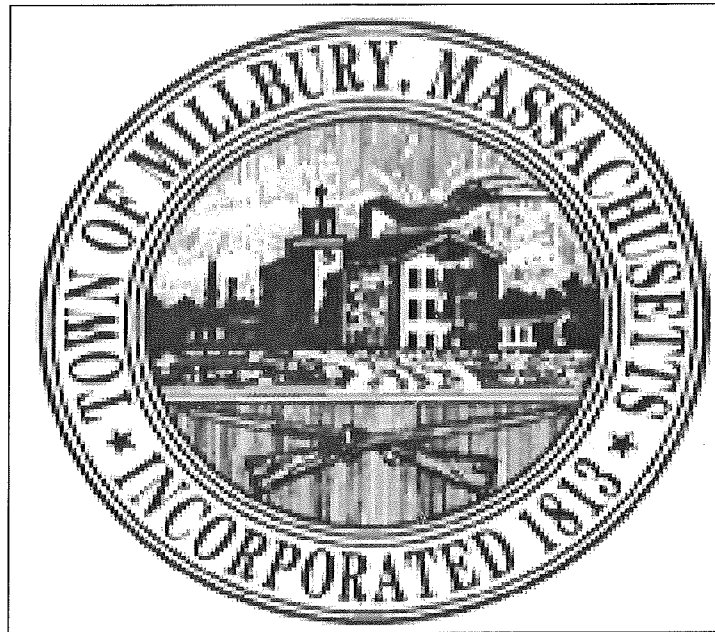


Town of Millbury



Energy Baseline & Energy Reduction Plan

May 24, 2011

(Revised June 24, 2011)

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I. PURPOSE AND ACKNOWLEDGEMENTS

A. Letters Verifying Adoption

Please see Appendix A for letters verifying that this energy reduction plan has been adopted by both the general government and the school district.

B. Contributors

The following individuals contributed to the development of the energy use baseline and the energy reduction plan:

Richard G. Bedard, Jr., School Business Manager and Energy Advisory Committee
Laurie Connors, Millbury Town Planner and Chair, Energy Advisory Committee
Jim Dunn, Vice Chair, Energy Advisory Committee
Sharon Anderson, Clerk, Energy Advisory Committee
Brian Stowell, Member, Board of Selectman and Energy Advisory Committee
Brad Turner, Member, Butler Farm Reuse Committee and Energy Advisory Committee
George D'Auteuil, Chair, Butler Farm Reuse Committee and Energy Advisory Committee
Bob Blackman, Town Building Inspector and Energy Advisory Committee

II. EXECUTIVE SUMMARY

A. Narrative Summary of the Municipality

According to the 2000 Census, Millbury is a town of 12,784 residents located in the heart of Massachusetts (Worcester County). Given Millbury's total land mass of 15.73 square miles, the Town had a population density of approximately 813 people per square mile. The 2000 Census identified 5,109 housing units in Millbury - 3,533 (69%) were single family detached dwellings and 1,576 (31%) were townhouses or of the multi-family variety. Millbury is the northernmost town in the Blackstone River Valley. It is located at the intersection of Route 146 and I-90 (the Mass Pike) on the south edge of Worcester, easily accessible by car, air or train.

Historically rich in mill village history, the Town evolved around the resources of the Blackstone River. Millbury's history is evident in its infrastructure, villages and open spaces scattered throughout town. With its proximity to jobs in Worcester, Boston and along the high tech I-495 corridor, direct access to major highways, and relative affordability of its housing stock, it is no surprise that Millbury is attractive to commercial and residential developers. The Town's infrastructure is poised for growth, with excess capacity available in the Millbury school system, water supply and distribution system and Upper Blackstone Water Pollution Abatement District treatment facility. An aggressive sewer expansion project was recently completed, which will eventually provide sewer service to approximately 697 additional Millbury homes and an untold number of new dwelling units.

The largest economic development project in the Town's history was completed in 2005. The Shoppes at Blackstone Valley provides more than 820,000 square feet of shopping and dining experiences. The complex also includes the 14-screen Blackstone Valley 14 Cinema De Lux movie theatre. Completion of this project coupled with the new Route 146/Mass Pike Interchange that made the Shoppes economically viable has made Millbury more appealing as a destination.

Recent growth coupled with a shift in the Town's perception has placed more demands on a municipal government suffering from the same fiscal constraints that restrain communities of all sizes throughout Massachusetts. The widespread economic recession has led to cuts in State Aid, smaller tax receipts and consequent layoffs. Therefore, the municipality is forced to do more with fewer resources. Faced with this reality, individuals within the municipal government have taken it upon themselves to find ways to reduce the costs associated with keeping the Town running. One aspect of this is to reduce the Town's overall energy consumption.

In September 2009 the Millbury Board of Selectman established the Energy Advisory Committee to assist the Town Planner with a project to site a wind turbine on municipal property as well as other energy efficiency efforts. The Energy Advisory Committee includes municipal officials, a school department representative and interested citizens. Since its inception, the Energy Advisory Committee has been committed to identifying and pursuing energy projects aimed at reducing the Town's energy consumption. The Committee has also worked to educate the community on the importance of energy conservation and reducing our carbon footprint. The Millbury Board of Selectmen, School Committee, Town Manager and School Superintendent support this goal.

To help finance its energy conservation initiatives, the Energy Advisory Committee strives to become certified as a Green Community. Adoption of the Stretch Code, which is the final outstanding prerequisite, is slated for the Millbury Annual Town Meeting scheduled for June 7, 2011. It is anticipated that the Town's Green Community Designation application will be forwarded to the Department of Energy Resources' Green Communities Division for approval by the June 10, 2011 deadline. This Energy Reduction Plan will document and formalize the Town's commitment to energy reduction. It will examine the various factors affecting energy consumption and devise a strategy for making the community more energy efficient. Tasks will be prioritized based on their ease of implementation and impact on the Town's bottom line. The Town is committed to surpassing the energy reduction goal of 20% reduction within five years.

B. Summary of Municipal Energy Uses

The community has sixteen major town buildings of various ages and designs as well as thirteen pump stations, five lesser structures associated with recreation facilities, municipal cemeteries, numerous athletic fields and conservation land. The Town's largest facilities are the Millbury Junior/Senior High School, Elmwood Street School and Shaw School. The largest non-school buildings are the Municipal Office Building, which also houses the Police Department, the Public Library, the Senior Center, the Highway Barn, and the Asa Waters Mansion. The Asa Waters Mansion, which sits adjacent to the Municipal Office Building in downtown Millbury, is a historic landmark owned and operated by the Town of Millbury. The Town contains four Fire Stations as well as a Transfer Station. Two municipal facilities- 130 Elm Street and 153 Millbury Avenue are leased to other organizations and are therefore not included in the inventory. A list of municipal buildings by department, address and fuel type is provided in Table 1. As one can see from the Table, most municipal buildings are heated using natural gas and #2 heating fuel. The two biggest consumers, Millbury Jr./Sr. High School and Elmwood Street School, use natural gas.

In addition to building information, Table 1 includes a summary of the buildings, vehicles, street lights, and traffic lights operated by the municipality. Totals include buildings, lights and vehicles for the school department as well as the general government.

