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The Town of New Castle Climate Action Plan 2011





TOWN OF NEW CASTLE

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April 26, 2011 Adopted Version



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LETTER *from the* TOWN BOARD

Dear Citizens of New Castle,

The best scientific consensus is that greenhouse gas emissions are a factor in global climate change. Simply put, this change, if left unchecked, will alter the ecology of our planet. Massive public and private expenditures will be required to cope.

Therefore, because “an ounce of prevention is worth a pound of cure”, it makes environmental and economic sense to address these issues now. Clearly, to maximize effectiveness, international, national and regional efforts are required. But the importance of local action cannot be overstated, or undervalued. Each individual, each household, and each locality can make an important difference.

In order to try to do our part, in 2008 the Town of New Castle became the very first municipality to become a New York State Department of Environmental Conservation’s Climate Smart Community. That same year we became one of the first towns in the country to adopt a goal of reducing its “carbon footprint” (greenhouse gas emissions) by 20% below 2005 levels by 2015.

An important step forward in this process was for the Town to join ICLEI, Local Governments for Sustainability, an international organization dedicated to helping local governments measure their greenhouse gas emissions, establish reduction targets, develop a plan to meet those targets, implement the measures in the town’s plan and, subsequently, monitor progress.

In 2009, Town of New Castle staff measured our greenhouse gas emissions (using 2005 as the base year) and began to develop a plan for the Town of New Castle to reduce those emissions 20% by the year 2015.

The Town of New Castle 2011 Climate Action Plan focuses on four sectors: Energy; Transportation; Land Use, Buildings, & Vegetation Management; and Waste Management. Within these sectors are many sub-categories that are incorporated into the broader topics. This is not a government plan or strictly for municipal use, but it encompasses our businesses, residences, schools and virtually every segment of our Town. We are all partners in this endeavor and we encourage your participation in helping us achieve our goal.

This effort will affect everything we do, from the cars we drive, to the houses we build, to the food we eat; but the rewards will be great. We will be saving money and we will be living healthier lives. By conserving energy we can achieve our ultimate goal of being a sustainable community. We cannot change the whole world but we can affect what happens in our Town and by doing so, insure a better future for ourselves and for generations to come.

Sincerely,

The Town of New Castle
Barbara Gerrard, Supervisor
Elise Kessler Mottel, Deputy Supervisor
John Buckley, Councilman
Robin Stout, Councilman
Michael Wolfensohn, Councilman



EXECUTIVE SUMMARY

1. Why New Castle Should Address Global Climate Change

The International Panel on Climate Change (IPCC), a United Nations advisory body involving about 2,500 scientists around the world, and the U.S. National Academy of Sciences, have both issued findings that global climate change is occurring and that greenhouse gas emissions from human activities play a significant role. The debate over climate change is no longer about whether it is happening but about how fast it is happening, what the impacts will be, and what to do about it. The evidence of climate change is seen in the measured increase of carbon dioxide and other greenhouse gases in the atmosphere, rising average temperatures, and rising sea level.

Climate change, caused by an increase in the concentration of atmospheric greenhouse gases, is considered to be one of the greatest challenges facing modern society. Potential climate change impacts in the Hudson River Valley include: rising sea levels, changes in weather patterns including more intense summer heat waves, more frequent flooding, diminished agricultural productivity, and an increase in the frequency and intensity of extreme weather. In addition, the volatility of energy markets has roused concern, and is forcing communities to think differently about their resources.

“Climate change is considered to be one of the greatest challenges facing modern society.”

In the *Interim Report on the NYS Climate Action Plan*, the state has identified that this challenge can be turned “into an opportunity by working aggressively to become a hub of the new clean energy economy and by making policies and investments that bring low-carbon choices to our citizens and future generations.”

Local governments are in a unique position to lead an intelligent and timely response to these challenges in a way that will keep them, and their communities, in the vanguard of environmentally sound progress.



