicles owned by the municipality for non-exempt vehicles and based on 2009 and 2008 EPA combined city and highway MPG fuel standard data, are to have no less than the following:
 - 2 wheel drive car: 29 MPG
 - 4 wheel drive car: 24 MPG
 - 2 wheel drive small pick-up truck: 20 MPG
 - 4 wheel drive small pick-up truck: 18 MPG
 - 2 wheel drive standard pick-up truck: 17 MPG
 - 4 wheel drive standard pick-up truck: 16 MPG
- exemptions from this criterion:
 - heavy-duty vehicles such as fire trucks, ambulances, and public works vehicles, and
 - police cruisers; however, they must commit to purchasing fuel-efficient cruisers when commercially available. Police administrative vehicles must meet above fuel standards.

5) Require all new residential construction over 3,000 square feet and all new commercial and industrial real estate construction to reduce lifecycle energy costs (such as adoption of the Stretch Code)

Communities that have already received Green Community designation have met this requirement most commonly through adopting 780 CMR.

115.AA, the MA Board of Building Regulations and Standards (BBRS) **Stretch Energy Code**.

- requires 20% greater building efficiency than the 2009 International Energy Conservation Code (IECC);
- the Stretch Code applies to both residential and commercial buildings in the municipality. Commercial buildings 5,000 sq.ft. and lower are exempt and follow the Base Code;



- new residential construction uses Home Energy Rating System (HERS) and requires homes < 3,000 sq.ft. to have a rating of 70 or less and > 3,000 sq.ft. a rating of 65 or less (HERS Index - 0-150 score with 0 pertaining to less energy and 150 pertaining to more energy). Performance testing also required to ensure correct installation and efficiency;
- for residential buildings, puts the Energy Star program into code with builder incentives up to \$8,000 and rebates on appliances, heating and cooling, lighting, etc. Also offers builder training and materials and subsidized HERS raters (third-party verification), and
- for commercial buildings, large buildings over 100,000 square feet are required to meet a performance standard set at 20% below the energy usage of the commonly used ASHRAE 90.1 2007 code, demonstrated through modeling by methods and software approved by the BBRs. Medium-sized commercial buildings, which include residential buildings of 4 stories or more, but that are less than 100,000 square feet, have the option of meeting the large building performance standard, or using a simplified, prescriptive energy code as an alternative to Chapter 13 in the current Energy Code 780 CMR.

IV - Energy Resources and Tools

There are many resources available to the communities in the Merrimack Valley to assist and guide them in reducing their energy consumption - thus reducing energy costs. There are federal resources, resources available from the Commonwealth of Massachusetts, and regional resources available through MVPC for our member communities. Assistance to communities range from the provision of wind and solar zoning ordinance templates to conducting energy audits and recommending energy efficient infrastructure upgrades, to the examination of old landfills to determine their potential as solar or wind farms. These resources are summarized in an easy to read table located at the end of this section of the Plan. The federal and state assistance programs are described in more detail below, the MVPC regional assistance programs are described further in Section VI.

Commonwealth of Massachusetts Energy Assistance Programs:

MassEnergyInsight Energy Inventory and Management Tool

In order to meet criteria three of the Green Communities designation program, which states that the community must “Establish a municipal energy use baseline and establishing a program designed to reduce use by 20 percent within five years,” the Massachusetts Department of Energy Resources (DOER) has made available a no-cost tool developed by Peregrine Energy Group to track and analyze energy consumption data. This web-based tool allows users to track electricity, natural gas and oil usage details across multiple years and compare that data from year to year to target specific areas for improvement. The system offers usage information for individual buildings, graphical comparisons of function-to function usage, and reports comparing building-to-building usage.

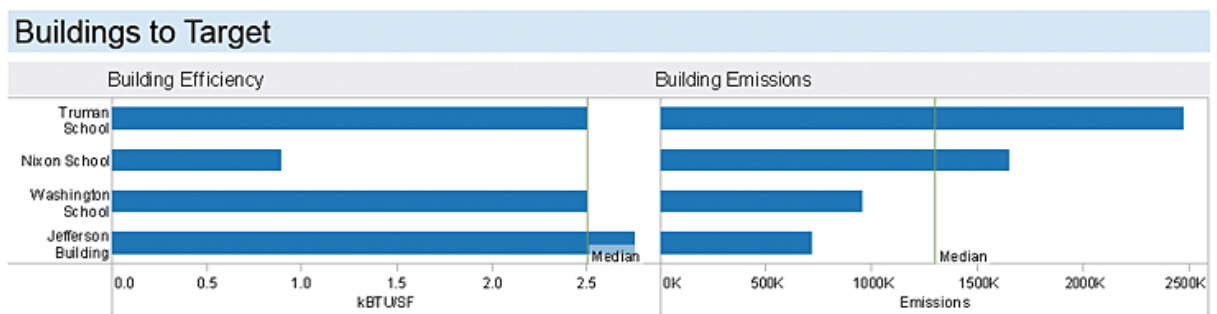
The system delivers:

- energy usage information compiled in one online location;
- comprehensive reporting capabilities;
- information for energy cost control and greater budget predictability;
- analysis for efficiency, conservation, and cost reduction commitments;
- official baseline to support grant applications and required measurement criteria, and
- support for emissions reporting and green initiatives.

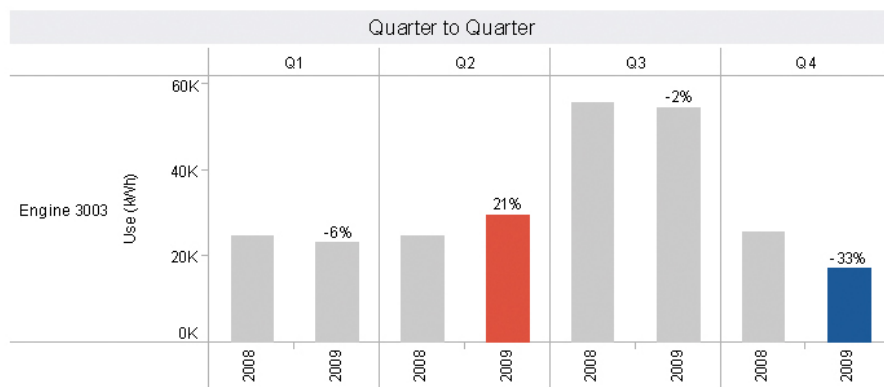


With an easy way to access comprehensive energy information, MassEnergyInsight allows towns to make informed decisions about future energy consumption in their community. Using this online tool, communities can commit to use less energy and initiative measurement and accountability, put conservation and efficiency programs in place, identify target areas for efficient cost savings, and use this benchmarking, measuring, and reporting infrastructure tool to participate in grant programs effectively. Additionally, MassEnergyInsight allows communities to strive to be greener communities with a lower carbon footprint.

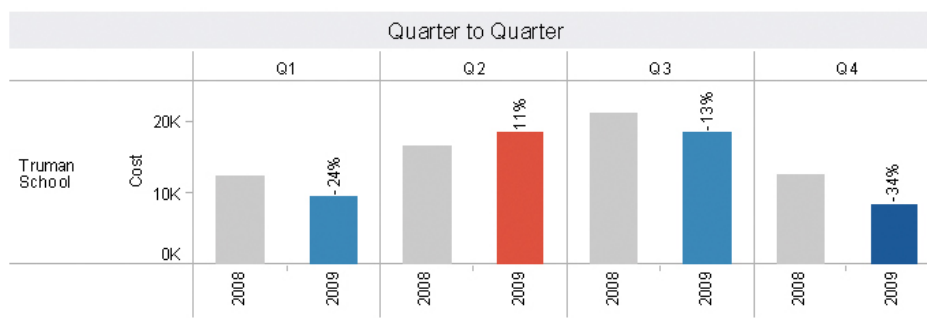
Example Screenshots:



Monitoring: Electricity Use



Monitoring: Electricity Cost



In order to assist our communities with the gathering and analyzing of the MassEnergyInsight data, the effort to which can be overwhelming, cumbersome and time consuming, MVPPC partnered with Merrimack College and students from the Department of Environmental Studies and Sustainability. This effort is explained in more detail in Section VI. MVPPC has also used the assistance of a UMass-Lowell graduate student, who working with the Merrimack College students, has helped access MassEnergyInsight data for our municipalities. The work from these students has made it possible for several of our communities to obtain baseline energy consumption data. For more information visit their website:

www.massenergyinsight.net/home

Mass Save

Mass Save is an initiative sponsored by Massachusetts' gas and electric utilities and energy efficiency service providers, including Bay State Gas Company, Berkshire Gas Company, Cape Light Compact, National Grid, New England Gas Company, NSTAR, Unitil, and Western Massachusetts Electric Company. To apply for an assessment visit their website: www.masssave.com/

Efficient Water and Wastewater Treatment

The Massachusetts Department of Energy and Environmental Affairs (DOER) is collaborating with the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency to provide energy management services targeted to drinking water and wastewater treatment plants. For more information visit their website: www.mass.gov/eea



Energy Management Services (EMS)

Energy Management Services (EMS) can help communities execute their energy efficiency plans. EMS can be used as performance contracting; the cost of implementing efficiency measures is paid for in whole or in part by the energy and water savings guaranteed from the project by the chosen vendor. The contract is awarded for the whole project eliminating the costs and potential delays of multiple bidding processes. For a regional EMS through MVPC please see section VI of this Plan. For more information visit their website: www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html

Massachusetts Clean Cities Coalition (MCCC)

The MCCC is part of a nationwide program sponsored by the U.S. Department of Energy that focuses on promoting the adoption of alternative fuel vehicles as well as supporting the development of infrastructure necessary to make alternative fuel vehicles a viable transportation option. The coalition works with vehicle fleets, fuel providers, community leaders, and other stakeholders to reduce petroleum use in transportation.

The Clean Cities Coalition provides:

- grant funding opportunities;
- discussion forums for alternative fuels, vehicles, and related infrastructure;
- information pool and vendor base;
- technical assistance with alternative fuel projects;
- help with planning and implementing alternative fuel events;
- education and training for the safety and maintenance of vehicles and infrastructure, and
- program support to increase alternative transportation for both state and local fleets across Massachusetts.

For more information email: DOER.cleancities@state.ma.us or visit their website: www.mass.gov/eea/energy-utilities-clean-tech/alternative-transportation/clean-cities-coalition.html



Massachusetts Municipal Association (MMA)

MMA has a MunEnergy program that helps communities stabilize energy costs and simplify energy management through a collaborative effort with Constellation.

MunEnergy offers:

- competitive Energy prices;
- flexible customized energy plans;
- fixed-rate, multi-year contracts, and
- MMA approved contract language.

For more information visit their website: www.mma.org/about-mma-mainmenu-62/munenergy.

Massachusetts Clean Energy Center (MassCEC)

The Massachusetts Clean Energy Center (MassCEC) helps support renewable energy projects throughout the Commonwealth. MassCEC offer grants for feasibility and/or design and construction of solar panels, wind turbines, biomass systems, hydroelectric systems, and other clean energy systems.

MassCEC Initiatives:

- Commonwealth Solar II & Commonwealth Solar Stimulus provide rebates for the installation of grid-tied photovoltaic (PV) systems;
- Commonwealth Wind Incentive Program - the Commercial Wind Initiative offers grants up to \$55,000 for feasibility studies for commercial wind projects (2 MW or greater) that will serve the whole-sale energy markets or for projects that do not qualify for net metering but provide on-site use;
- Commonwealth Wind Incentive Program - the Community-Scale Wind Initiative offers grants ranging from \$20,000 to \$85,000 for Feasibility projects, and \$107,250 to \$400,000 for Design & Construction projects;
- Commonwealth Wind Incentive Program - Micro Wind Initiative - offers rebates of up to \$4/W with a maximum of \$130,000 for design and construction of customer-sited small wind public projects, and
- Commonwealth Hydropower Initiative - offers grants up to \$40,000 for feasibility studies for hydropower facilities or \$600,000 for rehabilitation/ Redevelopment/development of hydropower facilities qualified (or expected to be qualified) for Massachusetts Renewable Portfolio Standard.

For more information visit the website: www.masscec.com/index.cfm/page/About-MassCEC/pid/11193



Net Metering

Massachusetts energy policy allows for renewable energy installations which are located off-site to off-set the retail value of electricity on municipal electricity bills. This policy is called “virtual net metering.” Net metering is the process where solar power on your roof allows your meter to spin backwards when you’re producing more energy than you are using and allows you to offset the retail value of the electricity produced by the solar system. Virtual net metering allows for an offsite solar system to apply the net metering value or “net metering credit” to a different electrical account within the same utility service territory and load zone. This allows a third party developer to build, own and maintain a solar system and sell the “net metering credits” to the community at a rate that is less than what you are currently paying for your electricity. For example, you can purchase net metering credits for 8 cents per kWh, and apply those credits to offset your current retail price of 12cents per kWh, saving you 4 cents per kWh (a 33% discount on your electricity price).

Developers need a long term contract for net metering credits with a credit worthy entity in order to be able to build, maintain and profit from developing a solar system. Therefore, solar developers have been approaching multiple municipalities across the state in order to enter into net metering credit purchase agreements. These agreements can sometimes be referred to as power purchase agreements or PPAs. There are about a dozen cities and towns in Massachusetts that have signed solar PPA agreements and many more that are currently negotiating these types of agreements. Visit their website: www.mass.gov/doer/. For MVPC’s regional net metering program see Section VI.

Federal Resources for Renewable Energy:

National Renewable Energy Laboratory (NREL) - Provide Technical Assistance for State and Local governments

State and local governments, Indian tribes, and overseas U.S. territories may apply to receive technical assistance from NREL for understanding and deploying energy efficiency and renewable energy technologies. Technical assistance includes:

- **Project Assistance** – renewable energy siting, green buildings, technical assessments, and measurement and evaluation;
- **Program Design** – energy efficiency and renewable energy assessments and portfolio design, sustainable community design, and assistance with reducing international barriers;



- **Contract Assistance** – technical specifications development for requests for proposals (RFPs) and performance contracting;
- **Financing Policies and Programs** – design and structure of revolving loan funds, loan loss reserves, credit mechanisms, and leveraging private investment
- **Planning** – strategic planning, energy management, building codes, project screening, and cost and capacity factors;
- **Policy Analysis** – local, state, federal, financial, and
- **Skills Development** – trainings, workshops, peer matching, and Webinars.

State and local governments can apply for technical assistance or request more information email: tech.assist@nrel.gov

Additionally, NREL offers technical assistance webcasts for state and local officials who want to learn more about implementing energy efficiency and renewable energy projects in their state or town. These webcasts are recorded and available on the NREL website and are free to download. Topics include:

- strategies for Successful Energy Management;
- financing Energy Efficiency Upgrades with ENERGY STAR;
- conducting and Using Energy Efficiency Potential Studies for States, and
- how to design and market Energy Efficiency Programs to Specific Neighborhoods.

Federal Qualified Energy Conservation Bonds (QECBs):

Incentive Type: Federal Loan Program

Applicable Sectors: Local Government, State Government, Tribal Government

With tax credit bonds, generally the borrower who issues the bond pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. The tax credit may be taken quarterly to offset the tax liability of the bondholder. The tax credit rate is set daily by the U.S. Treasury Department; however, energy conservation bondholders will receive only 70% of the full rate set by the Treasury Department under 26 USC § 54A.

Credits exceeding a bondholder's tax liability may be carried forward to the succeeding tax year, but cannot be refunded. Energy conservation bonds differ from traditional tax-exempt bonds in that the tax credits issued through the program are treated as taxable income for the bondholder.

Bond issuer may make an irrevocable election to receive a direct payment from the Department of Treasury equivalent to the amount of the non-refundable tax credit as described, which would otherwise accrue to the bondholder. The direct payment



comes in the form of a refundable tax credit to the issuer in lieu of a tax credit to the bondholder.

The definition of “qualified energy conservation projects” is fairly broad and contains elements relating to energy efficiency capital expenditures in public buildings; green community programs (including loans and grants to implement such programs); renewable energy production; various research and development applications; mass commuting facilities that reduce energy consumption; several types of energy related demonstration projects; and public energy efficiency education campaigns (see 26 USC § 54D for additional details). Renewable energy facilities that are eligible for CREBs are also eligible for QECBs.

Renewable Energy Options

A majority of the world’s energy, especially in the United States, is derived from the burning of fossil fuels, coal, and other non-renewable natural resources that are not only finite, but also pollute the environment and contribute to global climate change. As communities look to address the increasing energy demands and costs, a more sustainable future must be achieved to decrease dependence on fossil fuels and save significant amounts of money for their municipality.

1. Energy Conservation and Efficiency

Energy conservation and efficiency refers to the goal of improving existing designs of buildings and infrastructure to use less energy to operate. These practices include better-insulated buildings, eco-friendly building materials, energy efficient appliances, compact fluorescent light bulbs, etc. Energy efficiency also refers to the change in behavior such as remembering to turn off lights and computers, using appliances more efficiently, and carpooling that can take place through educating people about energy conservation.

