

# Watervliet Climate Action Plan

## 2008 Government Operations



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## Message from the Mayor



The City of Watervliet is committed to improving services and to protecting the environment. In 2009 I signed on behalf of the City, the Climate Smart Communities Pledge- a program of the NY Department of Environmental Conservation to help communities gain benefits of reducing greenhouse gas (GHG) emissions. As part of that commitment, we developed the Watervliet Climate Action Plan (WCAP), a plan formally adopted by City Council in June 2011. The City adopted a goal to reduce GHG emissions by 10% below our 2008 levels by the year 2014. We will aim, however, to achieve a full 20% reduction.

Climate Change impacts all of us and is thought to be caused by our dependence on fossil fuels. Not only will it warm the climate, reduce snowpack, and shift agricultural zones, it is predicted to increase the frequency of harsh weather events. Climate change may be linked to heavier floods, longer droughts, and stronger storms and tornados. As river city we are more vulnerable to flooding. State and local governments in New York are responding by participating in programs like Climate Smart Communities to reduce our carbon footprint.

Reducing emissions is far from just an environmental concern, it's a pressing business imperative for Watervliet. Our carbon footprint is directly attributed to the fuels we burn in our vehicles, the electricity we use in our homes and businesses, and the waste we send to landfills. With energy costs soaring, we spend almost a half a million dollars on energy and fuel to power our services. While our historic building stock contributes to our character, it is also expensive to maintain. Through the WCAP we are implementing innovative strategies like performance contracting to upgrade our facilities with no out-of-pocket cost to the city. We are also targeting waste recycling. We've already doubled metal, glass, paper, and plastic collections with single-stream recycling. We currently send organic waste to the Rapp Rd. landfill but when that closes we will be faced with larger disposal fees and higher GHG emissions as we contract to haul waste to facilities across the state. We are currently exploring innovative options with major community partners to try a technology called "anaerobic digestion" (AD) to enable us to process and recycle organic waste locally in a more cost effective and sustainable way. AD has the promise to reduce or eliminate our landfill tippage fees, generate renewable power, reduce the need for large landfills in New York, and reduce our GHG emissions. We'd be the first community in the northeast to try it.

To act as a steward of the Watervliet Climate Action Plan, the City's Local Development Corporation established the Watervliet Sustainability Working Group (WSWG) to meet, discuss, and update the WCAP on a regular basis. If you are interested in participating in the WSWG, please contact the City. Ideas are always welcome.

Regards

Mayor Mike Manning

## Acknowledgements

We would like to acknowledge a \$2500 grant from Clean Air Cool Planet that helped us draft and complete this Climate Action Plan.

## Climate Smart Communities

Watervliet prepared this plan as part of the NYDEC Climate Smart Communities program. The process is straight forward:

- **Appoint** a climate coordinator and galvanize community support.
- **Identify** sources of greenhouse gases in the community.
- **Set goals** for emission reduction and develop a climate action plan.
- **Implement** your plan, beginning with City facilities and vehicles and then moving to reduce emissions in the community at large.

Through this plan Watervliet is currently addressing energy and emissions from government facilities and vehicles owned by the city. The City will update the plan to include a baseline of emissions and an action plan for the larger community in a future update.

## Watervliet Sustainability Working Group (WSWG)

To tap the knowledge and enthusiasm of the community, the City's Local Development Corporation adopted a resolution establishing the Watervliet Sustainability Working Group (WSWG) to advise the city on practical hands-on strategies to reduce GHG emissions and save money. The WSWG will act as CSC climate coordinator and will provide a platform for community members to contribute ideas to the Watervliet Climate Action Plan (WCAP).

Through the WSWG the city completed its initial GHG baseline assessment, reviewed goals, and developed a climate action plan for city operations. The GHG baseline tells us our overall emissions profile and then breaks down energy use, expenditures, and emissions by each facility to help us target areas for action. The actions identified in this plan will help us save money and reduce GHG emissions. The WCAP is not a static "plan", it's a living document that records the actions that we have done, are currently planning to do, and the good ideas we'd like to explore in the future. By updating our baseline and plan on a regular basis, we'll be able to monitor our progress.