2. Reasons to Take Action

The primary purpose of this Plan is to provide a roadmap for the reduction of the Greenhouse Gas (GHG) emissions that cause climate change. An additional benefit is that actions that reduce GHG emissions also achieve other goals:

- a. **Reduce air pollution**: Burning fossil fuels results in conventional air pollutants that cause smog and other air quality problems. By reducing fossil fuel use through efficiency and switching to alternative fuels, actions can reduce GHGs while decreasing conventional air pollution.
- b. **Save money**: Using fuels and electricity more efficiently can lower operating costs. Savings can then be used for other purposes or to reduce taxes.
- c. **Improve energy security**: Petroleum and its products, such as gasoline, are a major source of GHG emissions. The United States depends on petroleum imports from other countries. Reducing petroleum use makes us less vulnerable to disruptions in supply and makes strides toward energy independence.
- d. **Improve livability**: Actions that reduce automobile dependency can decrease traffic congestion. Planting trees cools summer air temperatures. Encouraging walking and bicycling can improve public health. These actions all contribute make New Castle more livable.

3. New Castle's Greenhouse Gas Emissions

GHG Emissions Inventory

In 2008, New Castle inventoried GHG emissions using 2005 as the base year and, using ICLEI's (International Council for Local Environmental Initiatives) Clean Air and Climate Protection ("CACP") software, forecasted emissions in 2015. The inventory focused on carbon dioxide emissions and not other sources of greenhouse gas.

Carbon dioxide results from the combustion of fossil fuels such as oil, coal, natural gas, gasoline, and diesel. These fuels and materials are used in our daily activities at home and at work. Burning oil and gas to heat our homes and workplaces, using electricity to power lights and machines, burning gasoline and diesel to run cars and trucks, and disposing of trash all result in the emission of greenhouse gases.

The GHG inventory is based on accepted international protocols and is the same approach other participants in Cities for Climate Protection use. The inventory is not meant to be a precise accounting, but it does provide a broad-brush examination of our GHG emissions and helps point out where actions are most needed.

Government Inventory Results

In 2005, the Town of New Castle operations emitted approximately 3,957 metric tons (tonnes) of CO₂ e. As visible in Table 3.1 and Figure 3.1, the **Water Delivery Facilities** were the largest emitter of CO₂ e (45.3 percent) in 2005. Emissions from the **Vehicle Fleet** produced the second highest quantity of emissions, resulting in 21.9 percent of total CO₂ e. **Buildings and Facilities** produced 18.6 percent of total emissions. The remainder of emissions came from **Employee Commutation** (9.7 percent), **Public Lighting** (3.5 percent), and **Wastewater Facilities** (1 percent). **Emissions from government operations produced approximately 1.3 percent of total community emissions.**

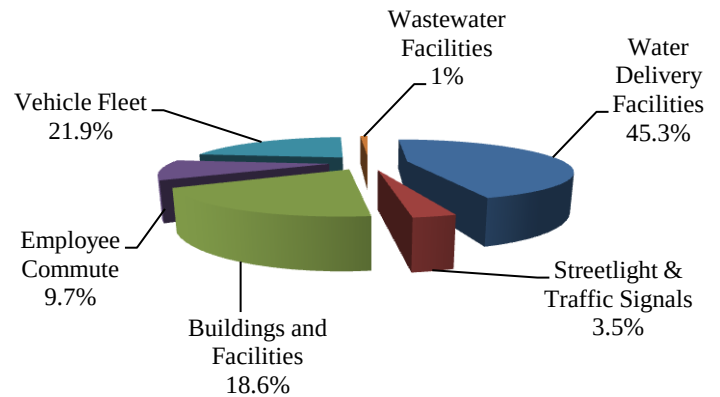


Table 3.1 2005 Government Emissions by Sector

Sector	Greenhouse Gas Emissions (metric tons CO ₂ e)	Greenhouse Gas Emissions (% CO ₂ e)	Energy Equivalent (million Btu)
Buildings	734	18.6%	8,422
Vehicle Fleet	865	21.9%	10,781
Public Lighting	138	3.5%	1,200
Water & Wastewater	1,834	46.3%	17,304
Solid Waste	0	0%	0
Employee Commutation	385	9.7%	4,815
TOTAL	3,957	100.0%	42,523



