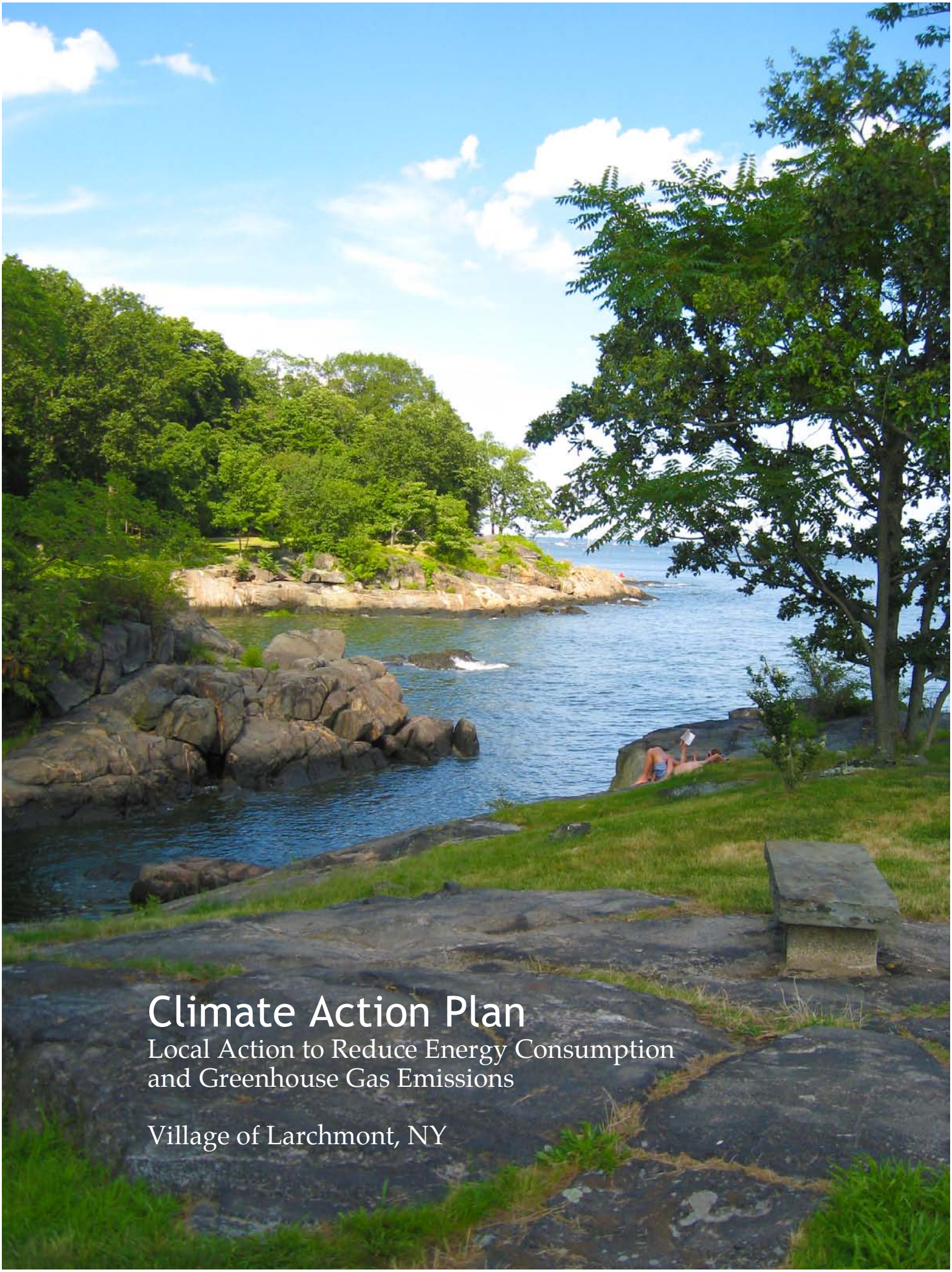

Climate Action Plan

Local Action to Reduce Energy Consumption and Greenhouse Gas Emissions

Village of Larchmont, NY

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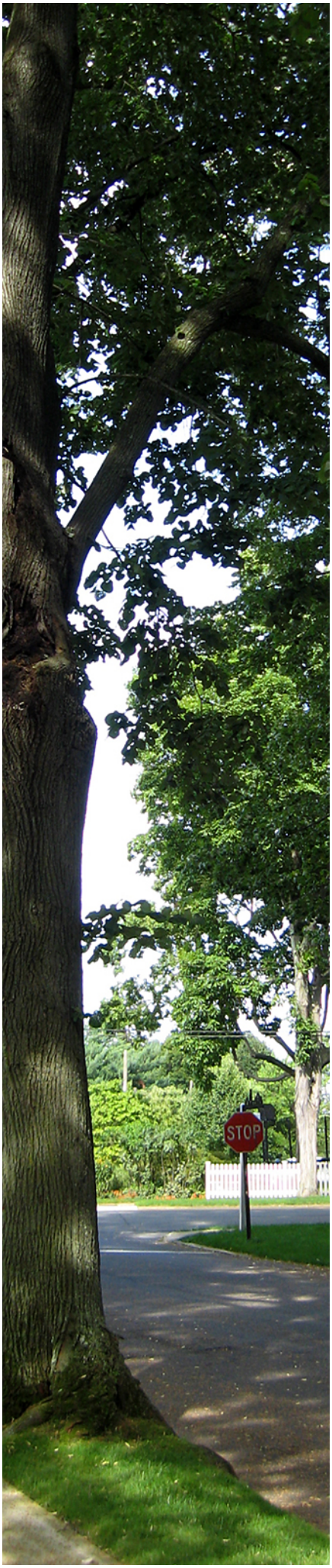


