REPORT OF THE SUSTAINABLE ENERGY COMMITTEE

Town Meeting adopted the Sustainable Energy Plan in 2010, with a goal of reducing the Town-wide Greenhouse Gas emissions ("GHG emissions" or "carbon footprint") by 10% between 2007 and 2013. The Selectmen adopted a leadership goal of a 20% carbon footprint reduction during this period for all Town-owned buildings, facilities and infrastructure.

The Sustainable Energy Committee ("SEC") consists of a representative from the Selectmen, School Committee and Wellesley Municipal Light Plant ("WMLP") as well as four people appointed by the Selectmen. The SEC recommends and coordinates initiatives to achieve the goals of the Sustainable Energy Plan and monitors progress.

The "carbon footprint" is an estimated number calculated from a variety of inputs, some actual and some estimated. It is based on actual municipal and college data, actual Town-wide electric and natural gas use, and estimates for heating oil consumption, fuel efficiency in the transportation sector and the conversion factors that translate energy use into GHG emissions (Carbon Footprint). The methodology is guided by the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions established October 2012 and ICLEI – Local Governments for Sustainability CACP 2009 software.

Town-wide Goal:	**Reduce Carbon Footprint by 10%**	**2007 to 2013**
Town-wide Progress:	**Carbon Footprint Reduced 11.6%**	**2007 to 2012**

In five years, it is estimated that the Town-wide six year goal has been exceeded. It is best to understand this in its underlying complexity.

e-CO2 thousand (tonnes)	Natural Gas & Fuel Oil, Gasoline & Diesel & Waste (RDF)				Electric			
% of Town-wide Emissions	**Sector**	**2007**	**2012**	**% Change**	**2007**	**2012**	**Change by Sector**	**Change in Town-wide Emissions**
34%	Residential	93	72	-23%	40	35	-12%	-6.7%
15%	Commercial*	19	14	-26%	39	34	-11%	-2.3%
12%	Colleges	37	33	-11%	9	7	-23%	-1.5%
39%	Transportation	155	151	-2.50%				-1.0%
1%	Waste	2	2	-6%				< 0.0%
	Sub-total	**306**	**271**	**-11%**	**88**	**76**	**-13%**	

**Includes Municipal*

	2007	**2012**	**% Change**
NG, Oil, Fuel, Waste	306	271	-11.2%
Electric	88	76	-13.0%
Town-wide Carbon Footprint Reduction	**394**	**348**	**-11.6%**

Analysis by Power Source

Gasoline and diesel fuel for vehicles contributes an estimated 43% of our GHG emissions. The data available, although limited, indicated that traffic counts remained approximately constant during the 2007 to 2012 period. Therefore, the variable is vehicle efficiency. Improvements in average vehicle emissions contributed an estimated 0.5% reduction in transportation emissions annually, based on national EPA data describing vehicles on the road. The Town's Transportation Advisory Group recently worked with the Metro-West Regional Transit Authority to apply for a grant to fund fixed-route bus service in Wellesley. If funded, this will provide the necessary foundation to reduce transportation emissions by providing an effective public transportation alternative to the private automobile.

Burning fossil fuels (natural gas and heating oil) for heat contributes 34% to the Town's GHG emissions. During this period:

- Actual BTUs used for heating have decreased by 11%.
- More structures have transitioned from heating oil to natural gas that burns an estimated 30% cleaner.
- Due to the rate of teardowns of residences that have been replaced each year by much larger homes, the residential aggregate square footage has increased.
- Due to the construction of Linden Square and other campus and commercial projects, the non-residential aggregate square footage has also increased.
- 2012 was a very mild winter. Estimating the portion of the reduction that is caused by milder temperatures is challenging, but heating degree data suggests that the milder winter of 2012 may be responsible for 10-16% reduction in heating, with 4-10% ascribed to improvements in the efficiency of furnaces, building envelopes and conservation measures such as adjusting the thermostat. Adjusting for Heating Degree Days would place the estimated emission reduction less than 8%.

Electricity contributes 22% of the GHG emissions. Electricity use decreased by 1%. GHG emissions from electricity decreased by 11% because the portfolio of power sources became less GHG intensive.

- The Sustainable Energy Committee's successful campaign to get the Stretch Building Code adopted helped boost energy efficiency in new structures and renovations.
- The Sustainable Energy Committee's successful **POWER TO CHOOSE campaign** helped to boost renewable energy with no GHG emissions to 9% of the power sources.
- Using the **POWER TO CHOOSE** renewable power and other cleaner sources, the electricity in 2012 produced less GHG emissions per kWh than in 2007.
- There has been a gradual transition from incandescent lighting to CFLs and LEDs as well as more efficient appliances

Analysis By Sector

Transportation was discussed above under "Gasoline and diesel fuel for vehicles."