Millwood Water Treatment Plant: Example of Governmental Energy Consumption in New Castle

Community Inventory Results

In 2005, The Town of New Castle Community as a whole emitted approximately 308,905 metric tons (tonnes) of CO₂e (within this total, governmental operations emitted a total of 3,957 tonnes CO₂e). As shown in Figure 3.2 (right) and Table 3.2 (below), the **Residential** Sector was by far the largest source of emissions, generating approximately 160,240 metric tons of CO₂ e, or 51.9 percent of total emissions during 2005.

The **Transportation** Sector was the second largest source of emissions, generating approximately 126,022 metric tons of CO₂ e, or 40.8 percent of total emissions. The Transportation Sector's emissions result from diesel and gasoline combustion in vehicles traveling on both local roads, and state highways that pass through the Town of New Castle boundaries. Similarly, electric and natural gas use in The Town of New Castle's **Commercial / Industrial** Sector, emitted 20,191 metric tons CO₂ e, or 6.6 percent of total community emissions. The remaining 0.8 percent (2,452 metric tons) is the estimated future methane emissions that will result from the decomposition of **waste** that was generated by the Town of New Castle community during 2005.

Figure 3.2 Community CO₂ Emissions

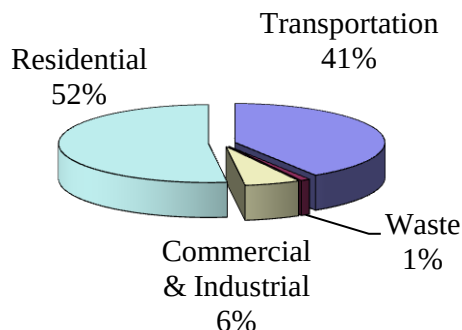


Table 3.2 2005 Community Emissions

Sector	Greenhouse Gas Emissions (metric tons CO ₂ e)	Greenhouse Gas Emissions (% CO ₂ e)	Energy Equivalent (million Btu)
Residential	160,240	51.9%	1,948,095
Transportation	126,022	40.8%	1,541,281
Commercial / Industrial	20,191	6.6%	224,635
Waste	2,452	0.8%	---
TOTAL	308,905	100.0%	3,714,011



Example of Residential Energy Consumption in New Castle

Emissions Inventory and the Plan

The inventory shows that in order to reduce GHG emissions, New Castle needs to focus on household energy use and transportation. The Energy section of this plan (pgs. 27 – 30) discusses in detail how energy use contributes to GHG emissions, lists the resources and programs available to support actions, and describes past, present, and future actions to reduce emissions.



Table 3.3 (below) lists energy consumption associated with the use of different types of appliances and devices. The table shows that consumers can make choices that affect how much greenhouse gas their activities emit. For example, replacing one 60-watt incandescent light bulb with a 15-watt compact fluorescent light bulb that provides the same amount of light while using less electricity saves 85 pounds of carbon dioxide in a year.

The inventory information can be used as a baseline to track progress in meeting the Plan's goals. It is recommended that the Town conduct inventories on a regular basis to evaluate the results of New Castle's efforts to reduce GHG emissions. The first evaluation should begin in late 2011 and examine 2010 usage data.

Table 3.3 Energy Use in the Home

Device/Appliance	Wattage	Annual Electricity Use (kilowatt hours)	CO ₂ Emissions (pounds)
Incandescent Bulb (4 hrs./day)	60	84	119
Energy Star CFL (same output)	15	24	34
Fridge/Freezer 17.5 cf frostless	757	2,256	3,203
Energy Star 17.5 Fridge/Freezer	551	1,572	2,232
Central Air Cond. (4 months use)	5,000	1,620	2,300
Room Air Cond. (4 months use)	1,500	804	1,141