1. Executive Summary

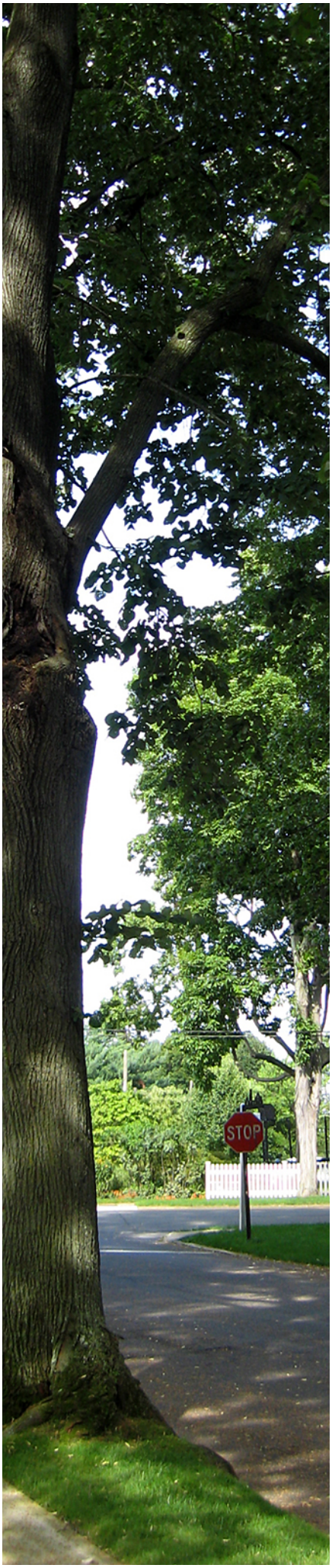
The Village of Larchmont (VoL or "the Village") set a goal of reducing overall greenhouse gas (GHG) emissions from municipal operations by 20% below 2005 levels by 2015. The total carbon dioxide equivalent (CO_2e) emissions by the VoL in 2005 were 1,198 tons. To reach the 20% reduction target, approximately 240 tons of CO_2e must be eliminated. The best available data from 2007 and 2009 indicates that the VoL decreased its GHG emissions compared to 2005 by approximately 9.4% and 14.8%, respectively.

The VoL Climate Action Plan (CAP or "the Plan") is an outline of actual measures the Village has already taken and recommended measures that the Village is encouraged to take, in order to achieve its emissions reductions target by 2015.

The recommended actions in this Plan are designed to increase energy efficiency and reduce emissions while raising public awareness of solutions to global climate change. The Plan presents information on implementation costs, financial savings, investment payback periods, and co-benefits of the recommended measure aside from the emissions reductions. Specific recommended actions are summarized in the table below.

The Village will continue to pursue a multi-part strategy to achieve its GHG reduction targets:

1) Provide leadership through increased energy efficiency and reduced emissions in the operations of municipal buildings, streetlights and traffic signals, parks, and vehicle fleet;
2) Implement several non-energy related actions; and,
3) Develop and lead a long-term public education program.



2. Call to Action

2.1. Climate Science[1]

2.1.a. Enhanced Greenhouse Effect

Carbon dioxide (CO_2), methane (CH_4), and nitrogen oxides (NO_x) are gases that both occur naturally and are released by human activities. Before the release of these gases by human activities began, their natural occurrence resulted in what is known as the "greenhouse effect" whereby sunlight passes though the atmosphere without being absorbed and is then converted to heat warming the earth's surface. The warmed surface emits heat to the atmosphere where some of it is absorbed by these and other gases. Without the natural greenhouse effect the earth would be nearly 60° F colder. However, human activities that increase the amount of these GHGs[2] in the atmosphere increase the amount of heat absorbed and amplify the greenhouse effect.

In 2007, the Intergovernmental Panel of Climate Change (IPCC),[3] which includes more than 2000 scientists from the United States and other countries, found that the average global concentrations of the three main GHGs, CO_2, CH_4, and NO_x, continue to rise. In 2005, CO_2 had increased by 35%, CH_4 had increased by 148%, and NO_x increased by 18% compared to pre-industrial concentrations. In 2007, the IPCC concluded that GHGs from human activities are responsible for most of the increase in global average temperature with greater than 90% certainty. CO_2 is the principle gas contributing to anthrogenic increases in GHGs. The burning of coal, oil, and natural gas accounts for about 80% of anthrogenic CO_2. Most of the other 20% comes from destructive land use practices like deforestation.

[1] All information in this section is drawn from the Pew Center for Global Climate Change, *Climate Change 101 Science and Impacts* and Northeast Climate Impacts Assessment Synthesis Team, *Confronting Climate Change in the U.S. Northeast*

[2] Halocarbons and sulfur hexafluoride are also considered GHGs and are released by certain industrial processes.

[3] The IPCC is a scientific body established by the United Nations Environment Programme and the World Meteorological Organization. It reviews and assesses the most recent scientific, technical, and socio-economic work relevant to climate change, but does not carry out its own research. The IPCC was honored with the 2007 Nobel Peace Prize.

2.1.b. What Does this Mean for Larchmont?

While there is empirical evidence and scientific consensus that GHG concentrations have increased over history in large part due to human activity and this increase is correlated with the increase in global average temperature, the precise nature and intensity of the resulting local impact is less certain and predictable. There have been efforts to draw upon recent advances in climate modeling to assess how climate change might impact the northeast United States.

Among the most significant effects of climate change is sea level rise caused by a combination of the thermal expansion of ocean water as it warms and the melting of land-based ice. Even the most conservative projections have global sea level rising by the end of the century. The possible consequences of this rise are the increases in the extent and frequency of coastal flooding, increased risk of storm damage, permanently inundated shoreline areas, shoreline erosion and wetland loss. VoL, as a shoreline community, may be vulnerable to all of these impacts.

Consequently, the VoL is compelled to do its part to reduce its emissions of GHGs from municipal operations because it is both contributor (albeit, a very small one) and an impacted entity. While its contribution is very small, a commitment to act is a sign of leadership. This local CAP is an outline of the measures the VoL has already undertaken and the measures that the Village is encouraged to implement in order to achieve its 20% GHG reduction target by 2015.

2.2. Commitment to Change

VoL had an environment committee for several years that met intermittently and concentrated on watershed issues. However, Trustee Marlene Kolbert's participation in the Westchester County Task Force on Global Warming in 2006 led to a shift in the committee's focus. In 2008, the Village joined the International Council for Local Environmental Initiatives (ICLEI) - Local Governments for Sustainability - and as consequence, then Mayor Liz Feld, revitalized the volunteer-staffed Committee on the Environment (CoE) with Trustee Kolbert as the liaison to the Board. The CoE was charged with developing a plan to reduce the carbon footprint of the Village and has evolved to be the locus of the Village's environmental and sustainability planning. This CAP was drafted by the CoE under direction of the Board of Trustees and with input and assistance from key municipal staff.

2.2.a Westchester Global Warming Task Force

The Westchester Global Warming Task Force ("Task Force"), formed in 2006, was made up of representatives from government, business, schools and colleges, and the environmental community so that each sector could address both short-term and long-term actions specific to their area. The Task Force set an aggressive reduction goal for GHG emissions. By 2015, countywide GHG emissions should be reduced by 20% below 2005 base year levels, with an 80% reduction in total GHG emissions by 2050. The Task Force has developed a detailed countywide action plan, Westchester Action Plan for Climate Change and Sustainable Development, 2008 to guide the way for Westchester communities. The Task Force has wrapped up its work and the Westchester County Climate Change Advisory Committee will be responsible for follow-up actions.

2.2.b International Council for Local Environmental Initiatives (ICLEI)

VoL joined a group of more than 1,100 cities and counties around the world who are taking part in ICLEI's *Cities for Climate Protection (CCP) Campaign*. ICLEI is an international association of local governments, as well as national and regional local government organizations, that have made a commitment to sustainable development.