Unlike large infrastructure projects like solar farms, wind turbines, geothermal plants, or landfill gas co-generation plants, energy conservation and efficiency are relatively low cost energy saving options and have the potential to reap a high reward with low cost and time commitment. Besides incorporating energy saving techniques into new building design, retrofitting and making energy efficiency improvements to existing buildings can immediately save money. These techniques can be used in homes and public buildings so the implementation can be widespread and effective.

The following table summarizes the Federal, State, Regional energy tools and resources available to the MVPC communities.

ENERGY RESOURCES AND TOOLS			
PROGRAM	DESCRIPTION	PROGRAM TYPE (State, Federal, Regional, Private)	WEBSITE
Green Community Designation and Grant Program	The Green Communities Designation and Grant Program assist communities toward qualification as a Green Community and provide funding to qualified municipalities for energy efficiency and renewable energy initiatives.	State - Massachusetts Department of Energy Resources	http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/gc-grant-program/
Energy Management Services (EMS)	Help communities execute their energy efficiency plans - can be used as a type of performance contracting; the cost of implementing efficiency measures is paid for in whole or in part by the energy and water savings guaranteed from the project by the chosen vendor. The contract is awarded for the whole project so this will eliminates the costs and potential delays of multiple bidding processes.	State - Massachusetts Department of Energy Resources	http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/ems.html .
MassEnergyInsight	Free web-based tool that collects, tracks, and reports energy consumption info for cities, towns, and local and regional governmental coalitions	State - Massachusetts Department of Energy Resources	http://www.massenergyinsight.net
MA Clean Cities Coalition	Works with vehicle fleets, fuel providers, community leaders to reduce petroleum use - provides grant funding opportunities, discussion forum for alternatives, information pool and vendor base, technical assistance, and education and training	State - Massachusetts Department of Energy Resources	http://www.mass.gov/eea/energy-utilities-clean-tech/alternative-transportation/clean-cities-coalition.html
Mass Municipal Association	MMA has a MunEnergy program that helps communities address energy costs and energy management	State - Massachusetts Department of Energy Resources	http://www.mma.org/about-mma-mainmenu-62/munenergy
Mass Clean Energy Center	Helps support renewable energy projects by offering grants for feasibility and/or design and construction of solar panels, wind turbines, biomass systems, hydroelectric systems, and other clean energy initiatives	State - MassCEC	http://www.masscec.com/index.cfm/page/About-MassCEC/pid/11193 .
Net Metering	The process where solar power on your roof allows your meter to spin backwards when you're producing more energy than you are using and allows you to offset the retail value of the electricity produced by the solar system.	State - Massachusetts Department of Energy Resources	https://sites.google.com/site/massdgic/Home/net-metering-in-ma
National Renewable Energy Laboratory	Provide Technical Assistance for State and local governments, Indian tribes, and overseas U.S. territories may apply to receive technical assistance from NREL for understanding and deploying energy efficiency and renewable energy technologies.	Federal – National Renewable Energy Laboratory	http://www.nrel.gov/applying_technologies/state_local_activities/
Federal Qualified Conservation Bonds (QECBs)	With tax credit bonds, generally the borrower who issues the bond pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. Qualified projects include energy efficiency capital expenditures in public buildings; green community programs; renewable energy production; various research and development applications; mass commuting facilities that reduce energy consumption; several types of energy related demonstration projects; and public energy efficiency education campaigns.	Federal – U.S. Department of Treasury via Massachusetts Department of Energy Resources	http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US51F
Regional Energy Manager	Assist participating communities develop strategic energy conservation and generation plans. The manager monitors energy use and expenses for the communities, recommends behavioral changes to reduce energy use, recommends capital equipment upgrades to reduce energy and be the point person for the community and contactors for energy matters.	Regional – Merrimack Valley Planning Commission	http://mvpc.org/wp-content/uploads/Energy-Management-Coordinator.pdf
Regional Renewable Energy Manager	The Regional Renewable Energy Manager (RREM) will provide expert advice and assistance to the communities on an as needed basis and as funds permit in order to help identify, evaluate, and advance viable solar and wind power projects. The goal is to provide municipalities with the technical expertise needed to conceptualize, plan, and implement renewable energy projects that are consistent with local community objectives, are environmentally-sound and protective of human health and property, provide a reliable source of revenue for the community, and enjoy broad public support.	Regional – Merrimack Valley Planning Commission	http://mvpc.org/wp-content/uploads/Regional-Renewable-Energy-Manager-RFP-8-10-2011.pdf
Regional Energy Services Company (ESCO)	An ESCO, or Energy Service Company, is a business that develops, installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities over a seven to twenty year time period. ESCOs generally act as project developers for a wide range of tasks and assume the technical and performance risk associated with the project.	Regional – Merrimack Valley Planning Commission	http://mvpc.org/wp-content/uploads/MVPC.ESCO_.RFQ_1.pdf http://mvpc.org/wp-content/uploads/MVPCEnergyPerformanceRFQ.FAQ_.pdf
MassEnergyInsight Assistance	MVPC will provide technical assistance for those interested or currently using MassEnergyInsight. This assistance will be provided to municipalities looking for additional information, help setting up their data, help pulling data reports, etc.	Regional – Merrimack Valley Planning Commission	http://www.mvpc.org http://massenergyinsight.net

2. Wind Power

Wind energy technologies use the power of wind to generate electricity, pump water, grind grain, or charge batteries. Most commonly, wind energy technologies are built as



stand-alone turbines, either built separately, or grouped together to form a wind farm. These turbines can be connected to a grid to provide utility-scale electricity to a region, off-setting the use of fossil fuels normally used to generate electricity. Wind turbines consist of a tall tower with a fan-like rotor that turns with the force of the wind, which turns a shaft inside the turbine that spins a generator to make electricity.

Wind generating technologies such as wind turbines can be constructed on-shore or off-shore. In the United States on-shore wind generation is maximized in the Plains states and the Southwest, where the flat landscapes provide consistent wind generation. Off-shore generation utilizes the more reliable wind currents along the ocean and can be more viable than on-shore generation for coastal communities. The Cape Wind off-shore wind farm in Nantucket Sound is an example of a current utility-scale wind generation project that will put 130 wind turbines in the waters of Nantucket Sound and produce up to 420 mega watts of electricity for adjacent Massachusetts communities.

3. Solar Electric Photovoltaic

Harnessing the energy from the sun, solar energy technologies use photovoltaic (PV) materials and devices to convert sunlight into electricity. PV cells, or solar cells, can



be installed in systems that are all hooked together to form a solar module that can power electrical devices in homes and buildings or when installed in large-scale solar modules, can be connected to a grid to provide electricity to the community. Private homeowners have begun to retrofit existing homes with solar arrays on the top of homes to off-set electricity consumption from the grid while new construction



projects of larger buildings and facilities have incorporated solar arrays into their site design to maximize solar energy potential during the construction of these buildings.

Because the Earth is round and sunlight strikes the Earth at different angles depending on the geographic location, time of day, season, local landscape, and the local weather, the energy concentration can vary widely depending on the location of the PV system. While solar electricity generation in the summer months, when the Sun is directly overhead, shining at close to a 90-degree angle on the surface, can be maximized, the downside occurs in the winter months when the angle of the sun and the sunlight concentration is weaker, thus producing less electricity.

4. Solar Thermal Hot Water

Solar thermal hot water heaters use the energy from sunlight to heat up solar collection plates attached to insulated water storage tanks that use heat energy



created by warming up these solar collectors to heat water in the tank. The hot water rises to the top of the tank and pumped down into the house or building where it's attached. While solar thermal hot water collectors are a cheap and efficient way to harness the heat energy from the sun for a practical use in the home, almost all systems require a backup hot water heater on cloudy days or days without direct sunlight such as winter months.

5. Geothermal Energy

Hot water below the Earth's surface can be utilized to produce energy, either direct-use, or used to create electricity. Direct-use of geothermal resources utilize hot water found in wells and in the ground that can be extracted and pumped into homes, commercial, or industrial uses to heat water sources, heating buildings, growing plants in greenhouses, drying crops, or heating water at fish farms. Alternatively, water in underground reservoirs heated from the earth at temperatures around 360-degrees Fahrenheit is pumped up through wells and when the change in pressure takes place as the water rises, water boils into steam, which spins a turbine and powers a generator making electricity.

Because the geothermal base in the United States is concentrated in the West, most geothermal electricity generation and direct-use primarily serves those regions of the country. Without underground geothermal concentrations, geothermal energy is not a cost effective or viable option for these areas.

6. Hydropower

Hydropower, or hydroelectric power, uses the flow of water to create energy that can be captured to generate electricity. Hydropower is the most commonly used and developed renewable resource in the United States. For large-scale electricity generation, dams and reservoirs have been constructed along rivers and large bodies of water to hold and release large flows of water. This flow of water is used to spin turbines, which power generators thus providing electricity back to the grid.

Since many large-scale hydropower dams and reservoirs have been criticized for altering wildlife habitats, impeding fish migration, and affecting water quality and flow patterns, there is expected to be a drop in construction of new, dammed hydropower projects in the future. While dammed reservoir systems to create hydropower have come under scrutiny about their environmental degradation, “run of the river” hydropower systems do not require damming and only divert a portion of the river’s water flow to spin a turbine and generate electricity. These micro-hydropower plants produce much less electricity but are still able to supplement the power of nearby homes and businesses and the community as a whole. These systems can be stand-alone or connected to a grid, do not require special professional assistance from a civil engineer, and run a significantly decreased risk of harming the environment.

7. Biomass

Biomass refers to organic materials produced by the photosynthesis of light and used to make fuels, chemicals, and power. The most widely utilized biomass material is the



use of wood from trees to produce heat. Humans use biomass materials such as wood products, dried vegetation, crop residues, and aquatic plants to heat homes and on an industrial scale burn wood product to create steam used to generate electricity. While plant-based materials are renewable products generated in nature, sustainability issues are raised with unregulated deforestation, contaminated waste wood, and municipal



solid waste and tires. Environmentalists would like a more narrow definition of biomass green power as a viable renewable energy source, which excludes burning garbage and limits biomass sources to forest-related harvesting, landscaping and right-of-way trimmings, and agricultural crops and by-products. Although the substitution of fossil fuels for biomass materials may seem appealing, the effects of deforestation and the environmental effects of farming and the production of biomass may present similar negative environmental impacts as the burning of fossil fuels.

8. Biofuels

Similar to biomass, biofuels are produced by using organic materials like plants to make liquid or gaseous fuels for transportation and electricity. The most common



biofuel used today is the ethanol added to gasoline. Most gasoline in the United States contains between 5-10% ethanol mixtures. In the US corn grain is used to produce ethanol but any starch-based plant such as sugar cane can be broken down to make ethanol. Newer techniques using cellulosic feedstock—such as grass, wood, crop residues, or old newspapers, have proven effective in making ethanol but require more time and energy to break down into ethanol.

9. Landfill Gas/Co-Generation

Municipal solid waste contains significant portions of organic materials that produce a variety of gaseous products when dumped, compacted, and covered in landfills.

Anaerobic bacteria thrive in the oxygen-free environments, resulting in the decomposition of the organic materials and the production of primarily carbon dioxide and methane. Carbon dioxide is likely to leach out of the landfill because it is soluble in water. Methane, on the other hand, which is less soluble in water and lighter than air, is likely to migrate out of the landfill. Landfill gas energy facilities capture the methane (the principal component of natural gas) and combust it for energy. Concerns over the potential for methane escaping into the atmosphere, which contribute to the effects of global warming, remain when discussing landfill gas co-generation plants. Additionally, leaching through liners in the landfills are a concern since these pollutants can flow into streams, rivers, groundwater, and other bodies of water that may be used for consumption, watering crops, etc.

V - Community Strategies

Assessment Questionnaire:

Early on in the development of this Energy Plan, an Energy Assessment Questionnaire was sent to all communities in the MVPC region. The questionnaire was as follows:

Dear MVPC Community:

The Merrimack Valley Planning Commission is seeking to assist member communities to formalize their energy planning efforts, focusing on municipal energy use and policymaking. MVPC has received an EDA grant for this purpose. This effort builds on MVPC's ongoing regional energy initiatives, including securing a Regional Energy Coordinator to support local energy initiatives, the region-wide energy performance contracting effort that selected Ameresco to work with cities and towns, and a new Regional Renewable Energy Manager initiative.

Our purpose is to better understand the interests and issues in your community with respect to energy management and local energy development, what you have accomplished to date and what you hope to accomplish.

Our objective would be to summarize this information in an initial Energy Plan document that:

- describes your current situation with respect to energy management and energy use, and*
- establishes energy related goals for your municipal government, clarifying whether the municipality would like some or all of these goals to be binding.*

We would then work with government representatives (and your local energy committee, if appropriate) to flesh out the Plan to:

- identify short-, medium-, and long-term strategies and actions to achieve these goals;*
- suggest resources (managerial, technical, and financial) that may be available to support these strategies, etc.;*
- confirm next steps;*
- confirm local roles and responsibilities for proceeding with agreed upon actions*
- establish timetables and indicators to measure progress, and*
- create a mechanism for periodic review and updating of the Plan.*

We would greatly appreciate it if you would answer the following questions, or forward this request to the appropriate person from your community to answer. You can answer by replying directly to this email, or we would be happy to meet with you in person if preferable. If you have any questions please contact Mike Parquette or Dennis DiZoglio at MVPC at 978-374-0519. Thank you kindly for your timely response.

Inventory & Energy Usage

1. Are energy costs a concern in your community?
2. Do you know roughly what your community spends on energy for buildings, streetlights, and vehicles? Do you compare use / cost year to year? Month to month? Both?
3. Has your community's energy budget increased or decreased over the past few years?
4. Does anyone have responsibility for tracking and reporting energy cost? Energy use? If yes, who?
5. If they do, are they using the free web-based MassEnergyInsight service that is provided to all communities in Massachusetts by the MA Department of Energy Resources (MA DOER)? Is there another system they use to track this information?
6. Would you like to learn more about MassEnergyInsight?
7. Would you like MVPC to provide you with baseline data on your energy consumption using the data provided by MassEnergyInsight?

Energy Efficiency (EE) and Renewable Energy (RE) Planning

8. What steps have the community taken to date to reduce energy use and cost? Have they been effective? Do you know how much you saved?
9. Is there a plan of action in place to reduce energy costs comprehensively?
10. Which buildings are your biggest energy users? Are you aware of energy systems in buildings that are inefficient, old, or that need to be replaced? Who is responsible for identifying opportunities for energy reductions in community buildings?
11. Have you had buildings audited by a professional? If yes, were there recommendations made that were followed?
12. Have you participated in any utility-sponsored energy programs? If yes, what and when?
13. Are you familiar with MVPC's region-wide performance contracting initiative? Have you considered participating?

14. Have you participated in other energy programs with other entities?
15. Are you aware of MA DOER's Green Communities program? Have you considered becoming a Green Community? If yes, are there issues or barriers that have made this difficult?

As one will see, the communities in the MVPC region are at all levels of implementing tools and techniques in order to reduce their energy consumption. Two of our communities, Andover and Newburyport, are "Green Communities" as designated by the Commonwealth of Massachusetts and explained in Section III of this Plan. Although not "Green Communities" other communities are tracking their energy costs and putting in place strategies to reduce these costs such as conducting energy audits on all municipal buildings, enacting zoning for renewable energy projects, or forming energy committees to develop plans of action. Regardless of the where our communities are in achieving reductions in energy, there appears to be a unanimous opinion that they all want to work towards energy reduction in whatever way their staffing levels and municipal budgets allow. At a minimum, most every community wants to track their energy costs through MassEnergyInsight. MVPC has been and will continue to assist in all these efforts in the months and years ahead.

The following is a community by community analysis, based on responses to the questionnaire, talking to community leaders, and researching community websites and reading current city and town plans and ordinances.