4. How New Castle is Responding

In 2008, the Town of New Castle made a commitment to “go green” in response to a general call to slow the spread of global warming and reduce harm caused to the environment. On October 28th 2008, the Town of New Castle adopted the goal of reducing the Town’s “Greenhouse Gas Emissions” (GHG, or “carbon footprint”) by 20% below 2005 levels by 2015. As further detailed herein, the Town has already commenced several steps in pursuit of this goal:

1. The Town has joined forces with other local, national, and international organizations which are: (a) documenting the causes and impacts of global warming; and (b) proposing prompt, specific, cost-effective actions to reduce harmful emissions and to ameliorate those impacts. See Section I.
2. In 2009 the Town prepared an inventory of its Greenhouse Gas Emissions as of 2005 in order to establish the baseline from which reductions will be achieved. This inventory included public government as well as private residential and private commercial activity.
3. The Town began implementation of straight-forward management practices, such as lighting replacement, and acquiring more energy efficient hybrid fleet vehicles.
4. By this Climate Action Plan, the Town will formalize its intent to adopt a framework of best management practices designed to meet or exceed the Town’s 2015 goals in a reasonable and cost-effective manner.
5. Performed comprehensive building energy audits on 80% of the Town owned buildings and is implementing the projects with the best return on investment.
6. Replaced seven fleet vehicles with hybrids, and is purchasing vehicles sized for the task.
7. Started the installation of the “Solar Wall” at the Water Plant to save 3,000 gallons of heating oil per year.

The 2008 Westchester County Global Warming Action Plan, developed by the Global Warming Task Force, calls for every resident, school, governmental entity, and business to strive to reduce its “carbon footprint” by 20% by 2015 and by 80% in 2050. More than 70 volunteers, including our then Town Administrator, Gennaro Faiella, assisted the 34-member Task Force in the development of this plan. Details of the Plan can be found on the Westchester County website www.westchestergov.com. Below are some of New Castle’s recent commitments toward combating climate change.

In February 2008, the Town of New Castle became the first municipality in the State to adopt the New York State Department of Environmental Conservation’s (DEC) “Climate Smart Communities” pledge. The Board unanimously passed this 10-measure commitment to encourage renewable energy, to increase recycling efforts, and to incorporate climate change, sustainability, and the use of environmentally sound goods and services within all development plans. The DEC established the Office of Climate Change that same year, to help governments and institutions respond effectively to the impacts of greenhouse

***The Town of New Castle
became the first
municipality in the State to
become a Department of
Environmental Conservation
“Climate Smart
Community.”***

gases. Through the development of policies and community assistance, their goal is to help reduce emissions and prepare for unavoidable global warming impacts. According to Town Supervisor Barbara Gerrard, “We need to adopt measures to help our community adapt to the changes we are seeing already and we need to enact policies to reduce greenhouse gas emissions to the maximum extent possible.”

By partnering with the DEC, the Town of New Castle has access to the Office of Climate Change’s technical staff of engineers, economists, and researchers. These experts will assist the Town at no additional cost, while also helping to explore potential new sources of funding to assist in the implementation of new measures the Town continues to adopt.



Also, in 2008, New Castle partnered with neighboring towns to adopt a regional planning agreement for Westchester, known as “The Greenprint for a Sustainable Future.” In doing so, New Castle made a commitment to consider certain environmental guidelines, and consequently is eligible for technical assistance, funding from Westchester County, and possibly preference in obtaining State grants. Westchester County is one of thirteen counties that make up the Hudson River Valley Greenway. The Hudson River Greenway is a state agency created to facilitate the development of a voluntary regional

strategy for preserving scenic, natural, historic, cultural and recreational resources while encouraging compatible economic development and maintaining the tradition of home rule for land use decision-making. Members of the Greenway make their own choices while considering environmental guidelines. Within the Greenway, Westchester is one of two counties that have an approved plan. By adopting Westchester’s plan, New Castle is proud to become part of the Greenway Compact.

On March 24, 2010, New Castle received a Green Star award from Grass Roots Environmental Education in recognition of the Community’s efforts to address issues of climate change, sustainability, and environmental health.