ICLEI provides technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level. Its basic premise is that locally designed initiatives can provide an effective and cost-efficient way to achieve local, national, and global sustainability objectives. A fundamental component of ICLEI's performance-based campaign model is the *milestone process*. Each campaign incorporates a five-milestone structure that participating local governments work through: (1) establish a baseline; (2) set a target; (3) develop a local action plan; (4) implement the local action plan; and (5) measure results. The *CCP Campaign* is the first international initiative that aims to facilitate emissions reduction of local governments through measurement, commitment, planning, implementing, and monitoring.

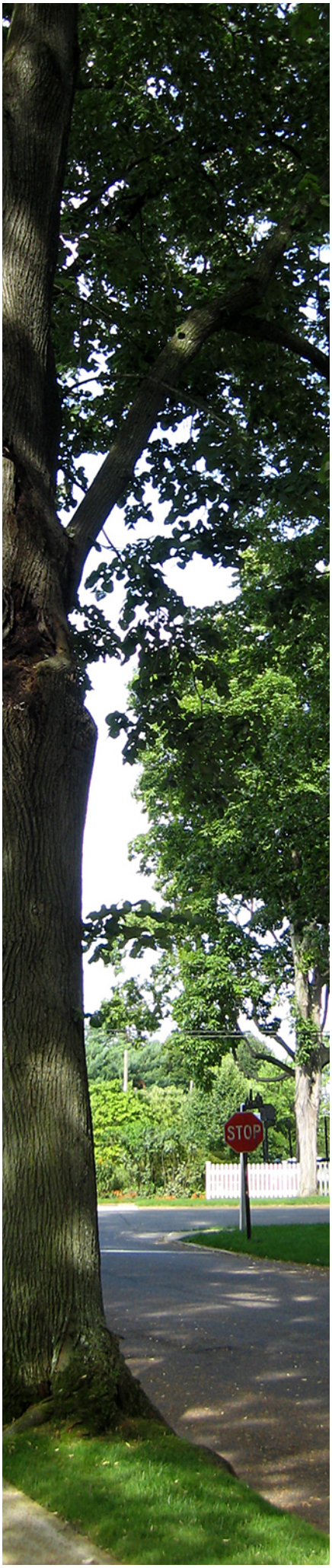
Local governments join the *CCP Campaign* by passing a resolution pledging to reduce GHG emissions from their local government operations and throughout their communities. The five milestones of the *CCP Campaign* and the methodology behind them provide a simple, standardized means of calculating GHG

emissions, establishing targets to lower emissions, reducing GHG gas emissions, and monitoring, measuring and reporting performance. ICLEI has developed several software tools that help local governments comply with the methodology.

VoL is well on its way through the *milestone process*. VoL completed Milestone 1 by conducting a baseline emissions inventory and forecast using software supplied by ICLEI. Based on energy consumption and waste generation, VoL calculated GHG emissions for the base year 2005 and for a forecast year (*e.g.*, 2015). The inventory and forecast provides a benchmark against which VoL can measure progress. Milestone 2 was completed by the adoption of an emission reduction target by passing a 2008 resolution to reduce the GHG emissions from Village operations 20% from a 2005 baseline. On May 15, 2009, VoL was recognized at the 2009 ICLEI Northeast Regional Meeting in White Plains, New York for completing the first two milestones.

2.2.c New York State Department of Environmental Protection Climate Smart Communities Program

On April 27, 2009, the Village again demonstrated its commitment to action by taking the *Climate Smart Communities Pledge*. The New York State Department of Environmental Conservation (NYSDEC) *Climate Smart Communities Program* is a partnership of state and local governments whose goal is to combat climate change. The program emphasizes local actions that will save taxpayer dollars and support other community goals while protecting the climate. The pledge includes all the elements of a successful local climate program and is very similar in form and substance to the ICLEI *CCP Campaign*. Resources are available to communities through the NYSDEC and special consideration is given to *Climate Smart Communities* in certain types of grant applications.



3. Current State

3.1. Village of Larchmont

The VoL is located approximately 20 miles north of New York City on the shore of the Long Island Sound in the County of Westchester in the State of New York. Approximately one square mile in area, it is located entirely within the boundaries of the Town of Mamaroneck with a population of approximately 5900 residents.

3.1.a. Municipal Operations

The VoL employs approximately 100 people. Municipal functions carried out in whole or in part by the VoL include: Building Department, Village Clerk's Office, Engineer's Function, Fire Department, Justice Court, Police Department, Department of Public Works (DPW); Recreation Department, Treasurer's Office, and Water Department.

Municipal solid waste removal is provided as a shared service with the Town of Mamaroneck through the Larchmont-Mamaroneck Joint Sanitation Commission. Electricity is provided by the New York Power Authority (NYPA) over Consolidated Edison Company of New York (Con Edison)'s distribution system. Vendors provide heating oil for oil-fired boilers. Con Edison provides natural gas for gas-fired boilers.

VoL-owned or operated municipal buildings are as follows:

- 120 Larchmont Avenue: Village Hall, Firehouse, and Police Station
- 121 Larchmont Avenue: Library and Village Center
- 2137 Boston Post Road: Storage room on Boston Post Road
- 2015 Boston Post Road: Village Yard for DPW on Boston Post Road
- Flint Park Playhouse
- Behind Village Hall: Larchmont Avenue Garage
- Housing at the Larchmont Reservoir Conservancy

3.1.b. Business District

Two main business district areas, one on Palmer Avenue and another on Boston Post Road, are home to a number of small businesses.

3.1.c. Residential Areas

The Village includes over 2,200 households and is essentially completely developed with little opportunity for additional residential development.

3.1.d. Schools

One public school, the Chatsworth Avenue School (elementary) and one private educational institution, the French-American School of New York, are located within the VoL. The public school is managed by the Larchmont-Mamaroneck Union Free School District and is outside of the authority of the VoL government. These schools are not covered by the CAP.

3.1.e. Parks and Green Space

The Town of Mamaroneck-Village of Larchmont Coastal Zone Management Commission issued an *Open Space Inventory Report* in March 2004. Open space in the Village consists of private property, public and privately owned parks, and cemeteries. There are eleven public and privately owned (public access) parks in the Village. Two of the largest parks include sports/ playground facilities (Flint Park, Lorenzen Park), three include playground facilities (Pine Brook Park, Woodbine (Willow) Park, and Vanderburgh Park), and six are limited to walking and passive recreation (Addison Park, Constitution Park, Fountain Square,* Kane Park, Manor Park* and Parkway Park (Palmer Avenue).) The VoL also owns the Larchmont Reservoir Conservancy, a sixty-acre

* Private parks operated by the Manor Park Society

nature Conservancy designated as a Critical Environmental Area by the NYSDEC. It is located outside the Village borders in the Town of Mamaroneck and the City of New Rochelle.