City of Amesbury

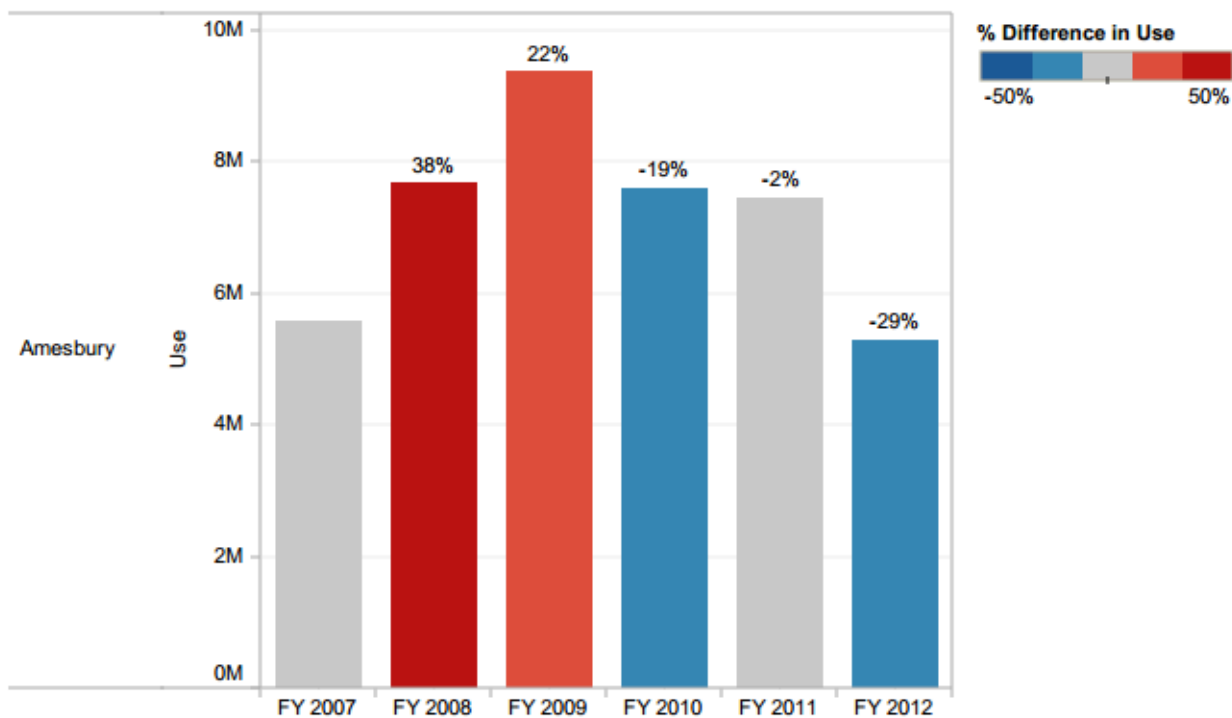
Current Conditions and Actions

The City of Amesbury established an Energy Resources Task Force in 2009 to address the community's long-term energy future, specifically addressing energy efficiency opportunities and renewable energy options. The community has expressed interest and is working towards the requirements for becoming a Green Community. The town has accomplished the following energy related initiatives:

- passed an ordinance to amend their zoning by-laws to provide As-of-Right siting for solar photovoltaic projects to provide renewable energy for the city;
- Amesbury adopted the International Energy Conservation Code (IECC), which requires altered and new building permits to meet energy conservation measures outlined in the IECC 2009 Code. In relation to the Green Community criteria, the fifth Green Community requirement, adoption of the Stretch Energy Code, is a modified version of the IECC 2009 Code;
- the City of Amesbury, in conjunction with the Task Force, was awarded by the Department of Energy Resources, a \$150,000 grant and subsequently installed a 20 kilowatt solar panel system on the roof of Amesbury High School. Annual cost savings realized are \$10,000;
- replaced inefficient light fixtures, lamps, and outdoor light poles at the High School, Middle School, and Cashman School realizing an annual savings of nearly \$61,000. Currently examining more school energy upgrades;
- completed an inventory of all city owned vehicles and calculated their average combined mileage;
- the Energy Task Force developed a report in July of 2011, Amesbury's Energy Future: Sensible Steps to Secure Long-Term Savings, to assess the current status of how Amesbury manages their energy consumption and recommendations for moving forward with energy efficiency and renewable energy projects within the Town. The full report can be found at this website:
http://scorzoni.files.wordpress.com/2012/04/skmbt_600120404130101.pdf
- in the spring of 2012, the city has held energy related public meetings and has expressed a strong desire to build solar or wind farms in the community, and
- Amesbury is in the process of establishing baseline energy consumption, having just begun using the MassEnergyInsight online energy data management tool. They have provided electricity and natural gas usage trends for the last 5 years displayed in the following graphs:

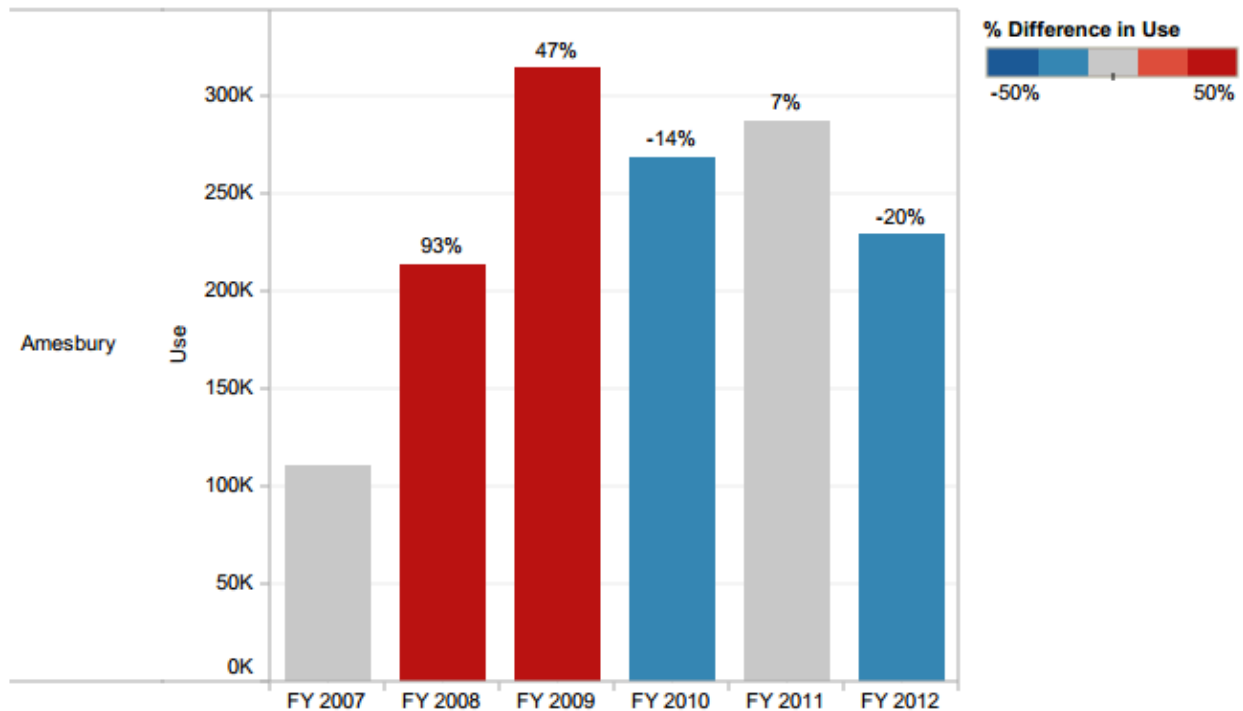
Electric usage changes (%), year to year:

Year to Year



Natural gas usage changes (%), year to year:

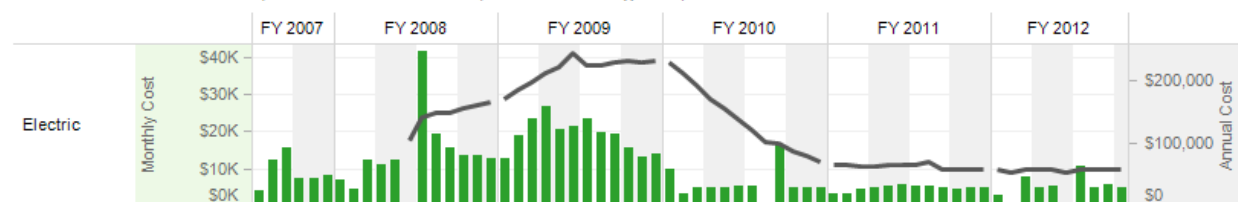
Year to Year



Sum of Use for each Usage End Date Year broken down by City. Color shows % Difference in Use. The marks are labeled by % Difference in Use. Details are shown for Fuel (units). The data is filtered on Town Filter, Department, Usage End Date Quarter, Fuel (copy), Category and Subcategory. The Town Filter filter keeps True. The Department filter keeps 388 of 388 members. The Usage End Date Quarter filter has multiple members selected. The Fuel (copy) filter excludes Electric - Competitive Supply and Gas - Competitive Supply. The Category filter keeps multiple members. The Subcategory filter keeps multiple members. The view is filtered on Usage End Date Year, Fuel (units) and City. The Usage End Date Year filter keeps FY 2007, FY 2008, FY 2009, FY 2010 and FY 2011. The Fuel (units) filter keeps Electric (kWh). The City filter excludes Amesbury.

Additionally, Amesbury High School's electric usage and costs were looked at. A clear effect of the installation of the solar array can be seen in the reduction of electric costs for the building.

Cost Trends



Recommendations:

The Amesbury Energy Resources Task Force has done some outstanding work and the city has many energy projects and initiatives moving forward. The city may be further along to becoming a “Green Community” than they realize. They have had some frustrating results with obtaining energy consumption data, which MVPC will help to resolve. MVPC recommends these actions to move forward with addressing energy efficiency, energy consumption, and renewable energy issues:

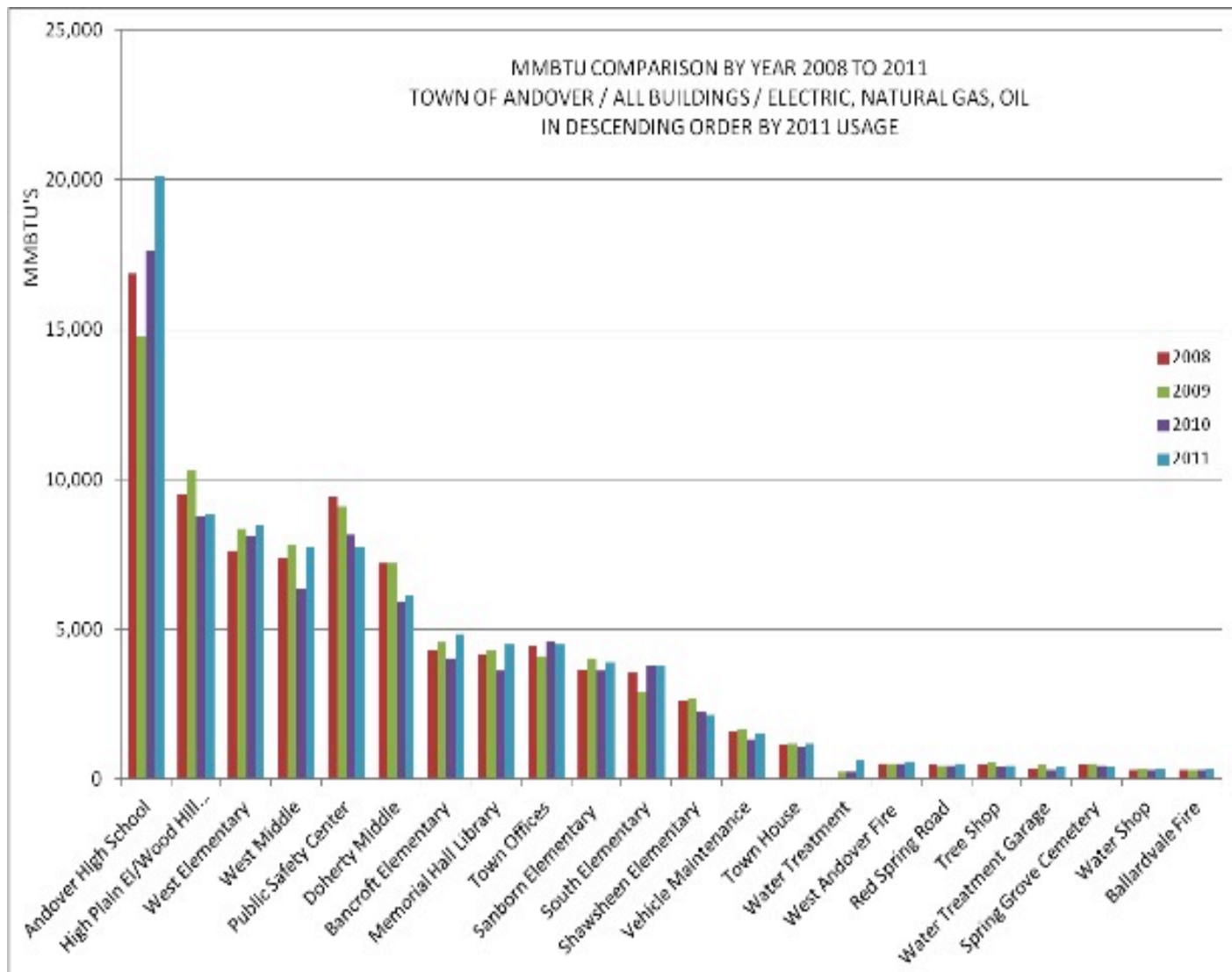
- continue to work with MVPC to access MassEnergyInsight and gather baseline energy data;
- continue to pursue steps to achieving Green Community Designation. The city has passed an As-of-Right Siting zoning bylaw and expedited permitting process for renewable energy projects and is close to developing a fuel-efficient vehicle fleet management plan. The city will need to pass the stretch code and gather the baseline energy data;
- pursue agreement with the regional energy services company (ESCO) to receive a preliminary energy audit and move forward with identifying energy efficiencies and possible improvements;
- the city is eager to create renewable energy projects as evidenced by the solar panel system on the high school roof. The city should work to gain legal control of the closed landfill. The landfill has the potential to be used as both a solar and/or wind farm. The city should work with the regional renewable energy manager to assist in this effort and to identify other potential sites for renewable energy facilities, and
- MVPC recommends the city move forward with plans to upgrade the lighting in the Middle and High School auditoriums as well as re-lamp the entire middle school and upgrade the school thermostats, electric motors, and automatic shutoffs.

Town of Andover

Current Conditions and Actions:

The Town of Andover's commitment to energy efficiency and overall energy reduction over the past five years has made Andover a model community for energy management initiatives in the Region. In 2010, the town was designated as a “Green Community” under the Massachusetts Department of Energy Resources (DOER) Green Communities Program.

Also, prior to designation as a Green Community, Andover completed its energy use inventory for municipal buildings, vehicles, and street and traffic lighting using the Utility Direct School Dude program. The town has used FY08 as their “baseline” inventory and as the benchmark for achievement of a 20% reduction of this figure in 5 years. Andover is finding that many of the measures taken to reduce energy consumption prior to their baseline year may be affecting their ability to decrease energy usage as quickly as they expected for their Green Community goals. Many of the “easier”, but nonetheless important steps had been implemented before starting the Green Community program. But the town is committed to saving additional energy, saving money, and decreasing their carbon footprint. Andover has had great success in reducing electrical usage, as most of the energy improvement measures implemented so far have been electric based. Unfortunately, many of these savings were overshadowed by an increase in gas and oil consumption. In their Green Community Annual Report, while Andover recognizes the issue of increased gas and oil consumption, an increase off-setting the 10.6% electricity use decrease from their 2008 baseline year, Andover has not completed any gas saving energy efficiency projects in their Energy Reduction Plan to date. While they have not completed any projects, Andover has recognized that the High School is the biggest consumer of energy resources, natural gas, oil, and electricity and plans to apply corrective action to this problem area. See below for a breakdown of the major energy consumers broken down by building:



Annual Municipal Energy Use 2008 to 2011

	2008 MMBTU	2009 MMBTU	2010 MMBTU	2011 MMBTU	Change from Baseline
All Utilities Combined					
Buildings	86,638	86,501	82,344	89,172	2.9%
Street Lights	4,656	4,696	3,579	3,224	-30.8%
Water Treatment	29,476	26,727	24,696	28,133	-4.6%
Vehicles	16,871	17,056	15,966	16,391	-2.8%
Total Energy Consumption	137,642	134,980	126,585	136,921	-0.5%

	2008 MMBTU	2009 MMBTU	2010 MMBTU	2011 MMBTU	Change from Baseline
Electric Only					
Buildings	28,924	27,097	26,417	25,850	-10.6%
Street Lights	4,656	4,696	3,579	3,224	-30.8%
Water Treatment	25,218	22,398	20,520	23,517	-6.7%
Total Energy Consumption	58,798	54,191	50,516	52,591	-10.6%

	2008 MMBTU	2009 MMBTU	2010 MMBTU	2011 MMBTU	Change from Baseline
Heat (Natural Gas + Oil)					
Buildings	57,714	59,404	55,920	63,315	9.7%
Water Treatment	4,258	4,329	4,177	4,616	8.4%
Total Energy Consumption	61,972	63,733	60,097	67,931	9.6%

	2008 MMBTU	2009 MMBTU	2010 MMBTU	2011 MMBTU	Change from Baseline
Vehicle Gasoline					
Vehicles-Unleaded	10,464	10,546	10,077	9,988	-4.5%
Vehicles-Diesel	6,408	6,510	5,889	6,403	-0.1%
Total Energy Consumption	16,872	17,056	15,966	16,391	-2.9%

	2008 MMBTU	2009 MMBTU	2010 MMBTU	2011 MMBTU	Change from Baseline
Renewable Energy/Solar					
Buildings	0	0	7	7	zero base

Renewable Energy Activities:

A major clean energy project for the town was approved in July, 2011 when a private solar photovoltaic ground mount PV solar facility got the approval to be built on 17.4 acres of land to the west of I-93 in the “Lowell Junction” area. In addition, a “fatal flaw” analysis has been conducted on the town’s former landfill to determine the potential of developing a wind or solar farm on the 26 acre site. The site does not exhibit the potential for wind generated power, but the northern section of the site may be viable for development of ground based PV once it is closed and capped. In addition, the Town of Andover is seeking to enter a 20-year contract to buy virtual net metering credits from solar PV installations located anywhere in the appropriate NGRID service zone. They are currently (March, 2012) evaluating a half dozen proposals. The town has also identified four town-owned properties they will consider leasing to a PV developer, who would then sell the town the virtual net metering credits. A solar consultant has examined the sites and estimated the potential solar PV output and revenue to the town. For more information on “net metering” in the region, see Section V.

