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# The Town of Stoughton Local Energy Action Plan

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## Part I – Stoughton Energy Profile, Goals, & Actions

November 28, 2012



Prepared by the Metropolitan Area Planning Council (MAPC)

for

The Town of Stoughton





# Acknowledgements

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Professional technical assistance was provided by the Metropolitan Area Planning Council (MAPC): Erin Brandt, Energy Planner; Helen Aki, Energy Services Coordinator; and Po-Yu Yuen, Energy Intern.

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# Executive Summary

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Since October 2009, the Stoughton Energy & Sustainability Committee (ESC), a citizen advisory group to the Stoughton Board of Selectman, has met to help advance clean energy and sustainability efforts in the Stoughton community. In May 2011, the ESC released the “Town of Stoughton Greenhouse Gas Emissions Baseline Study” to shed light on the energy consumption of the town’s municipal, residential, and commercial sectors.

In early 2012, Stoughton was selected through a competitive application process to participate in the Metropolitan Area Planning Council (MAPC) Local Energy Action Program (LEAP). Through LEAP, MAPC is providing energy technical assistance to the Town over a two-year period to expand Stoughton’s clean energy work. This effort builds upon the 2011 GHG baseline study and aims to help the Town identify and pursue opportunities to reduce energy consumption and increase renewable energy generation across all sectors in the community.

The Stoughton Local Energy Action Plan is a collaborative document drafted by MAPC with input from the ESC and the Stoughton LEAP Working Group. The plan uses the 2011 baseline study as a starting point, and provides guidance on how stakeholders, including town officials, the ESC, residents, and businesses, can advance their clean energy efforts.

The Local Energy Action Plan is divided into three parts. Part I presents a profile of Stoughton’s energy consumption, outlining how energy is used in Stoughton’s municipal, residential, and commercial sectors, and recommends a list of short and long-term energy goals and actions. Part II of the plan consists of detailed action strategies to help guide energy stakeholders through key energy activities. Lastly, Part III contains supporting materials and information for the plan.

Although the Town has already begun several clean energy-related initiatives, many opportunities remain for energy savings and renewable energy development in the municipal sector, as well as with residents and businesses. While such opportunities in municipal facilities are likely to be most readily pursued by Town officials, the large energy use among Stoughton’s residential and commercial/industrial sectors emphasizes the need to explore opportunities across all sectors in order to achieve significant reductions in Stoughton’s overall energy use. In addition to recommending a more focused approach to addressing and managing municipal energy consumption, this plan also emphasizes the need to set clear MassSave program participation goals and energy reduction goals for the residential and commercial sectors to help support Stoughton residents and businesses reduce their energy consumption.

The majority of the recommendations for action presented in this plan are outlined to take place in the next five years. However, this plan is designed to also position the Town and its constituents to continue to set and to pursue new energy goals beyond the five-year mark.

# Table of Contents

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## **Part I – Stoughton Energy Profile, Goals, and Actions**

Acknowledgments.....	i
Executive Summary.....	ii
Table of Contents.....	iii
Introduction.....	1
Stoughton Energy Profile.....	3
<i>Municipal Energy Profile</i> .....	5
<i>Residential, Commercial, &amp; Industrial Energy Profile</i> .....	13
Stoughton Energy Goals & Actions.....	17
<i>Recommendations for Municipal Energy Goals and Actions</i> .....	16
<i>Recommendations for Residential Energy Goals and Actions</i> .....	25
<i>Recommendations for Commercial Energy Goals and Actions</i> .....	26
<i>Energy Action Guide</i> .....	27

## **Part II – Action Strategies**

Outreach Strategies for Energy Efforts.....	1
Community Solar and Efficiency Program.....	8
Energy Curriculum in Schools.....	15
Local Green Business Program.....	22
Annual Review of Energy Action Plan.....	26
Planning for Municipal Retrofit Projects.....	30

## **Part III - Appendix**

Appendix A: Methodology for Weather Normalization.....	1
Appendix B: Municipal Energy Efficiency Opportunities Recommendations.....	8
Appendix C: Municipal Project Estimated Energy Savings.....	9
Appendix D: Greenhouse Gas Emissions Baseline Study Recommendations.....	10
Appendix E: Stoughton LEAP Working Group Meeting (April 26) Handouts.....	11
Appendix F: Stoughton LEAP Working Group Meeting (April 26) Minutes.....	13

# Introduction

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Due to concerns over increasing energy costs, municipal fiscal responsibilities, and environmental consequences due to climate change, communities across the country are pursuing cost-effective and innovative ways to reduce energy consumption and to invest in cleaner energy sources. Over the last several years, the Stoughton Energy & Sustainability Committee (ESC) has made great strides to advance clean energy and sustainability efforts in the Stoughton community. Such work includes the 2011 Town of Stoughton Greenhouse Gas Emissions Baseline Study and the Disposal of Household Wastes and Rules and Regulations that was updated in April 2012. Together, the two documents mark an important step in promoting clean energy and sustainability planning and project implementation in the community.

In February 2012, MAPC selected the Town of Stoughton through a competitive application process to participate in MAPC's Local Energy Action Program (LEAP). Over a ten-month period, MAPC met with town officials, the ESC, residents, business owners, and other stakeholders, such as National Grid and Columbia Gas, to understand the community's priorities and interests in energy, sustainability, and community and economic development issues. These stakeholders were also represented on a Stoughton LEAP Working Group, which MAPC convened to solicit guidance and recommendations during the plan's development. Using feedback from the ESC and the LEAP Working Group, MAPC created a set of recommendations for the Town and its constituents to advance Stoughton's commitment to clean energy.

The Stoughton Energy Action Plan provides a blueprint for the Town of Stoughton to achieve community-wide energy reductions. Although the Town has made strides to pursue energy efficiency in the past, there remains significant potential for further energy reductions. On the municipal side, the Town can take advantage of existing utility programs and incentives and leverage energy cost savings to improve building occupant comfort and drive infrastructure modernization, as well as reduce GHG emissions. Pursuing this work in municipal facilities will also have the additional benefit of establishing the Town as a leader in the realm of energy efficiency and renewable energy development. Since the residential, commercial, and industrial sectors account for 96% of the Town's energy consumption, it is crucial that any clean energy efforts in Stoughton also address energy use outside of municipal facilities. The Energy Action Plan contains recommendations and actions to promote energy efficiency and renewable energy installations, to increase community awareness of the importance of clean energy efforts, and to help Stoughton residents and businesses access opportunities to participate in the utility energy efficiency programs and incentives.

## HOW TO USE THE PLAN

The purpose of this plan is to arm Stoughton with new energy goals and action strategies to advance the community's clean energy efforts. While the plan focuses on specific guidance for the next five years, it is also designed to position the Town and its energy stakeholders to continue to work on energy issues indefinitely. This plan should be treated as a "living document," meaning that the Town and the ESC should review and update the document on an annual basis so that it continues to guide the community beyond 2017.

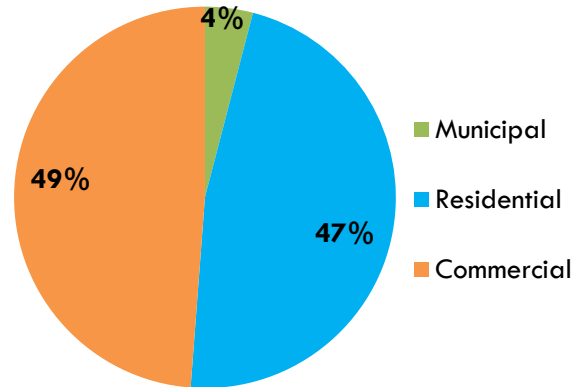
The plan is divided into three parts:

- **Part I**
  - **Stoughton Energy Profile:** This section provides an overview of Stoughton's energy use, including a history of Stoughton's past energy work and achievements and a profile of municipal, residential and commercial energy use.
  - **Stoughton Energy Goals and Actions:** This section offers recommended energy goals and actions for Stoughton to expand its clean energy work.
- **Part II**
  - **Energy Action Strategies:** The Energy Action Strategies presented in Part II are designed to help stakeholders design and implement recommended energy actions.
- **Part III**
  - **Appendix:** The Appendix includes information that was used to develop the Stoughton Energy Action Plan.

# Stoughton Energy Profile

The Town of Stoughton is a diverse community with residents and businesses that are actively engaged in local initiatives. In the past several years, the Town has invested greater effort to make Stoughton a more energy efficient and sustainable community.

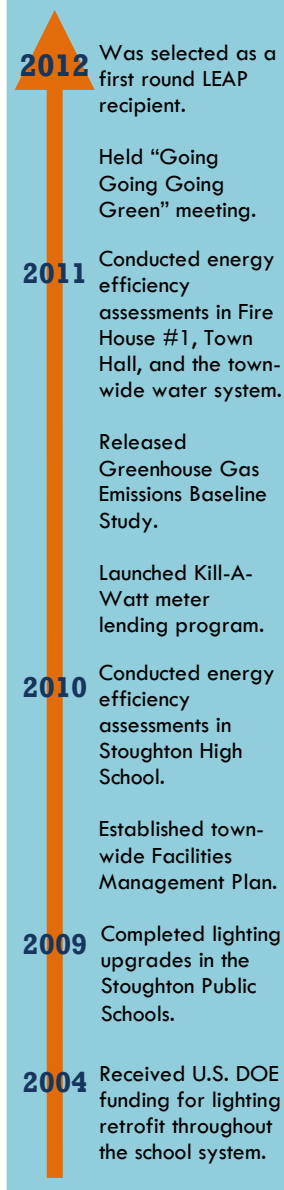
**FY 2009 Stoughton Energy Consumption by Sectors**



Since it was established in October 2009, the Stoughton Energy & Sustainability Committee (ESC) has worked hard with key Town stakeholders, such as the Board of Selectmen, the Town Manager and municipal departments, to strengthen clean energy and sustainability efforts in Stoughton. Thus far, the Town has focused its efforts on municipal energy efficiency improvements. The ESC has worked with the Stoughton Department of Public Works, Public Schools, and the Facilities Planning Committee, and engaged professional energy consultants and auditors, to identify additional saving opportunities in the municipal sector. As of November 2012, the Town has implemented five projects in the Stoughton Public Schools, which have realized some electric energy savings. The Town has the opportunity to continue to pursue municipal energy cost savings through additional facility upgrades and building retrofit projects.