3.2. GHG Emissions from Municipal Operations

GHGs in the form of CO_2e from municipal operations result from the Village's use of the following energy sources:

- Oil and natural gas to produce heat and hot water for Village buildings;
- Gasoline and diesel to run Village vehicles; and
- Electricity to power Village buildings, park lights, traffic signals, streetlights, water pumps, and sewage pumps.

Emissions from waste collection and disposal and wastewater treatment were not counted in the VoL footprint because the VoL does not control those municipal services.

3.3. GHG Emissions Accounting for Municipal Operations

Village municipal operations were inventoried for the years, 2005, 2007 and 2009. The CoE plans to complete bi-annual inventories to track the effect of the reduction measures in this Plan toward the Village's stated goal of achieving a 20% CO_2e reduction by 2015, as compared to the base year of 2005.

3.3.a. GHG Emissions Accounting 2005

ICLEI Milestone 1, a GHG Emissions Inventory, was completed in 2008 for the base year of 2005. Specialized software provided by ICLEI, know as Clean Air and Climate Protection (CACP), converts gallons and kilowatt-hours (kWh), etc. of energy product usage to eCO_2. The completed inventory set a baseline measurement of eCO_2 for Village operations.

The inventory was based upon data supplied by the VoL Treasurer's Office. Copies of all invoices for the base year from the four companies that supply energy to the Village were made available to the CoE. These companies are:

- New York Power Authority: NYPA supplies almost all the electricity used by Village operations.
- Con Edison: Con Ed supplies natural gas and a miniscule amount of electricity.
- Sprague Energy Corp.: Sprague supplies gasoline for the Village vehicle fleet.
- Lawrence Oil: Lawrence supplies No. 2 heating oil for heating buildings and low-sulfur diesel fuel for the Village vehicle fleet.

After entering the data into CACP, the inventory indicated that approximately 1198.4 tons of CO_2e were released due to municipal operations in the Village in 2005.

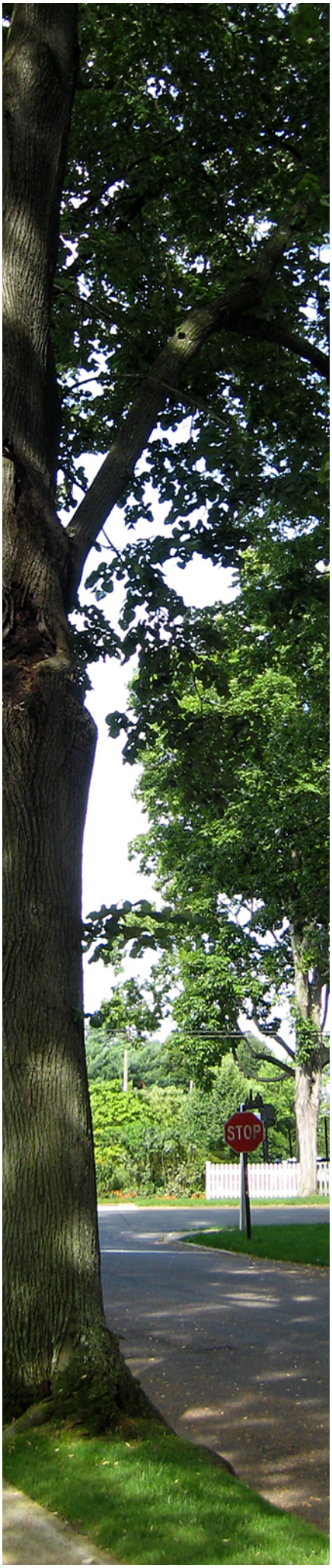
3.3.b. GHG Emissions Accounting 2007

An identical inventory was conducted for 2007. The 2007 inventory indicated that approximately 1085.3 tons of CO_2e were released due to municipal operations, a decrease of 113.1 tons from 2005, a total reduction of 9.4%. Factors contributing to this reduction may include the installation of energy efficiency measures, energy conservation behavior of Village staff, a warmer winter, etc.

3.3.c. GHG Emissions Accounting 2009

An identical inventory was conducted for 2009. The 2009 inventory indicated that approximately 1021.0 tons of CO_2e were released due to municipal operations, a decrease of 177.4 tons from 2005, a total reduction of 14.8%.[4]

[4] Fuel vendors are changed periodically. At the time of publication, the fuel vendors are Metro Fuel Oil Corporation for No. 2 heating oil; Global Montello Group Corporation for diesel fuel; and Sprague Energy Corporation for gasoline.



4. Future State

The Village is blessed with many desirable attributes. Located on the Long Island Sound with picturesque historic housing stock, a short, reliable commute on public transit to New York City, and many of its commercial, educational, and recreation resources within walking distance, the Village offers the truly livable environment that is increasingly rare. In July 2005, CNN/Money and Money magazine ranked Larchmont 11th on its list of the *100 Best Places to Live in the United States.*

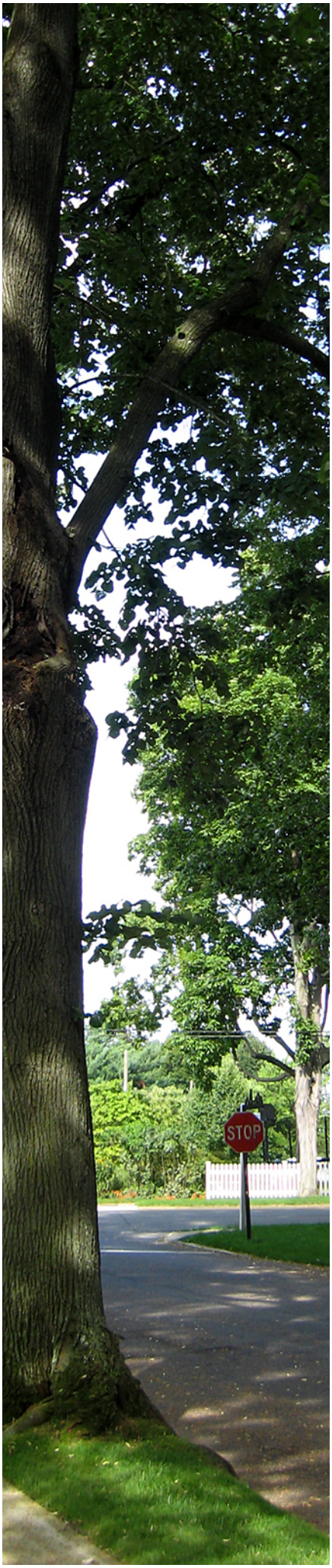
Our vision of the future is one in which Village operations, residential and commercial activities are conducted in the most sustainable manner feasible. Local businesses and commercial enterprises thrive in a community that appreciates the value of commerce accessible by walking or bicycling. The use of energy and other resources (*e.g.*, water) is minimized and renewable energy use is maximized. Waste generation is minimized and whatever wastes are generated are reused, recycled, or composted to the maximum extent possible. There is ample green space for active and passive recreation and a robust tree planting and maintenance program to shade the community and sequester CO_2.