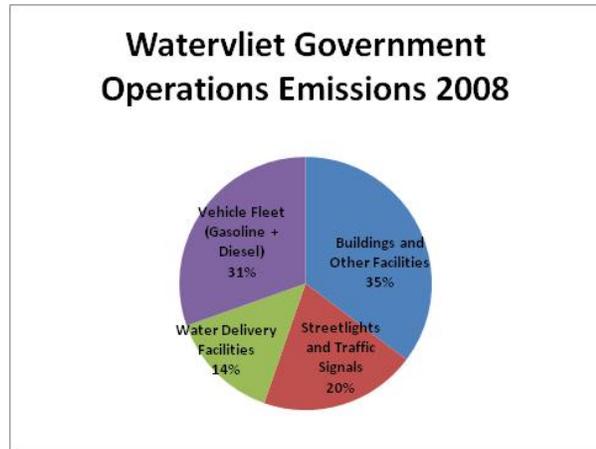
When the City moves to the next phase of developing a climate action plan for the larger community focusing on residences and businesses, the WSWG will meet regularly to discuss that plan and to vet and select initiatives. The group is led by the Mayor.

## Government Operations GHG Inventory

### Baseline Year and Emissions Summary

Watervliet selected 2008 for its baseline to track progress of actions implemented since 2009. To prepare this inventory, Watervliet followed the official Local Government Operations Protocol (LGOP), a protocol produced by ICLEI- Local Governments for Sustainability and The Climate Registry that governs how to make calculations and report this information.

This inventory includes emissions attributed to city operations that consume fossil fuels (electricity and natural gas in buildings, gasoline and diesel in city vehicles). Emissions related to electricity use are called “indirect” because, although they are caused by the city’s electricity use, actual emissions occur at power plants. The LGOP requires they be included in the analysis because the city can reduce these emissions indirectly by controlling energy use.



Watervliet’s government operations in 2008 produced 1128 Metric Tons of GHGs and the city spent close to half a million dollars on energy costs in 2008 (\$483,927). 50% of emissions came from city facilities, 30% from the city’s fleet operations, and 20% from streetlights and traffic signals.

**TABLE 1: Energy and Emissions by Sector**

	Electricity (MWh)	Natural Gas (Therms)	CO2e (Metric Tons)	Energy Cost (\$)
<b>Buildings and Other Facilities</b>	496.89	43173.81	398.14	\$138,352.38
<b>Streetlights and Traffic Signals</b>	687.41	0.00	225.99	\$174,974.67
<b>Water Delivery Facilities</b>	381.73	6529.70	161.01	\$67,934.15
<b>Vehicle Fleet (Gasoline + Diesel)</b>			343.37	\$102,666.35
<b>TOTAL GOVERNMENT:</b>	<b>1566.03</b>	<b>49703.51</b>	<b>1128.51</b>	<b>\$483,927.55</b>

As permitted in the LGOP, Watervliet did not include indirect emissions associated with waste generated from government operations. Municipal waste, when sent to a landfill, will decay there and create some indirect GHG emissions at the landfill. For a government operations inventory, emissions from waste generated at city facilities is typically very small compared to the sources and gathering data is difficult since collection at government facilities is comingled with community collections. As is

conventional practice, Watervliet will report waste GHG emissions as part of Watervliet’s community-wide GHG emissions baseline.