Table 1		
Municipal Energy Uses		
Town of Millbury		
	Number	Ownership
Major Buildings		
Oil Heat (Municipal)	7	Town
Municipal Office Building, Asa Waters Mansion, Fire Station Eng. #1 and Fire Station Eng. #2, Fire Station Eng. #3, Main Pump Station, Butler Farm		
Natural Gas Heat (Municipal)	4	Town
Public Library, Senior Center, Highway Barn and Fire Station Eng. #5		
Oil Heat (School)	1	School
R.E. Shaw Elementary School		
Natural Gas Heat (School)	2	School
Millbury Jr./Sr. High School and Elmwood Street School		
Other (Municipal)	2	Town
Transfer Station and Parks Building		
Total Major Buildings	16	
Motor Vehicles		
Non-Exempt	10	Town
Non-Exempt	5	School
Total Non-Exempt	15	
Exempt	43	Town
Exempt	5	Regional Transit
Exempt	1	School
Total Exempt	49	
Street Lights	994	Town
Street Lights	56	National Grid
Total Street Lights	1050	
Traffic Lights	6	Town
Water and Sewer		
Main Sewer Pump Station	1	Town
Water/Sewer Pumping Stations	13	Town

According to the "Summary of Town of Millbury Lighting Inventory" prepared by National Grid, 1,050 street lights and parking lot lights were located within the Town of Millbury as of January 12, 2010. Of those, 994 lights are at least in part owned and maintained by the Town and are therefore included within the Energy Inventory. Fifty-six lights are exclusively owned and maintained by National Grid and are therefore excluded from the Inventory. The lamp wattages of street lights vary from 50W to 400W, although the vast majority of the Town-owned/maintained lamps, or 921 lamps, are 50W. The Town also owns and operates six traffic lights.

As one can see from Table 1, the Town currently has a fleet of approximately sixty-four (64) motor vehicles comprised of emergency response vehicles, public works trucks, passenger

vehicles and light trucks. Of the sixty-four vehicles, fifteen (15) are categorized as non-exempt by our Fuel Efficient Vehicle Policy.

C. Energy Use Baseline and Plans for Reductions

Table 2 includes a summary of the energy use baseline for the municipality, as well as the planned reductions to reach the goal of 20% savings.

Table 2 Energy Use Baseline & Reductions Town of Millbury FY 2009				
	MMBtu Used in Baseline Year	% of Total MMBtu Baseline Energy Consumption	Projected Planned MMBtu Savings	Savings as % of Total MMBtu Baseline Energy Consumption
Buildings	36,573	73.94%	9,379	18.96%
Vehicles	11,848	23.95%	168	0.34%
Streetlights	945	1.91%	726	1.47%
Open Space	97	0.20%	-	0.00%
Total	49,463	100%	10,274	21%

D. Goals and Strategies to Carry Out Energy Reduction Plan

The Town of Millbury strives towards greater energy efficiency and fossil fuel reduction with regards to all municipal buildings, vehicles and other energy consuming assets such as street and traffic lights. To accomplish this goal, the Town of Millbury will use the following strategies:

- *Obtain Green Community certification;*
- *Continue to track the energy usage of the Town's energy-consuming assets;*
- *Properly maintain existing systems and replace parts/systems with appropriate energy-efficient alternatives when available;*
- *Pursue installation of renewable and alternative energy facilities when practical and feasible;*
- *Promote community participation in energy conservation projects;*
- *Pursue grants, financial incentives and creative strategies for financing energy efficiency projects.*

III. ENERGY USE BASELINE INVENTORY

A. Inventory Tool Used

The Town used the *MassEnergyInsight* software tool to compile the energy baseline inventory. Over the course of the past year, the Millbury Town Planner and the School's Business Manager have worked together to compile an inventory of all the town's buildings, recreation facilities, motor vehicles and street/traffic lights. In essence, the inventory includes anything

town-owned or operated that consumes energy. From that starting point, they monitored the Town's energy consumption since FY 09, which was selected as the Town's baseline year.

The School Department uses a couple of other programs to track energy usage as well. The Department tracks monthly heating degree days and uses the National Grid's on-line Energy Profiler to compare current weather and building conditions to actual consumption and trends. The software School Dude is used to track building maintenance work orders so that HVAC problems may be repaired in a timely fashion. The Millbury Jr./Sr. High School and Elmwood Street School use an earlier version of Honeywell software in order to automate building temperature control.

B. Baseline Year

The Energy Advisory Committee selected FY 2009 as the baseline year.

C. Municipal Energy Consumption for the Baseline Year

Table 3, on page 8, includes a summary of the energy use baseline for the municipality, by building and by fuel type. The buildings are sorted by total annual MMBtu usage in the FY 2009 baseline year. As one can see from the Table, in FY 09 the Town of Millbury used 49,463 MMBtu's of which 74% of the Town's energy is consumed by municipal and school buildings. The Town plans to reduce energy use by at least 9,892.6 MMBtu's, or 20% within a 5 year timeframe.

D. Areas of Least Efficiency

The Committee identified the following areas of least efficiency:

- *Millbury Jr./Sr. High School has the highest energy intensity, at 13,845 MMBtu's in FY 09. MassEnergyInsight's "Buildings to Target" table (See page 9), identified this building as the one with the highest energy use and worst efficiency. This building was also identified by National Grid as a high end user that is eligible for their Whole Building Assessment audit. This building was the focus of an energy audit prepared by ICF International in May 2011. The audit identified many areas of inefficiency that, if addressed, would reduce energy consumption by 2,377 MMBtu's annually.*
- *Elmwood Street School has the second highest energy intensity, at 9,024 MMBtu's in FY 09. MassEnergyInsight's "Buildings to Target" table (See page 9), identified this building as one with high energy use and poor efficiency. This building was identified by National Grid as a high end user that is also eligible for their Whole Building Assessment audit. This building was the focus of an energy audit prepared by ICF International in May 2011. The audit identified many areas of inefficiency that, if addressed, would reduce energy consumption by 1,757 MMBtu's annually.*