Recommendations:

- the Town of Andover has a formal energy reduction plan in place as required in the Green Communities program. Many energy savings improvements have been completed such as lighting upgrades to all municipal buildings; motion sensors in the High Plain/Wood Hill, Sanborn, South, and West schools; and the installation of energy efficient street lights. Improvements planned in the next few years include: installation of demand control ventilation in several buildings, vending machine controls, kitchen hood controls, BAS recommissioning, variable frequency drives, premium motor upgrades, boiler retrofits, and computer power management. The town should consider participating in the Merrimack Valley Energy Services Contract (ESCO) Program. An investment grade audit (IGA) could be conducted by the ESCO, which would include project cost estimates, O & M cost savings and a payback period estimates to develop a financing and implementation plan;
- the town has adopted an energy efficient vehicle policy and, to date, has replaced three non-compliant Astro Vans with fuel efficient Ford Transit vans. The town should purchase two additional Ford Transit vans in the coming year to replace non-compliant vans. The town should also replace two non-compliant sedans with energy efficient sedans;
- the town installed five trash/recycling units which have allowed them to collect large volumes of recycling thus reducing the total tonnage of trash collected. The



town will need to monitor the use of public trash receptacles to see if there is a need for additional units;

- to stay current with their energy saving needs the town should fully participate in the MassEnergyInsight Program. The town should continue to work with MVPC and Merrimack College to obtain all their energy consumption data from MassEnergyInsight and use this data to inform their planning needs, and
- the Town of Andover has identified a number of renewable energy generating opportunities and should consider participating in MVPC's regional renewable energy manager program with the goal of converting the former landfill (once it is capped) to a solar farm and exploring PPAs from developers for identified Greenfield sites.

Town of Boxford

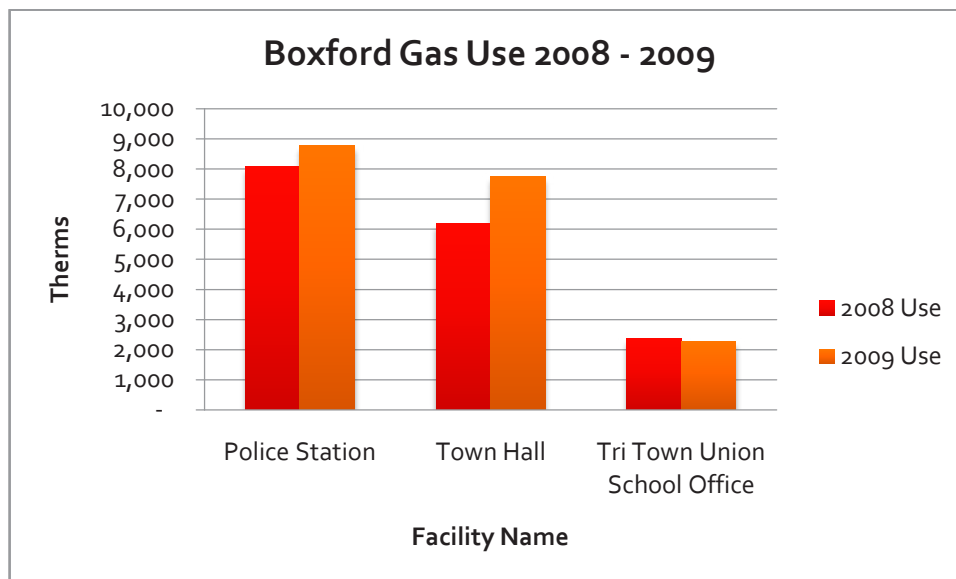
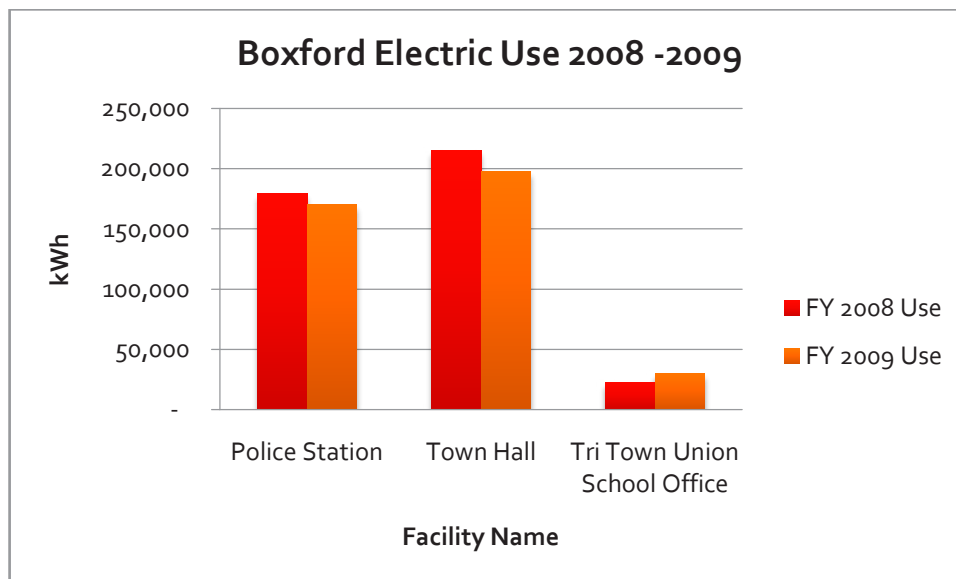
Current Conditions and Actions:

The Town of Boxford has been working actively to initiate efforts to reduce energy consumption. Their 2008 Master Plan makes energy conservation in the realm of housing construction and renovation a high priority by the selectmen. While this commitment was made in the 2008 Master Plan, efforts to change zoning to include as-of-right siting for renewable energy facilities, and efforts made in the May 2011 Town Meeting to adopt an energy efficient building (“stretch code”) were not successful.

Boxford reports that they have been obtaining energy consumption benchmark data for over five years using EPA’s Energy Star Portfolio Manager Software. The Town has saved over \$150,000 in the past four years on municipal building energy costs.

Additionally, the Department of Public Works is working with National Grid and the principal and teachers from Boxford’s Spofford Elementary School to take part in a new pilot program named “See the Light.” Sponsored by National Grid, this is a collaborative effort to bring energy conservation and reduction to the classroom, incorporating energy efficiency principles into the classroom. The program will work with teachers, school officials, children, and their parents to lower energy consumption in the school and hopefully encourage children to incorporate what they learned to everyday life at home.

The following graphs document energy consumption from 2008 and 2009:



Recommendations:

The Massachusetts DOER Green Communities Program is a worthwhile goal to realizing energy and cost savings while promoting a sustainable energy future. The five criteria of the Green Communities program allows for cities and towns easier access to sustainable natural resources such as wind and solar power that can contribute to energy savings. Furthermore, the Green Communities designation makes municipalities eligible for green energy grants provided by the state. MVPC recommends the Town of Boxford undertake the following:

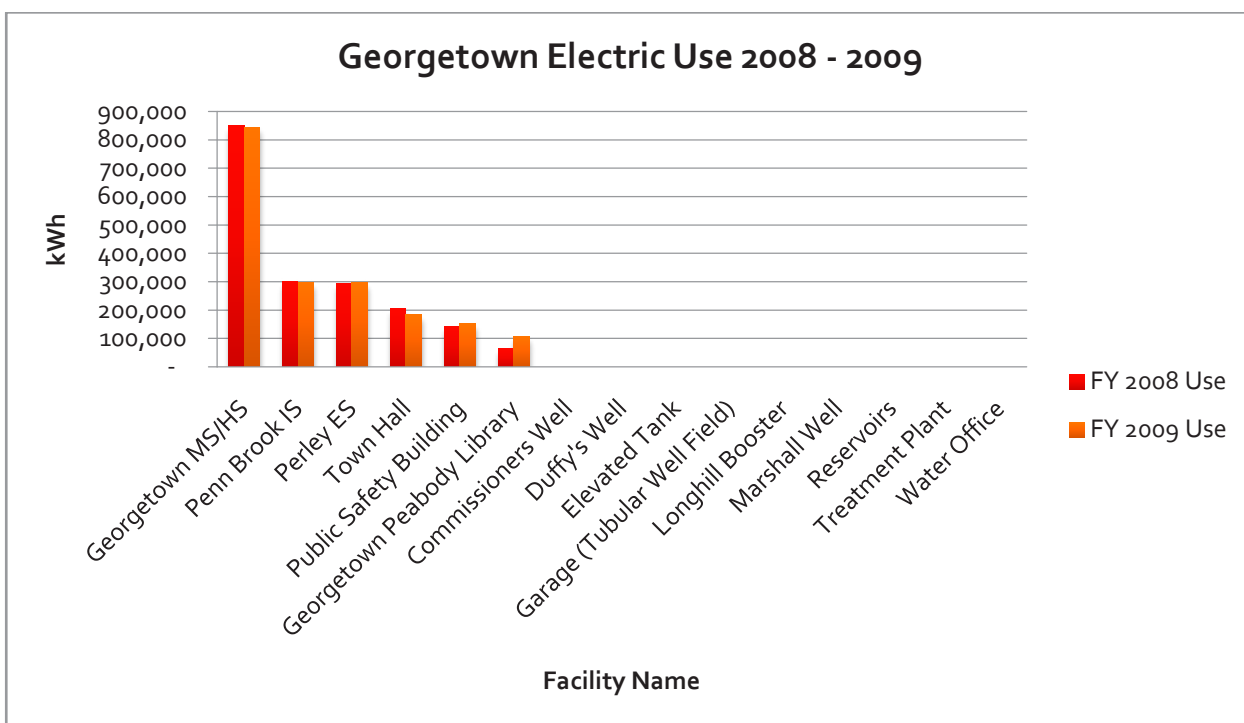
- while it is not easy or always appropriate for all communities to achieve the Green Communities designation, any aspects of the five criteria, which the town may adopt, will be a worthwhile initiative. An incremental process of adoption may work best for the town;
- since 2008 Boxford has tracked and managed energy consumption through the Energy Star Portfolio Manager, an online energy data tracking tool provided for free by Energy Star. Their Public Works Department is committed to keeping track of energy consumption in all the municipal buildings and has been actively engaging town officials and the heads of each department to be conscious and proactive in their efforts to lower energy consumption, and
- as part of MVPC's fatal flaw analysis for potential renewable energy locations in their region, Boxford's municipal landfill was identified as one of only four landfill sites in the region deemed an acceptable site for a large solar installation. Since the site has been out of operation for over 10 years, Boxford should officially close the landfill in accordance with the Department of Environmental Protection protocol. Utilizing unused public land for renewable energy generation can benefit the town by lowering energy costs and reducing overall energy consumption.

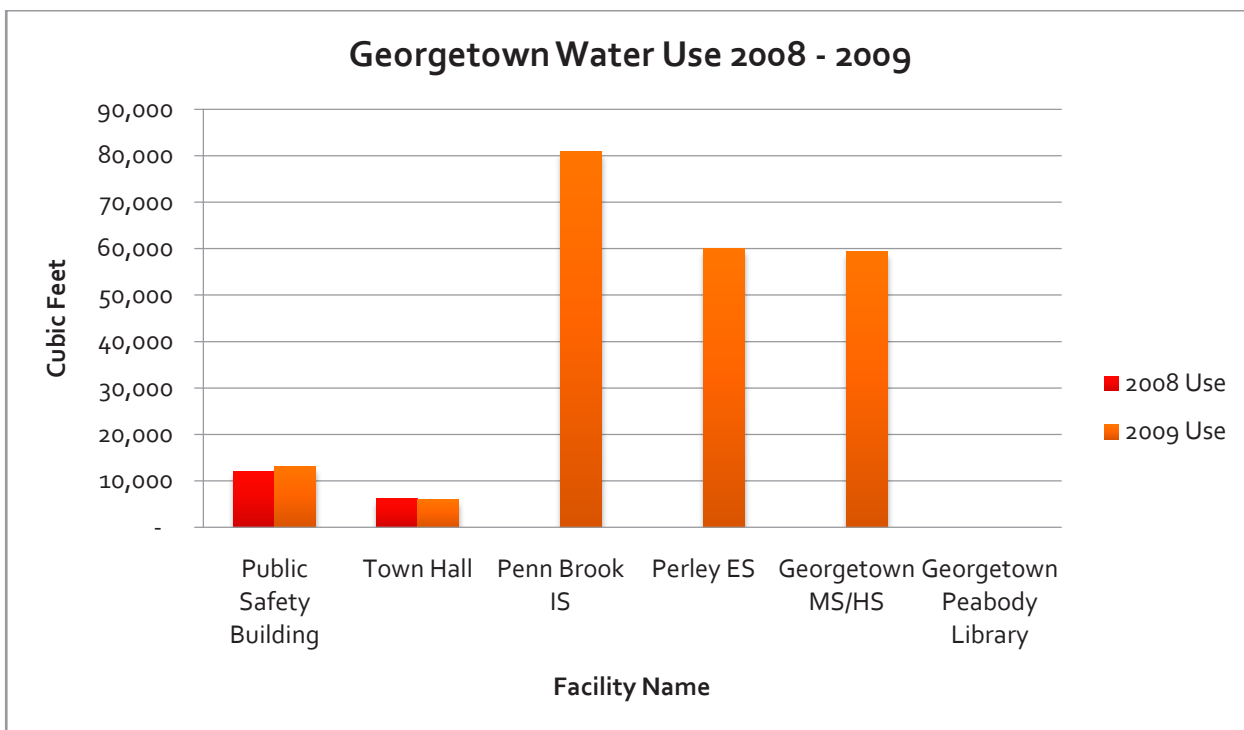
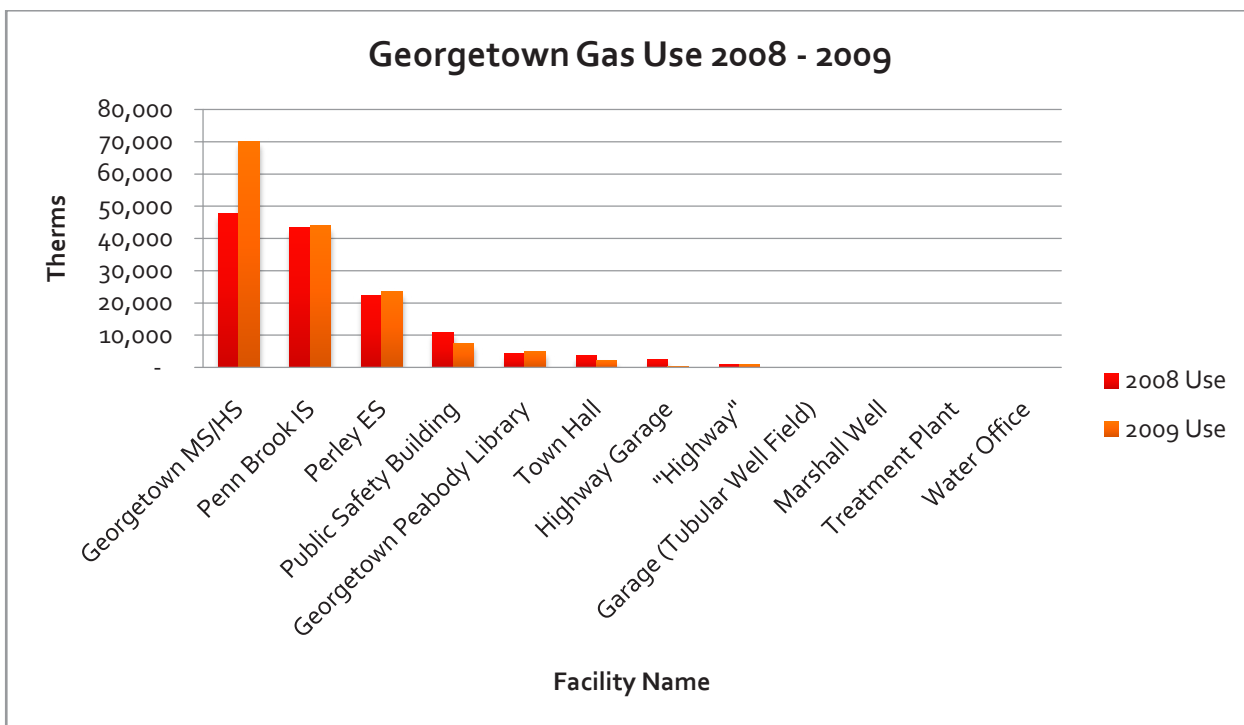
Town of Georgetown

Current Conditions and Actions:

The Town of Georgetown has a 5 person Energy Committee made up of the Town Administrator, Light Department Manager, School Business Manager, Finance Advisory Board member, and a Board of Selectman appointee. The committee reports that the Town has entered into a \$2.2 million Energy Management Services Agreement with ABM Building Solutions under MGL 25a. The infrastructure improvements resulting from this project will guarantee a minimum 20% savings in total energy usage to the Town.