## Watervliet, a Commitment to Hydropower

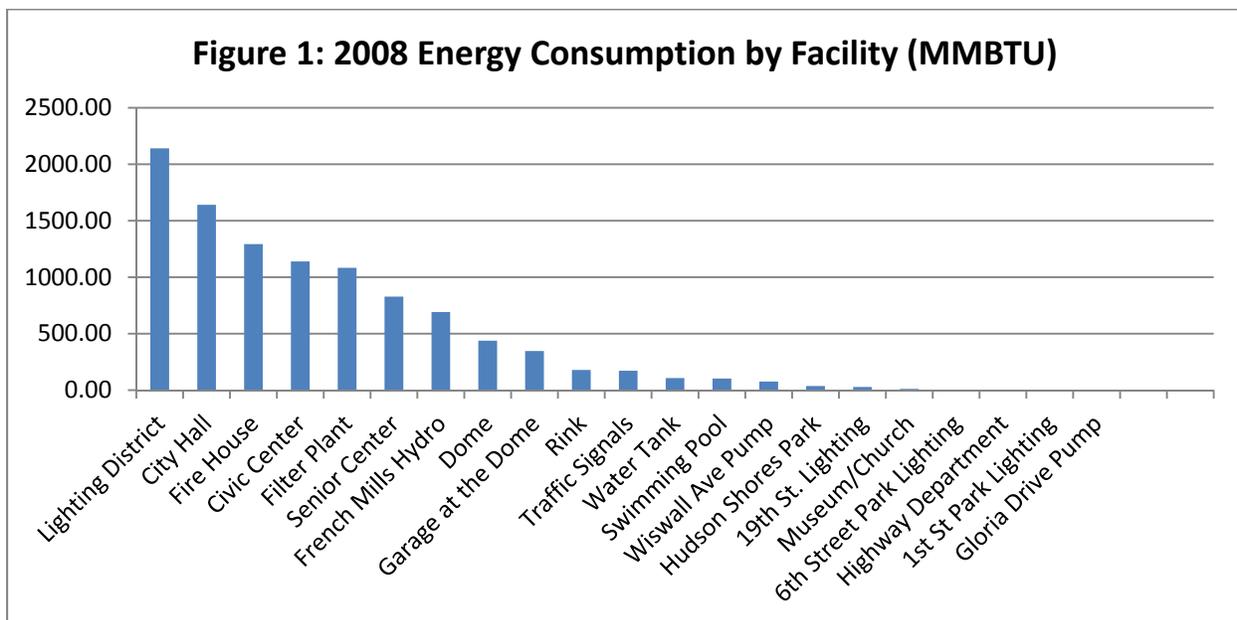
Watervliet generates and consumes a lot of its own clean renewable hydropower at the Watervliet Reservoir in Guelderland. This reduces the City’s carbon footprint substantially. Table 1 includes only retail “grid” electricity purchased by the City and indicates that 14% of total purchases are used to power water delivery facilities. Typically, however, for communities like Watervliet that offer water supply services the percentage would normally be 40-70% because water is heavy and pumping it uses a lot of unclean electricity. Instead, the hydro station at the Watervliet Reservoir meets all of that facility’s pumping needs (~300 MWh/year) and goes on to sell more than 10 times that back to the grid to reduce the carbon footprint of other communities. The small amount of grid power purchased by the City for water delivery facilities reporting in Table 1 is to power operations not directly connected to the reservoir, such as the Filter Plant, small pumps and water tower operations.

*Crunching the **renewable** numbers...*

*In 2008, Watervliet government facilities consumed 1860 MWh of electricity. The city purchased 1560 MWh from the retail grid and generated and consumed 300 MWh of pure hydro power from the Guelderland Reservoir. Because the upstate NY grid is already made up of 30% renewable energy (Hydro, wind, biomass, solar), we find that a whopping 43% of electricity consumed by our government operations is clean and renewable.*

## Facility by Facility Energy Consumption

Facilities make up the largest share of the emissions inventory, with the lighting district and city facilities combining to make up 70% of total emissions. To better understand where to target energy actions, Watervliet combined electricity and natural gas usage at each facility and ranked them according to total energy consumption:



The City’s general street lighting district was the biggest user of grid electricity and is, by far, the most expensive energy expenditure. Following this are the City’s major facilities- City Hall, the Fire House, the Civic Center, the Filter Plant, and the Senior Center. At the time of the baseline (2008) these facilities like many older buildings in the City had inefficiently lighting, non glazed windows, and inefficient heating systems. They are good candidates of energy efficiency retrofit work.