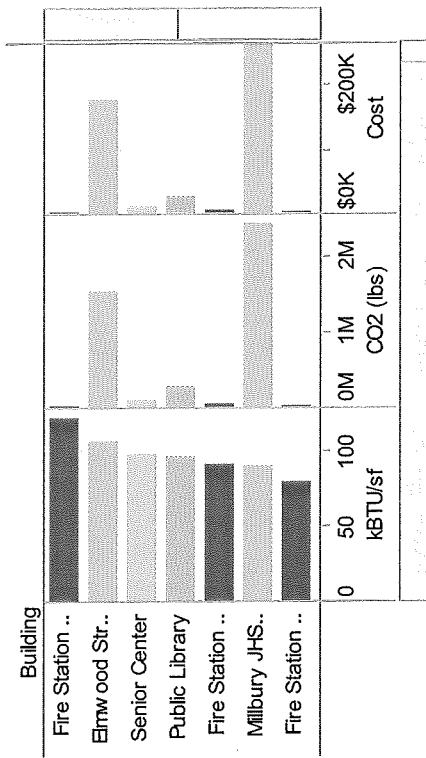
	Table 3											
Percent	Town of Millbury											
of Total	FY 2009											
MMBtu		Electricity		Natural Gas		Fuel Oil		Propane		Gasoline		Total
Usage		kWh	MMBtu	Therms	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	MMBtu
	Buildings											
27.99%	Millbury Jr./Sr. H/S	1,636,600	5,584	81,682	8,168	669	93					13,845
18.24%	Elmwood St. School	980,400	3,345	56,785	5,679							9,024
9.19%	R.E. Shaw School	414,880	1,416			22,500	3,128					4,544
3.56%	Public Library	142,320	486	12,770	1,277							1,763
3.52%	Municipal Office Bldg.	243,760	832			6,551	911					1,743
3.51%	Main Sewer Pump Station	419,400	1,431			2,203	306					1,737
	Water/Sewer Pumping Stations (12 Locations)	247,609	845									845
1.71%	Senior Center	51,670	176	5,383	538							714
1.44%	Highway Barn	31,768	108	4,900	490							598
1.21%	Asa Waters Mansion	23,930	82			3,207	446					528
1.07%	Fire Station Eng #1	22,362	76			2,552	355					431
0.87%	Fire Station Eng #2	7,714	26			1,932	269					295
0.60%	Fire Station Eng #3	5,843	20			1,342	187					207
0.42%	Transfer Station	34,025	116									116
0.23%	Fire Station Eng #5	2,910	10	978	98							108
0.22%	Butler Farm	96				527	73					73
0.15%	Parks Building	1,077	4	none								4
0.01%	TOTAL for BUILDINGS	4,266,364	14,557	162,498	16,250	41,483	5,766	0	0	0	0	36,573
	Open Space											
0.20%	Open Space (5 Locations)	28,363	97									97
	TOTAL for OPEN SPACE	28,363	97	0	0	0	0	0	0	0	0	97
	Motor Vehicles											
23.95%	Motor Vehicles (78% diesel, 22% gas)									87,313	11,848	11,848
	TOTAL for MOTOR VEHICLES	0	0	0	0	0	0	0	0	87,313	11,848	11,848
	Street/Traffic Lights											
1.91%	Street/Traffic Lights	276,863	945									945
	TOTAL STREET/TRAFFIC LIGHTS	276,863	945	0	0	0	0	0	0	0	0	945
	TOTAL ENERGY CONSUMPTION	4,571,590	15,599	162,498	16,250	41,483	5,766	0	0	87,313	11,848	49,463

- *R.E. Shaw Elementary School has the third highest energy intensity, at 4,544 MMBtu's. Although this building has not specifically been the focus of an energy audit, it has above average energy intensity and is also the building with the largest floor area, so potential energy savings from this building may be high. It is likely that many of the recommendations included within the energy audits for the Millbury Jr./Sr. High School and the Elmwood Street School would apply to the Shaw School as well.*

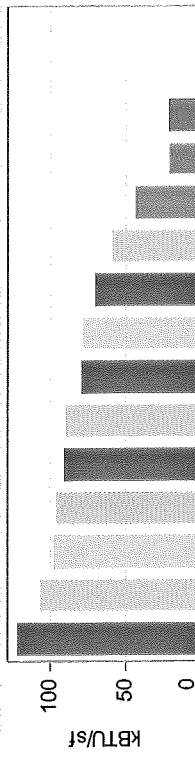
Buildings to Target

This dashboard compares buildings to one other on an energy use per area metric, measured as kBtu/square foot. In the quadrant chart on the right, buildings with the highest energy use and worst efficiency (as compared to other buildings in your portfolio) are in the upper right hand quadrant. Facilities of the types Open Space, Water/Sewer, Street/Traffic Lights, and Vehicles are not displayed.

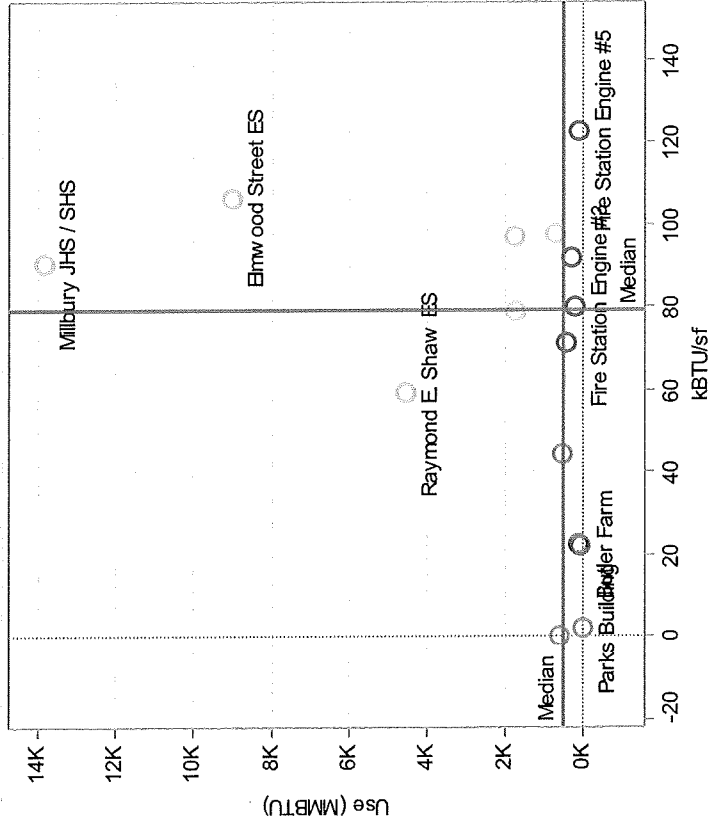
Building Efficiency, Emissions and Cost



Select a building name above to see how efficient it is compared to your other buildings. Lower numbers indicate greater efficiency.



Efficiency and Use



- Building Subcategory**
- Administ..
 - Library
 - Other
 - Public S..
 - Public ..
 - Recreati..
 - School
- Building Subcategory**
- Administ..
 - Library
 - Other
 - Public S..
 - Public W..
 - Recreati..
 - School

- Year**
- FY 2007
 - FY 2008
 - FY 2009
 - FY 2010
 - FY 2011

- *Public Library consumed 1,763 MMBtu's in FY 09. Many of the lights in this building remain lit twenty-four hours a day, seven days a week. The lighting system should be reconfigured with motion sensors and only a minimal number of lights should be left on when the library is closed. MassEnergyInsight's "Buildings to Target" table identified this building as one with high energy use and poor efficiency. This building was the focus of a National Grid Energy Audit in March 2011. The audit recommended a number of lamp, ballast and motion sensor retrofits that would yield an annual savings of 126 MMBtu's.*
- *Municipal Office Building consumed 1,743 MMBtu's in FY 09. MassEnergyInsight's "Buildings to Target" table identified this building as one with high energy use and poor efficiency. This building was the focus of an energy audit prepared by ICF International in May 2011. It has very old, inefficient and compartmentalized heating equipment that is in need of replacement. It also needs automated temperature control improvements and a new boiler reset control system. The audit identified many areas of inefficiency that, if addressed, would reduce energy consumption by 369 MMBtu's annually.*
- *Seven sewer pump stations (Knollwood Circle, Grafton Street, Rayburn Drive, Warren Street, Elm Court, Wheelock Avenue, and Elmwood Street) are antiquated and need to be replaced. Combined, they consumed 560 MMBtu's in FY 09. Although the pump stations vary in size, it can be assumed that upgrading the pumps and equipment will yield a 60% decrease in power consumption (this was the decrease in consumption realized from the Knollwood Circle pump station upgrade project completed in 2009). This will yield a combined annual savings of 336 MMBtu's.*
- *Street lights are incandescent and can be replaced with more efficient LED lights. In FY 09, street, parking lot and traffic lights accounted for 945 MMBtu's. Conversion of these lights to LED would translate into an annual savings of 710 MMBtu's.*

E. Areas That Can be Most Easily Addressed

A number of tasks can be implemented that require little effort and even less cost. Behavioral changes, such as turning off lights when a room is unoccupied, turning off computers when they are not in use, adjusting temperature gauges to more efficient settings, moving furniture, equipment and paperwork away from baseboard radiators and unit ventilators to allow unrestricted air flow, and minimizing idling can go far to reduce the Town's energy consumption for absolutely no cost. These tasks can be accomplished in the short term through policy changes and staff education.