Given that the residential and commercial sectors account for 96% of Stoughton’s overall energy consumption, the ESC recognizes the significance in promoting clean energy and sustainability efforts in the community.<sup>1</sup> As part of its goal to “distribute information to residents, and businesses about sustainability, climate change, and energy and resource conservation,” the ESC works closely with local stakeholders to design and implement outreach and education efforts. In 2011, the Committee launched a Kill-a-Watt meter lending program in the Stoughton Public Library to increase awareness on energy and cost savings. In the same year, the ESC updated the Disposal of Household Wastes and Rules and Regulations, a guide on waste recycling that educates local residents about the local recycling program offered by the Department of Public Works. To promote commercial energy efficiency efforts, the ESC

## Energy-pedia #1: The Town of Stoughton Energy Timeline



<sup>1</sup> Municipal energy consumption does include vehicle fuel consumption.



participated in the Stoughton Chamber of Commerce's October 1, 2012 "Going Going Going Green" event, which sought to educate Stoughton businesses on the opportunities and financial options for performing energy audits and efficiency retrofits. These examples highlight the valuable efforts the ESC and the Town of Stoughton have undertaken to support clean energy and sustainability in the community.

# Municipal Energy Profile

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To date, Stoughton’s clean energy efforts have focused on increasing energy efficiency in municipal buildings and facilities. Over the past several years, the ESC and Town officials have identified energy efficiency improvement opportunities through four main efforts. These efforts include:

- Energy Efficiency Retrofits in Schools;
- Energy Efficiency Assessments;
- A Facilities Master Plan; and
- A Greenhouse Gas Emissions Baseline Study.

## ENERGY EFFICIENCY RETROFITS IN SCHOOLS

The Stoughton Public School system is the greatest energy user among all municipal service divisions.<sup>2</sup> In 2004, the Town received funding from the U.S. Department of Energy (DOE) to perform lighting retrofits in the eight school buildings. The project was completed in 2009 and has resulted in 2,117 MMBTU savings between FY 2010 and FY 2012. To further advance energy savings in the school buildings, the Town is currently pursuing four additional energy efficiency improvement projects in the Stoughton Public Schools, including roof replacements, occupancy sensor installations, classroom/corridor lighting upgrades, and exterior lighting replacements. The opportunity for energy savings from these projects are further discussed in the “Municipal Building Projects” section on page 10.

### Municipal Energy Profile At-A-Glance

- The Energy & Sustainability Committee has nine member volunteers who are appointed by the BOS
- Municipal energy consumption accounts for ~4% of Town-wide baseline energy consumption
- Municipal Baseline Consumption: 87,880 MMBTU in 2009

### Energy-pedia #2: Stoughton Energy and Sustainability Committee

The Energy & Sustainability Committee (ESC) is a citizen’s advisory group to Stoughton’s Board of Selectmen that focuses on local energy and sustainability issues pertaining to energy and resource conservation, greenhouse gas monitoring, waste reduction, and community outreach. The Committee is comprised of volunteer members from the Stoughton community who leverage their broad range of individual expertise—including environmental science, biological science, facility management, construction management, mechanical and systems engineering, education, and public policy—to advance local energy and sustainability efforts in the community.

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<sup>2</sup> For more detail, see the “Municipal Energy Consumption” section on page 7.

## ENERGY EFFICIENCY ASSESSMENTS



Source: Stoughton –MA

Since the completion of the lighting upgrade project in 2009, Stoughton has conducted energy efficiency assessments in four municipal facilities, including Fire House No.1, Stoughton Town Hall, Stoughton High School, and the water system.<sup>3</sup>

### TOWN-WIDE FACILITIES MASTER PLAN

The need for town-wide energy planning and coordination was highlighted in Stoughton’s 2010 Town-wide Facilities Master Plan.

The Plan was a comprehensive report

that included a schedule of prioritized repairs and replacements of municipal facilities. The Facilities Master Plan offered a path for the Town to design and prioritize facility improvement projects that could improve municipal energy efficiency and increase energy cost savings in Stoughton.

## GREENHOUSE GAS EMISSIONS BASELINE STUDY

In May 2011, the ESC released the “Town of Stoughton Greenhouse Gas Emissions Baseline Study” to inventory and to quantify town-wide greenhouse gas emissions, energy and water consumption, and wastewater and solid waste generation in calendar year 2009. The report provides a foundation for the Town’s future energy and sustainability activities by:

- Identifying the Town’s largest sources of greenhouse gas emissions and resource consumption;
- Determining the resource impacts of the Town (electricity, natural gas, water, wastewater, solid waste, and transportation);
- Providing recommendations to town leadership and other parties interested in reducing Stoughton’s greenhouse gas footprint and resource consumption;
- Identifying gaps in available information that limit the precision of studies; and
- Determining the most effective next steps for the committee in helping the Town become more sustainable.

<sup>3</sup> The four energy efficiency assessment reports include two National Grid/B2Q’s Energy Efficiency Opportunities reports for Stoughton Fire House No.1 and Stoughton Hall; the National Grid/B2Q’s Whole Building Assessment Initiative report for Stoughton High School; and TNZ’s Stoughton Water System Energy Performance report.

Based on the Town's energy consumption and greenhouse gas emission analysis report, the Committee developed the following recommendations for the community:

- Increase participation in the utility MassSave energy efficiency incentive programs;
- Encourage the installation of solar technologies;
- Perform energy efficiency retrofits in municipal buildings;
- Include energy efficiency planning when making municipal purchasing decisions; and
- Adopt building energy codes.

## MUNICIPAL ENERGY CONSUMPTION<sup>4</sup>

The municipal energy consumption data in this plan comes from Stoughton's MassEnergyInsight (MEI) account. *However, the utility data in the Town's MEI account is not organized in a system that best utilizes the program's data analysis and reporting functions. This lack of data organization creates challenges for monitoring the energy use of specific Town buildings and facilities accurately and efficiently.* While writing this plan, the ESC and MAPC began reorganizing Stoughton's MEI account to identify missing data that currently limits the accuracy of using MEI to analyze municipal energy use. Moving forward, MAPC will work with the Town to develop a Town-specific user manual that will help municipal staff and volunteers more accurately and systematically collect, enter, and manage MEI data.

*It is important to note that since the energy analysis in this plan is developed using incomplete data in MEI (as of November 2012), the following analysis will likely change once the Town's MEI account is re-organized; the energy use for municipal buildings and facilities presented in this plan can only shed light on broad energy use patterns in Stoughton and should not be used for benchmarking purposes.*

### **Energy-Pedia #3: Monitoring Stoughton's municipal energy use.**

The Stoughton Energy & Sustainability Committee monitors its municipal energy data using the MassEnergyInsight (MEI) tool. MEI is a free, web-based tool developed by Peregrine Energy Group and made available to cities and towns in Massachusetts through the Department of Energy Resources (DOER) as part of the Massachusetts Green Communities Program. Electricity and natural gas usage for Stoughton's municipal accounts is pre-loaded by National Grid and Columbia gas into the MEI program; other fuel use data must be manually entered and kept up-to-date by Stoughton staff.

For more information, see: <http://www.massenergyinsight.net/mei/overview.html>

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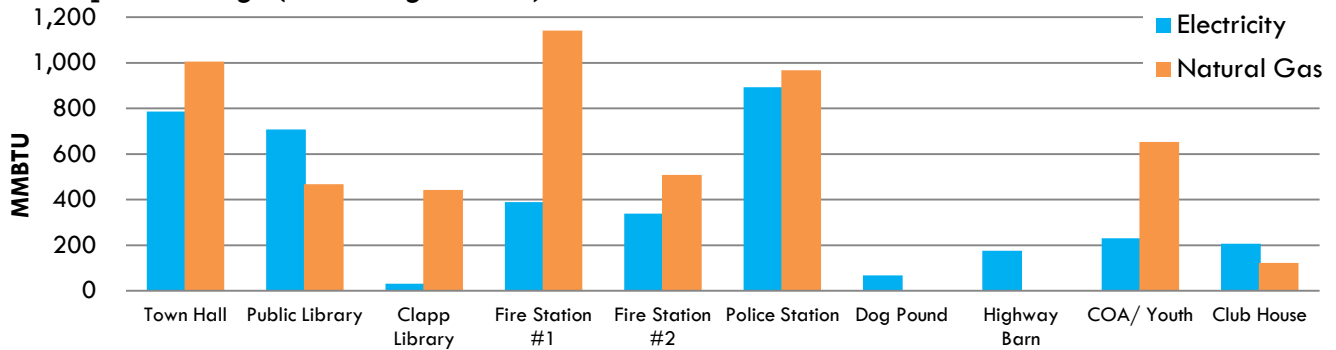
<sup>4</sup> The FY 2012 energy consumption data in MEI does not include vehicle fuel consumption.