### City Vehicle Fleet

The city maintains a small fleet of gasoline and diesel vehicles, including police and fire, code enforcement, sanitation, and off-road equipment. These vehicles contribute 30% of Watervliet’s total GHG inventory. In 2008, the city procured and distributed fuels to its vehicles from the Highway Department garage. Based on invoices paid by the city for purchases, the city distributed 26,919 gallons of gasoline, and 21,939 gallons of diesel. Of that, some was provided to the Housing Authority, the Senior Center, and School District- services not operated by the city- and so consumption of vehicles from these entities were omitted.

In 2009, the City installed fleet fuel tracking software at the distribution station and now tracks fuel usage by vehicle and city department. In future GHG inventory updates, the City should be able to produce better tracking of fuel consumption by department, and be better able to track changes in consumption over time.

### Emission Reduction Goal

The City adopts a goal to achieve an emissions level that is 10% below our 2008 baseline by 2014, and further adopts a stretch goal to double that reduction to 20% in the same period. The City will monitor progress towards these goals through regular updates of the GHG inventory.

### Featured Climate Actions

Watervliet is in the process of designing and implementing a number of strategies to reduce energy and GHG emissions. We estimate that reductions from these actions will amount to 10-20% of our baseline footprint measured in 2008. Some of the actions have been implemented, others are pipelined, and others are longer term goals and aspirations. Actions listed as concept or as an idea will need to be fully evaluated before being pipelined for implementation. Watervliet will update this list periodically as new ideas emerge through the WSWG.

<b>Sector</b>	<b>Measure</b>	<b>Status</b>	<b>Reductions</b>	<b>Offsets</b>
<b>Energy Efficiency</b>	Performance Contracting	Underway	208	
<b>Renewables</b>	Solar Installations	Complete	27	
	Rome Hydro Project	Planning		6539
	Geothermal at Cultural Center	Concept	20	
<b>Waste Recycling</b>	Single Stream Recycling	Complete	N/A	

	Anaerobic Digestion	Concept	N/A
<b>Vehicle Fleet</b>	Fuel Additives	Complete	20
	Green Fleet Procurement	Concept	69
<b>Totals</b>			<b>344 6,539</b>

## Energy Efficiency

### Performance Contracting

Savings/year: 487,552 KWh, 8,731 Therms, \$90,436 savings, 208 Metric Tons GHGs  
 Status: Phase I implementation underway.

As shown in the emissions inventory baseline, city facilities account for 50% of emissions and energy consumption from all city operations. To address this, the City entered into a 10-year multi-phase performance contract with Honeywell in 2009 to reduce energy use by major city facilities. The City finances energy efficient upgrades and then pays for the upgrades through the cost savings associated with the upgrades. There is no out-of-pocket cost to the City.



Over three phases the project aims to address \$1.3 million in infrastructure needs and will generate roughly \$100,000 in annual cost savings. Phase 1 is the largest phase and is already underway. It is targeting the top energy consuming facilities shown in Figure 1, and includes interior lighting upgrades (better lighting, occupancy sensors, etc), window glazing, vending misers, variable frequency drives (VFDs) at pumping station, etc.

Project	KWH	Therms	\$ saved	GHG saved
<b>Lighting Upgrades</b>	294,419		\$49,168	97
<b>Park Lights</b>	36,257		\$6,055	12
<b>boiler controls</b>		1289	\$1,601	7
<b>VFD/Hydro Plant</b>	128,792		\$15,903	42
<b>HVAC</b>	15,449	1573	\$4,533	14
<b>window film</b>	12,635		\$3,271	4
<b>infiltration reduction</b>		5869	\$7,289	32
<b>Total</b>	487,552	8,731	\$87,820	208

As part of the facilities performance contract the City has retrofitted park lights at the Hudson Shores Park and the Veterans Memorial Park. Prior to this upgrade these parks were lit by 34 250 watt or

higher pole mounted lights. The City retrofitted them using highly efficient light emitting diode (LED) technology to reduce both energy consumption and operations maintenance costs.