Much of what is required for the realization of this future state is outside the scope of this Plan and beyond the influence of the CoE. Some of what is required to realize this sustainable future is beyond the control of the Village municipal government. However, there are measures recommended in this Plan that, once implemented, will contribute to this future state.

VoL will need to manage its operating expenses through the reduction of energy use, water consumption, materials use, and waste generation. It will also require that the Village elected officials and municipal staff commit to employ the newest technologies to the extent possible and support appropriate operational practices. Our elected officials will be challenged to

find creative ways to fund the improvements in infrastructure necessary to reduce resource use across the board.

The Village municipal government should facilitate and enable the residential and business community to do the same. This CAP is offered to guide and assist our elected officials and community towards a truly sustainable Larchmont.



5. Electricity

VoL consumes electricity from the Con Edison electric distribution grid for buildings, streetlights and traffic signals, and Water Department operations.

Table 1 – Summary of Electricity Consumption

Subtotal Area	**2005 Electricity Consumption (kWh)**	**2007 Electricity Consumption (kWh)**	**2009 Electricity Consumption (kWh)**
Buildings	520,389	524,336	476,910
Streetlights and others	574,149	570,244	582,705
Water department	40,533	42,992	24,714
Total Electricity Consumed	**1,135,071**	**1,137,572**	**1,084,329**

Emissions reductions associated with electricity consumption can be achieved in one of two ways: the generation of power from sources cleaner than the portfolio of generation provided by existing grid electricity and the reduction of electricity consumption through improved equipment efficiency and behavioral modifications. The fuel mix (%) of sources used to generate electricity in Westchester County is 0.5% non-hydro renewables, 0.0% hydro, 43.5% nuclear, 3.0% oil, 34.9% gas, and 0.0 % coal.[5]

In 2009, the VoL DPW completed a 6.4kW photovoltaic solar power installation on a building in the Village Yard, offsetting the electricity consumption for that location. The capital cost of the solar panels was funded partially through NYPA. Assuming 1,200 annual hours of generation at 100% rated capacity, the installation of this 6.4kW system is estimated to avoid 2.88 tons of CO_2e emissions annually.

[5] From US EPA http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html

The CoE has begun to evaluate opportunities for VoL to generate additional electricity in the Village. Electric power generation options using hydro, wind, solar, and cogeneration with existing boilers were all considered.

Improving equipment efficiency offers several opportunities for VoL to reduce emissions through reduction of electricity consumption. Streetlights, traffic signals, parking lot lighting, and park lighting constitute approximately 50% of total electricity consumption of the Village municipal operations. Upgrading existing incandescent and inefficient fluorescent lighting to Light Emitting Diodes (LEDs) or high efficiency fluorescents can significantly reduce electricity consumption.

5.1. Electricity Action 1 – Install Solar Powered Electricity Generation

Photovoltaic solar panels may be installed in the Village in several locations, such as municipality-owned building rooftops, freestanding or ground-mounted panels on Village property, solar-power lighting equipment for parks and parking lots, and utility pole-mounted panels. However, despite continued

improvements in the technology, solar power is still financially unattractive compared to conventional generation or purchasing electricity from the existing electricity grid. As a non-taxpaying entity, VoL is not able to take advantage of state and federal tax subsidies for solar power. VoL may qualify for a 30% capital grant post-installation from the federal government as a non-tax paying entity, but this option will require initial capital investment by either VoL or an investing group using municipal property as a host site.

As a NYPA customer, VoL does not pay into the System Benefits Charge (SBC) that customers of other utilities, such as Con Edison pay, and consequently excludes VoL from qualifying for any New York State Energy Research Development Authority (NYSERDA) grants for solar power.

We recommend that the CoE and the Village Board work with local solar power vendors to evaluate financially viable options for solar powered electricity generation. If a 10kW project can be cost justified, this represents the potential to generate 12,000 kWh per year[6] with no GHG emissions. Assuming this energy can be used to offset grid-supplied electricity, 4.5 tons of eCO_2 could be avoided, and a $1,680 reduction per year[7] of purchased electricity costs.

Additionally, we recommend that the CoE explore a demonstration project of solar panels mounted on utility poles, either to power streetlights or to feed directly into the grid.

5.2. Electricity Action 2 – Upgrade Streetlights and Traffic Signals

Street lighting consists of a mixture of incandescent, fluorescent, and LEDs. Reducing electricity consumption by replacing existing lighting with more efficient lighting offers the potential of significant energy savings. Based on VoL's 2005 accounting, the Village used 1.96 million British Thermal Units (mmBTU) equivalent to approximately 583,000 kWh of energy and spent $79,071 on electricity for street lighting alone, at approximately a $0.14/kWh rate.

LEDs can replace incandescent lights or fluorescent High Pressure Sodium (HPS) ballasts at a lower wattage and provide equivalent "brightness" - the source of energy reduction.

[6] Assumes 1,200 hours per year of availability at 100% rated capacity.

[7] Based on an average rate of $0.14 per kWh.

The energy reduction comes at a financial price. LED fixtures are more expensive than HPS, the most common type of streetlight used in VoL today. For example, one new outdoor HPS ballast costs $100, where the same LED new is $650. The New York State Department of Transportation (NYSDOT) primarily owns streetlights, and the Village will need to work with the DOT in order to pursue an upgrade plan.

Streetlights are not metered. Instead, Con Edison bills customers using a predefined rate and assumed kWh based on existing HPS ballasts consumption rates. Installing LED streetlights will save energy, but will not reduce energy costs unless the electricity tariff is adjusted to reflect the expected lower kWh consumption.

There are many cities already piloting LEDs for outdoor lighting including San Francisco, Los Angeles, and London. New York City announced a plan to convert its streetlights in December 2008. The CoE recommends that VoL work with other Westchester municipalities which are also interested in streetlight upgrades.

Using a conservative estimate of 30% energy consumption reduction if all streetlights are upgraded to more efficient fixtures, VoL could eliminate 175,000 kWh of annual use, translating into 66 tons of avoided CO_2e emissions. If the electricity service tariff is amended to account for the decreased usage, annual energy savings could total $24,500 based on 2005 rates. Efficient streetlight using these assumptions would contribute 27% toward the 2015 goal.

On February 12, 2010, VoL submitted to the NYSERDA a competitive grant application for several energy efficiency improvements (*i.e.*, traffic signals lighting upgrade and fire department lighting upgrade) with a total project cost of $38,000 (VoL's cost sharing component estimated to be $3,800.) Specifically, the project calls for the replacement of all VoL traffic signals and pedestrian lights with LED fixtures and the replacement of all T-12 fluorescent ceiling lights from the Fire Department Apparatus floor at Village Hall with T-8 bulbs. Unfortunately NYSERDA did not look favorably upon the VoL application. Subsequently, the VoL self-funded the upgrade of fire department lighting.