Another task that can be accomplished in the short term involves installing vending misers on all school vending machines. The School Department purchased these units, but has not yet installed them. It is believed that this measure will save the district 61.3 MMBtu's annually according to the ICF, International Energy Audit.

This summer, the Town will begin upgrading the Grafton Street Pump Station. The existing pump station has 15 Hp 3ph – 460 compressors that will be replaced by 23 Hp 3ph-460V motors. It is believed that this measure will save the Town 98.4 MMBtu's annually (See Appendix D).

F. Efficiency Measures Implemented Prior to Designation Application

Strides aimed at reducing the Town's energy consumption that were implemented during the last few years are as follows:

Energy Advisory Committee: As mentioned previously, the Millbury Board of Selectmen established the Energy Advisory Committee in September 2009. The Energy Advisory Committee includes municipal officials, a school department representative and interested citizens. Since its inception, the Energy Advisory Committee has been committed to identifying and pursuing energy projects aimed at reducing the Town's energy consumption. The Committee has also worked to educate the community on the importance of energy conservation and reducing the Town's carbon footprint.

School Department: After completion of lighting system audits of the three school buildings in 2009, the School Department completed lamp and ballast retrofits at the Shaw School in May 2009, at the Millbury Memorial Junior/Senior High School in October 2009 and at the Elmwood Street School in November 2009. Prism Consulting, who completed the audits and performed the work, estimated that full implementation of the recommendations would result in an annual savings of 1,502.9 MMBtu's. The Prism Consulting reports are included in Appendix B. The projects were coordinated and financed in part through a National Grid Rebate Program.

Fire Department: Fire Station #1, which is the Fire Department's Main Headquarters, underwent a complete lighting retrofit project on October 23, 2009 after completion of an energy audit at all four stations by Prism Energy Services (See Appendix B). It was determined that only the Main Headquarters was eligible for upgrades. Prism Energy Services estimated that full implementation of the recommendations would result in an annual savings of 13.7 MMBtu's. In 2007, the Fire Department also purchased and installed an ENERGY STAR boiler – Peerless ECT04 – with a CAaefue energy efficiency rating of 86.1 at Fire Station #3 (located at 1489 Grafton-Worcester Road) (See Appendix D for Invoice and Energy Star Boiler Product List). In 1999, windows at the Main Headquarters were replaced with energy-efficient alternatives. Prior to this work, the Fire Department installed energy efficient light bulbs in its four stations after an audit was completed in 1998 through the Massachusetts' Electric Company's Small Commercial & Industrial Program. By order of the Board of Fire Engineers in 1980, all apparatus floor thermostats are set between 40 - 50 degrees and all meeting rooms are set between 45 -55 degrees (See Appendix D for policy letter from the Board of Engineers).

Millbury Library: The Library was retrofitted with energy efficient light bulbs/ballasts and motion sensors were installed in the restrooms.

Municipal Office Building: The Municipal Office Building was retrofitted with energy efficient bulbs/ballasts and motion sensors were installed in the Large Conference Room.

Knollwood Pump Station: In 2009, the Knollwood pump station was upgraded with new pumps and equipment. The 7 1/2 Hp 3 ph – 208V compressor system was replaced with new submersible pumps having 20 Hp 3 ph- 460V motors. Because the construction period extended over the course of several months during the 2009 and 2010 fiscal years, the 2008 and 2010 calendar years were compared to determine savings. During the 2008 calendar year, the pump station consumed 35,828 kWh. During the 2010 calendar year, the pump station consumed 14,172 kWh. This constitutes a 60% decrease in power usage or an annual savings of 21,656 kWh or 73.9 MMBtu's.

Municipal Vehicles: In 2010, the Town replaced a 2004 Ford Taurus with a newer model, a 2009 Ford Taurus vehicle. The new vehicle consumes 22 MPG on average, which translates into a savings of 2 MPG over the 2004 vehicle. According to the Fuel Economy Calculator on www.fueleconomy.gov, 2 MPG savings translates into annual savings of 2.8 MMBtu's and \$88 a year based on a fuel price of \$3.85/gallon. The Town also currently uses five electric automobiles to reduce carbon emissions.

IV. SUMMARY OF ENERGY AUDITS

Over the course of the last two years, three companies performed audits of municipal buildings with an eye towards reducing the Town's energy consumption. Prism Consulting, Inc. completed lighting analyses for the three Millbury Public School buildings and four fire stations in 2009 as part of the National Grid Municipal Financing Program. The recommendations consisted primarily of lamp and ballast retrofits. The Prism Consulting reports are included in Appendix B.

On March 25, 2011, National Grid completed an energy audit of the Millbury Public Library under the Small Business Energy Efficiency Program. The recommendations consisted primarily of lamp, ballast and occupancy sensor retrofits. The National Grid audit is included in Appendix B.

On May 18, 2011, ICF International conducted energy audits of three facilities: Millbury Memorial Junior/Senior High School, the Elmwood Street School and the Municipal Office Building. The audits considered any and all opportunities to reduce energy consumption, including measures affecting all fuel types, and low-cost/no-cost cost measures as well as capital improvements. The report recommended that all three buildings undergo recommissioning to ensure that existing building systems and controls are optimized to achieve energy savings. The specific results of the audits are included in Appendix B.

On May 31, 2011, National Grid completed more in-depth analyses of the Millbury Jr/Sr High School and Elmwood Street School under the Whole Building Assessment Program. Unfortunately, the results will not be received in time for incorporation into this Plan.

The Town of Millbury should continue to have energy audits performed at its municipal facilities on a regular basis and implement energy efficiency upgrades recommended in the reports. These upgrades can save the Town a substantial amount of money, particularly since utilities are often willing to fund all or a portion of the improvements through rebate, incentive and grant programs.

V. ENERGY USE REDUCTION

A. Overview of Short- and Long-Term Goals

The Town of Millbury will implement both short and long-term strategies for accomplishing its energy reduction goals. Short-term strategies are those that can be implemented within the next five years. Most of these tasks will be relatively inexpensive and they will be prioritized based on ease of implementation and amount of cost savings. Long-term strategies, such as

erection of a wind turbine at the Butler Farm and the ultimate replacement of the entire fleet of non-exempt municipal vehicles with fuel efficient alternatives will require a greater commitment of time and resources.