## Renewable Energy

### Solar Installations at Hudson Shores Park, the Firehouse, and the Senior Center

Savings/year: 83,816 KWh, \$13,998 energy costs, 27 Metric Tons GHGs (estimated)

Status: Implemented



To further the City's goal of expanding the use of renewable energy in government facilities, the city installed over 100 KW of solar panels, including a 17 KW solar system on the Hudson Shores Park boathouse and two larger 37 KW PV systems on the Firehouse and the Senior Center. All projects were done in collaboration with NYSERDA. For the Firehouse and Senior Center projects, the City received 100% federal stimulus financing. The US EPA designated Watervliet in Dec 2010 as a Green Power Partner to honor the City's ongoing commitment to generating power from clean renewable sources.

### Rome Hydro Power Generation

Savings/year: 20,000 MWh, 6500 Metric Tons (Offsets)

Status: Planning

Watervliet has a long history of water projects in the Capital District. The City already installed a 1.25 MW hydro power generation unit at the Watervliet Reservoir.

The City is planning to expand its hydropower portfolio by building a new 5MW hydro plant on a dam owned by the New York State Canal Corporation that separates Delta Lake in Rome from the Mohawk River. The city is currently seeking necessary approvals and is



hoping to begin construction in 2012. All of the renewable power (20,000 MWh) will be sold back to the grid and will displace an estimated 6500 Metric Tons of GHG emissions based on the current upstate NY grid power mix. The revenue from the sale of electricity will be used to update existing water service infrastructure including, possibly, replacing the existing filter plant with a new system on-site at the Watervliet Reservoir in Guilderland.

### **Geothermal Heating at the Watervliet Cultural Center**

Savings/year: 20 Metric Tons GHGs

Status: concept phase

Watervliet's Cultural Center is a historic Dutch reformed church and had been powered by an oil fired boiler that is now defunct. The City is investigating the feasibility of installing a geothermal heating loop for this facility to tap limitless, free, and GHG-free geothermal energy to heat this building. Geothermal heating would greatly reduce oil and gas consumption annually at the building.

GHG savings are based on an estimate that the facility would use 2000 gallons of fuel oil annually if it continued to operate with the existing oil fired boiler.

### **Vehicle Fleets Initiatives**

#### **Fuel Additives**

Savings/year: 2000 gallons diesel, 20 Metric Tons GHGs

Status: implemented

The City launched a pilot study in collaboration with NYSERDA and Taconic Energy to test a bio-surfactant fuel additive designed to reduce fleet fuel consumption by 2-5% per year, or roughly 2000 gallons of diesel per year.



#### **Green Fleet Vehicle Procurement Policy**

Savings/year: 7000 gallons gasoline and diesel, 69 Metric Tons GHGs

Status: concept

The city is evaluating the feasibility of setting a goal to purchase new vehicles that are, on average, 20% more fuel efficient than those used during the baseline year. This will save the city more than \$25,000 per year in fuel costs, decrease gasoline and diesel fuel consumption by an estimated 7000 gallons, and reduce GHG emissions by 69 Metric Tons.