5.3. Electricity Action 3 – Upgrade Firehouse Lighting

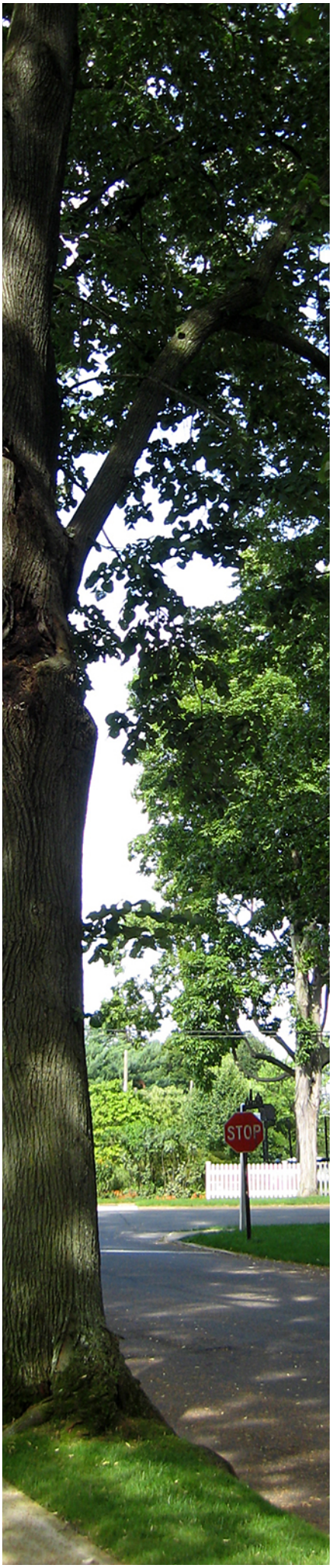
The Village can reduce electricity consumption by replacing existing fluorescent lighting in the firehouse with higher efficiency fluorescent lighting or LEDs. Firehouse lighting is not metered separately from the total Village Hall electricity usage[8]. For estimation purposes, it is assumed firehouse lighting constitutes 5% of the total electricity load at Village Hall, resulting in 12,100 kWh in 2005. Assuming a potential consumption reduction of 40%, this reduction would annually yield 4,840 kWh avoided and 1.8 tons CO_2e reduction and $675 of savings. As mentioned before, VoL recently self-funded an upgrade of existing firehouse lighting with the energy efficient lighting.

5.4. Electricity Action 4 – Employ Energy Efficiency Measures

Additional conservation measures for municipal employees to reduce electricity consumption are recommended. These include the shutdown of work area lighting and computer equipment during off-hours. The installation of occupancy sensors for lighting and heating, ventilation, and air-conditioning (HVAC) control can reduce building electricity consumption. Occupancy sensors vary in price from $20 to $40 each and require very little labor to install. Assuming the Village installs 10 occupancy sensors, the cost would be approximately $400.

Additionally the Village should install a Vending Machine Miser which can reduce energy usage on the Village's three vending machines by as much as 45% for a cost of $200 each, for $600 total. Increasing awareness of building staff regarding energy reduction targets can also help to reduce usage. A target of 5% reduction based on 2005 is reasonable, and would avoid 12,100 kWh, 4.5 tons of eCO_2, and saving $1,700 per year.

[8] Electricity consumption numbers included in this calculation are a gross estimation.



6. Building Facilities

The CoE worked with the DPW to evaluate opportunities for emissions reductions of Village owned or operated buildings and facilities. Possible actions identified include insulation improvements, window replacements, appliance or equipment upgrades, and roof improvements. In addition, any future building refurbishment or renovation or wholly new construction conducted by the Village should seek to incorporate as many LEED[9] elements as feasible. Two specific recommendations are set forth below.

6.1. Building Facilities Action 1 – Convert Boilers from Oil-to-Gas

Upgrades of oil burning equipment to natural gas firing can reduce eCO_2 emissions by 20%. VoL operates four locations with oil-fired boilers for heat and hot water: Village Hall, Village Library, Village Senior Center (part of the Library Building), Flint Park Playhouse, and Byram water pump station.

According to Con Edison, natural gas service is already readily available for the Village Hall and Village Library and Senior Center locations, making these boilers prime candidates for upgrades. Conversion of the boilers at the Flint Park Playhouse and Byram water pump station could require investment in natural gas distribution piping, diminishing the potential cost savings associated with these two locations.

Capital costs for conversion to gas would include the purchase of the new equipment including boilers, and pumps. Flue liners may be required and Con Edison will need to confirm that the existing

[9] The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the U.S. Green Building Council (USGBC), provides a suite of standards for the environmentally sustainable design, construction and operation of buildings and neighborhoods.

natural gas service pipe is adequately sized to provide necessary supply for any new boilers. Additional expense for the labor and internal plumbing work will be required, including removal of existing oil tanks. Capital costs required for the gas conversion upgrades may be partially offset by energy efficiency incentives, preferential pricing natural gas from Con Edison, and favorable loan rates from NYPA.

An estimated 20% reduction in fuel costs and consumption is expected due to the improved heating efficiency of the natural gas. Based on the 2005 No. 2 fuel oil use for the Village Hall and Library locations, VoL could save 20% of 2,377 mmBTU annually for 475 mmBTU reduction. This reduction yields 40 tons of CO_2e avoided, which equates to 16.5% toward the 20% goal for 2015.

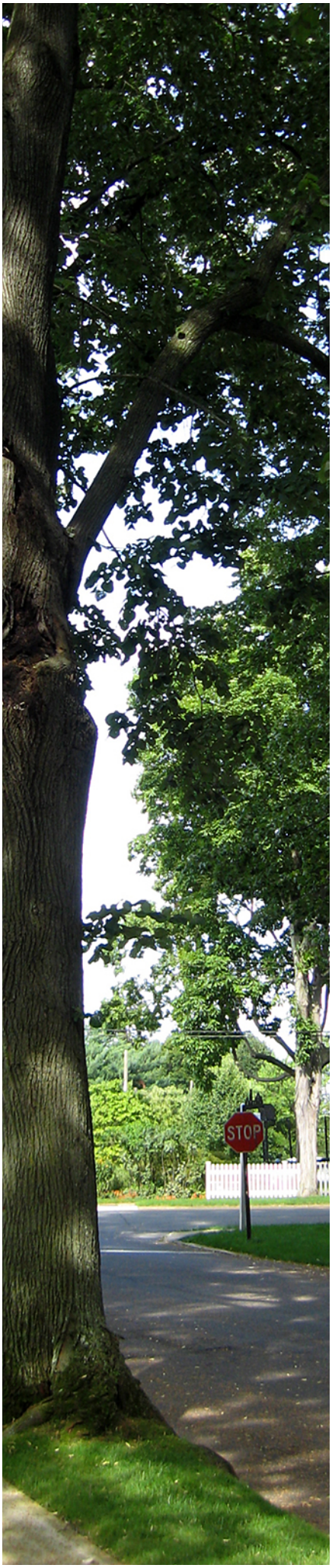
6.2. Building Facilities Action 2 – Cool Roof Installations

Solar reflective surfaces installed on building roof surfaces can reduce energy absorption, and thereby reduce summer air-conditioning cooling demand. Coatings are high-albedo, referring to the reflective properties of the material, and these coatings reflect more solar radiation than conventional roofing materials. Air-conditioning demand is typically decreased by 10-20% in building with cool roofs installed.