5. ICLEI and Cities for Climate Protection

New Castle is a member of ICLEI (International Council for Local Environmental Initiatives), an international organization of local governments that has a commitment to reducing GHG emissions and promoting sustainable development. By joining ICLEI, New Castle is provided with technical consulting, training, and information to help meet its goals. The Deputy Commissioner of Public Works, Gerard Moerschell, oversees the implementation of ICLEI’s initiatives.



One of the initiatives New Castle chose to join is the Cities for Climate Protection Campaign (CCP). This campaign helps cities adopt policies and implement quantifiable measures to reduce local greenhouse gas emissions, improve air quality, and enhance urban livability and sustainability. All CCP participants agree to enter into a process that involves five basic steps:

1. Conduct an inventory of GHG emissions
2. Set an emissions reduction target
3. Prepare a local action plan
4. Implement the local action plan
5. Monitor the results

New Castle has conducted an emissions inventory, set a reduction target, and prepared this Plan, which provides strategies and actions to achieve it.

6. GHG Emissions Reduction Goal

The Climate Action Plan (the “Plan”) proposes that New Castle reduce GHG emissions by 20 percent below 2005 levels by 2015. *

This means the community needs to reduce and prevent annual GHG emissions of **61,781 tons** of carbon dioxide.

* The 20 percent target is typical of those set by other Cities for Climate Protection (CCP) communities (Westchester County has adopted a goal of 20% reduction). Many scientists indicate that far greater worldwide reductions, in the realm of 75 to 85 percent, will be necessary to stabilize the concentration of greenhouse gases in the atmosphere. At present, we do not know how to achieve such a reduction without considerable social disruption. However, the plan proposes that we begin by undertaking actions that are feasible now and that for the most part provide multiple benefits, including cost savings and ultimately energy independence.

7. Vision and Strategies

The vision of this Plan is for the Town of New Castle to be smarter and more resourceful about the manner in which its buildings use energy, people and goods are transported, and waste is managed. New Castle is in a position to apply many existing technologies and approaches to tackle this problem and to take advantage of emerging trends and resources in energy, transportation, land use, and waste management. By undertaking the actions in the Climate Action Plan, the Town can reverse the trend of increasing GHG emissions, begin to reduce our annual emissions, and begin to realize important cost savings.

The Plan proposes strategies based on increasing energy efficiency, switching to renewable energy sources, reducing vehicle miles traveled, and reducing the generation of solid waste. These community-wide strategies include:

- Improve efficiency of electricity use by 12.5%.
- Reduce natural gas and fuel oil use by 10%.
- Reduce emissions associated with electricity generation by 40%.
- Purchase 20% of electricity from green power sources.
- Increase average fuel economy to 40 MPG.
- Reduce vehicle miles traveled by 10%.
- Increase recycling rate to 60%

Some of the reductions are not in New Castle's control and depend on action at the federal or state level. The Town can play an advocacy role in these cases.

While these strategies are focused on reducing greenhouse gas emissions, they will have added benefits including reduced conventional air pollution (i.e., smog), savings on utility and fuel bills, reduced traffic congestion, conservation of natural resources, and other positive effects. The strategies will be put into effect through proposed actions on energy, transportation, land use, and waste management. The full Plan describes the existing situation in each area, available tools and resources, and proposed actions.