## MUNICIPAL BUILDING ENERGY OVERVIEW

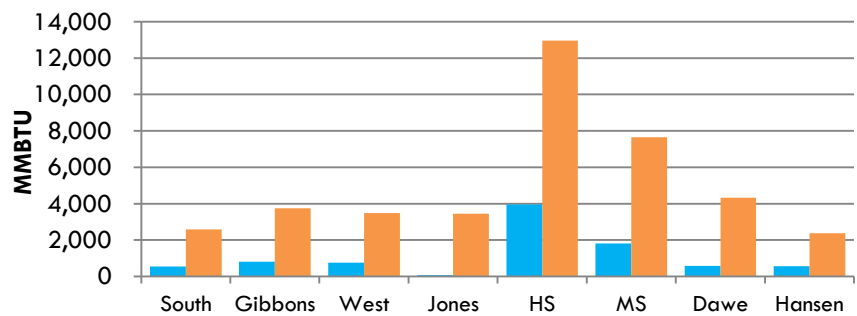
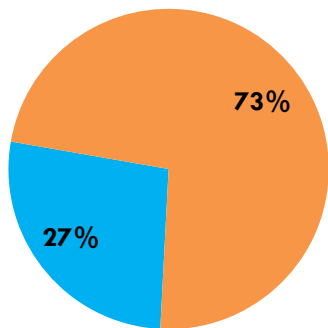
Stoughton’s municipal energy consumption is largely from building energy use, with municipal buildings accounting for approximately 78% of Stoughton’s municipal energy use in FY 2012.<sup>5</sup> Further, natural gas accounts for over 70% of municipal building total energy consumption. The eight school buildings together account for the highest energy use among all municipal departments, with the High School being the single building with the greatest municipal energy consumption, followed by the middle school. The school buildings are primarily natural gas users, with natural gas use accounting for over 80% of the department’s total energy consumption. After the Public Schools, the Police Station, the Town Hall, and Fire Station #1 are the next biggest energy users among all municipal buildings.

### FY 2012 Municipal Energy Use by Fuel Types<sup>6</sup>

Municipal Buildings (Excluding Schools)



Stoughton Public Schools



<sup>5</sup> Overall municipal energy use does not include vehicle fuel use.

<sup>6</sup> The building energy consumption data in this document is adjusted to account for abnormal fuel consumption due to weather differences each year using Simple-Ratio Based Weather Normalization. For detailed information about the normalization methodology, please refer to Appendix A.

Although overall energy consumption helps identify the buildings with highest energy use, it is also helpful to look at the ratio between total building energy use and floor area to get a sense of how efficient a building is. The Municipal Building Inventory chart below shows that public safety buildings, such as the Police Station and Fire Station #1, have a relatively high energy use-to-floor area ratio, with energy intensity ratings of 155 kBTU/sq.ft and 109kBTU/sq.ft respectively. The Clapp Library and the Council of Aging and Youth Commission also have fairly high ratios. Whereas, the Public Schools, which account for the highest energy use in Stoughton both collectively and individually, have relatively low ratios that range between 66 kBTU/sq.ft to 89kBTU/sq.ft, suggesting that the schools are the relatively efficient. While, such ratios help highlight potential inefficiencies, it is critical to do more detailed analysis of each building's energy use, as some buildings that appear to be inefficient, such as the public safety buildings, may have a high energy use to floor area ratio because such buildings are operating for longer periods than other municipal buildings.

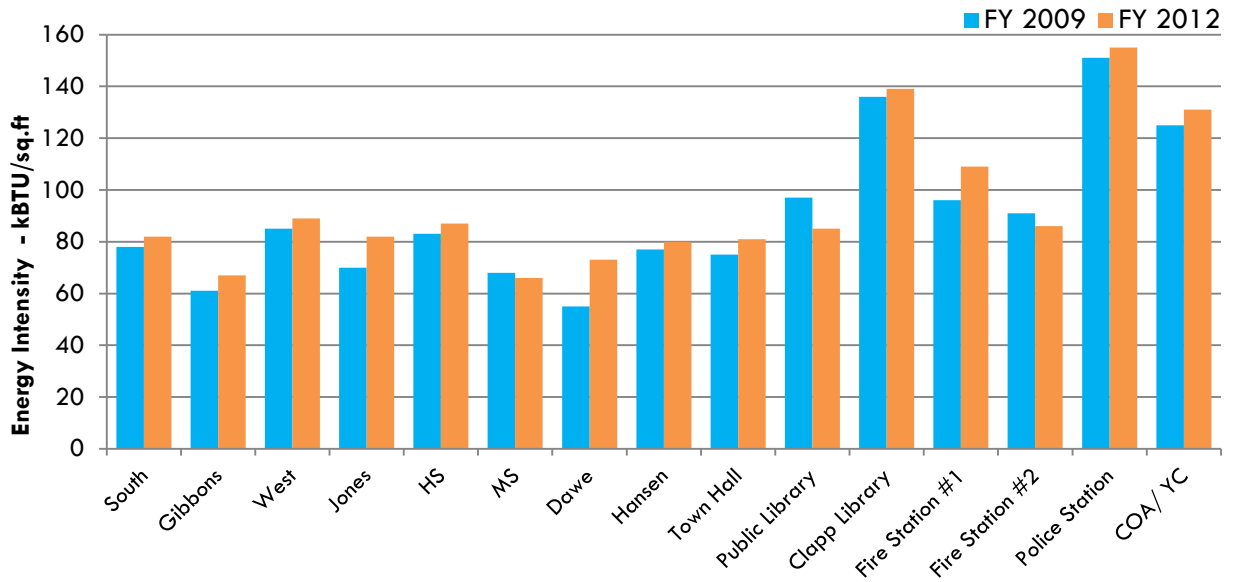
### Municipal Building Inventory

Dept.	Building/ Facility	Floor Area (sq.ft)	2009 Baseline Energy Use (MMBTU)	2009 Baseline Energy Efficiency (kBTU/sq.ft)	2012 Energy Use (MMBTU)	2012 Energy Efficiency (kBTU/sq.ft)
School	South Elementary School	38,000	2,966	78	3,131	82
	Gibbons Elementary School	67,600	4,122	61	4,561	67
	West Elementary School	47,662	4,042	85	4,251	89
	Jones Early Childhood Ctr.	43,200	3,031	70	3,524	82
	High School	195,000	16,265	83	16,909	87
	O'Donnell Middle School	144,000	9,849	68	9,468	66
	Dawe Elementary School	67,600	3,733	55	4,911	73
	Hansen Elementary School	36,821	2,830	77	2,949	80
Admin.	Town Hall	22,085	1,659	75	1,792	81
Library	Public Library	13,806	1,335	97	1,176	85
	Clapp Library	3,400	463	136	474	139
Fire	Fire Station #1	14,000	1,345	96	1,530	109
	Fire Station #2	9,860	899	91	846	86
Police	Police Station	12,000	1,808	151	1,860	155
	Dog Pound	-	95	-	67	-
DPW	Highway Barn	-	144	-	176	-
COA/YC	COA/ YC	6,740	843	125	883	131
Other	Club House	624	590	945	329	528