The Village Hall[10] and Village Library are both candidates for cool roof installations, and together these locations consumed 472,900 kWh in 2005. Cool roofs can cost approximately $0.50 - $1.15 per square foot, and may be eligible for energy efficiency incentives.

Assuming air-conditioning constitutes 15% of the total electricity consumption for these two sites, the cool roof has the potential to impact 70,930 kWh of usage. If a 15% demand reduction is achieved through the cool roof, 10,640 kWh will be avoided, translating to 4 tons of eCO_2 reduction and $1,500 a year in potential electricity cost savings.

[10] Only the flat portions of the roof may be suitable.



7. Transportation

VoL operates numerous passenger vehicles and trucks, resulting in combined gasoline and diesel fuel eCO_2 emissions of 438 tons in 2005. The DPW, the Building, Fire and Police Departments, and various other municipal departments use these vehicles.

Table 2 – Summary of Vehicle Fuel Consumption for Transportation

	2005	2007	2009
Gasoline consumption (gallons)	30,422	23,785	23,298
Diesel consumption (gallons)	11,000	12,541	12,044

Reduction of GHG emissions associated with transportation fuel consumption can be accomplished one of three ways: use vehicles less often, use cleaner burning fuel, or upgrade vehicles to more efficient engines.

7.1. Transportation Action 1 – Replace Existing Vehicles with Electric Vehicles

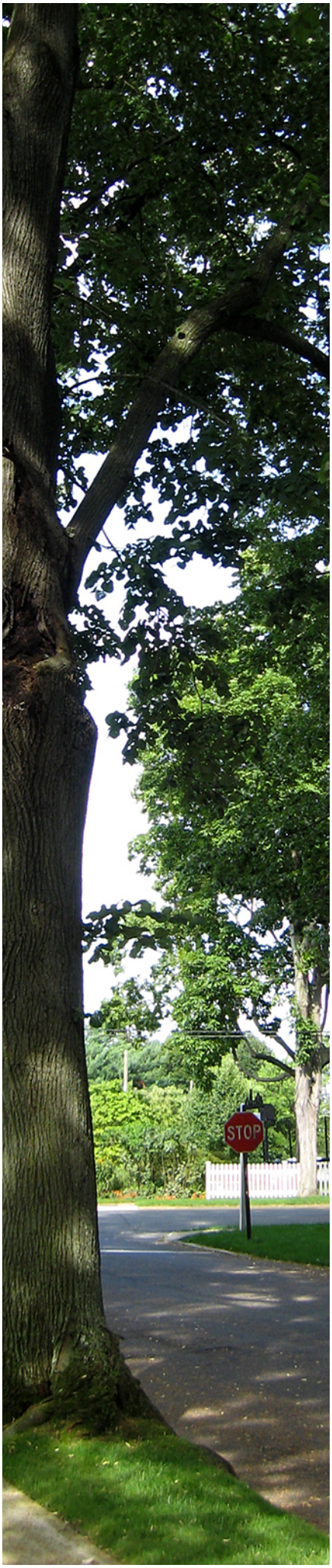
VoL's DPW currently operates one electric vehicle, a Global Electric Motor (GEM) car. If VoL targets a 5% decrease of fuel-powered vehicles by switching to electric vehicles, then a 22 ton reduction in eCO_2 emissions can be achieved, resulting in savings of approximately $6,000 per year in fuel costs. Investments in electric vehicles require further evaluation to determine the practically of this action. Hybrid electric passenger vehicles cost approximately $25,000 new. For purposes of cost-benefit analysis, this Plan assumes Larchmont replaces two gasoline powered passenger vehicles with hybrid electric vehicles to achieve the 5% reduction in fuel usage.

7.2 Transportation Action 2 - Replace Diesel Fuel with Cleaner Alternatives

Biodiesel fuel blends are available up to 20% for use in standard diesel engines, reducing CO_2 emissions by 10% compared to conventional diesel. Biodiesel products are currently more expensive, up to 1.2 times the cost of conventional fuels, and may not be practical for VoL municipal operations at this time. In addition, the use of ultra-low sulfur diesel fuel may be an alternative.

7.3 Transportation Action 3 – Make Larchmont More Bikeable and Walkable

Evaluate municipal roadways and existing infrastructure to ensure that infrastructure is adequate to support walking and biking as alternative modes of transportation. In June 2010, the VoL bought 12 "hitching post" type bicycle racks for installation around the Village business districts. Representatives of the VoL Board, the Chamber of Commerce, and the VoL CoE have sited the bike racks in the commercial areas. The racks have been well received and well used. We recommend the installation of at least six more bike racks of this type. This action relates to the community at large rather than Village employees, though any attempt to replace motor vehicle usage with bike usage by Village employees would be welcome.



8. Other Areas of Opportunity

There are other measures for reducing GHGs recommended as part of this CAP that can not be easily quantified and can not be counted towards the reduction target. However, the CoE believes that they are still an important part of the work that contributes to a sustainable community.

8.1 Housing at Larchmont Reservoir Conservancy

VoL maintains a one-family residence for employee housing at the Larchmont Reservoir Conservancy. It recently implemented several energy saving improvements to the residence including the installation of approximately 2000 square feet of R-15 Class 1 cellulose insulation and spray foam insulation, the repair of ceiling and trim around the attic access door, and the replacement of an old boiler (originally coals fired and retrofitted for oil; estimated 30% efficiency) with new a high efficiency oil fired boiler (85% efficiency and Energy Star™ Certified). This building is not included in the VoL footprint because the energy costs are borne by the resident employee.