B. Getting to 20% Energy Use Reduction Within 5 Years

1. Municipal Buildings (including Schools)

Considering that more than 76% of the Town's energy usage is claimed by its buildings, a range of energy conservation measures will be pursued in municipal buildings to meet the Town's short-term 20% energy reduction goal. In Spring 2011 energy audits were conducted of four facilities (Millbury Senior/Junior High School, Elmwood Street School, Municipal Office Building, and the Millbury Public Library). The four facilities inventoried represent 53% of the energy used by municipal buildings in FY 09. The energy reduction implementation plan will prioritize implementing energy conservation measures at these facilities in order to obtain the greatest energy savings in the shortest period of time. Many of the recommendations will be applied in some part to similar facilities that were not specifically audited including the Shaw School and the Millbury Senior Center. The measures generally fall into the categories below, listed roughly in order of priority:

- *Operations and Maintenance Improvements/Systems Re-commissioning*
- *Demand Control Ventilation*
- *Lighting Retrofits & Occupancy Sensors*
- *ECM Motors in Unit Ventilators*
- *Vending Miser Controls*
- *Window Replacement*

In addition to the above, some no cost/low cost changes that can result in energy savings in facilities in the short term are as follows. An energy awareness program should be implemented that educates all municipal employees about responsible energy usage. Based on the "Best Practices Checklist for Improved Energy Performance" available on energystar.gov, it is believed that implementation of these strategies will yield a 15% decrease in buildings' total electricity usage or 2,183.6 MMBtu's.

Individual Light Switches: Individual light switches may control the lighting in individual office spaces, closets and public spaces such as conference rooms, lunch areas and restrooms. In these instances, the lights should be turned off when the rooms are unoccupied for any extended period of time. Occupancy sensors should be installed in all bathrooms and meeting spaces.

Task-oriented Energy Consumption: Some employees use individual floor lamps, desk lamps, radios, space heaters, fans, air purifiers, and other electronic devices to assist them with their tasks. Unnecessary electronic office equipment should be eliminated. Other devices should be turned off when not in use and employees should be encouraged to use Compact Fluorescent Light (CFL) bulbs in desk/floor lamps.

Computers, Monitors and other Desktop Electronics: Even when turned off or switched to "sleep mode", some equipment can draw minimal amounts of power when plugged in. To reduce energy consumption from desktop equipment, personnel should plug all monitors, personal printers, scanners, speakers, and AC adaptors into a surge suppressor and turn the

surge suppressor off when leaving for the day. This will make it easy to turn off all of these devices while ensuring that they do not continue to draw power during off-shift hours. Please note that personal computers should be properly shut-down before the surge suppressor is turned off.

Appliances and Office Electronic Equipment: Only Energy Star appliances (i.e. refrigerators) and office electronic devices (i.e. printers, copiers) should be purchased.

Table 4, which appears on pages 15-22, includes specific energy efficiency measures identified for the municipal and school buildings, along with the associated energy savings. Measures are listed in order of priority. It should be noted that, with the exception of upgrades to sewer pump stations, the Town does not anticipate making significant changes to its building stock during the 5 year timeframe covered by this Plan.

2. Vehicular Energy Conservation

Below is a prioritized list of strategies to improve municipal vehicle fuel economy:

- *In keeping with Criteria 4 of the Massachusetts Green Community application, the Town of Millbury adopted a fuel efficient vehicle policy (See Appendix C) that was approved by the Board of Selectmen on September 7, 2010 and the School Committee on October 13, 2010. Appendix C also includes a replacement plan for all non-exempt vehicles. The Vehicle Replacement Plan was approved by the Board of Selectmen on January 25, 2011 and the School Committee on March 9, 2011. Under this policy, non-exempt vehicles will be replaced with fuel-efficient ones whenever such vehicles are commercially available and practicable. The Town is exploring the possibility of replacing the Building Inspector's 1996 Ford Taurus vehicle with a 2011 Ford Fusion Hybrid. The hybrid consumes 39 MPG on average, which translates into a savings of 21 MPG over the 1996 vehicle. According to the Fuel Economy Calculator on www.fueleconomy.gov, a reduction of 21 MPG translates into annual savings of 16.5 MMBtu's. The School Department is also interested in replacing the 2003 Chevrolet Express Van with a 2011 model, which will save the Town 2 MPG. According to the Fuel Economy Calculator on www.fueleconomy.gov, 2 MPG savings translates into annual savings of 2.5 MMBtu's and \$80 a year based on a fuel price of \$4.00/gallon.*
- *The following heavy duty exempt vehicles will be replaced with hybrid exempt vehicles: The School Department's 2002 Chevrolet 19 passenger Girardin mini-yellow bus will be replaced with a hybrid-electric or propane powered mini-yellow bus. This will save the Town approximately 83.4 MMBtu's in energy usage.*
- *Broaden awareness of the Anti-idling law. This law restricts the amount of time vehicles can idle. Signs should be posted in conspicuous places at the Municipal Office Building, Senior Center, DPW barn, transfer station, and where school buses and parents wait for students to be dismissed.*

Table 4 Energy Conservation Measures Town of Millbury								
Building	Energy Conservation Measure	Projected Annual Savings (kWh)	Projected Annual Savings (therms)	Projected Annual Savings (gallons oil)	Projected Annual Savings (gallons gas)	Projected Annual Savings (MMBtus)	Source for Projected Savings	
Millbury Jr./Sr. High School								
Millbury Jr./Sr. High School	Lighting Retrofit/occupancy sensors	171,632				585.6	ICF, International Audit	
Millbury Jr./Sr. High School	Retrofit Incandescent Lighting	4,300				14.7	ICF, International Audit	
Millbury Jr./Sr. High School	Additional Occupancy Sensors	3,600				12.3	ICF, International Audit	
Millbury Jr./Sr. High School	Allow Unrestricted Air Flow from Unit Ventilators		800.0			80.0	ICF, International Audit	
Millbury Jr./Sr. High School	Control Restroom Exhaust Fans with Occupancy Sensors/Timers	15,000				51.2	ICF, International Audit	
Millbury Jr./Sr. High School	Recommissioning	163,700	8,200.0	70.0		1,388.3	ICF, International Audit	
Millbury Jr./Sr. High School	Kitchen Exhaust Controls	3,500	700.0			81.9	ICF, International Audit	

Building	Energy Conservation Measure	Projected Annual Savings (kWh)	Projected Annual Savings (therms)	Projected Annual Savings (gallons oil)	Projected Annual Savings (gallons gas)	Projected Annual Savings (MMBtus)	Source for Projected Savings
Millbury Jr./Sr. High School	Install LED Lighting in parking lot	7,700				26.3	School Calculation Based on Energy Usage
Millbury Jr./Sr. High School	Upgrade Honeywell temperature controls	66,000				225.2	School
Millbury Jr./Sr. High School	Vending Misers	12,000				40.9	ICF, International Audit
Millbury Jr./Sr. High School	ECM Motors in Unit Ventilators	35,000				119.4	ICF, International Audit
Millbury Jr./Sr. High School	ECM Motors and Evaporator Fan Controls in Walk-in Coolers	2,800				9.6	ICF, International Audit
Elmwood Street School							
Elmwood Street School	Lighting Retrofit/occupancy sensors	167,876				572.8	ICF, International Audit
Elmwood Street School	Lighting Retrofit/occupancy sensors	167,876				572.8	ICF, International Audit
Elmwood Street School	Additional Occupancy Sensors	12,800				43.7	ICF, International Audit
Elmwood Street School	Allow Unrestricted Air Flow from Unit Ventilators		570.0			57.0	ICF, International Audit
Elmwood Street School	Recommissioning	98,000	5,700.0			904.4	ICF, International Audit