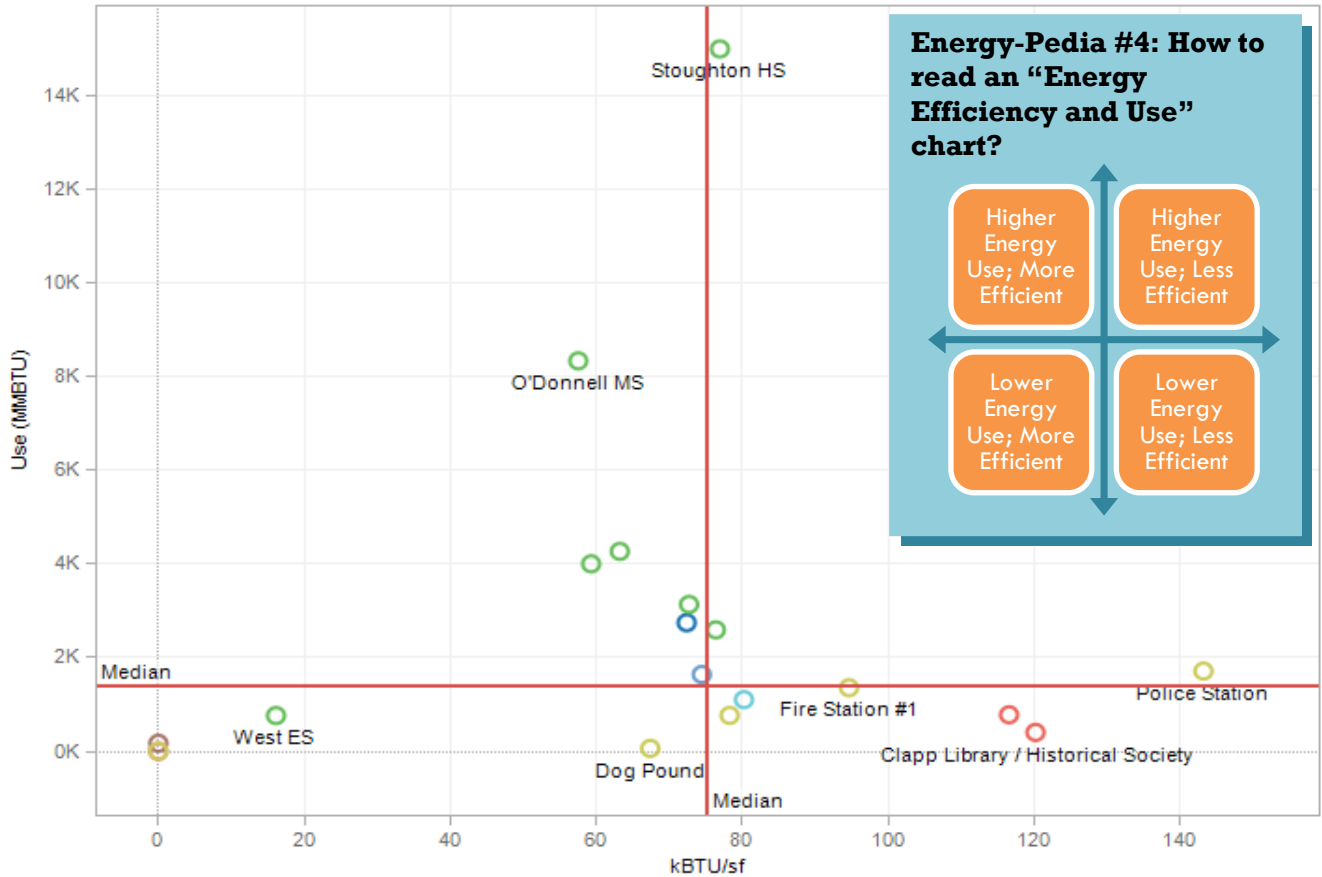


Source: Stoughton Patch and Stoughton Public Schools Elementary Resource Site

## FY 2009 and FY 2012 Municipal Building Energy Intensity<sup>7</sup>



## FY 2012 Municipal Energy Use and Energy Efficiency



Source: MassEnergyInsight

<sup>7</sup> The Club House is not included in this chart since the facility’s current energy consumption in MEI accounts for the total energy consumption by the Cedar Hill Golf Course, including non-building energy use such as exterior lighting.

## Municipal Building Projects

Stoughton's past municipal energy efficiency efforts have focused on public school buildings, which are the largest category of energy use in the Town, as noted above. In 2009, the Town completed lighting retrofits in all eight school buildings. The project was expected to reduce the Department's energy consumption by 6% (2,773 MMBTU).<sup>8</sup> Between FY 2010 and FY 2012, electricity consumption in the municipal sector decreased by 2,117 MMBTU. As of November 2012, four additional energy efficiency improvement projects are being implemented in the schools.

## School Building Energy Projects Overview

Completed Projects								
	High School	O'Donnell MS	Elementary School					Jones ECC
			South	Gibbons	West	Dawe	Hansen	
Lighting Retrofits	X	X	X	X	X	X	X	X
Projects in Progress as of November 2012								
New roof with PV Panels								X
Occupancy sensors	X	X	X	X	X	X	X	X
Classroom/ corridor lighting upgrade	X	X	X	X	X	X	X	X
Exterior lighting replacement	X	X	X	X	X	X	X	X

In addition to the school building projects, Stoughton has identified additional energy opportunities through energy efficiency assessments and facilities retrofit planning. In 2010, Stoughton participated in National Grid's Whole Building Assessment (WBA) program and received a report from B<sub>2</sub>Q Associates, Inc for the Stoughton High School. The WBA report provides a list of recommended energy efficiency measures that, if implemented, could potentially achieve up to 11% in energy reductions and result in a total of \$35,406 in energy cost savings with a payback term of 5.1 years. The following chart summarizes the energy efficiency measures recommended for the High School.

Energy Efficiency Improvement	Estimated Electricity Savings (kWh)	Estimated Natural Gas Savings (therms)	Estimated Energy Cost Savings (\$)	Estimated Payback Year (Yr.)
Computer power management	30,000	-	\$3,782	0.4
Schedules, setpoints, O&M	3,350	1,290	\$2,022	0.5
Vending machine controls	8,000	0	\$1,009	1.0
Spray faucet	-	336	\$417	0.1
Education & awareness	11,095	645	\$2,199	0.5
Variable speed drives on HW pumps	10,681	-	\$1,347	9.5
Demand controlled ventilation in auditorium	4,262	1,328	\$2,184	6.3
Variable speed drives on AHU fans	13,742	-	\$1,732	10.0
Thermostat replacement	2,952	6,450	\$8,372	10.0
Kitchen hood controls	923	3,402	\$4,336	2.3
Steam tray survey	-	3,139	\$3,893	3.1
Lighting and Control Upgrades	48,672	-	\$6,136	4.5
<b>Total</b>	<b>130,326</b>	<b>15,300</b>	<b>\$3,5406</b>	<b>5.1</b>

<sup>8</sup> Information about the estimated energy savings from the energy efficiency improvement projects in the Stoughton Public Schools is from the "Stoughton's 5 Year Energy Use Reduction Plan" Draft Report prepared by ESC member Eric Studer.



National Grid and B<sub>2</sub>Q conducted two additional energy assessment reports in 2011 for the Stoughton Town Hall and Fire Station #1. These reports recommended energy efficiency opportunities, including computer power management, vending machine controls, occupancy sensors, air sealing/weatherization, thermostat upgrades, window unit upgrades, with payback years ranging from immediate to six years without incentives.<sup>9</sup>

In 2010, the Town also commissioned a Facilities Master Plan, which highlights energy efficiency improvement opportunities through facility repair and/or equipment replacement projects in all municipal buildings. These projects include window unit replacements, HVAC controls upgrades, boiler replacements, roof insulation, and exterior envelope upgrades.

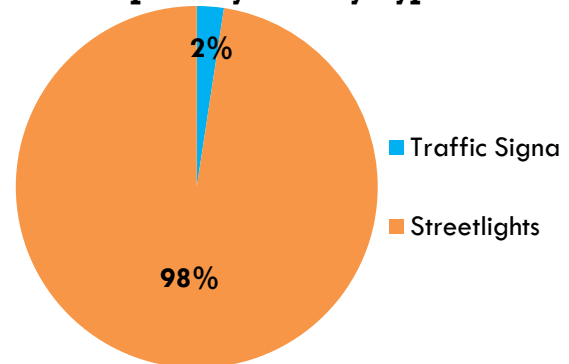
## NON-BUILDING ENERGY OVERVIEW

Non-building energy use makes up roughly 22% of Stoughton’s municipal non-transportation energy consumption in FY 2012. The largest categories of non-building energy use in the Town are the energy usage of streetlights/traffic signals and open space, followed by water and sewer.

### Street Lighting & Traffic Signals

Streetlight and traffic signal energy usage accounted for 8% of the Town’s non-building municipal energy consumption in FY 2012. Unlike most communities in Massachusetts, the Town of Stoughton owns all of its streetlights. Streetlight ownership creates an opportunity for Stoughton to immediately pursue energy reduction measures in the Town’s street lighting infrastructure. Specific recommendations and actions towards this end are described in “Recommendations for Municipal Energy Goals and Actions” section on page 16 in this plan.

**FY 2012 Street/Traffic Signals Energy Consumption by Facility Types**



### Open Space

Stoughton’s open space includes the Little League Playing Field and parking lots for the Department of Public Works and the Recreation Department. In aggregate, the energy use of these areas comprises approximately 8% of the municipal sector’s non-building energy use.

<sup>9</sup> See Appendix B for more information about these recommendations.

## Water & Sewer

Stoughton’s water and sewer facilities are comprised of utility accounts at ten locations. Together, the Town’s water and sewer facilities accounted for 6% of Stoughton’s non-building municipal energy consumption in FY 2012. In 2011, TNZ Energy Consulting, Inc. evaluated seven of the eight pumping stations in Stoughton and released the Stoughton Water System Energy Performance report. The performance report identified (1) low- and no-cost measures to increase energy cost savings for Stoughton and (2) energy efficiency retrofits that might be eligible through utility incentive programs. According to the report, the recommended measures could result in up to \$20,810 in energy cost savings for the Town annually.

## VEHICLE ENERGY OVERVIEW

Municipal vehicle fuel consumption data is currently not available in Stoughton’s MEI database. In the absence of updated data, the vehicle energy data used for this analysis comes from the Greenhouse Gas Emissions Baseline Study, which has data from 2009. In 2009, the energy use of municipal vehicles comprised approximately 20% of the municipality’s overall energy use. As of 2009, slightly over half of the Town’s fleets are diesel vehicles, and the remaining are gasoline vehicles.

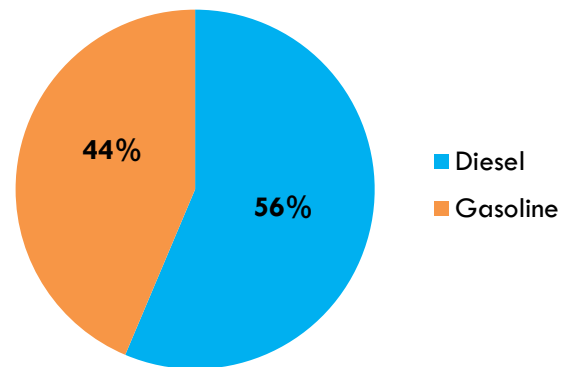
### Recommended Water System Energy Conservation Measures

The following energy conservation measures were recommended by TNZ Energy Consulting, Inc. to the Stoughton Department of Public Works. They have not yet been implemented as of November 2012.