8.2 Waste Minimization, Recycling, Reuse, Composting

Waste removal is managed by the Larchmont-Mamaroneck Joint Sanitation Commission and is collected from residences in both the Town of Mamaroneck and the VoL and is not included in the GHG footprint for the Village. Based on the 2009 Materials Recycling Report Card from the Westchester County Department of Environmental Facilities Larchmont-Mamaroneck reported that of 22,367 tons of waste generated, 13,784 tons of material (62%) was recycled in the form of paper, plastics, glass, metal and organic

material. We proudly rank among the top communities in Westchester for recycling. Aside from the benefits to the environment, we avoided over $170,000 in additional waste disposal costs.[11] The waste transfer stations operated by Westchester County now have the capacity to recycle paper, glass, metals, and all numbered plastics.

The CoE is working closely with the Town of Mamaroneck Administrator to increase the amount of recycling collected in the public receptacles in Larchmont's two business areas and public spaces. A plan is currently underway to relocate existing garbage cans to higher trafficked areas and pair them with recycling cans. Based on the success of a local pilot program, when garbage and recycling cans are placed together, people will choose to recycle more if the opportunity to do so is accessible and easy.

Other recommended actions are: the performance of a waste audit of all Village operations to identify opportunities for waste minimization and reduction, and improved recycling; work with the Joint Sanitation Commission to evaluate fee modifications to encourage recycling and reduce solid waste; vigorous enforcement of recycling law; strengthening of the green deconstruction program; the conduct of a public information campaign on water bottles and plastic bags; and a sustained public education campaign aimed at increasing on-site composing. Education and information campaigns will be coordinated with the Westchester Master Composters & Recyclers who will conduct education workshops and demonstrations in the areas of backyard composting, recycling and deconstruction.

8.3 Tree Planting

Trees have one big advantage compared to all other methods of addressing climate change as they actually remove GHGs from the atmosphere and work to lessen the already high levels that currently exist. A large tree can remove and store several tons of GHGs over a lifetime. Urban and suburban trees do double duty as they moderate air temperatures and thereby reduce the need for energy for air conditioning and heating.

The VoL recognizes the value of its trees. As part of the National Arbor Day Foundation program, Tree City USA[12], Larchmont is required to meet the following standards – have a tree board or department; a tree care ordinance; a community forestry program with an annual budget of at least $2 per capita; and an Arbor Day

[11] http://environment.westchestergov.com/index.php?option=com_content&task=view&id=2559&Itemid=4595. This rate is calculated from the total recyclables in tons divided by the total solid waste in tons and is for the entire area covered by the Larchmont-Mamaroneck Joint Sanitation Commission. The County-wide recycling rate was 60%. In addition, the amount of garbage generated overall was slightly down at both the Town of Mamaroneck and County levels.

[12] http://www.arborday.org/programs/treeCityUSA/index.cfm

observance and proclamation. The Village has had an active Parks and Trees Committee for many years. This committee assists municipal employees in maintaining an impressive stock of trees scattered throughout Village parks and adjacent to many of our streets.

8.4 Greening the Village Code

The Village Code should be reviewed to identify existing provisions which impede green practices or new provisions to be included which would allow or encourage green practices. It is recommended that VoL invest the appropriate time and resources to review the Village code and that such assessment be made a priority.

Areas for potential change include the incorporation of green building and deconstruction standards, such as LEED, for all new construction and major renovations.

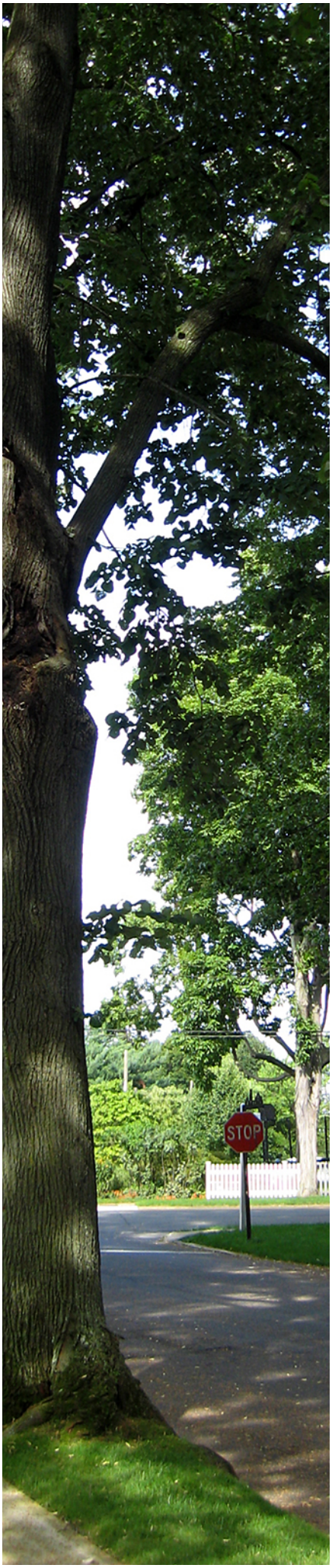
8.5 Public Education

VoL has embarked on a sustained campaign to educate its residents about the implications of climate change and what can be done to reduce GHGs. Some of the steps taken include:

- Held a February 2, 2009, *Sustainability Summit: Toward a Sustainable Larchmont* aimed at the educating selected community leaders;
- Enacted a Village anti-idling law prohibiting non-emergency vehicles from idling for more than five minutes when the temperature is 40°F or above. Outreach and education accompanied the passage of this new law;
- Sponsored on April 24, 2010, a tri-municipal *Sustainability Expo: Green Solutions for the Community;*
- Incorporated a new CoE website link into the existing Village website.[13]

There will need to be repeated campaigns aimed to inform and educate on the numerous topics covered in this Plan. The local media is receptive to the Village's efforts, and often publishes articles about environmental projects.

[13] http://www.villageoflarchmont.org/government/environment.asp



9. Implementation

The CoE will review this CAP with VoL elected officials and municipal operations staff. The CoE also intends to benchmark this plan and future revisions with other environmental committees in Westchester County. Where municipalities have common recommended actions, it may be advantageous for joint efforts to achieve reduction targets (e.g., improved streetlight fixtures, inter-municipal bike lanes).

The VoL intends to monitor its progress with the implementation of this Plan and report its progress to the community.

Acknowledgements

The VoL gratefully acknowledges the leadership and efforts of the following people in the creation of this CAP. Our community is indebted to their contribution towards a more sustainable Larchmont.

Committee on the Environment Members and former Members

Climate Change and Energy Efficiency Work Group
Jill Anderson*
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Lisa Boillot*
Lisa Chase
Lynn Crowley*
Jennifer Jensen
Sally Maca
Ellen Martin*
Holly Moskow*
Diane Neff
Julia Steinmetz
Lori Stevenson*

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Marlene Kolbert, Trustee
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Lorraine Walsh, Trustee

Liz Feld, Mayor*
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Richard Ward, Trustee*

Village of Larchmont Municipal Staff

Rick Vetere, Department of Public Works
Denis Brucciani, Treasurer
Joanne Lanza, Treasurer's Office

*former Committee members or Elected officials