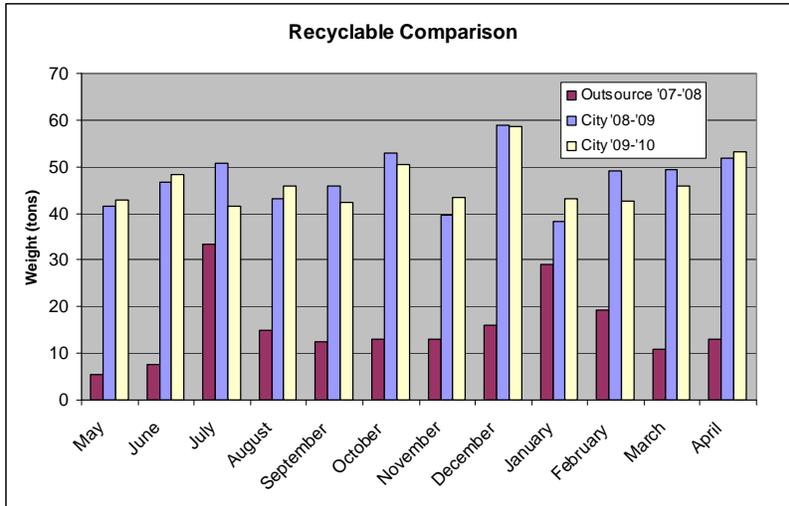
### **Waste Recycling and Reduction**

#### **Single Stream Recycling for Paper, Glass, Plastic, and Metal**

Savings/year: 1020 Metric Tons GHGs (community-wide)

Status: implemented

Prior to late 2008, the city contracted for services to collect waste and recycling. At that time the city began to operate its own waste collection and implemented single stream recycling that tripled total recyclables collected from city residents from 16 to 47 tons/month. The program saves the city money by reducing tippage fees to the landfill and reduces GHG emissions by an estimated 85 Metric Tons / month (based on EPA's Warm model for diverting an additional 30 tons/month of mixed recyclables from a landfill).



### Anaerobic Digestion, Organic Waste

Savings/year: 400-4000 Metric Tons (community-wide)

Status: concept

Sending waste to landfills is expensive and creates GHG emissions. Typically small communities have no option other than to contract to dispose community waste in landfills. When the Rapp Rd landfill closes, the city will need to contract with transfer stations to take the waste much farther away, increasing transportation requirements, tippage fees, and GHG emissions.

Watervliet is committed to exploring new, sustainable ways to manage waste locally. The City is planning to implement a pilot project to evaluate the feasibility of using anaerobic digestion (AD) as an option to treat community waste. AD is a process commonly deployed on farms where organic waste is brought to small and compact units that convert the waste into renewable energy and usable compost. At an AD facility waste is not stored underground like a landfill. Instead it is fully "flow-through" facility meaning that waste converted into usable products and moved out of site. Implementing AD for Watervliet may enable us to save money, reduce GHG



emissions, generate renewable power, reduce need for landfills, generate green jobs, and demonstrate to hundreds or thousands of municipalities that yes you have the power to manage this problem locally.

Because this concept is so innovative, the City is planning to first explore AD in a phased manner starting with a small pilot digester suitable for handling the waste of several local commercial partners. If the model works, the city will gradually expand the program to include general curbside collections from the community.

The estimated emission reductions are based on an assumption that all of the community organic waste is processed by AD rather than going to a landfill. It is not counted as a reduction of government emissions because it is, instead, a reduction of wider community emissions.

## **Monitoring and Verification (M/V)**

The Watervliet Climate Action Plan will be updated annually or biannually using an M/V checklist.

Action items under consideration for the M/V checklist include:

- Update the GHG inventory annually. This will produce a real-world check against our progress, and will enable the city to update and troubleshoot the Watervliet Climate Action Plan.
- Update the WCAP projects list. Through the year the Watervliet Sustainability Working Group (WSWG) will keep track of existing projects, as well as formulate new ideas for consideration. The WSWG will update the projects list including adding, deleting, and/or changing project status of existing actions.
- Update the GHG reduction estimations. WSWG will evaluate completed and proposed projects to determine if reduction estimates should be updated.
- Issuing an appendix to the WCAP for the update year. The appendix will reflect the changes from the prior update.

In addition, the City will consider using an online service such as EPA's Building Portfolio Manager or other related service to track energy and GHG emissions. This will improve data quality and security.