Water Station	Description
Muddy Pond	Muddy Pond Pump Optimization
	Muddy Pond Boiler Retrofit
	Muddy Pond Weatherization
Harris	Harris Heating Improvements
Gurney	Gurney VSD and Pump Motor Replacement
Pratts Court	Pratts Court Pump Optimization
	Pratts Court Gas Conversion & Boiler Replacement
	Pratts Court Lighting Upgrade
	Pratts Court Exterior Lighting Control
	Pratts Court DHW Pipe Insulation
	Pratts Court Dehumidifier Selection
Goddard	Goddard Heating Improvement

Source: TNZ Energy Consulting’s Stoughton Water System Energy Performance

### FY 2012 Vehicles Energy Consumption by Fuel Types



# Residential, Commercial, & Industrial Energy Profile

Approximately 4% of the Town’s overall baseline energy consumption is attributable to municipal facilities and operations; the remaining 96% of the Town’s energy baseline is used in its residential, commercial, and industrial sectors. Although the most accurate way to baseline community-wide energy consumption is through aggregate-level utility data, updated utility data for FY2012 was not available at the time this plan was written. Instead, the baseline for these sectors was created using aggregate electricity and natural gas data for CY2009. This data was provided by National Grid and Columbia Gas during the development of the ESC’s 2011 GHG baseline study. Heating oil use was approximated using data provided by the Assessors’ Office on the number of residences and businesses with oil-fired heating systems in Stoughton and average heating oil consumption data for New England residences and businesses.

## RESIDENTIAL SECTOR

Stoughton’s population by race and ethnicity shares similar characteristics with the state average. Slight variations exist in the form of slightly larger white and black populations and a smaller Asian population. The Town’s population is older than the state average, with a higher percentage of adults in their 40s and 50s. Stoughton’s median household income (\$70,485) is slightly higher than the state median (\$62,859). However, 38% of Stoughton’s households earn below the state’s annual median income, with 13% earning between 60% and 80% of the state median household income.

**Residential Sector At-A-Glance**

Stoughton Residential Profile		
Median Household Income	\$70,485	
Total # Housing Units	10,219	
Units that Heat with Natural Gas	56%	
Units that Heat with Fuel Oil	33%	
Housing Type	Owner-Occupied	Renter-Occupied
Single-Family, Detached	63%	4%
Single-Family, Attached	6%	0.2%
Multi-Family, 2-4 Units	2.5%	10%
Multi-Family, 5+ Units	5%	9%
Other	0.1%	-
<b>Total</b>	<b>77%</b>	<b>23%</b>

Source: US Census 2010

Stoughton’s housing profile is also fairly similar to the state average. The Town’s rental housing stock is slightly smaller than the state average. Single-family detached housing makes up the largest portion of the Town’s owner-occupied housing stock and multi-family housing makes up the largest portion of the renter-occupied housing stock. Over half of the homes in Stoughton heat with natural gas (56%). An additional 33% of homes heat with fuel oil. The remaining 11% have electric heat or use another heating fuel, such as cordwood.

## Residential Energy Consumption<sup>10</sup>

The residential sector makes up approximately 47% of non-transportation energy consumption in Stoughton in 2009. Electricity consumption accounts for the greatest source greenhouse gas emissions in the residential sector, followed by natural gas, then fuel oil. Space heating accounted for an estimated 67% of the residential sector's annual energy consumption.

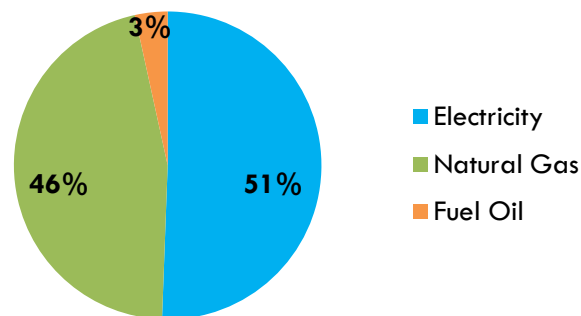
Annual Residential Energy Consumption in Stoughton		
Fuel Type	Energy Consumption	Greenhouse Gas Emission
Electricity	80 million kWh	66 million lbs CO <sub>2</sub>
Natural Gas	5.2 million therms	61 million lbs CO <sub>2</sub>
Fuel Oil	200 thousand gallons	4.5 million lbs CO <sub>2</sub>

GHG emissions are derived using the energy consumption by fuel type and the following conversion factors:

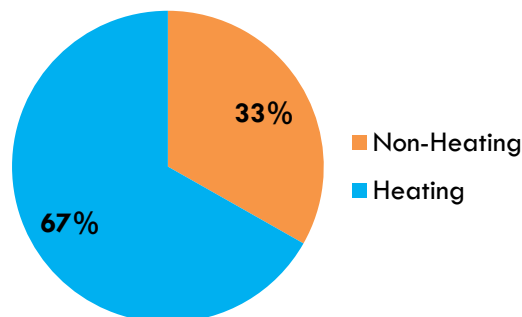
Annual Residential Energy Consumption in Stoughton		
Fuel Type	Factor (lbs CO <sub>2</sub> per Fuel Unit)	Fuel Unit
Electricity	0.828	kWh
Natural Gas	11.71	Therms
Fuel Oil	22.38	gallons

Source: MassEnergyInsight

**2009 Residential Energy Use by Greenhouse Gas Emissions**



**2009 Residential Energy Use by Uses**



<sup>10</sup> The residential energy consumption data is 2009 aggregate utility data from the Town of Stoughton Greenhouse Gas Emissions Baseline Study.

## COMMERCIAL AND INDUSTRIAL (C&I) SECTORS

The commercial and industrial sectors in Stoughton consist of 1,017 business establishments. The food service sector and the public assembly sector are the largest employers in Stoughton. The Town also has a relatively large retail stock, especially in the strip malls sector. The Town

has a relatively small industrial sector.

Among all industrial establishments, the specialty trade contractor industry has the largest workforce in the Town, followed by the heavy and civil engineering construction industry.<sup>11</sup>

### C&I Sectors At-A-Glance

#### Stoughton Commercial Profile

<b>Median Weekly Wage</b>	\$941	
<b>Total Employment</b>	12,667	
<b>Total Establishments</b>	1,017	
<b>Industry</b>	<b># Est.</b>	<b># Emp.</b>
Food Sales	19	340
Food Service	56	1,090
Lodging	56	595
Retail (non-mall)	11	399
Enclosed and Strip Malls	42	1,225
Office	12	202
Public Assembly	270	2,272
Religious Worship	20	124
Warehouse & Storage	18	58
Other	11	130

#### Stoughton Industrial Profile

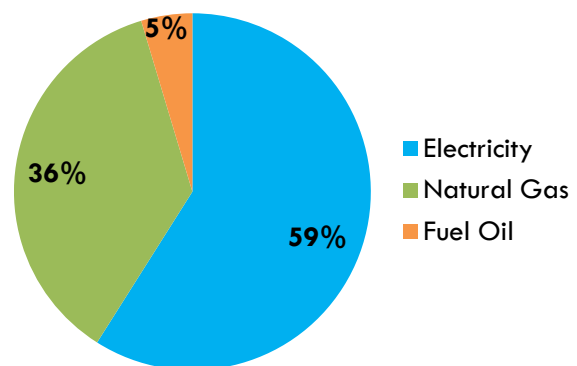
<b>Industry</b>	<b># Est.</b>	<b># Emp.</b>
Construction of Buildings	35	120
Heavy and Civil Engineering Construction	12	313
Specialty Trade Contractors	76	703
Printing and Related Support	11	219
Chemical	3	42
Furniture	7	100
Miscellaneous	6	117

Source: Bureau of Labor Standards Economic Survey, 2010

### Commercial Energy Consumption<sup>12</sup>

The commercial sector accounted for 49% of the town-wide non-transportation energy consumption in 2009. Electricity consumption is the greatest source of greenhouse emissions in the commercial sector, followed by natural gas and then fuel oil. Due to limited data availability, this energy analysis does not separate commercial sector and industrial sector energy consumption.

### 2009 Commercial Energy Use by Greenhouse Gas Emissions



#### Annual Commercial Energy Consumption in Stoughton

Fuel Type	Energy Consumption	Greenhouse Gas Emission
Electricity	110 million kWh	91 million lbs CO <sub>2</sub>
Natural Gas	4.8 million therms	56 million lbs CO <sub>2</sub>
Fuel Oil	320 thousand gallons	7 million lbs CO <sub>2</sub>

GHG emissions are derived using the energy consumption by fuel type and the following conversion factors:

Fuel Type	Factor (lbs CO <sub>2</sub> per Fuel Unit)	Fuel Unit
Electricity	0.828	kWh
Natural Gas	11.71	Therms
Fuel Oil	22.38	gallons

Source: MassEnergyInsight

<sup>11</sup> The labor statistic data is derived from reports filed by all employers subject to unemployment compensation laws, both state and federal. Industry employment and payroll information is produced both quarterly and annually for the Town.

<sup>12</sup> The commercial energy consumption data is from the Town of Stoughton Greenhouse Gas Emissions Baseline Study.

# Stoughton Energy Goals & Actions

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The recommendations for energy goals and actions presented in this section were developed based on the Stoughton Greenhouse Gas Emissions Baseline Study, the Stoughton Energy Profile, and feedback from the Stoughton LEAP Working Group and additional community stakeholders, such as municipal staff, Energy & Sustainability Committee members, and the Stoughton Chamber of Commerce. The recommendations in this plan highlight municipal energy reduction opportunities, as well as identify opportunities to support Stoughton's residents and businesses in clean energy activities.