Below are graphs depicting Georgetown's electric, gas, and water usage from 2008 to 2009:







Recommendations:

- a fatal flaw analysis of Georgetown's capped and closed landfill prepared by MVPC documents that for a solar PV- no fatal flaws exist. MVPC recommends the town work with the Regional Renewable Energy Manager to move forward with development of a solar farm on the landfill;
- the town should work with MVPC to access MassEnergyInsight data in order to obtain current energy consumption data so that an energy reduction plan can be developed, and
- the town should consider an incremental adoption of the "green communities" criteria with the goal of full adoption and becoming a "green community". Adoption of any of the five criteria is positive accomplishments for the town.

Town of Groveland

Current Conditions and Actions

The Town of Groveland, one of the smallest communities in the Merrimack Valley, has taken proactive steps in relation to energy efficiency and renewable energy measures. Over the past several years, the Town's energy costs have decreased, in part through the Town's replacing of lighting fixtures and all heating systems with energy efficient systems and locking all thermostats to control heating. The Town has taken advantage of energy efficiency programs through National Grid in spring 2011, which provided an energy audit and recommendations to provide more insulation in town buildings and more programmable thermostats.

Also, in December 2011 the Conservation Commission unanimously agreed to bring the topic of Green Community Designation to the Groveland Board of Selectman in order to address energy inefficiencies in the Town, as well as bring solar power to some of the municipal buildings.

In addition, and as described below, the town light department is building a solar field on town owned property to ensure stable electricity rates.

Renewable Energy:

In May 2012 the Groveland Municipal Light Department submitted an Environmental Notification Form to the Massachusetts Office of Energy and Environmental Affairs for approval for a solar field to be built at 446 Main St, the site of a former gravel pit. From this 35-acre parcel of land, the town plans to develop 15 acres of the site for pedestal mounted solar arrays. The estimated completion date for the project is December 30, 2012. This 3.5-megawatt solar farm will generate approximately 4 million kilowatt hours of energy per year, which will offset about 12% of Groveland's yearly energy purchases.

Recommendations:

The Town of Groveland has stated they do not need direct assistance from MVPC at this time, and are comfortable moving forward with their energy savings initiatives at a pace that a small town with very little staff is able to comfortably handle. MVPC recognizes Groveland's accomplishments, and will help with any future initiatives, as the town desires. These initiatives which MVPC recommends the town consider include:

- technical assistance with renewable energy projects using the regional energy manager;
- data tracking and management using the MassEnergyInsight online energy data tool, and
- Groveland should follow through with the Conservation Committee's unanimous vote to explore Green Community designation.

City of Haverhill

Current Conditions and Actions:

Haverhill's Mayor's Energy Task Force completed a report in 2007 outlining the status and future actions concerning energy consumption in the city. The key goals of the task force were to reduce energy "footprint" and expenditures, be at the forefront of new energy technology, and these recommendations should involve negligible capital investment from the general fund. Go to the special task force website: <http://havenergy.civiczone.net>, but it has not been updated since March 2010. The city has recently signed on with Ameresco to conduct audits of all their municipal buildings.

As part of their Federal application in 2009 for the Energy Efficiency Community Block Grant (EECBG) program, Haverhill committed to an Energy Efficiency and Conservation Strategy.

A primary feature of Haverhill's proposed EECBG strategy is to leverage other resources, funds, and activities with EECBG funds and initiatives, to the maximum level possible. To that end, Haverhill planned to take the following steps:

- 1.) Convene a City EECBG Steering Group made up of representative of major City departments, including the Mayor's Office, School Department, Public Works, and Finance, to ensure that ongoing City activities are in sync with EECBG goals, that no opportunities to leverage EECBG funds are lost, and that all expenditures can be fully audited.
- 2.) Meet with National Grid representatives to share EECS and to learn about the technical support and investment incentives available to increase the efficiency of City buildings. Also, consult with state agencies about complementary services and programs that may be available to Haverhill through the State Energy Plan, State's EECBG program, etc., as well as competitively from Federal sources.
- 3.) Technical analysis of additional City buildings to identify projects and technical specifications. (An IGA with Ameresco has been completed).
- 4.) Implement single-stream recycling pilot and analyze results, through the Recycling Coordinator. (This has been done).
- 5.) Begin small and large energy efficiency retrofits, including the City Center, with ongoing monitoring and verification. (City Council has approved a bond for this work and EECBG funds will be used).

A key priority for the Mayor's Energy Task Force was to establish an Energy Manager role within the City of Haverhill. This Energy Manager would:

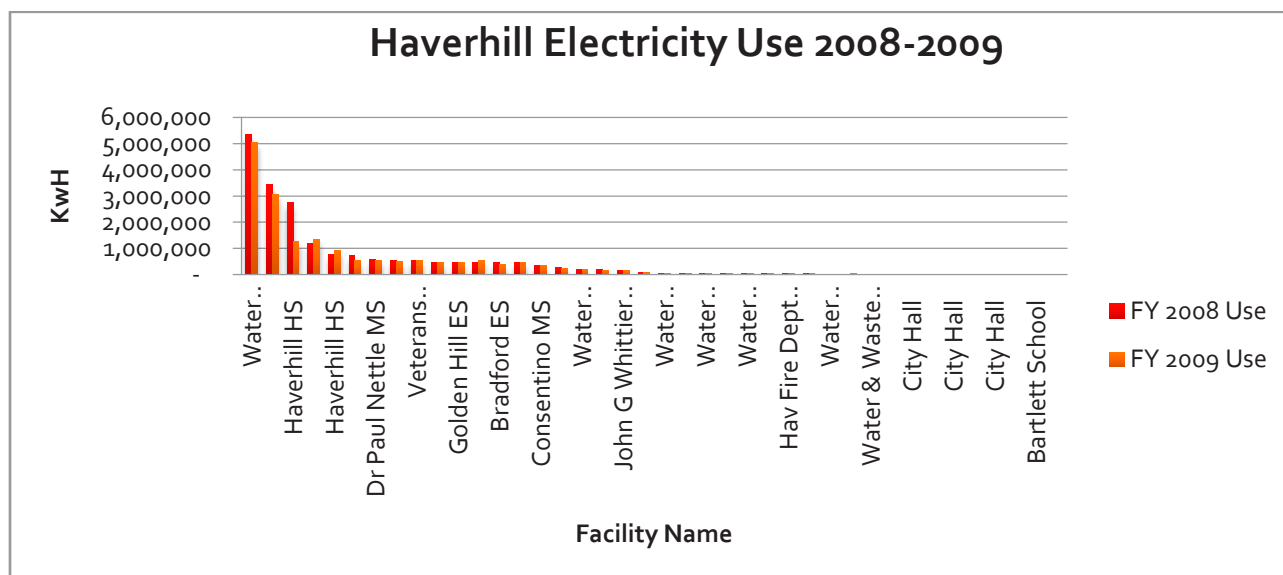
- monitor energy use and expense throughout the city;
- recommend behavioral changes to reduce energy use;
- recommend capital equipment upgrades to reduce energy use, and
- be the focal point for city employees and contractors for all energy matters.

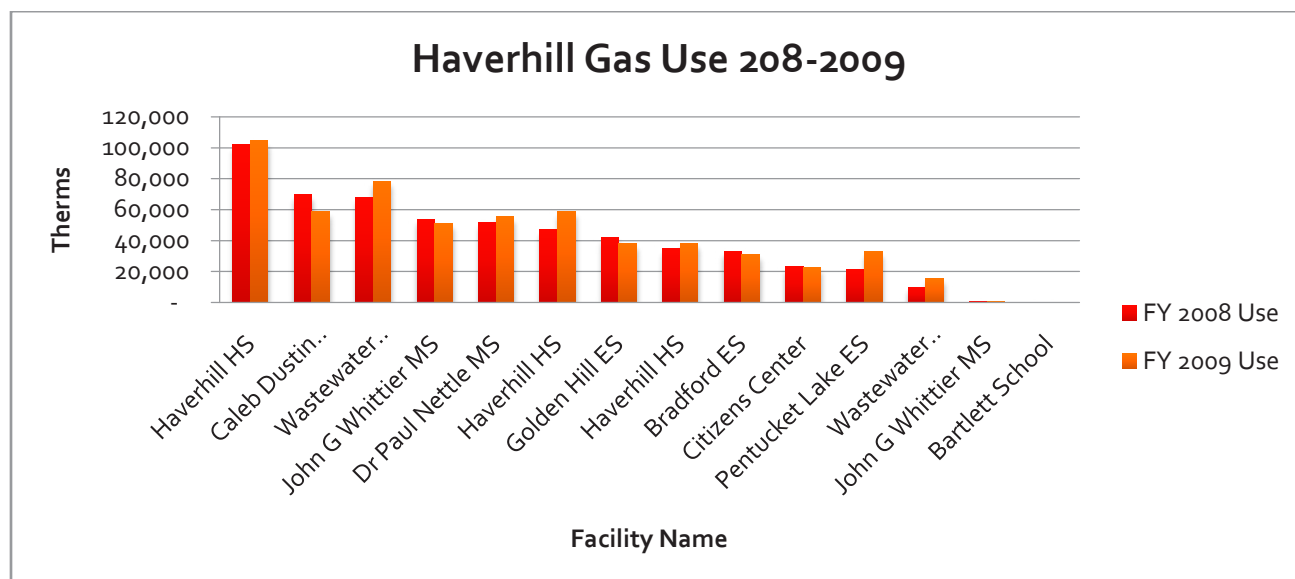
The city has been working with Peregrine Energy Group who in effect has been serving the role of Energy Manager for the city.

Some of the other recommendations to emerge from the Task Force report were the following:

- encourage Haverhill citizens to purchase clean electricity;
- issue an energy savings performance contract RFQ;
- pursue a power purchase agreement;
- consider the use of bio-diesel fuel for city vehicles;
- incorporate renewable energy requirements in public building standards for new development (MA Stretch Energy Code);
- consider evaluating alternative electric supply contracts to reduce expenses, and
- continue to upgrade pumps and controls.

The following graphs show the energy consumption by facility between 2008 and 2009. Data was collected for facility electricity and gas use for these two years.





2008 and 2009 Fuel Use - Aggregated by Building

Fuel	FY 2008 Use	FY 2009 Use	Percent Change	Fuel Units
Electric	19,817,888	17,632,104	-11%	kWh
Gas	555,719	585,890	+5.4%	Therms

Recommendations:

The City of Haverhill recognized the need to reduce their energy consumption, and assembled a task force to address the issue, and outlined more energy efficiency and conservation strategies in an EECGB application. MVPC recommends the following as the city moves forward:

- The city should continue to use the Regional Energy Manager;
- The city should also consider using MassEnergyInsight to gain a complete understanding of their energy consumption. These baseline energy numbers will be necessary in order to move forward and lower their energy consumption;
- The city has entered into an IGA with Ameresco for an energy audit of all the municipal buildings, a positive step towards addressing energy issues. We encourage them to move forward with this positive step;
- The City should also consider seeking Green Community Designation through the MA DOER Green Communities Program, or consider adopting criteria of green community's designation most suitable for Haverhill such as creating a baseline vehicle inventory and non-fuel efficient vehicle reduction plan;
- The city has made upgrades to pumps and controls, and should continue to do so;
- The city has implemented a single stream recycling program and has been encouraging citizens to use the system. This will be an ongoing and somewhat slow educational process to obtain a high user rate, but should be vigorously pursued, and
- The city should cap the landfill and pursue its potential as a solar farm. A fatal flaw analysis completed in 2011 documented that no fatal flaws existed. Once it has been closed, the Regional Renewable Energy Manager can assist the city move forward with that initiative.

City of Lawrence

Current Conditions and Actions:

With a goal of being designated a Green Community under the Massachusetts Department of Energy Resources Green Communities Program, in 2009, the City of Lawrence made commitments to improving energy efficiency and conservation as stated in their December 2009 US Department of Energy's Energy Efficiency and Conservation Block Grant (EECBG) Program application. This effort is summarized below. In addition, the City has contracted with the regional energy services company, Ameresco, and a preliminary energy audit and an investment grade energy audit (IGA) have been completed. The energy efficiency recommendations made in Ameresco's IGA have been divided into two phases. Phase one involves energy conservation improvements in City Hall and the Library and will be completed in August 2012. Phase one is projected to cost \$545,000 and will be funded with EECBG assistance. The project will save the community \$50,000 in energy costs per year once completed. The city is also looking at a Phase two, a much larger project, which would need borrowing authorization or a long term lease agreement. Phase two is being discussed among city officials.

Energy Efficiency and Conservation Strategy Goals:

The Energy and Efficiency and Conservation Strategy outlined four important municipal goals:

- reduce energy use and expense in City buildings, including schools;
- demonstrate a commitment to renewable energy;
- have energy saving codes in place, and
- continue to refine and expand recycling capabilities.

EECBG-related activities were proposed along with other ongoing local energy initiatives including energy efficient new school construction, retrofitting streetlights and traffic signals, and photovoltaic on the regional wastewater facility.

A primary feature of Lawrence's proposed EECBG strategy was to leverage other resources, funds, and activities with EECBG funds and initiatives, to the maximum level possible. To that end, the city proposed the following steps be taken:

The City of Lawrence EECBG strategies:

- 1.) Establish a city EECBG Steering Group made up of representatives of major city departments, including the Planning Department, School Department, and Public Works to ensure that ongoing city activities are in sync with EECBG goals and that no opportunities to leverage EECBG funds are lost.
- 2.) Meet with representatives of local gas and electricity utility distribution companies to learn about the technical support and investment incentives offered to increase the efficiency of city buildings.
- 3.) Consult with state officials about state services and programs that may be available to Lawrence through the State Energy Plan and State EECBG Strategy, as well as under the States' 2008 Green Communities legislation.
- 4.) Initiate technical evaluations of City buildings, beginning with the poorest performers, based on benchmarking data, and continuing with other buildings and energy users, to identify specific projects.
- 5.) Enhance and expand the city's recycling efforts.
- 6.) Begin implementation of all projects, including ongoing monitoring and verification.

The city's implementation plan for the use of EECBG Program funds to assist in achieving the goals and objectives for energy efficiency and conservation offered the following:

Lawrence will use its EECBG funds to meet the goals of reducing energy use and expense in City buildings, including schools; demonstrating a commitment to renewable energy; putting energy saving building codes in place; and continuing to refine and expand recycling capabilities.

1.) Develop an Energy Efficiency and Conservation Strategy:

Lawrence has engaged a consultant to support its development and implementation of an Energy Efficiency and Conservation Strategy, as well as to help identify activities and projects that the city will pursue and resources that can be leveraged. This effort was initiated in June 2009.

2.) Technical Consultant Services:

Lawrence will reserve EECBG funds for technical services that may be required to support projects, as well as to leverage technical services from other sources. Consultant services will be used to identify and quantify the benefits of operational improvements and capital projects that can be implemented using EECBG funds or with other funds that the City may commit to this purpose in the future. The city expected to use a portion of EECBG allocation for specialized support to assist with development of equipment specifications and bid documents as needed, as well as for monitoring and verification of results and reporting to DOE. The city will work closely with National Grid, the electricity distribution company, to secure whatever assistance is available to the city and will also consult with Columbia Gas of Massachusetts, the natural gas supplier. They anticipate additional support from the MA Department of Energy Resources to identify additional technical support services, including audits, consultant advisors, and benchmarking tools that can be used to target investments and maximize city benefits.

3.) Energy Efficiency Retrofits:

Lawrence proposed leveraging electric and natural gas utility incentive dollars, using EECBG funds as the owner cost share for energy efficiency projects. Their goal is to stretch the leveraged impact of the federal funds as much as possible, taking advantage of programs the utilities offer to underwrite and finance such investment. The city will also explore the availability of other State and Federal resources, which can be used to complement and supplement these funding sources.