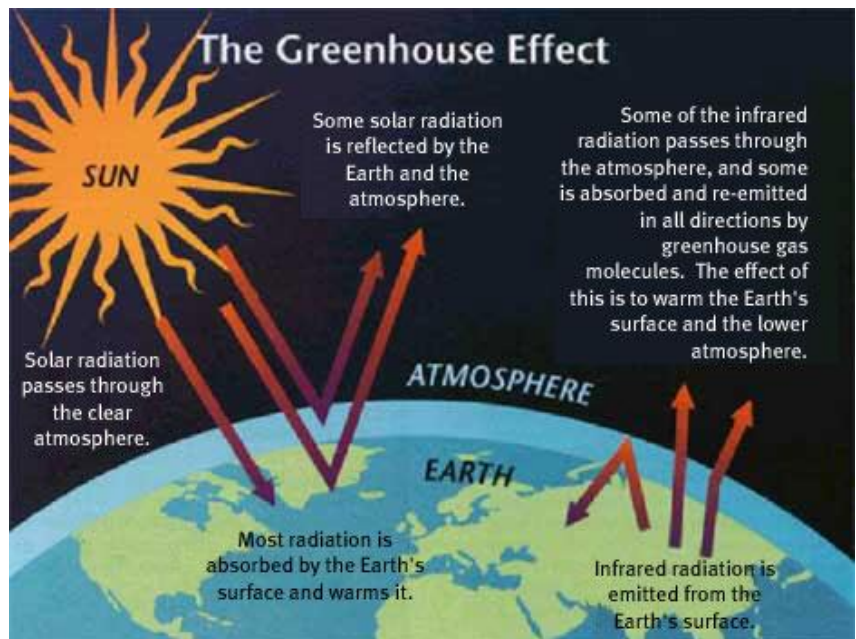


INTRODUCTION

1. Climate Science

A balance of naturally occurring gases dispersed in the atmosphere determines the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Overwhelming evidence suggests that human activities are increasing the concentration of greenhouse gases in the atmosphere, causing a rise in global average surface temperature and consequently climate change. Modern human activity--most notably the burning of fossil fuels for transportation, electricity and heat generation--introduces large amounts of carbon dioxide and other greenhouse gases into the atmosphere.

Collectively, these gases intensify the natural greenhouse effect, causing rising average global surface temperatures, which affects local and global climate patterns. These changes in climate are forecasted to manifest themselves in a number of ways that might impact the Town of New Castle, such as increased summer heat and heat related illnesses, increased insect borne diseases, increased precipitation, as well as changes to local and regional weather patterns and species migration.



Beyond the local community, scientists also expect changing temperatures to result in more frequent and damaging storms accompanied by flooding and landslides, summer water shortages as a result of reduced snow pack, and disruption of ecosystems, habitats, and agricultural activities. In response to the threat of climate change, communities worldwide are voluntarily acting to reduce greenhouse gas emissions. Many communities in the United States are addressing climate change at the local level. Since many of the major sources of greenhouse gas emissions—fuel consumption in personal vehicles, energy consumption in buildings, organic waste decomposition in landfills—are directly or indirectly controlled through local policies, local governments have a primary role to play in reducing greenhouse gas emissions within their boundaries. Through the use of proactive measures around sustainable land use patterns, transportation demand management, energy efficiency, renewable energy, green building, and waste reduction, local governments can dramatically reduce emissions in their communities. In addition, as the effects of climate change become more common and severe, local government adaptation policies will be fundamental in preserving the welfare of local residents and businesses.

2. Climate Change and Greenhouse Gases

The buildup of greenhouse gases in the atmosphere is a major contributor to the increase in global temperatures. Carbon dioxide is the main greenhouse gas but methane, nitrous oxide, and certain man-made gases (chlorofluorocarbons, sulfur fluoride compounds) are also significant contributors. Soot and the level of solar activity also influence temperatures. In addition, the loss of forests reduces the planet's capacity to absorb greenhouse gases.

The concentration of carbon dioxide in the atmosphere has been rising since the beginning of the Industrial Revolution when fossil fuels like coal and oil began to be burned in large quantities. As carbon dioxide concentrations increased, temperatures rose too.

The climate change problem has increased as human activities have added growing amounts of carbon dioxide and other greenhouse gases to the atmosphere, thereby increasing the natural greenhouse effect. The more greenhouse gases increase, the more heat is trapped.