Building	Energy Conservation Measure	Projected Annual Savings	Projected Annual Savings	Projected Annual Savings	Projected Annual Savings	Projected Annual Savings	Source for Projected Savings
Elmwood Street School	Kitchen Exhaust Controls	3,500	650.0			76.9	ICF, International Audit
Elmwood Street School	Upgrade Honeywell temperature controls	53,000				180.8	School
Elmwood Street School	Vending Misers	3,000				10.2	ICF, International Audit
Elmwood Street School	ECM Motors in Unit Ventilators	25,000				85.3	ICF, International Audit
Elmwood Street School	ECM Motors and Evaporator Fan Controls in Walk-in Coolers	2,800				9.6	ICF, International Audit
R.E. Shaw Elementary School							
R.E. Shaw Elementary School	Lighting Retrofit/occupancy sensors	100,824				344.0	Prism Consulting, Inc Audit
R.E. Shaw Elementary School	Lighting Retrofit/occupancy sensors	3,668				12.5	Town Calculation Based on ICF, International Audit of Other Buildings
R.E. Shaw Elementary School	Additional Occupancy Sensors	11,100				37.9	Town Calculation Based on ICF, International Audit of Other Buildings
R.E. Shaw Elementary School	Allow Unrestricted Air Flow from Unit Ventilators		495.0			49.5	Town Calculation Based on ICF, International Audit of Other Buildings

Building	Energy Conservation Measure	Projected Annual Savings (kWh)	Projected Annual Savings (therms)	Projected Annual Savings (gallons oil)	Projected Annual Savings (gallons gas)	Projected Annual Savings (MMBtus)	Source for Projected Savings
R.E. Shaw Elementary School	Recommissioning	85,260	4,900.0			780.9	Town Calculation Based on ICF, International Audit of Other Buildings
R.E. Shaw Elementary School	Kitchen Exhaust Controls	3,500				11.9	Town Calculation Based on ICF, International Audit of Other Buildings
R.E. Shaw Elementary School	Vending Misers	3,000				10.2	Town Calculation Based on ICF, International Audit of Other Buildings
R.E. Shaw Elementary School	ECM Motors in Unit Ventilators	25,000				85.3	Town Calculation Based on ICF, International Audit of Other Buildings
R.E. Shaw Elementary School	ECM Motors and Evaporator Fan Controls in Walk-in Coolers	2,800				9.6	Town Calculation Based on ICF, International Audit of Other Buildings
Millbury Public Library	Lighting Retrofit/occupancy sensors	36,874				125.8	National Grid Program
Fire Stations							
Millbury Fire Station Headquarters - Engine #1	Lighting Retrofit/occupancy sensors	4,025				13.7	Prism Consulting, Inc Audit
Millbury Fire Station Headquarters - Engine #1	All apparatus floor thermostats set at 55 degrees	5,000				17.1	Energystar.gov

Building	Energy Conservation Measure	Projected Annual Savings (kWh)	Projected Annual Savings (therms)	Projected Annual Savings (gallons oil)	Projected Annual Savings (gallons gas)	Projected Annual Savings (MMBtus)	Source for Projected Savings
Millbury Fire Station Headquarters - Engine #2	All apparatus floor thermostats set at 55 degrees	5,000				17.1	Energystar.gov
Millbury Fire Station Headquarters - Engine #3	All apparatus floor thermostats set at 55 degrees	5,000				17.1	Energystar.gov
Millbury Fire Station Headquarters - Engine #5	All apparatus floor thermostats set at 55 degrees	5,000				17.1	Energystar.gov
Municipal Office Building							
Municipal Office Building	Vending Meters	4,900				16.7	ICF, International Audit
Municipal Office Building	Retrofit Fluorescent Lighting to High Perf. T8 or T5 lamps	10,000				34.1	ICF, International Audit
Municipal Office Building	Allow Unrestricted Air Flow from Baseboard Radiators			70.0		9.7	ICF, International Audit
Municipal Office Building	Recommissioning			990.0		137.6	ICF, International Audit
Municipal Office Building	Replace Boiler Reset Controls			300.0		41.7	ICF, International Audit
Pumping Stations							
Grafton St. Pump Station	Replacing 15 Hp compressor	28,850				98.4	Town Calculation Based on Energy Savings from Knollwood Pump Station Upgrade

Building	Energy Conservation Measure	Projected Annual Savings (kWh)	Projected Annual Savings (therms)	Projected Annual Savings (gallons oil)	Projected Annual Savings (gallons gas)	Projected Annual Savings (MMBtus)	Source for Projected Savings
Knollwood Pump Station	Upgrade of new compressor, pumps and equipment	21,656				73.9	Town Calculation Based On Electricity Usage Analysis
Rayburn Drive Pump Station	Upgrade of new compressor, pumps and equipment	18,464				63.0	Town Calculation Based on Energy Savings from Knollwood Pump Station Upgrade
Senior Center							
Senior Center	Kitchen Exhaust Controls	3,500				11.9	Town Calculation Based on ICF, International Audit of Other Buildings
Highway Barn							
Highway Barn	Vending Misers	3,000				10.2	Town Calculation Based on ICF, International Audit of Other Buildings
Municipal/School	Behavioral Changes	639,955				2,183.6	Energystar.gov
BUILDINGS	SUBTOTAL	2,045,460	22,015	1,430		9,379	
Municipal	2004 Ford Taurus Replacement				20.0	2.5	Fueleconomy.gov
Municipal	Replace Bldg. Inspector's 1996 Ford Taurus with Hybrid				133.0	16.5	Fueleconomy.gov

Building	Energy Conservation Measure	Projected Annual Savings (kWh)	Projected Annual Savings (therms)	Projected Annual Savings (gallons oil)	Projected Annual Savings (gallons gas)	Projected Annual Savings (MMBtus)	Source for Projected Savings
School Department	Replace Mini-bus with alternative energy bus				600.0	83.4	Fueleconomy.gov
School Department	Replace SPED Out of District Van				20.0	2.8	Fueleconomy.gov
Municipal/School	Anti-idling policy				450.0	62.6	EPA Fuel Savings Calculator
VEHICLES	SUBTOTAL				1,223.0	167.7	
Town	LED Traffic lights	4,783				16.3	nrel.gov
Town	LED Street lights	208,122				710.1	Town Calculation Based on Osram Sylvania/NorthEast Electrical Dist. Estimate
STREET AND TRAFFIC LIGHTS	SUBTOTAL	212,905				726.4	
OPEN SPACE	SUBTOTAL	-	-	-	-	-	
	TOTAL Projected Savings	2,258,364.6	22,015.0	1,430.0	1,223.0	10,273.6	

The State of Massachusetts adopted an anti-idling law (MGL Chapter 90, Section 6A) aimed at reducing air pollution. It has the added benefit of helping communities become more energy efficient. The specific language of the law is as follows:

"No person shall cause, suffer, allow or permit the unnecessary operation of the engine of a motor vehicle while said vehicle is stopped for a foreseeable time period in excess of five minutes. This section shall not apply to (a) vehicles being serviced, provided that operation of the engine is essential to the proper repair thereof, or (b) vehicles engaged in the delivery or acceptance of goods, wares, or merchandise for which engine assisted power is necessary and substitute alternate means cannot be made available, or (c) vehicles engaged in an operation for which the engine power is necessary for an associate power need other than movement and substitute alternat power means cannot be made available provided that such operation does not cause or contribute to a condition of air pollution. Whoever violates any provision of this section shall be punished by a fine of not more than one hundred dollars for the first offense, nor more than five hundred dollars for each succeeding offense."