4.) Building Codes and Inspections:

The Planning Department will have lead responsibility for this activity, developing guidelines to ensure that new construction and major rehabilitation projects reflect best industry practices for Green construction. This will include: educating and equipping building inspectors with the tools for encouraging and enforcing green standards and energy efficiency; and also coordinating permitting practices to increase building energy efficiency. An emphasis of this activity will be to address and alleviate the city's congestion problems related to public parking and automobile use by promoting transit-oriented development ("TOD").

5.) Materials Conservation:

The city's Municipal Recycling Coordinator will take the lead in applying EECBG funds to acquire recycling roll-out "totes" and bins for residents as well as barrel reuse stickers. A new Automated Trash Collection System is being adopted for 11,500 households and EECBG funds will support public education on proper materials handling. Further, school programs, such as "Litter-acy for Youth" will be funded to build support for recycling among school children.

6.) Renewable Energy on Government Buildings:

The city proposed the installation of a photovoltaic system atop the Lawrence Public Library to demonstrate solar energy's potential, reduce electricity costs for municipal buildings, and educate library users. The installation included an educational kiosk to provide information on ongoing electricity generated and its benefits to the city and the planet.

Recommendations:

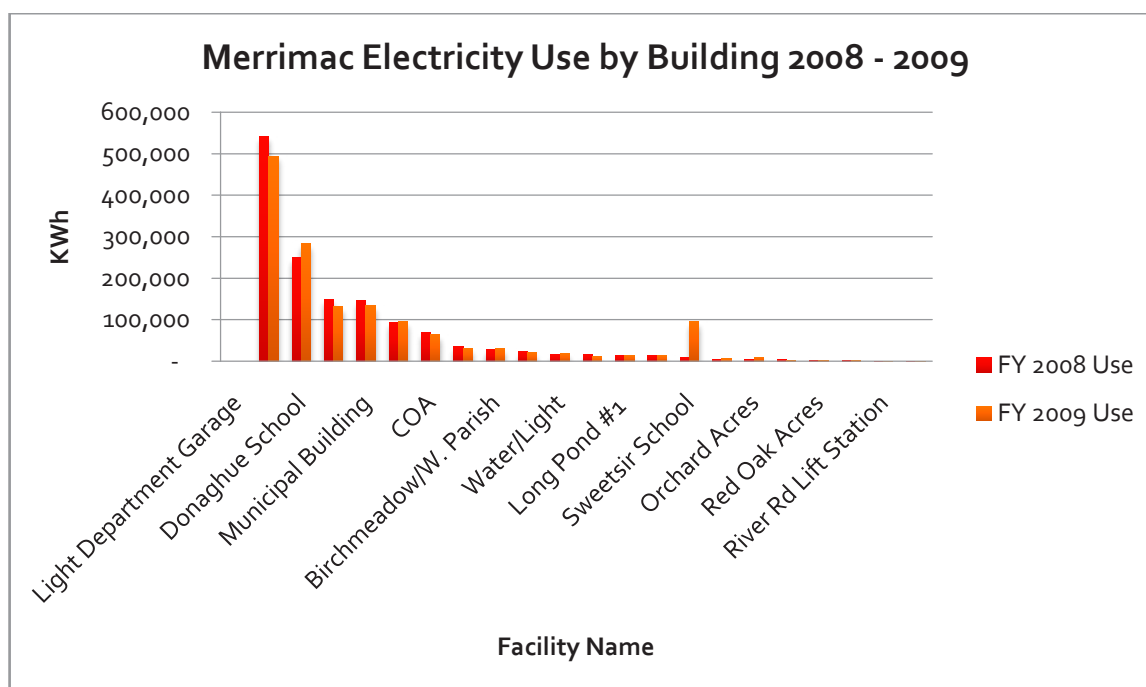
- seek designation by the commonwealth as a "Green Community";
- utilize MassEnergyInsight, using the support of MVPC;
- MVPC recognizes that Lawrence has used a majority of the EECBG grant money to renovate the Public Library and City Hall. We recommend that they recommit to the goals set forth in their 2009 EECBG strategy to make further energy efficiency improvements across City municipal buildings, expand recycling capabilities, and explore opportunities to incorporate renewable energy, and
- MVPC recommends that Lawrence moves forward with financing the recommendations made in the Ameresco IGA, which include improvements to heating, lighting, and other energy efficiency and conservation improvements to the remaining city buildings and school buildings.

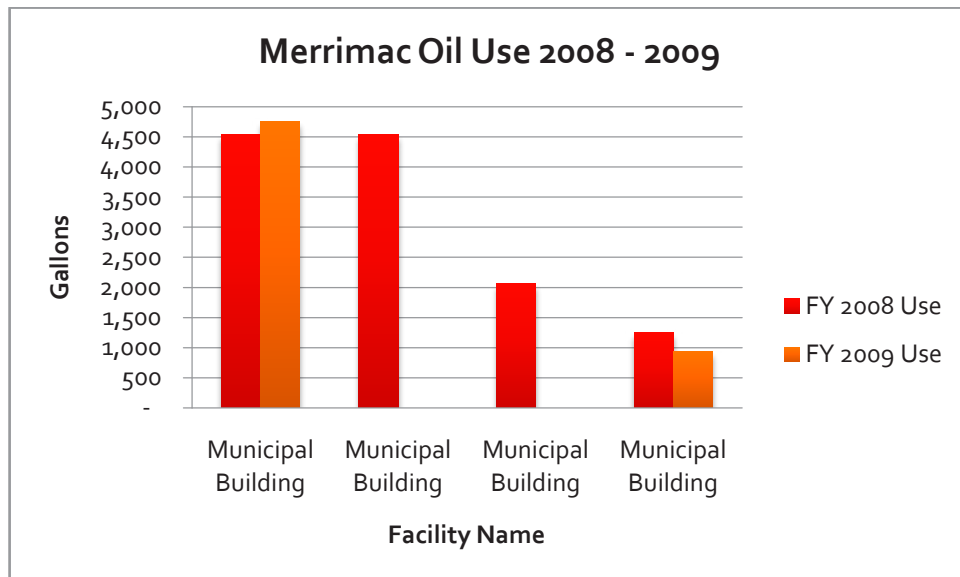
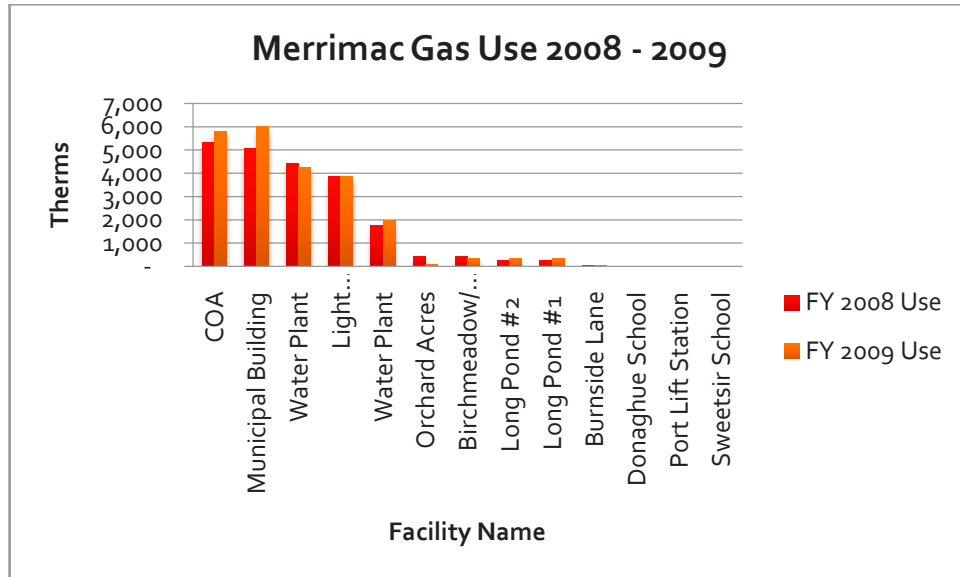
Town of Merrimac

Current Conditions and Actions:

As a smaller community, Merrimac has limited staff to address their energy concerns, but they have expressed interest in Green Community designation and reducing their energy costs. They have seen increases in their energy costs and want to develop a plan of action to reduce these costs and overall consumption. They are currently working with Ameresco to begin auditing all their buildings to create baseline energy consumption data for future improvement. A preliminary energy audit was presented to the board of selectmen and approved. An investment grade audit will be complete in June 2012. Additionally, Merrimac has indicated that they would like to utilize the MassEnergyInsight tool to better track their energy consumption.

MVPC has energy consumption data for Merrimac from 2008 and 2009. The following charts display electricity, gas and oil use in 2008 and 2009, broken down by municipal building:





Recommendations/Future Actions:

Merrimac has shown interest in lowering energy costs, tracking energy consumption, and developing an overall management plan. Using the free MassEnergyInsight online tool provided by MA DOER would be a low-cost first step towards more efficient energy management. Suggested recommended actions:

- consider steps to becoming a designated Green Community. This can be done over time as to best suit the towns' needs and resources.
 - identify sites suitable for renewable projects and approve “as-of-right siting” zoning amendment;
 - approve expedited application and permitting process for renewable energy facilities;
 - work with MVPC and Merrimack College to begin utilizing the Mass Energy Insight online energy tracking tool in order to obtain baseline energy consumption data so a plan can be put in place to reduce consumption;
 - Purchase only fuel-efficient vehicles for municipal use whenever such vehicles are commercially available and practical, as well as developing a vehicle fleet inventory, and
 - adopt the Stretch Energy Code.
- using the information provided by the ESCO, develop an “infrastructure modernization plan” to make the towns buildings more energy efficient.

City of Methuen

Current Conditions and Actions:

The City of Methuen has taken some positive steps to reduce their energy consumption. They have received funds from the Energy Efficiency and Conservation Block Grant Program which is described in more detail below, the city has used national grid to conduct a public building audit, they intend to replace all their servers and reduce the number of servers from 35 to 3 thus reducing the energy consumption by 95%, and they have recently signed on with Ameresco for energy audits.

Energy Efficiency and Conservation Block Grant Program

As part of their Federal application in 2009 for the Energy Efficiency Community Block Grant (EECBG) program, Methuen committed to an Energy Efficiency and Conservation Strategy.

A primary feature of Methuen's proposed EECBG strategy is to leverage other resources, funds, and activities with EECBG funds and initiatives, to the maximum level possible. To that end, Methuen planned to take the following steps:

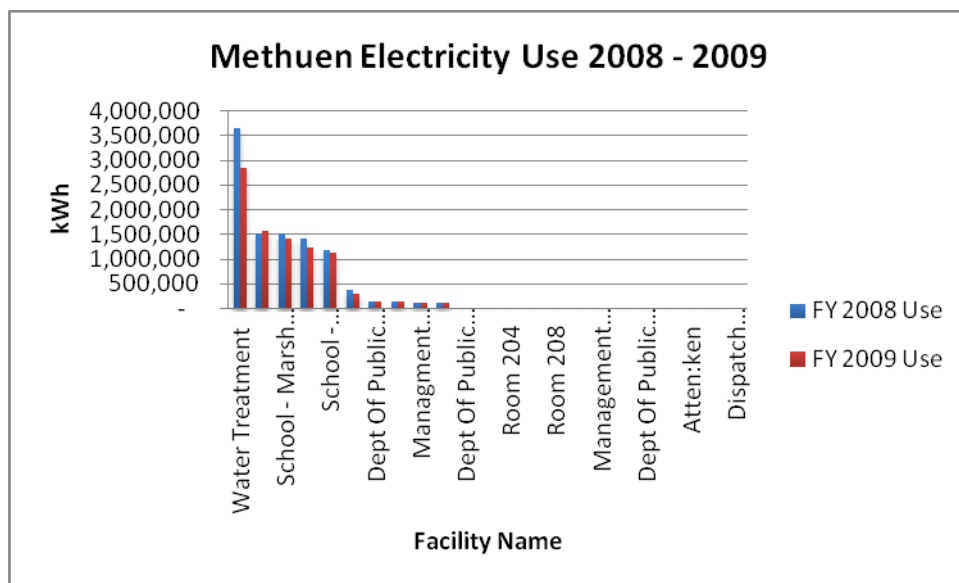
- establish a City EECBG Steering Group made up of representatives of major City departments, including the Mayor's Office, School Department, Public Works, Finance, and the Committee on Energy Efficiency to ensure that ongoing City activities are in sync with EECBG goals and that no opportunities to leverage EECBG funds are lost;
- meet with representatives of local gas and electricity utility distribution companies to share the EECS and to learn about the technical support and investment incentives offered to increase the efficiency of City buildings;
- consult with state officials about state services and programs that may be available to Methuen through the State Energy Plan and State EECBG Strategy, as well as under the States' 2008 Green Communities legislation;
- initiate technical evaluations of City buildings, beginning with the poorest performers, based on benchmarking data, and continuing with other buildings and energy users, to identify specific projects, and
- design a single stream recycling demonstration program through the City's Recycling Coordinator.

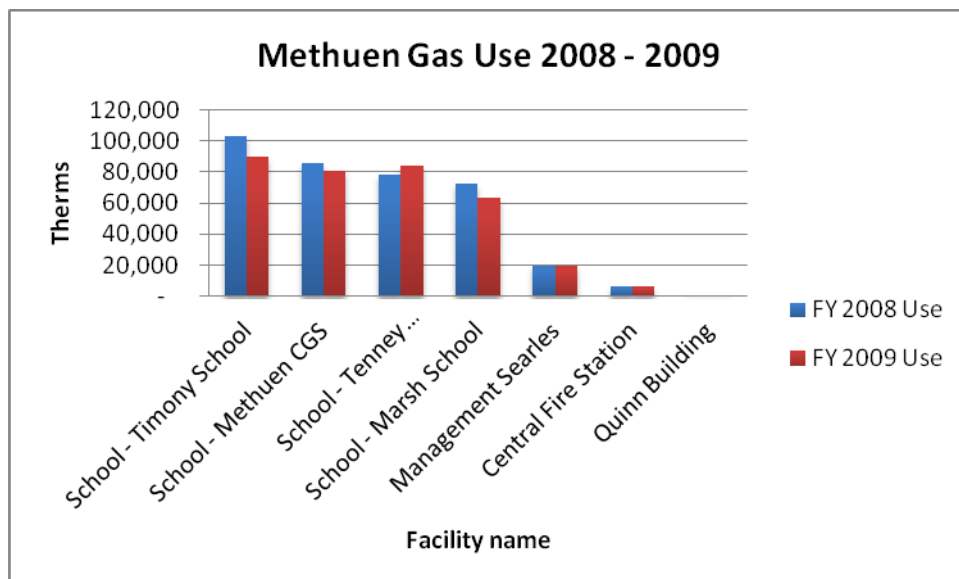
“Net-Metering Utility Credit Proposal”

The City of Methuen has solicited a proposal for qualified and experienced renewable energy developers to implement a performance based renewable energy system.

- Methuen aims to purchase the net-metering credits from a PV Solar system(s) of up to 9000 kW (DC) with a ground mounted solar photovoltaic (PV) arrays for the city;
- reduce the total price paid for electricity by the City in the short and long term;
- proposal shall be for developing up to 9.0 Mega Watts of solar electricity projects to be sites off municipal property, not on city owned land, and
- the City of Methuen intends to enter into a Net-Metering Utility Credit Purchase Agreement (NMUCPA) with the Developer. Negotiations are presently ongoing.

In terms of tracking energy use information, Methuen has provided MVPC with electricity and gas use by facility in 2008 and 2009. While both graphs show a slight decrease for several facilities from 2008-2009, the consumption patterns remain fairly consistent across both years.





Renewable Energy:

The City of Methuen should be credited for the work they have done to convert a former municipal landfill into a solar farm where 5,000 solar panels could be installed. The panels are expected to generate enough power to reduce the city's annual electric costs by \$92,000. Methuen began exploring the idea of a solar farm in late 2009, and received a grant from the Department of Energy Resources to hire a consultant to help develop a request for proposal. The City Council, in November 2011, unanimously approved two agreements with a company that would install the panels on the landfill and sell the resulting power back to the city at reduced rates. The company has prepared design plans for the project and has submitted plans on the city's behalf in early May 2012 to Mass DEP for a post closure landfill modification plan. The city is awaiting the approval of the modification plan. Also plans have been submitted to the Methuen Conservation Commission and an approval has been received to proceed with work. Construction of the solar arrays is expected to begin in August 2012.