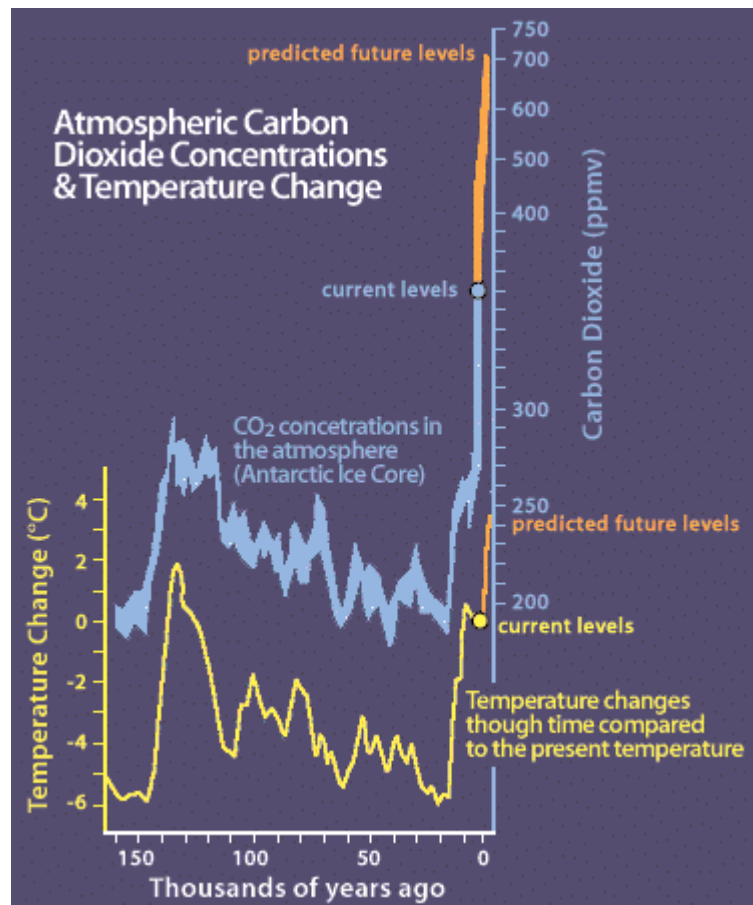
If the trend of increasing emissions continues through this century, CO₂ concentration will rise to levels not seen on earth for 50 million years.

3. Signs of Climate Change

Rise in temperatures: Over the twentieth century, average global surface air temperature has warmed between 0.7 and 1.5 °F.

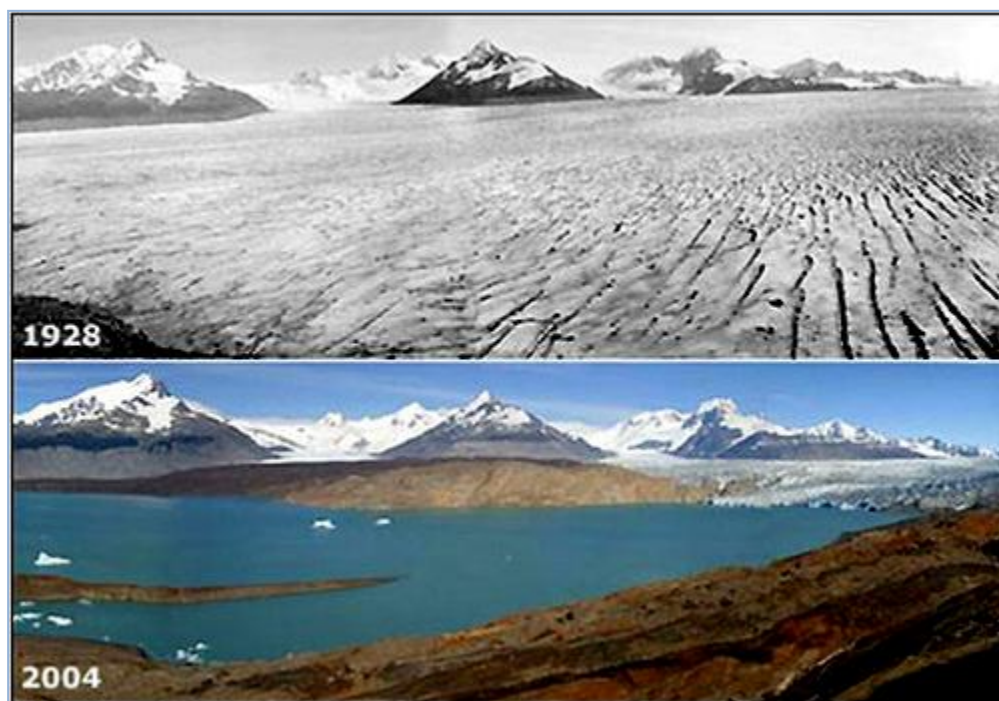
Rise in sea level: Sea levels have been rising by an average of 0.1 to 0.2 meters per year during the twentieth century. This is mostly attributed to heat expansion of global waters.