According to the EPA's Fuel Savings Calculator, the Town could save 225 gallons of fuel annually, which translates into 31.1 MMBtu's and \$900 (based on fuel cost of \$4.00 per gallon) if 10 school buses decrease their idling time by 15 minutes a day. The School Department's vendor for school bus service is Atlantic Express. They utilize a fleet of 11 full-sized buses, 2 half-sized buses, 1 wheelchair accessible bus, and several passenger vans. Although their personnel are already required to adhere to the anti-idling law, it is anticipated that the Town will enjoy similar savings if their heavy duty vehicles, such as DPW and public safety trucks, eliminate unnecessary idling. Not only will fuel usage and associated fuel costs decrease, but emissions will lessen as well. Although this is a very conservative number, the Town estimates a savings of at least 450 gallons of fuel annually, which translates into 62.6 MMBtu's, for eliminating unnecessary idling.

The MassDEP offers training to help school bus drivers and municipal employees eliminate unnecessary idling. The Town of Millbury should consider organizing training sessions with the MassDEP in order to adopt better idling practices for municipal vehicles.

Projected savings from these strategies are included in Table 4.

3. Street and Traffic Lighting Energy Conservation

At a meeting on July 30, 2010, Northeast Electrical Distributors provided estimates detailing cost savings and environmental savings if all of the one thousand 50W HPS lamps, ten 100W HPS lamps, ten 150W HPS lamps, ten 250W HPS, and five 400W HPS lamps were retrofitted with compatible LED systems. Please see Appendix D for the total cost savings. If the 980 town-owned/maintained lights (please note that Northeast Electrical Distributors did not provide an estimate for the 70W HPS lamps therefore they were removed from this analysis) were converted over the course of the next three years, the Town would realize a savings of 2,476,650 kWh saved over the life of the product, assuming coal electrical generation. This would translate into a total savings of 8,452.8 MMBtu's, or an annual savings of 710.3 MMBtu's when all street lights are converted to LED systems.

The Town of Millbury owns and maintains six traffic lights. Four of these traffic lights were converted to LED systems prior to FY 09. The remaining two traffic lights (located near the Goretti's Market and Fire Station #3), which currently use standard incandescent 116 watt

lamps, together consumed 6,833 kWh in FY 09. They are targeted for conversion within the year using a National Grid incentive program. According to documents on the National Renewable Energy Laboratory (NREL) website, LED traffic signals may save 70-80% or greater in energy use than comparable incandescent lamps. If one were to assume 70% savings, this would translate into a combined annual savings of 4,783 kWh or 16.3 MMBtu's.

Projected savings from these strategies are included in Table 4. It is anticipated that street and traffic lights will be converted to combatable LED alternatives by FY 14.

In addition to the conversion of existing street lights, the Town of Millbury should modify its Subdivision Rules and Regulations so as to require LED street lights or solar-powered street lights within proposed subdivisions. This no cost measure will ensure that street lights installed along future public roadways will be energy-efficient.

4. Estimated Capital and Operating Costs and Implementation Schedule

For the efficiency measures outlined in Table 4, Table 5 includes the projected cost of implementing all of the energy conservation measures, as well as the projected savings and simple payback. The Town of Millbury will seek funding from a variety of grants, including the Green Community Grant Program, utility incentive programs and other resources to help offset the Town's implementation costs. The Town is exploring the possibility of establishing an energy conservation savings reinvestment plan in which a percentage of energy savings will be set aside into a fund that will finance future energy efficiency or renewable efficiency measures. This will make energy savings "self funding" and self-perpetuating.

Table 5 Estimated Costs of Energy Conservation Measures					
Use	Projected Total Cost of all ECMs	Potential Utility Incentives (\$)	Net Cost	Annual \$ Saved	Years to Payback
School Buildings					
Millbury Jr/Sr High School Energy Upgrades	\$78,450	\$3,670	\$74,780	\$79,059	1.0
Elmwood Street School	\$66,500	\$12,710	\$53,790	\$59,418	1.1
Municipal Buildings					
Municipal Office Building Energy Upgrades	\$43,950	\$17,880	\$11,070	\$10,648	4.1
Millbury Public Library Energy Upgrades	\$21,720	\$15,204	\$6,516	\$4,100	1.6
Millbury Fire Department Light Upgrades	\$3,855	\$2,965	\$889	\$151	5.9
Grafton Street Pump Station Upgrades	\$650,500	Unknown	\$650,500	\$4,616	140.9
Rayburn Drive Pump Station Upgrades	\$701,272	Unknown	\$701,272	\$2,954	237.4
Replace Town Vehicles	\$125,000	None	\$120,000	\$2,976	40.3
Replace Street and Traffic Lights	\$236,320	Unknown	\$236,320	\$44,806	5.3
Total	\$1,927,566	\$52,429	\$1,855,137	\$208,729	

A timeline for implementation of measures is included in Table 6, which appears on page 25.

C. Measurement and Verification Plan for Projected Reductions

The Town of Millbury will use DOER's web-based energy information tool, *MassEnergy Insight* to track and compare energy use on an annual basis. The School Department will continue to use the School Dude Utility Direct tracking software to monitor monthly usage and cost while taking into account Heating and Cooling Degree Days, and will use the National Grid's on-line Energy Profiler to compare current weather and building conditions to actual consumption and trends. Aggregate building energy usage reductions will be the principal verification of energy savings measures.

Motor vehicle fuel consumption is measured and recorded on a regular basis. Fuel savings from energy conservation measures such as idling restrictions and the purchase of more efficient vehicles should ultimately result in less fuel being consumed. However, winter storm events may cause fluctuations in vehicle usage and consequent fuel usage that may skew the results. Therefore, the Town will track fuel usage of non-exempt vehicles to determine the impact of these new policies on an annual basis.

On an annual basis, the Energy Advisory Committee will compile a report that summarizes use and cost trends and distribute it to the Millbury Board of Selectmen, School Committee and DOER Green Communities Division. This report will describe energy reduction action steps implemented during the course of the year and their impact on the Town's bottom line from both an energy consumption and cost standpoint. It will also describe unforeseen obstacles that may have impeded the Town's ability to accomplish certain tasks and unforeseen opportunities that were implemented despite the fact that they were not specifically identified within the Plan.

Table 6			
Schedule for Implementation			
Town of Millbury			
Building	FY 2012	FY 2013	FY 2014
Millbury Jr./Sr. High School:			
Exhaust Controls	X		
Recommissioning		X	
Temperature Control Upgrade			X
Parking Lot LED Lights	X		
Vending Misers	X		
ECM Motors		X	
Elmwood Street School:			
Exhaust Controls	X		
Recommissioning		X	
Temperature Control Upgrade			X
Vending Misers	X		
ECM Motors		X	
R.E. Shaw Elementary School:			
Exhaust Controls	X		
Recommissioning		X	
Vending Misers	X		
ECM Motors		X	
Municipal Buildings:			
Library Lighting Retrofit	X		
Municipal Office Bldg. Lighting Retrofit	X		
Vending Misers	X		
Recommissioning	X		
Boiler Reset Controls		X	
Pump Station Compressors	X	X	
Exhaust Controls	X		
Vehicles:			
Municipal Taurus Replacement	X		
School Mini-Bus Replacement		X	
School SPED Van Replacement			X
Traffic Lights:	X		
Street Lights:	X	X	X

The team responsible for implementing the specific recommendations within this energy reduction plan includes the following individuals:

Jim Dunn, Energy Advisor – The energy advisor will assist the school and town on the implementation of energy reduction projects.