Source: Stoughton Chamber of Commerce

## Recommendations for Municipal Energy Goals and Actions

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As evidenced in the Municipal Energy Profile, the Town has already made advancements in energy efficiency improvements and cost savings. To further advance Stoughton's clean energy efforts and to increase energy conservation and savings, the Town should pursue the following recommendations to guide municipal decision-making concerning energy and capital improvement projects:

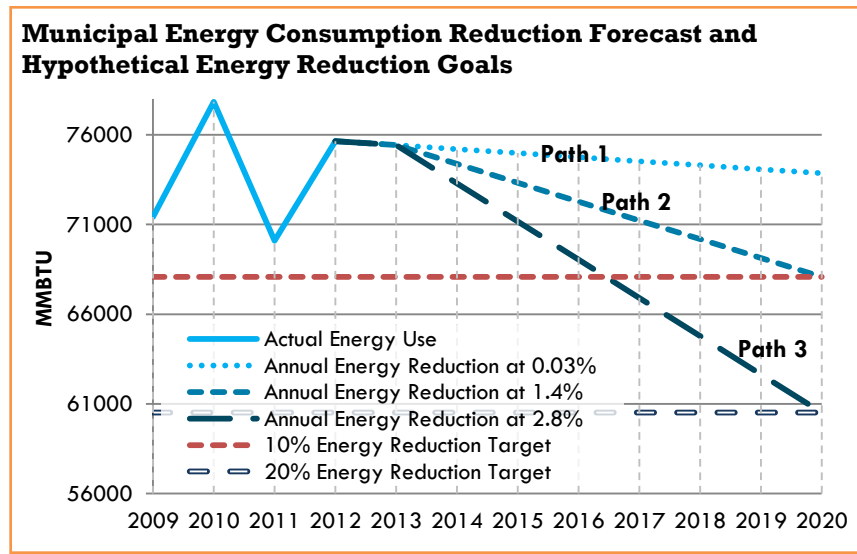
- Establish municipal energy reduction goals,
- Establish renewable energy goals, and
- Identify practical and cost-effective opportunities that will expand the municipality's potential energy reduction and clean energy opportunities, given existing capacity and resources.

## 1. ESTABLISH AN ENERGY REDUCTION GOAL.

It is recommended that Stoughton establish an energy reduction goal that guides municipal energy reduction efforts. The municipal energy reduction goal should be established based on available staff and financial capacity and Stoughton’s energy efficiency potential. The following “Hypothetical Energy Reduction Goals” section highlights how different energy goals could play out in Stoughton.

### Hypothetical Energy Reduction Goals

Since 2009, Stoughton’s annual energy consumption has fluctuated between 66,000 and 78,000 MMBTUs, and annual energy expenditure has dropped 5% from \$576,550 in 2009 to \$546,338 in 2012. The chart below can be used as a reference when establishing Stoughton’s energy reduction goals. The “Municipal Energy Consumption Reduction Forecast and Hypothetical Energy Reduction Goals” chart depicts three potential energy reduction paths for the town.<sup>13</sup> Municipal energy cost savings will depend on the type of energy work that is completed.



1. The first path (Annual Energy Reduction @ 0.03%) assumes that the Town continues its current rate of energy reduction progress. The completion of the four projects currently in progress in the schools is expected to reduce Stoughton’s energy consumption by an estimated minimum of 224 MMBTU.<sup>14</sup> If the Town continues to implement energy efficiency improvement projects that amount to an additional 224 MMBTU savings annually, the Town will see only 0.03% in annual energy reductions. At this rate, by

<sup>13</sup> Municipal energy reduction targets that range from 10 to 20% are common energy reduction goals for Massachusetts communities. Further, many communities have established an energy reduction target of 20% to qualify for the Green Communities Program. The target year of 2020 was chosen based on the Greenhouse Gas Emissions Baseline Study’s recommendation for the Town to establish an energy reduction target to be achieved within 5-8 years. The Town Manager and the Energy & Sustainability Committee should use this analysis as a reference to establish plausible municipal energy reduction goals based on municipal capacity and resources to complete efficiency work.

<sup>14</sup> Due to limited data, this estimate of energy consumption savings does not account for the savings from the implementation of the classroom/lighting upgrade and the exterior lighting upgrade projects in the Stoughton Public Schools.

2020, the Town will have reduced municipal energy consumption by only 2.3% from the 2012 level.

2. The second path (Annual Energy Reduction @ 1.4%) shows that the only way Stoughton can reduce energy consumption by 10% by 2020 is through more aggressive energy reduction measures. In order to achieve a 10% reduction in energy consumption by 2020, the Town will need to increase its annual energy reduction rate to 1.4%.
3. The third path (Annual Energy Reduction @ 2.8%) shows that the only way Stoughton can reduce energy consumption by 20% by 2020 is by having an extremely aggressive annual energy savings of 2.8%. In order to achieve this ambitious energy reduction target, the Town must actively pursue additional energy efficiency improvement opportunities. For example, if Stoughton continues to implement projects on an annual basis that have the same magnitude of energy reductions potential as those identified for the Stoughton High School in the Whole Building Energy Assessment (1,974 MMBTU annual savings) the Town will meet its 10% energy reduction target by 2017. At this rate, by 2020, the Town will have reduced municipal energy consumption by 19% and will be 1,087 MMBTU away from meeting a 20% reduction goal. *It is important to note that if Stoughton wishes to follow this more aggressive energy reduction path, the Town will need to identify and implement projects on an annual basis that have the same magnitude of energy reductions potential as those identified for the Stoughton High School.*

In order to accelerate the Town's reduction in energy consumption, the Town must implement additional energy efficiency projects. The following "Recommended Municipal Energy Efficiency Improvement Opportunities" chart summarizes energy efficiency improvement projects previously recommended to the Town of Stoughton, which the Town should consider implementing.<sup>15</sup> A partnership with an ESCO through a performance contract or an aggressive program to receive comprehensive assessments from the utilities will be necessary to identify additional projects on top of this project list if sustained incremental savings are to be achieved each year.

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<sup>15</sup> For a detailed version of this chart, please refer to Appendix C on page 9 in Part III.



## Previously Recommended Municipal Energy Efficiency Improvement Opportunities

Energy Efficiency Improvement	Expected Reduction		Target Buildings	Recommendation Source
	Elec.	Gas		
R-30 roof insulation	1%	5%	HS, Gibbons, South, West, Jones	Facilities Master Plan
Door replacement	0.5%	2%	MS, Dawe, Gibbons, Hansen	Facilities Master Plan
New windows	1%	5%	MS, Dawe, Gibbons, Hansen, South, Clapp Library, Fire Station #1, Police Station, Pump Stations	Facilities Master Plan
Boiler replacement	-	10%	HS, Dawe, Gibbons, South, Town Hall	Facilities Master Plan
Univent replacement	3%	1%	HS, MS, Dawe, Gibbons, Hansen, South, West, Jones	Facilities Master Plan
HVAC controls upgrade	2%	2%	HS, MS, Dawe, Gibbons, Hansen, South, West, Jones	Facilities Master Plan
Faucet retrofit	-	0.5%	HS, MS, Dawe, Gibbons, Hansen, South, West	Facilities Master Plan
Occupancy sensors	1%	-0.1%	HS, MS, Dawe, Gibbons, Hansen, South West, Jones, Town Hall, Fire #1	Facilities Master Plan
Burner improvements	0.25%	3%	HS, MS, Hansen, West, Jones	5 Year Energy Use Reduction Plan
Steam traps	-	4%	HS, MS, West, Jones	5 Year Energy Use Reduction Plan
Pipe insulation	-	0.5%	HS, MS, Dawe, Gibbons, Hansen, South, West, Fire #1	5 Year Energy Use Reduction Plan
Cooling upgrade	1%	-	HS, MS, Dawe, Gibbons, Hansen, South, West	5 Year Energy Use Reduction Plan
Constant volume VSDs	4%	-	HS, MS, Dawe, Gibbons, Hansen, South, West	5 Year Energy Use Reduction Plan
Demand control ventilation	1%	3%	HS, MS, Dawe, Gibbons, Hansen, South, West	5 Year Energy Use Reduction Plan
Economizers	1%	-	HS	5 Year Energy Use Reduction Plan
Walk-in equipment	0.5%	-	HS, MS	5 Year Energy Use Reduction Plan
Hood controls	1%	2%	HS, MS, Jones	5 Year Energy Use Reduction Plan
Thermostat replacement	-	3%	HS, Town Hall, Fire#1	EE Opportunities Report; Whole Building Energy Assessment Report
Heating valve survey and replacement	-	5%	Town Hall, Fire #1	Whole Building Energy Assessment Report
Chiller replacement	0.19%	-	Town Hall	Whole Building Energy Assessment Report
Destratification fans	25%	-	Town Hall	Whole Building Energy Assessment Report
Motor upgrades	4%	-	Town Hall	Whole Building Energy Assessment Report
Air sealing/ weatherization	-	2%	Fire #1	Whole Building Energy Assessment Report
Refrigerator replacement	0.01%	-	Fire #1	Water System Energy Performance
Water Station Boiler Retrofit	-	20%	Pump Stations	Water System Energy Performance
Water Station Weatherization	-	20%	Pump Stations	Water System Energy Performance
Water Station Heating Improvements	15%	-	Pump Stations	Water System Energy Performance
Water Station VSD and Pump Motor Replacement	20%	-	Pump Stations	Water System Energy Performance
Water Station Gas Conversion & Boiler Replacement	-	45%	Pump Stations	Water System Energy Performance

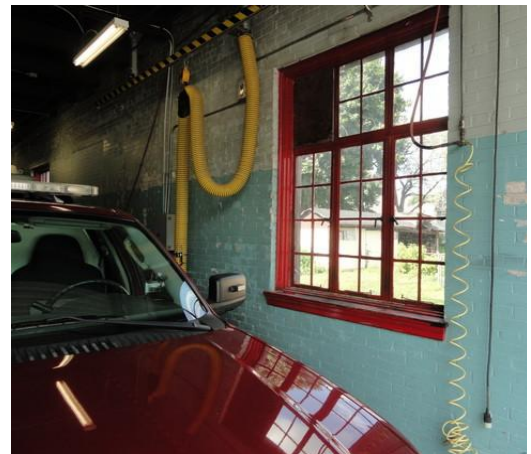
Source: Energy Efficiency Opportunities report for Fire House #1; Energy Efficiency Opportunities report for Town Hall, Whole Building Energy Assessment report for Stoughton High School; Stoughton Water System Energy Performance report; and Stoughton's 5 Year Energy Use Reduction Plan DRAFT

## 2. PURSUE COMPREHENSIVE ENERGY PROJECTS.

The Town should consider the benefits of bundling facility retrofit projects identified in the Facilities Master Plan with energy projects that have both long and short payback periods. Given the number of energy efficiency opportunities in Stoughton, it is recommended that the Town consider with a professional Energy Services Company (ESCO) to provide energy management services through a performance contract. Performance contracting is a creative financing mechanism that allows communities to use guaranteed energy cost savings over a 15-20 year period to pay for a bundle of energy saving, infrastructure renewing projects across a portfolio of buildings.