Recommendations and Future Actions:

The Massachusetts DOER Green Communities Program is a worthwhile start to realizing energy and cost savings while promoting a sustainable energy future. The five criteria of the Green Communities program allows for cities and towns easier access to sustainable natural resources such as wind and solar power that can contribute to energy savings. Furthermore, the Green Communities designation makes municipalities eligible for green energy grants provided by the state. Lastly, the criteria that mandates an energy tracking system gives each municipality the ability to easily collect, track, and analyze energy data over time by facility or as a whole to realize potential problem areas and designate them as priorities for future action. Any action the city puts forth towards “green community” designation is a positive step, and some elements will be easier to achieve than others. With this as an ultimate “goal” MVPC recommends the following:

- Methuen work with MVPC and begin utilizing the MassEnergyInsight online energy-tracking tool in order to obtain baseline energy consumption data so a plan can be put in place to reduce these numbers;
- Methuen has been working to convert their old landfill into a “bright-fields” site. The city should work to insure completion of this project;
- continue working with an ESCO to perform energy audits on all municipal buildings;
- implement as appropriate the strategies identified in the EECBG;
- consider using the Regional Renewable Energy Manager to assist in identifying other opportunities such as installation of solar panels on the high school roof, and
- follow through with the replacement of servers reducing the number from 35 to 3.

Town of Newbury

Current Conditions and Actions:

The Town of Newbury has demonstrated that energy consumption and related issues are a concern in their community, and therefore are taking proactive steps to assess and explore opportunities to realize energy savings in their town. The town has considered becoming a “green community”, but felt adoption of the stretch code was not appropriate for the town at the present time. Nevertheless, the town has taken related steps towards assessing energy consumption. The town has taken advantage of the National Grid utility programs that saw the Town Hall heating system converted from a low efficiency oil burner to high efficiency gas burner which resulted in significant heating cost savings. National Grid also replaced the lighting in Town Hall, Police Department, and Police trailers. Furthermore, the un-insulated garage doors at the Department of Public Works (DPW) building have been replaced with insulated doors, and the windows have been replaced with insulated panes. In addition, some street lights have been turned off, and future plans call for attic insulation in the DPW building and Town Hall, and door and window replacement in the police trailers as well as replacing the police station heating system. The Town has recognized that the DPW building and the police trailers are the biggest energy consumers and have identified that the DPW heating system needs to be replaced as well as adding new insulation. Lastly, the town has begun to work with MVPC to assess their energy consumption through the use of MassEnergyInsight data.

Renewable Energy Activities:

The town, (in July 2012) signed a six month contract with American Renewable Energy & Sustainability Solutions of Newburyport allowing them to explore the viability of using town owned land on Central Street and land near the town’s closed landfill for a possible ground mounted solar farm. The project includes plans to sell the energy or “utility credits” produced by the facility to a third party. Newbury would gain revenues from rental fees and a payment in lieu of taxes for use of the land. The town could also enter into a “power purchase agreement” and purchase some of the power generated by the solar farm at discounted prices. The sites to be examined include 63 acres at 81 Central Street, a 15-acre site on Hanover Street, and 27 acres at 75 Boston Road.

In addition, the town, working with National Grid, has also explored the potential of installing solar arrays on the roofs of Town Hall and the DPW facility.

Recommendations:

- since Newbury's energy costs have increased over the last several years, town officials have begun the process of working with MVPC to assess energy consumption, specifically through the DOER MassEnergyInsight online energy-tracking tool. The town needs to move this initiative to the next level;
- the town should work with the Regional Renewable energy Manager to advance the idea of installing solar arrays on the roofs of Town Hall and the DPW building;
- the town should revisit the idea of becoming a "green community". With better education of town officials and the general public, adoption of the "stretch code" may be possible. Over 100 communities in the commonwealth have done so. Adoption of any of the five elements to becoming a "green community" is a positive step for the town and worth the effort. At the towns desired pace, incremental passage of these elements should be considered, and
- the town has conducted an audit of the town buildings. They should now work with the Regional Energy Services Company to complete the recommended infrastructure improvements.

City of Newburyport

Current Conditions and Actions:

The City of Newburyport was designated as a “Green Community” under the Massachusetts Department of Energy Resources (DOER) Green Communities Program in December of 2010. They have achieved this through meeting the five criteria set by DOER’s Green Community program. As part of their Green Community application, the City of Newburyport developed an Energy Reduction Plan in 2010 to further explain their commitment to reducing energy consumption in the city. Below is a summary of that plan.

In addition, Newburyport is one of few communities in the state to have created a full time position dedicated to energy management as well as recycling, composting, and solid waste reduction. This clearly documents the emphasis Newburyport places on energy reduction and the associated benefits.

Energy Reduction Plan - October 2010

- using Mass Energy Insight energy consumption data, Newburyport has identified the police department, library, City Hall and the Kelley School Youth Center as the least efficient public buildings. Additionally, the Nock/Molin Middle School, the Newburyport High School and the Brown Elementary School have been identified as high energy users;
- the Newburyport Public Schools have been prioritized as areas for energy efficiency improvements including:
 - New boiler at Bresnahan School;
 - New lighting in High School, and
 - Repairs to heating equipment in the High School, Nock/Molin School, and Brown School.
- LCI Energy conducted an audit of 8 Newburyport buildings in 2009 (four school buildings, four city buildings) and the energy conservation measures proposed as a result of this audit included:
 - air sealing and insulation repair;
 - new boiler at the Bresnahan School (completed);
 - air source heat pumps and gas-fired duct heaters at the Nock/Molin School;
 - HVAC Controls improvements at the Brown and Bresnahan Schools;
 - lighting and/or upgrades in several buildings;
 - Economizer operation for air handling in units at the police station, and
 - Lighting controls at the library;

- HVAC Controls improvements at the Police Station and City Hall, and
- HVAC modernization at the Kelley School.

The projected savings from these measures is approximately 9714 MMBtu's, which represents approximately a 20% reduction in energy consumption from Newburyport's Fiscal Year 2009 baseline. The timeline for completion of these projects is FY 2014.

Baseline energy inventory and reductions summary:

FY2009 vs. FY2010 energy consumption and greenhouse gas emissions in municipal buildings

	FY2009		FY2010		Percent Change	Percent change energy consumption
	CO ₂ emissions	Energy consumption	CO ₂ emissions	Energy consumption	CO ₂ Emissions	Energy Consumption
Electric	7,031,171	23,168	6,326,686	23,844	-10%	3.1%
Gas	1,385,387	12,019	755,717	6,675	-45%	-44.5%
Oil	552,204	3,454	474,255	2,967	-14	-14.1
Total	8,968,762	38,641	7,556,658	33,486	-15.7	-13.3%

Estimated Costs and payback for Energy Conservation Measures

Building	Total Cost of ECMs	Potential Utility Incentive (estimate)	Net Cost	Annual \$\$ Saved	Years to Payback
City Hall	\$41,562	\$21,000	\$20,562	\$7685.00	2.68
Police Station	\$51,080	\$20,000	\$31,080	\$12,839.00	2.42
Library	\$70,754	\$15,000	\$55,754	\$10,485.00	5.32
Kelley School	\$116,190	0	\$116,190	\$7,712.00	15.07
Brown School	\$61,360	0	\$61,360	\$10,083.00	6.09
Bresnahan School	\$127,107	\$22,500	\$104,607	\$312,492.00	3.29
Nock/Molin Middle School	\$1,696,365	\$78,000	\$1,618,365	\$119,707.00	13.52
High School	\$75,252	\$23,000.	\$52,252	\$43,381.00	1.20
Total	\$2,239,670	\$179,500	\$2,060,170	\$524,384	6.10

Newburyport has a plan to reduce all energy consumption in municipal buildings, including the school buildings, by 20% in five years. Because they have been awarded

Green Community Designation, they also have a plan to move towards energy efficient vehicles where appropriate. Below is the schedule of completion for energy efficiency measures:

Facility	FY09	FY10	FY11	FY12	FY13	FY14
Water Department						
R.A. Nock Middle School	x	x	x	x	x	x
Newburyport High School	x	x	x	x	x	x
Street and Traffic Lights						
Library				x	x	x
G.W. Brown School	x	x	x	x	x	x
Police Department			x	x		
Sewer Department						
City Hall			x	x	x	
F.T. Bresnahan School	x	x	x	x	x	x
Fire Department						
Public Works Department						
Firehouse Center						
Office of Emergency Management						
Harbormaster Building						
Kelley Youth Center			x			
Projected Savings (MMBTu)		4023	3000	1503	1072	
% Change from Baseline	+ <1%	-6%	-5%	-5%	-4%	
Total Savings:	9714 MMBtus					

Renewable Energy Status:

Solar Photovoltaic

Solar panel installation was completed on the R.A. Nock Middle School and at the Department of Public Services buildings in September of 2009. Solar panels were also installed at the Department of Public Services building. Within the next two years, solar panels will provide energy to the wastewater treatment plant. A representative from the City of Newburyport was on the selection committee with the Merrimack Valley Planning Commission for a Regional Renewable Energy Manager. Newburyport anticipates working with the Manager over the next several years to install solar panels on those municipal buildings where it makes sense.

In the summer of 2010, a vestibule was built on the Bresnahan School to create a secondary space and reduce air infiltration which the city anticipates will yield savings this winter as the main area of the building will be separated from the direct exposure to the outside.

Additionally, Newburyport has entered into a “net metering” contract with a Salisbury solar energy firm which will enable the city to receive a 10% discount on its energy costs over the next 20 years. True North LLC of Salisbury is building a solar farm on Rabbit Road in Salisbury and through the states’ green communities act can enter into long term contracts with Salisbury, Newburyport, and the Triton school district.

Newburyport has also been named one of only 17 communities in the Commonwealth to participate in Mass Clean Energy Center’s “Solarize Massachusetts” program. The Solarize Massachusetts program provides a unique and comprehensive opportunity for homeowners and small businesses to install solar photovoltaic (PV) panels on their property at a lower cost than available elsewhere with very short-term financial payback, and even the choice to lease the system with low or no upfront costs.

Biomass

In their 2010 Energy Reduction Plan, Newburyport identified that about 10% of the schools in Vermont are using biomass. In response, the city will investigate the usage of biomass where applicable in the city including using wood material from its composting facility as the source of energy. As Newburyport is close to wooded areas in New Hampshire, Vermont and Maine, as well as many state parks, it is anticipated that there would be abundant biomass to support the new facility.

Recommendations:

Since Newburyport has been awarded Green Community Designation, they have committed to reducing energy consumption in the town. The city needs to continue with the implementation of their Green Community Plan and complete the energy reduction measures outlined in the Plan. The city received \$155,000 from the Green Community Grant to fund air sealing, modifications to the HVAC system, lighting replacement, and other mechanical system improvements to the police station and city hall.

- Newburyport should consider whether there is an opportunity to use the ESCO (Ameresco) to meet their energy reduction plan goals, and
- work with the Regional Renewable Energy Manager to identify renewable energy opportunities on public facilities.

Town of North Andover

Current Conditions and Actions:

While the Town of North Andover has not been designated a Green Community under the Massachusetts Department of Energy Resources (DOER) Green Communities Program, they have taken some major steps to reducing their energy consumption. The town did complete a Green Communities Action Plan with technical assistance from ICF International and Horsley Witten Group (ICF/HW) in April 2010. The Action Plan describes the progress to date and the subsequent steps to be completed in order for the community to meet all five Green Communities criteria within one year of finishing the plan. North Andover, to their credit, has successfully amended and passed four of the five criteria for Green Community Designation. These include the as-of right siting of renewable energy facilities and the expedited permitting of these facilities; the establishment of baseline energy consumption data using MassEnergyInsight, and a plan to reduce the baseline by 20% in five years; and a plan to purchase fuel efficient vehicles.

Unfortunately, the fifth criteria of adopting the stretch energy code to meet the requirement of all new residential construction over 3,000 square feet and all new commercial and industrial real estate construction to minimize the life-cycle cost of the facility by utilizing energy efficiency, water conservation and other renewable or alternative energy technologies has not been adopted. The submission of the energy stretch code to the Board of Selectmen was scheduled to take place in February 2011 with final voting to take place at the annual May Town Meeting; however, the Stretch Code was not presented or voted on during the 2011 Town Meeting. The town may propose adoption of the code at a later time or they may identify another way to meet this criterion without adopting the Stretch Code.

North Andover has contracted with Ameresco, the regional energy services provider, to provide a baseline energy audit for their town, to be completed summer 2012. Phase 1, the Preliminary Energy Audit, and phase 2, the Investment Grade Audit (IGA), have been completed. The IGA is a key step in developing a successful energy savings and infrastructure improvement project focusing on the exact needs and desires of the town. The purpose of the IGA is to analyze and quantify the feasibility of installing certain improvements or energy conservation measures (ECMs). North Andover's IGA quantifies how the town will be able to reduce utility costs nearly \$400,000 annually, through the acquisition of just over \$4 million dollars in capital expenditures. Of note, is that the investment will not require up-front capital. The town will achieve the improvements



via a “Performance Contract” designed to extract energy inefficiencies in the current utility operating budgets to self-fund the projects from future energy savings. Payments are made over time utilizing Ameresco’s guaranteed annual energy savings for security. A summary of the recommended ECMs is listed below:

- lighting system improvements;
- lighting controls;
- domestic water conservation;
- new energy management systems;
- boiler replacement at Fire Station 2;
- variable frequency drives to save energy in the Police Station ventilation system, and heating systems at the Franklin, Thomson, and Middle Schools
- replace steam traps at a number of town buildings;
- weatherization improvements, which include weather stripping and air sealing methods on major sources of infiltration such as exterior doors, windows, roofs and roof/wall interfaces;
- replace overhead doors serving the basement of Fire Station 2 and a few overhead doors in Town buildings that are not relatively new, heavy-duty, and well-insulated;
- replace heating and ventilating rooftop unit HV-1 for the Police Station that serves the Station’s basement;
- replace furnace in DPW with a 95% efficient furnace;
- vending machine controls at the Youth Center to adjust to non-operating hours of the center to save energy;
- steam and condensate pipe insulation at the Kittredge Elementary School, Atkinson Elementary School, and Franklin Elementary School;
- replace the Franklin Elementary School Cafeteria air handling unit and portions of its distribution system;
- replace heating and ventilation equipment in classrooms and heating equipment in storage spaces and public areas in the Kittredge, Atkinson, and Franklin Elementary Schools;
- add additional direct digital controls for the Sergeant and Thomson Elementary Schools, which allows for better management of energy consumption in these buildings, and
- Ameresco will replace or upgrade approximately 173 exterior lighting fixtures that will reduce energy use and enhance the quality of lighting.

Recommendations:

The Town of North Andover is to be commended for their efforts to date to reduce energy consumption and promote renewable energy. They are one of the leaders in the Merrimack Valley in this regard. North Andover is currently working with Ameresco, the region's energy services company (ESCO), to evaluate their energy consumption, costs, and areas for improvement to develop a comprehensive plan for addressing energy inefficiencies in their Town. The final Investment Grade Audit (IGA) will form the basis for the scope-of-work under the subsequent Energy Services Agreement (ESA), whereby Ameresco will provide design, acquisition, installation, modification, commissioning and training for the ECMs presented in their IGA. MVPC recommends the following:

- the town was drawn a setback when the 6/12/12 town meeting did not approve entering into the performance contract with Ameresco. North Andover should try again to approve the ESA;
- try again to pass the stretch code and be formally designated a “green community” by the commonwealth;
- the town should consider participating in MVPC's regional renewable energy manager program to identify renewable energy generating opportunities, and
- work with the state to determine whether a solar farm can be built on the closed landfill which sits on state owned property.

Town of Rowley

Current Conditions and Actions:

The Town of Rowley, a small community with approximately 5,000 residents, has recognized that energy demands are an issue within their community. Their limited staff and resources control the scope of their actions and initiatives concerning energy efficiency and renewable energy; however, the town has taken some cost savings measurements and is trying to take advantage of renewable energy when opportunities arise.

Through the Rowley Municipal Light Plant, an energy audit was conducted and the recommendations made were followed. The town has installed programmable thermostats and has replaced an oil burner with a natural gas powered boiler in the annex building, and a few years ago the town closed down offices on Fridays and shut the heating system down. Closing the town offices had little energy impact, but some of the other steps taken to reduce energy costs were effective.

The town of Rowley has an 18 acre capped and closed landfill which has been evaluated by MVPC for any “fatal flaws” which would prohibit it from being developed into a viable commercial wind and/or photovoltaic (PV) power generation facility. The site was determined to have the potential for development of either a wind turbine or a ground based PV estimated at 600kW.

Most recently, the Rowley Municipal Light Plant signed a purchase power agreement with a wind farm in Woodstock, ME, which will provide 3% of electricity needs, enough electricity to power approximately 200 homes.

Recommendations:

- the town should consider use of the DOER MassEnergyInsight energy data tracking and auditing tool;
- the town should work with the regional renewable energy manager and proceed with the next steps to develop the old landfill into a renewable energy facility for the town;
- the town should work with the regional renewable energy manager to determine if other town owned sites (including buildings) have the potential for development of solar arrays;
- the town has expressed an interest in pursuing “green community” designation. This is a worthwhile goal and can be done incrementally over a period of time if more acceptable for the town. Passage of any of the criteria needed to becoming a green community is a positive step forward, and
- The town may want to use the regional energy manager to conduct a more complete energy audit of the town owned buildings and put forth an infrastructure improvement plan to upgrade the buildings to be more energy efficient.