Chester Hanratty, School's Director of Facility – The facility manager will manage school retrofit projects and implement Operations & Maintenance strategies.

Robert Blackman, Town Building Inspector – The facility manager will manage town retrofit projects and implement Operations & Maintenance strategies.

Richard G. Bedard, Jr., Business Manager – The business manager will ensure that funding is available for key school projects.

Laurie Connors, Town Planner – The Town Planner will pursue funding for non-school related projects.

Richard G. Bedard, Jr., Business Manager and Laurie Connors, Town Planner – These two people will track energy consumption and progress towards energy reduction goals in MassEnergyInsight. The School Business Manager will track heating degree days and the National Grid Energy Profiler and how it relates to building and weather conditions.

Millbury Energy Advisory Committee – Energy committee members will assist in identifying and making the case for energy efficiency measures to be pursued.

Robert Spain, Town Manager – The Town Manager will ensure that funding is available for key municipal projects. The Town Manager endorses the energy reduction plan, and will ensure that the implementation of the plan remains a town priority.

Susan T. Hitchcock, Superintendent of Schools – The Superintendent of Schools endorses the energy reduction plan, and will ensure that the implementation of the plan remains a school priority.

D. Summary of Long-Term Energy Reduction Goals – Beyond 5 Years

The Town of Millbury will continue to identify opportunities to reduce energy consumption above and beyond the five year horizon targeted in this document. Long-term actions include but are not limited to the following:

- *Install industrial-scale wind turbine(s) at the Butler Farm.*
- *Install Solar PV systems on appropriate municipal buildings, including the Elmwood Street School and Millbury Jr/Sr High School.*
- *Ensure that all new municipal construction projects are designed and built to Leadership in Energy and Environmental Design (LEED) standards.*
- *Replace both non-exempt and exempt heavy duty public works trucks and emergency vehicles with fuel efficient alternatives when they become available and cost effective.*
- *Identify new energy conservation opportunities as they are developed and implement them when they are economically feasible.*

VI. ONSITE RENEWABLE ENERGY PROJECTS & RENEWABLE ENERGY

Under the direction of the Energy Advisory Committee, the Town of Millbury is exploring two types of Renewable Energy projects, Solar PV and a large Wind Turbine.

Solar PV Power Potential – In 2007, Millbury Fire installed a photovoltaic system to power the communications system and operate the generator located at the Butler Farm. This offsets the electricity used by the Fire Department communications system and saves the Town of Millbury approximately 6.7 MMBtu's annually. The quote from W.J. Budzyna dated March 14, 2007 and invoice dated April 18, 2008 for the solar installation is included in Appendix D.

The Committee is exploring installation of Solar PV power on the roofs of the Municipal Office Building (85 KW system), Elmwood Street School (250 KW system) and Millbury Jr/Sr High School (600 KW system). The potential is to generate a combined total of more than 800 KW of power, which could produce 930 Solar Renewable Energy Certificates (SREC's) or 930 MWH of energy per year. This translates into 930,000 MMBtu's per year at an installed cost of approximately \$4 million. Ultimately, the Town of Millbury could enjoy over \$100,000 and 3,150 MMBtu's in annual energy savings. Appendix D includes a Letter of Intent from Future Solar Systems, LLC for installation of an 85 KW DC Solar System on the roof of the Municipal Office Building. This system could provide up to 98,000 kWh of electricity per year to the Municipal Office Building. Under the agreement, Future Solar Systems would install and maintain the system at no cost to the Town. The Town would purchase the power at a reduced rate of \$.075 per kWh under a 20 year Purchase Agreement with a 3% annual escalator. The Town wants to install smaller solar systems on the roofs of the school buildings during this plan period with an eye towards expansion in the long term.

Wind Energy Production - The Committee is exploring the possibility of installing one or more industrial-scale wind turbines at the Butler Farm, a 50-acre municipally-owned property located at 44 Singletary Road. In June 2009, after the Town received technical assistance for a site survey from the Massachusetts Clean Energy Technology Center (MassCEC) Renewable Energy Trust, a representative of the University of Massachusetts' Wind Energy Center (WEC) completed a study on the siting considerations of wind power at three potential municipal properties in Millbury. On the heels of that study, the Town was awarded a grant from the same agency to study the feasibility of siting a wind turbine at one of those three sites- the Butler Farm. The Energy Advisory Committee hired Weston & Sampson, Inc. to produce a Feasibility Study. The Draft report, which was presented to the Town in January 2011, presents a comprehensive review of the critical factors and considerations necessary to determine if installing a wind turbine in Millbury is possible from a technical and economic standpoint. It incorporates a thorough evaluation of virtual MET mast and existing published wind data; electrical usage, consumption and generation; economics, environmental, avian and noise impacts; and engineering assessments and permitting issues that affect development of a commercial-scale wind turbine. Using predicted wind speed and WindPRO modeling software, the Draft Report considered four different sized wind turbines for the site. Net energy production for each of the wind turbine models is as follows:

TABLE 7 Summary of Energy Production Modeling (P90)

Characteristics	Northwind - 100	Elecon T600-48	G.E. XLE	Vestas V 90
Turbine Size, kW	100	600	1,500	1,800
Estimated Project Cost	\$1,032,314	\$1,871,717	\$4,255,511	\$4,558,006
Possible CEC Grant	\$165,000	\$320,500	\$400,000	\$400,000
Cost per kW (No Grant)	\$10,323.14	\$3,120	\$2,837	\$2,532
Cost per kW (With Grant)	\$8,673	\$2,585	\$2,570	\$2,310
Net Capacity Factor, % (P90)	18.1%	20.4%	25.6%	26.0%
Estimated Net Energy Output, MWh	159	1,071	3,370	4,097

If the Town installs the G.E. XLE, the Town will generate approximately 11,350 MMBtu's per year.

Because the results of the Draft Report are favorable thus far, Weston & Sampson is in the process of erecting a metrological tower at the proposed turbine location for the purpose of gathering wind speed data for a 12 month period of time. Upon finalization of the Feasibility Study in summer 2012, the Town will make a "GO" or "NO GO" decision on the project.

Financing – The Committee is considering financing either or both of these projects using a third party owner with the power produced sold to the Town under a 15 to 20 year Power Purchase Agreement (PPA). It is anticipated that some of the potential funds from the State Green Communities Program will be used to solicit bidders for performing either or both of the solar and wind projects.

CONCLUSION

The Town of Millbury is committed to using a variety of methods to reduce its energy consumption in both the short and long term. Not only is this good for the environment, but it is also good for the Town's bottom line. During the last two years, the Town has invested a significant amount of time and resources in trying to understand how energy is consumed so as to identify areas of waste. The Town has come up with a solid strategy to reduce consumption in all areas - building, vehicle, street and traffic light usage- that will have the added benefit of making Millbury a Greener Community overall.