An ESCO energy performance contract is an effective tool for financing energy efficiency improvements and modernizing municipal buildings and facilities. It helps the Town accelerate the renewal of its energy systems and infrastructure without the need to compete for resources with other more pressing capital budget needs. Because a performance contract eliminates deferred maintenance, an ESCO should also be considered as a strategy to expand the Town's long-term energy efficiency potential through building maintenance and management.

When considering whether the Town should use an ESCO or pursue energy projects individually using just utility incentives and rebates, the Town should consider both its energy efficiency potential and its staff capacity to implement projects. Since performance contracts are paid by energy cost savings, an ESCO project is the most suitable in communities with high energy efficiency potential. Stoughton officials should review existing building energy audits and performance assessments to confirm the Town's energy efficiency potential. Further, ESCOs are most valuable in communities where there is limited staff capacity to plan for and manage multiple energy retrofit projects.



Source: Stoughton Patch

The clearest path to advancing town-wide energy reductions is to pursue energy efficiency upgrades in buildings that are both the most inefficient and have the highest energy consumption. However, in addition to selecting projects based on savings, it is also important to consider how bundling projects, which occurs in an energy performance contract, helps municipalities complete projects that have higher paybacks that in other circumstances would never be paid for. Further, because MEI data can only tell so much about a building's energy use, pursuing an ESCO, or at the very least, reviewing existing building assessments and getting assessments of additional buildings, will help the Town identify which buildings are in fact that most inefficient and most prime for retrofit work.

## Focus on Fuel-Type Specific Projects

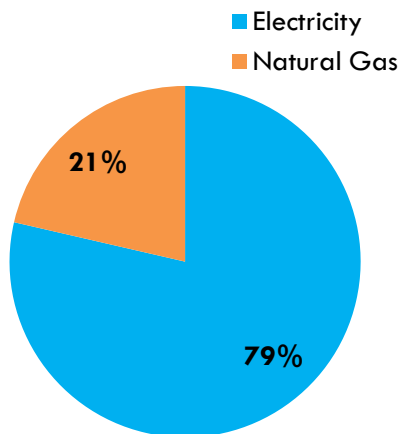
In addition to looking at buildings with high efficiency potential, the Town should also consider whether certain fuel-specific projects have higher savings opportunities. In FY 2012, electricity expenditure accounted for 79% of Stoughton’s non-transportation energy expenditure in the municipal sector, with natural gas making up the remaining 21%. In order to achieve significant energy cost savings, the Town should consider projects that reduce electricity demand. Since FY 2010, town-wide electricity consumption has been reduced by 2,117 MMBTU due to the lighting retrofits in the schools. The following chart highlights some energy efficiency improvement projects recommended by various energy assessments and performance reports that have high electricity savings potential. Stoughton should consider such projects whether it pursue an ESCO or implements projects on an individual basis.

### Energy Efficiency Improvement Projects and Estimated Savings by Fuel Types

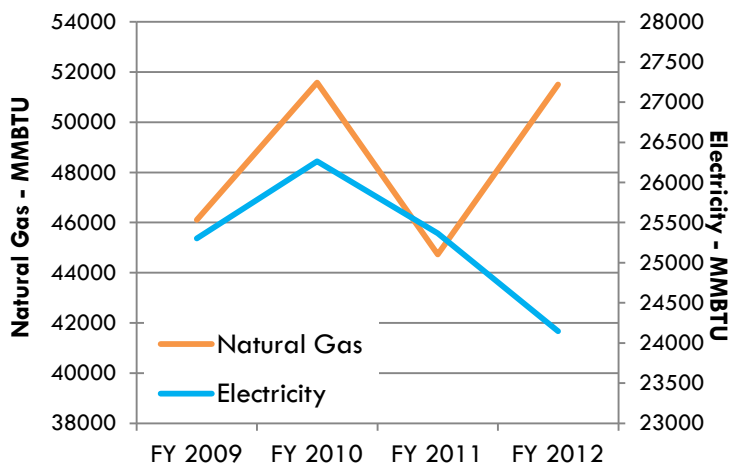
Energy Efficiency Improvement	% Estimated Savings per Building	
	Electricity	Natural Gas
Univent replacement	3%	1%
HVAC controls upgrade	2%	2%
Constant volume VSDs	4%	-
Lighting retrofit	6%	-0.5%
Destratification fans	25%	-

Source: Energy Efficiency Opportunities report for Fire House #1; Energy Efficiency Opportunities report for Town Hall, Whole Building Energy Assessment report for Stoughton High School; Stoughton Water System Energy Performance report; and Stoughton's 5 Year Energy Use Reduction Plan DRAFT

### FY 2012 Municipal Energy Expenditure by Fuel Types



### Municipal Energy Reductions by Fuel Types



## Retrofit Streetlights

Unlike most communities in Massachusetts, Stoughton owns all of its streetlights. This creates an opportunity for Stoughton to implement streetlight upgrades independent of the utility. Because upgrading streetlights with LEDs have a short payback period and yield significant energy savings, the Town should participating in MAPC’s Bulk Purchasing of LED Street and Outdoor Lighting program.

### 3. EXPLORE ADDITIONAL FINANCING MECHANISMS AND ENERGY SAVING OPPORTUNITIES.

In addition to an ESCO performance contract, there are additional funding and energy efficiency opportunities Stoughton should consider that can be used in lieu of or in conjunction with a performance contract. It is important to note that utility rebates, grant funds, and other funding sources are not mutually exclusive to an ESCO performance contract. Instead, they can be effectively applied to “buy down” the cost of an ESCO project and to support additional energy efficiency improvements outside of the guaranteed energy savings.

The following “Utility Incentives for Municipal Retrofits” chart is an overview of the utility incentive programs available for funding municipal retrofit projects.

#### Utility Incentives for Municipal Retrofits

Incentive Program	Descriptions	Available Projects
<b>New Construction and Equipment Incentives</b>	Provides technical assistance and incentives to improve energy efficiency in a new facility or for replacing aging equipment.	Lighting & Controls; HVAC Systems’ Motors; Compressed Air; Variable Speed Drives; Energy Management System
<b>Existing Facility Incentives</b>	Provides technical assistance and incentives to improve energy efficiency and promote energy savings for energy efficiency retrofits at an existing facility or for replacing inefficient equipment.	Lighting & Controls; HVAC Systems’ Motors; Compressed Air; Variable Speed Drives

Source: National Grid and MassSave

For more information, see:

- MassSave New Construction: <http://www.masssave.com/business/new-construction-and-equipment/find-incentives>
- MassSave Retrofit: <http://www.masssave.com/business/building-or-equipment-upgrades/find-incentives>
- National Grid: [http://www.nationalgridus.com/masselectric/business/energyeff/3\\_large.asp](http://www.nationalgridus.com/masselectric/business/energyeff/3_large.asp)

#### **4. ESTABLISH & PURSUE RENEWABLE ENERGY GOALS.**

Given the ESC's mission in reducing fossil fuel energy use in Stoughton, it is recommended that Town develop goals that specifically address municipal renewable energy development. Such goals can be tied to energy reduction goals if energy reduction goals and benchmarking are focused on the reduction of greenhouse gas emissions rather than simply reducing overall energy use.

The Town can also create separate renewable energy goals that are focused on developing specific types of technology on municipal property, such as photovoltaic panels and organics-to-energy facilities. However, given how rapidly energy technologies evolve, it is recommended that Stoughton focus on establishing at least some renewable energy goals that are technology-neutral to ensure that Town is pursuing the most innovative and advanced renewable energy systems.

Once municipal renewable energy goals are established, the Town should prioritize which goals to pursue, keeping in mind energy grant and program opportunities offered by DOER, MAPC, and MassCEC.

# Recommendations for Residential Energy Goals and Actions

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**W**ith the residential sector accounting for approximately 47% of Stoughton’s energy consumption, it is critical that any effort to reduce Stoughton’s energy consumption addresses residential use. Stoughton residents that are served by National Grid and/or Columbia Gas are eligible to participate in the state’s MassSave program, so any effort to promote energy efficiency in the residential sector should focus on increasing participation in these existing opportunities. MassSave offers residents free energy assessments, as well as rebates and incentives for insulation, air sealing and the installation of energy efficiency measures, such as efficient lighting and ENERGY STAR appliances.