Town of Salisbury

Current Conditions and Actions:

The Town of Salisbury is actively working towards renewable energy opportunities in their town. Their established Energy Committee works to bring energy issues and initiatives to the public and town officials. The Energy Committee's goals and objectives as described on the Salisbury official website are:

- work towards the establishment of clean renewable energy opportunities;
- become educated about the costs and benefits of various technologies focusing on solar and wind service providers;
- recognize the variety of secondary opportunities that result from renewable energy (i.e., science, technology, green trades, and educational programs), and
- educate the public about the benefits of renewable energy

Salisbury understands the benefits of “green community” designation, and are incrementally advancing the criteria but have expressed that adoption of the stretch code at town meeting may be difficult.

Salisbury's 2008 Master Plan made energy efficiency, renewable energy, and potential cost saving measures a priority for the town. This has been proven in the Master Plan's establishment of the Energy Committee as well as their success in moving forward with solar and wind renewable energy initiatives.

Lastly, Ameresco, the regional energy services provider, has contracted with Salisbury to provide a baseline energy audit for their town, to be completed in 2012.

Renewable Energy Activities:

In 2010, Salisbury town meeting approved a Wind Energy Facilities zoning by-law and a Solar Zoning by-law. These two renewable energy by-laws meet the first criteria of the program requirements for the DOER Green Communities program, creating as-of-right siting for renewable energy generating facilities, research and development facilities, or manufacturing facilities. Additionally, the permitting process for the Wind Energy Facilities Zoning by-law meets the “expedited permitting” process requirement, the second criteria of the Green Community program.

Enactment of the new solar zoning by-law paved the way for the construction of a privately owned 43-acre solar farm consisting of 30,000 ground mounted solar panels on Rabbit Road. Once completed, the six-megawatt facility should produce commercially seven million kilowatt-hours of electricity every year. Salisbury will benefit greatly from

the project due to contracting with the developer (True North) to use some of the electricity produced at a 15% discount for the next 20 years. Similar agreements have also been reached between True North and the City of Newburyport and the Triton Regional School District.

Also being proposed is the development of a solar farm on 95 acres of land behind the Salisbury Elementary School. The site of an old quarry, this solar farm is being proposed by the Thompson Design Group, who currently has options to purchase the land. As with the True North project, Salisbury is interested in obtaining, at discounted prices, electricity generated by the project.

Lastly, the town has a 12 acre capped and closed landfill with the potential to be developed for wind and/or solar power. A “fatal flaws” analysis conducted by MVPC, shows the site has “no fatal flaws” and is ready to move forward for development of renewable energy.

Recommendations:

- Salisbury is actively advancing an energy program and we recommend that in addition to the initiatives described above, the town work with MVPC to obtain energy consumption data from MassEnergyInsight so that baseline energy use figures can be realized and a plan put in place to reduce the consumption;
- once their energy audit is completed, Salisbury should work with the regional energy manager to implement the infrastructure improvement projects recommended;
- Salisbury should continue to work towards achieving “green community” designation, and
- MVPC recommends Salisbury work with the regional renewable energy manager to move forward the development of the old landfill into a solar and/or wind farm.

Town of West Newbury

Current Conditions and Actions:

The Town of West Newbury is actively trying to achieve the DOER Green Community Designation. West Newbury has an Energy Advisory Committee made up of citizens and public officials and meets on a monthly basis to address the community's energy related concerns, projects, and initiatives. In accordance with DOER's Green Community Program criteria, below is the status of West Newbury's efforts towards achievement of their goal of becoming a Green Community.

1) As-of-Right Siting

Two articles were approved at West Newbury's May 3, 2012 Town Meeting for this criterion. An As-of-Right Zoning Bylaw for solar PV systems 250 KW or greater, and a change to the Zoning Map to designate approximately 4 acres of a specific piece of Town owned land (roughly 2 acres buildable after accounting for setbacks) as an Overlay District for Solar PV to match-up with the As-of-Right Bylaw were both approved. Any proposed PV development is subject to Site Plan Review.

2) Expedited Permitting

The Board of Selectmen voted to approve the use of Town Counsel's time to review applicable bylaws and regulations to affirm that permitting can be accomplished in 12 months or less. West Newbury expects this to be a low hurdle, and anticipate no problems, but starting this work has been contingent upon the adoption of the As-of-Right siting bylaw, which was recently approved by Town Meeting as noted above.

3) Energy Baseline Inventory Tool / 20% Energy Reduction

The Town of West Newbury has signed up to use the state's MassEnergyInsight energy data tracking tool. Their staff and time is limited to spend much time on this tool, therefore, they are exploring what type of technical assistance from MVPC would be most beneficial.

4) Fuel Efficient Vehicles Purchasing Plan

The Board of Selectmen seems likely to accept an Energy Efficient Vehicle Policy, but the town is not quite there yet and need to meet with the Select Board at least once more on this issue with all of the necessary information in hand (i.e. all vehicles accounted for and properly defined as Exempt or Non-Exempt).

5) Minimize Life-Cycle Costs - Stretch Code Adoption

West Newbury hopes that passing As-of-Right siting in the April Town Meeting was the first step in moving towards adopting the Stretch Code. The Town worries that concerns about the costs and burdens on new construction with the Stretch Code rules will be unfavorable with both Town officials and the public. Now that the As-of-Right siting by-law passed in April, they hope to be able to bring it to Town Meeting in the Fall Special Town Meeting for acceptance and adoption.

Recommendations:

As the Merrimack Valley's least populous community with only 4,235 residents and very few full time employees, West Newbury is to be commended for the efforts taken to date by the Energy Advisory Committee towards being designated a "Green Community" by the Commonwealth. MVPC recommends as follows:

- the "as-of-right siting" bylaws passed at the April 30, 2012 town meeting, the town should now move forward and try to pass the Stretch Code in the fall special town meeting;
- MVPC recommends West Newbury work with the MVPC to connect and define and fix the few lingering holes in collection of MassEnergyInsight data;
- the town may wish to work with our regional energy services company - Ameresco to conduct energy audits on all the municipal buildings, and
- work with MVPC's Regional Renewable Energy Manager to install solar arrays at the 694 Main Street site recently rezoned at Town Meeting.

VI - “We Are All In It Together”

The Region’s energy challenges have been documented. The plans and priorities for each of the region’s fifteen communities have been identified. The resources available to help the communities advance their strategies and the recommendation in the Merrimack Valley Regional Clean Energy Action Plan have been outlined. Now is the time to move forward and begin implementing the Plan.

Individually a number of the communities are advancing their strategies. Toward this end they have organized their efforts to begin the implementation process. They have formed energy committees, identified key personnel to advance their strategies, and have in place tactical plans to move forward. They have completed energy conservation audits and have entered into Energy Service Agreements to begin energy and building infrastructure improvement programs. They have identified renewable energy projects and have solicited proposals and have entered into Power Purchasing Agreements to bring them on line.

And while much progress has been made there is still a need to bring collective capacity, share experiences, solicit available resources, create efficiencies, and maximize community benefits. The communities working together to further advance their plans can accomplish all these goals. In the Merrimack Valley communities have demonstrated an interest in collectively addressing common challenges they face. The Merrimack Valley Mayors & Managers Coalition has verified that working together communities can make cost effective and efficient progress in addressing their common needs. Clearly the energy challenge lends itself to this approach.

In developing these opportunities to work together around energy issues each community section was reviewed for common priorities and recommendations. The resources available chapter was reviewed for those resources that lend themselves to regional/collective use. The following are opportunities to work together to make the Merrimack Valley Clean Energy Action Plan successful.

Green Community Designation

Currently two communities, Andover and Newburyport, have obtained Green Community designation from the Commonwealth. While not all communities have identified designation as a community priority many of the green community criteria are among the elements in all the region’s communities’ priorities. So it makes sense for the communities to work together to consider green community criteria and designation.

To accomplish this effort MVPC will conduct a series of workshops to provide capacity and technical assistance to deal with the various green community criteria. Sessions will include participation from the Commonwealth Department of Energy Resources and the Green Communities Division to provide details associated with the designation and the resources available from the commonwealth to help communities become eligible. Other session elements will include as-of-right siting of renewable energy facilities and expedited permitting requirements, energy base line data and ways of reducing energy use by 20% over a five year period of time, vehicle replacement options and regional acquisition opportunities, and the nuances and strategies associated with the adoption of energy “stretch” codes.

Merrimack Valley Regional Energy Services Contracting (ESCO)

Working with the Merrimack Valley Mayors & Managers Coalition it was determined that many of the fifteen communities in the region were interested in upgrading their building infrastructure to reduce energy costs and invest in preventive maintenance activities. A strategy to implementing these upgrades and make this investment at a lower cost with guaranteed savings is through energy performance contracting.

Energy Performance Contracting is a special procurement tool that allows Massachusetts cities, towns, school districts, and other public agencies to purchase a bundle of energy management services through a one-time offer from qualified energy vendors. These agreements are called “performance contracts” because the selected energy vendor guaranties that implemented projects will result in specified, measurable savings. Examples of energy management services include engineering, design, construction, commissioning, and savings measurement and verification for energy and water related capital investment projects. Energy performance contracting is often used for “big ticket” asset modernization projects with long paybacks, but will typically also address a range of end uses, building systems, and equipment. Qualified energy vendors are secured through competitive solicitations.

As part of its ongoing commitment to providing regional services that offer economies to members, MVPC issued a regional solicitation for energy management services on behalf of municipalities, school districts, and other qualified government entities within the 15-community MVPC territory in May of 2010. Participating parties were able to enter into contracts with the selected vendor if they choose to do so and be assured that they met the Commonwealth’s competitive bidding requirements.

To date six communities (Lawrence, Haverhill, Merrimac, Methuen, North Andover, and Salisbury) have entered into an Investment Grade Audit Agreement with Ameresco, the selected ESCO provider. Preliminary estimates suggest that Ameresco will undertake

approximately \$13M in improvements, which will result in over \$1.3M of energy savings each year for the six communities participating.

To continue to improve on this level of success MVPC will work with those communities that have not participated in the regional ESCO effort up to this point. This Plan identifies those communities that are candidates for ESCO assistance and MVPC will offer to assist them.

Merrimack Valley Regional Energy Assistance Program (REAP)

Based on community surveys and identified needs the capacity to deal with energy related issues is a challenge for most of the communities in the region. Energy related expertise is not the primary responsibility for many municipal managers. To address this shortfall MVPC has initiated two energy technical assistance programs, the Regional Energy Manager Program and the Regional Renewable Energy Manager Program. Through 30B procurement process MVPC secured the services of two consultant firms with expertise in energy management issues (Peregrine Energy Group) and the development of renewable energy (Meister Consultant Group). Both firms are under contract with MVPC and can provide the expertise lacking in the region.

The Peregrine Group has been providing assistance to a number of communities in the region since 2009. Their assistance has focus on helping communities develop tactical energy plans, administer and applying for federal Energy Efficiency Conservation Block Grants, managing the ESCO procurement effort and acting as an owner's agent for the communities with the ESCO vendor. MVPC will market these services as well as others offered by Peregrine to those communities that need assistance.

The Meister Consultant Group has kicked-off their assistance effort with a Solar Energy 101 Session in 2012. Meister has used this session to begin to meet individually with communities interested in developing renewable energy projects. Assistance offered has ranged from site identification, to community engagement, to preparation of Request for Qualifications (RFQ), to evaluation of proposals, to negotiation of Power Purchase Agreements with developers. MVPC will market these services as well as others offered by Meister to those communities that need assistance.

MassEnergyInsight Energy Inventory and Management Tool

Many communities in the region have embraced the Green Communities designation requirement that municipalities must establish a municipal energy use baseline and establish a program designed to reduce use by 20 percent within five years. To assistance communities accomplish this the Massachusetts Department of Energy Resources (DOER) has made available a no-cost tool developed by Peregrine Energy Group to track and analyze energy consumption data. This web-based tool allows users

to track electricity, natural gas and oil usage details across multiple years and compare that data from year to year to target specific areas for improvement. The system offers usage information for individual buildings, graphical comparisons of function-to-function usage, and reports comparing building-to-building usage.

With an easy way to access comprehensive energy information, MassEnergyInsight allows communities to make informed decisions about future energy consumption in their community. However it is very labor intensive to download data and take advantage of this valuable tool. To help communities deal with this challenge MVPC has partnered with Merrimack College.

Merrimack College has been assisting MVPC and its member communities by engaging the use of students, supervised by the Director of the ESS program and MVPC, to gather MassEnergyInsight data for communities in the region. The goal is to have the students examine the customized electricity, natural gas, and oil usage data and use this information to complete energy consumption reports for the municipalities in the MVPC region. This data will then be used to provide the necessary “baseline” and “benchmark” energy consumption figures in order for each community to complete an energy reduction plan.

MVPC will market this resource and its partnership with Merrimack College to assist the communities in the region meet their energy reduction goals.

Net Metering Utility Credit Purchase Agreements

In accordance with the Green Communities Act passed in July 2008, the Massachusetts Department of Public Utilities (DPU) adopted a new net metering policy in July 2009 that made all municipalities with access to wind or solar PV up to 10 MW eligible for net metering credits. These credits are earned when eligible on-site distributed generation of wind or solar PV energy generates more electricity than it uses so the electric meter runs backward when a developer’s net metered facility is producing more power than is being consumed. The developer then receives net metering credits for net excess generation at the end of the month billing period, which also can carry over to the next month if the facility does not use all of their earned credits. These credits may be carried forward to the next month indefinitely, and credits from net metering facilities may be transferred to another customer of the same utility as long as they are within the same service territory and ISO-NE load zone. Municipalities can purchase these net-metering credits to reduce the total price paid for electricity in the short and long term. The aggregate capacity of net metering is limited to 2% of each utility’s peak load for government or municipal entities.

A community can enter into a *Net-Metering Utility Credit Purchase Agreement (NMUCPA)* with a Developer offering the most advantageous proposal, taking into consideration price and the evaluation criteria. Because of the ability to lower electricity costs most communities are interested in exploring net metering potential. Net metering is an evolving market and requires significant expertise. Using the Regional Renewable Energy Manager MVPC will issue a RFP soliciting Net-Metering Utility Credit Purchase proposals similar to the process used to solicit an ESCO vendor for the region. MVPC will solicit interest from the communities in the region and the renewable energy manager will prepare a RFP and evaluate proposals. The Manager will also negotiate specific terms and prepare legal documents to secure this energy cost benefit for the communities in the region.

MVPC Clean Energy Performance Measures

As part of the Merrimack Valley Clean Energy Action Plan, performance measures to assess the impact of the plan on the 15 municipalities are vital to tracking the success of a sustainable energy management plan. While all communities cannot obtain Green Community Designation, implement large-scale renewable energy projects, or have the infrastructure for Smart Growth zoning districts, they can implement other energy improvements within their community that can impact their energy consumption bottom line and contribute to the Region's commitment to better managing energy consumption. The communities in the MVPC region range from cities and towns with Mayors or/Town Managers with full time staff, to small rural communities with and without full time management by a Town Administrator. This greatly affects the level and degree to which communities can implement energy reduction policies and programs.

The following are the performance measures MVPC will use to measure successes by the regions cities and towns. No success is deemed too small or insignificant. The ultimate goal may be to have all the communities designated as "Green Communities", but we understand this may not be possible. Linking up with MassEnergyInsight and getting baseline energy consumption data is also a highly significant success and a great place to start towards an energy reduction plan.

As we work together to implement this Regional Energy Action Plan for the Merrimack Valley, and review and update the Plan as needed annually, the performance measures used to determine our success will be as follows:

- number of communities that become “Green Communities”;
- communities that adopt any of the 5 Green Community Criteria
 1. As-of-Right Siting
 2. Adopt expedited application permitting
 3. Establish an energy use baseline inventory to reduce baseline inventory by 20% in 5 years
 4. Purchase fuel-efficient vehicles - Establish vehicle plan and inventory
 5. Adoption of Green Energy Stretch Code
- number of communities that use the REAP services;
- number of communities that participate in the MassEnergyInsight Program;
- number of communities that enter in an ESCO invest grade audit agreement or an energy management service agreement;
- reduction of energy consumption (electricity, gas, water, oil, etc.) by 10%, 15%, 20%;
- renewable energy plans and renewable energy projects
 - Total MWhrs of renewable energy generated, and
 - Number of communities that enter into NMUCPA
- number of green energy grants and how much awarded to municipalities;
- municipalities that implement Smart Growth zoning, and
- community involvement: energy committees, public workshops relating to energy, community outreach, flyers, education.



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