The **Residential** sector contributed more than half of the estimated carbon footprint reduction. The upward pressure from the addition of larger homes and more electronics and media in the homes was more than offset by the success of initiatives and behavioral changes as outlined above including electricity produced with less emissions, increased use of cleaner burning natural gas, more energy efficient building envelopes and more efficient appliances and lighting. The mild winter of 2012 has improved the 2012 snapshot because less heat was needed as compared to an average winter.

The Commercial sector that includes Municipal also showed significant reductions. Municipal will be discussed separately below. Those owning commercial buildings benefitted from the cleaner electricity and their lower use of heating fuel implies that cost effective energy efficiencies and lighting upgrades have been adopted.

Babson and Wellesley Colleges (Mass Bay Community College is included in the "Commercial" sector), contribute 12% to town-wide emissions. Both colleges are taking dramatic steps to reduce their carbon footprints and their reductions contribute to the Town-wide improvement.

Municipal Leadership Goal:	**Reduce Carbon Footprint by 20%**	**2007 to 2013**
Municipal Progress:	**Carbon Footprint Reduced 15%**	**2007 to 2012**

Municipal GHG Emissions by Source

in e-CO2 Tonnes	**FY07**	**FY12**	**% Change**
Electricity	3,222	2,779	-14%
Fuel Oil	1,999	442	-78%
Natural Gas	2,113	2,746	30%
Subtotal - Buildings	**7,334**	**5,967**	-19%
Street, Traffic & Field Lights - Electricity	971	670	-31%
Water, Water, Sewer, RDF - Electricity	953	811	-15%
Subtotal Municipal w/o Fleet	**9,258**	**7,448**	-20%
Diesel - Vehicle	442	512	16%
Gasoline - Vehicle	737	880	19%
Total Municipal with Fleet	**10,437**	**8,840**	**-15%**

Because only 3% of our emissions are from the **Municipal Sector** and waste management at the RDF, the estimated 15.6% reduction in the municipal sector has a small positive impact on Wellesley's carbon footprint. However, it has a material benefit to the Town of Wellesley because:

- Cost avoidance of energy costs saves money for the tax payers;
- The Town demonstrates leadership to the community, illustrating what is very feasible; and
- The environment is benefiting.

Upward pressure on the carbon footprint was caused by the 20%+ aggregate square footage increase of the new High School. These numbers must be considered in the context that the High School was only open for the last four months of fiscal year 2012. Additional efficiencies will be realized from the High School's state of the art energy efficiency systems after several years of operations.

The purchase of "greener electricity" along with the heating conversion from oil to natural gas at both the Middle School and High School were material contributors to the carbon footprint

reductions. Further reductions in energy consumptions were realized from the collaborative efforts of the Facilities Maintenance Department ("FMD"), the WMLP and the SEC.

The dramatic drop in Street Light electricity use is a result of the replacement of metal halide bulbs with LED bulbs for all 545 ornamental street lights.

Improvements in the carbon footprint in many Town buildings and facilities, was partially offset by a sharp increase in the fuel used for municipal vehicles.

Next Steps

Municipal

Energy Policy – The SEC in partnership with the FMD has proposed the adoption of an Energy Policy to the Board of Selectmen and School Committee. It is anticipated that this Energy Policy will be used to guide Wellesley's efforts going forward and we look forward to its enactment in March 2013.

Energy Manager – Based on the design of the new FMD, an Energy Manager was hired in December 2012. His first 100 days have been a whirlwind with long term planning such as an evaluation of the energy efficiency implications of the 10 year Capital Plan and many short term steps that will provide immediate conservation benefits such as:

- Reprogrammed the "on/off" lighting schedule at the Middle School;
- Replaced 16,000 lights with highly efficient bulbs received for free, for an estimated savings of $30,000 per year; and
- Obtained five free energy audits for Town buildings from National Grid

Building Champions Program – In partnership with the Selectmen, the School Committee and the FMD, the SEC is launching a "Building Champions" initiative. Together with the Energy Manager, they will work with the designated Building Champion in each department and school, sharing information, technical assistance and methodology for improving both the technical energy management and the occupant behavior regarding energy conservation. The ultimate "Building Champions" will be the Superintendent of Schools and the Selectmen.

Town-wide

In early March 2013, the SEC launched the **POWER TO $AVE** campaign, with a goal of 400 homeowners receiving no cost energy assessments. These are underwritten by the campaign sponsors, the WMLP and National Grid. The goal is to aid homeowners in reducing their utility costs and lowering their carbon footprint.

Other initiatives such as a potential "Solarize Wellesley" campaign are under development.

Conclusion

The successes to date in reducing the Town-wide and Municipal carbon footprints have demonstrated what is possible. Much has been learned from what did not work and even more from what has been successful. With the momentum gained from the support of all areas of Town government and many independent Town organizations such as houses of faith, environmental groups, garden clubs and service organizations, we believe much more progress is possible.