An outreach effort to encourage residential participation in MassSave should be collaborative in nature, leveraging the resources and institutional knowledge of National Grid and Columbia Gas and energy service vendors, and the local and community expertise of municipal staff, the ESC, and other community stakeholders. Recommendations for how to create a successful efficiency outreach strategy can be found in “Outreach Strategies for Energy Efforts” on page 1 in Part II of this plan.

As referenced in the “Residential, Commercial, and Industrial Energy Profile,” a lack of up-to-date aggregate energy use data creates a barrier to monitoring and benchmarking progress towards energy reduction goals. Therefore, it is critical that the Town of Stoughton work with National Grid, Columbia Gas, and/or approved MassSave vendors to develop a mutually agreed upon system for accessing residential aggregate data by zip code on a semi-annual basis.

In the first year of outreach to residents, this plan recommends that the Town set a goal of increasing residential MassSave participation by 25%. With updated aggregate baseline data, the Town will also be able to approximate the percentage of energy reductions associated with this participation goal. After a year of targeted outreach, the Town can adjust its participation and reduction goals accordingly based on estimated remaining opportunity and likelihood of certain achievements.

In addition to creating a general outreach effort for all residents, the Town should consider developing targeted outreach strategies for (1) residents who are more likely to participate in MassSave, such as single- or multi-family, owner-occupied households; and (2) those that face more barriers to MassSave participation, such as renters and fuel oil users. The “Community Solar and Efficiency Program” strategy on pages 8 in Part II provides more detailed guidance on how to target such efforts.

Beyond an outreach program, other actions that could potentially help the Town reach residential energy goals include adopting the Stretch Code and adopting as-of-right siting for renewable energy development.

# Recommendations for Residential Energy Goals and Actions

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Stoughton's commercial and industrial sectors account for 49% of the community's energy consumption, and therefore are of equal importance in a strategy to reduce Stoughton's overall energy consumption. In working to engage the commercial sector, the Town will also need to address the same baselining and benchmarking challenges that exist within the residential sector. Initially, it is recommended that the Town set a goal of increasing commercial MassSave participation by 25%, to serve as a ruling stick to measure success and evaluate future opportunities. However, as with the residential sector 25% reduction goal, the Town should anticipate adjusting this overall goal and/or developing more targeted goals once a standard system for accessing commercial aggregated data on a semi-annual basis is secured.

Similar to the recommendations made for targeting the residential sector, any effort to reduce energy in Stoughton's businesses will need to be collaborative. At minimum, the Town should plan to engage and coordinate with National Grid, Columbia Gas, and the Stoughton Chamber of Commerce. In October 2012, the Stoughton ESC and MAPC participated in the Stoughton Chamber of Commerce's "Going, Going Green" meeting that brought utility and MassSave vendor representatives together to discuss energy efficiency opportunities for Stoughton businesses. The event was attended by over 40 local business owners, who demonstrated interest in further pursuing opportunities to save money and energy. The momentum created by this meeting could be leveraged in the near-term to further engage local businesses in specific follow-up activities.

As local stakeholders consider how to engage local businesses, they should consider focusing on businesses that have specific energy consumption patterns, such as the food sales and services industries. The "Local Green Business Program" strategy on page 25 in Part II details how the Town can develop a more advanced green business program.

In addition to encouraging businesses to participate in the utility MassSave program, other actions that could potentially help the Town reach commercial energy goals include adopting the Stretch energy code, adopting as-of-right siting for renewable energy developments, and adopting expedited permitting process for energy manufacturing facilities.





# Energy Action Guide

The following chart is designed to highlight the energy actions that the Town, the Energy & Sustainability Committee, and other community stakeholders can take to help Stoughton reach its energy goals. This chart builds upon the recommended measures in the 2011 Greenhouse Gas Emissions Baseline Study. To see how the recommendations in this chart align with the recommendations in the baseline study, please see Appendix D on page 10 in Part III.

## GUIDE TO READING THIS CHART

- The symbols below each strategy indicate which ESC goal(s) a specific strategy is aiming to reach.

### Stoughton Energy and Sustainability Committee Goals:

-  1. Reduce fossil fuel energy use in Stoughton.
-  2. Quantify energy and resource use via a town-wide greenhouse gas inventory.
-  3. Distribute information to Town departments, residents, and businesses about sustainability, climate change, and energy and resource conservation.
-  4. Produce cost savings for the Town departments, residents, and businesses through resource conservation and improved energy efficiency.







- The “See Part II” in the “More Info” column identifies priority strategies that will be discussed in more details in Part II of the Energy Action Plan.
- The checked off years indicate when a strategy should take place. Some strategies will take place over multiple years.
- The on-going symbols indicate strategies that will take place on a reoccurring basis.







Source: Stoughton Chamber of Commerce





















## ACTIONS TO PROMOTE RESIDENTIAL CLEAN ENERGY EFFORTS

Objective	Strategy	Key Implementers	2012	2013	2014	2015	2016	2017	More Info
1. <b>Track residential energy consumption.</b>	a. Utilize the 2011 GHG inventory, the Energy Action Plan, and available aggregate residential energy consumption data to (1) set up a residential energy baseline, (2) establish energy reduction goals, and (3) benchmark energy reductions.  	ESC; National Grid and Columbia Gas	X						On-going
2. <b>Increase residential awareness of energy opportunities and adoption of energy efficiency and renewable energy measures.</b>	a. Partner with energy service vendors to design and implement an outreach campaign that (1) promotes participation in MassSave and (2) distributes information on the benefits of, incentives, rebates, and other financial opportunities for energy efficiency upgrades and solar development.  	ESC; National Grid and Columbia Gas; Energy Service Vendors	X						
	b. Develop school curriculum and events to educate students and parents on clean energy science, technology, policy, and opportunities to pursue clean energy projects (such as getting a home energy audit through the MassSave program).  	ESC; PTA; Stoughton Public Schools				X	X		See Part II

## ACTIONS TO PROMOTE COMMERCIAL CLEAN ENERGY EFFORTS

Objective	Strategy	Key Implementers	2012	2013	2014	2015	2016	2017	More Info
3. <b>Track commercial energy consumption.</b>	a. Utilize the 2011 GHG inventory, the Energy Action Plan, and available aggregate commercial energy consumption data to (1) set up a commercial energy baseline, (2) establish energy reduction goals, and (3) benchmark energy reductions.  	ESC; National Grid and Columbia Gas	X						On-going
4. <b>Increase commercial awareness of energy opportunities and adoption of energy efficiency and renewable energy measures.</b>	a. Partner with energy service vendors, utilities, the Chamber of Commerce and other stakeholders to design and implement an annual green business outreach campaign to (1) inform local businesses of clean energy opportunities, (2) promote participation in MassSave, (3) encourage the implementation of energy efficiency measures, and (4) celebrate local clean energy.  	ESC; National Grid and Columbia Gas; Energy Service Vendors; Chamber of Commerce	X						

## ACTIONS TO PROMOTE MUNICIPAL CLEAN ENERGY EFFORTS

Objective	Strategy	Key Implementers	2012	2013	2014	2015	2016	2017	More Info	
5. <b>Track municipal energy consumption.</b>	a. Establish a standard process for (1) maintaining and updating the Town's MassEnergyInsight account and (2) utilizing the data to benchmark energy reductions. 	Town Manager; DPW; Stoughton Public Schools; ESC	X	On-going					See Part II	
6. <b>Build municipal capacity and leadership.</b>	a. Annually review Energy Action Plan, document achievements, and plan for next steps.  	Town Manager; ESC	X	On-going					See Part II	
	b. Identify and integrate key energy goals into Stoughton's Facilities Master Plan 	Town Manager; Facilities Master Plan Committee; ESC	X	X						
	c. Identify a municipal employee who will serve as an active and on-going liaison with the ESC and who will assist with monitoring municipal energy use, implementing Energy Action Plan strategies, and championing energy projects. 	Town Manager	X		On-going					
	d. Explore working with an ESCO through an energy performance contract as a financing option for implementing parts of Stoughton's Facilities Master Plan through energy cost savings. 	Town Manager; Facilities Master Plan Committee; ESC	X	X						
7. <b>Increase municipal energy efficiency and renewable energy adoption.</b>	a. Create and maintain a plan for completing municipal retrofit work, which will include a list of priority projects, funding recommendations, and proposed strategies for implementation.  	Town Manager; Building Department; DPW; Stoughton Public Schools; ESC	X		On-going					See Part II
	b. Evaluate ability to become a Green Community by meeting the program's five criteria.   	Town Manager; Board of Selectman; ESC	X		On-going					
	c. Research and educate Town on innovative financing models to complete energy efficiency upgrades in municipal and school buildings.  	Town Manager; Town Finance and Accounting Department; ESC	X		On-going					
	d. Research and educate Town on solar development opportunities on municipal properties, including the capped landfill. 	Town Manager; Redevelopment Authority; ESC	X	X	X					
	e. Review and update municipal zoning and master plan documents to establish both as-of-right siting for renewable energy generation, research & development, and/or manufacturing facilities and an expedited application and permit process for as-of-right energy facilities. 	Town Manager; Zoning Board; Planning Board; Town Planner; ESC	X	X						
	f. Implement a policy and provide training to municipal staff for using life cycle cost analyses when making energy-related purchasing decisions. 	Town Manager; DPW; ESC			X On-going					
	g. Adopt an anti-idling policy to limit idling time for DPW, police, and fire vehicles. 	Town Manager; DPW; ESC			X	X				
	h. Retrofit streetlights with LEDs through collective procurement services and install streetlight control systems. 	Town Manager; DPW; ESC		X	X					