Increase in concentrations of carbon dioxide in the atmosphere: Since 1750, there has been an increase of 31%. The present CO₂ concentration has not been exceeded during the past 420,000 years and probably not during the past 20 million years. The current rate of increase is unprecedented during at least the past 20,000 years. Concentrations of other greenhouse gases have also increased significantly since 1750, including methane (151%) and nitrous oxide (17%).



Mountain glaciers around the globe are retreating. Glaciers in the European Alps have lost about 30 to 40% of their surface area and about half of their volume since 1850. In the New Zealand Southern Alps, glaciers have lost about 25% of their area over the past 100 years. Mount Kilimanjaro in East Africa has already lost 82% of its ice since 1912. At current rates of warming, the famous snowcap will disappear in 20 years. In Glacier National Park, Montana, the number of glaciers dropped from an estimated 150 in 1850 to about 50 today; at current rates of warming experts predict that the park's glaciers will be gone by 2030.

The extent and thickness of Arctic sea ice is decreasing. Declassified data collected by U.S. and Russian submarines show that the central Arctic ice has thinned 1.3 meters over the past 20 to 40 years, representing a 40% decrease in volume. Satellite data indicate a 10 to 15% decrease in summer sea ice concentration over the entire Arctic.



Upsala Glacier in Argentina's Los Glaciares National Park near Santa Cruz

4. Climate Change Impacts

Warming of air temperatures is just the first step in climate change. Rising temperatures lead to changes in rainfall and snowfall patterns, soil moisture, and sea level, which in turn cause physical changes in the landscape, modifications in the ranges of plants, animals, and other living organisms, and impacts on human structures and systems.



According to the United Nations Environmental Programme and the financial services industry, worldwide economic losses due to natural disasters appear to be doubling every 10 years. Each year, four times as many weather-related natural disasters occur compared to 40 years ago. On current trends, annual losses will reach nearly \$150 billion in the next decade.

5. Why Waiting is Not an Option

Because climate systems are complex and we can't predict the nature and extent of the impacts with certainty, some people advocate delaying action. Unfortunately, waiting to resolve any scientific uncertainties in predicting climate could be disastrous.

To slow the rate of global warming, we must lower the concentration or total amount of greenhouse gases in the atmosphere. This means that not only do we have to lower the rate of greenhouse gas emissions, but we also have to reduce the total quantity of emissions until they are lower than the rate at which nature removes carbon from the air. Otherwise, the concentration of carbon dioxide and other GHGs will continue to rise, as will temperatures. Currently, the rate of human-made GHG emissions is roughly double the rate of removal. Consequently, emissions must fall by at least half to stabilize GHG concentrations at current levels, and even more to lower the concentration. Scientists indicate that ultimately emissions need to fall to 75 to 85% of current levels. Waiting to take action is dangerous because of the nature of GHGs. When carbon dioxide emitted by a motor vehicle, building furnace, or power plant enters the atmosphere, it will stay there for a long time—50 to 200 years. This means the warming trend cannot be reversed quickly. The longer the wait, the worse the problem.

While uncertainties in predicting how climate will change in the future may cause scientists to overestimate some elements of the impact, there are also uncertainties that may cause them to underestimate them as well. For example, it is unlikely that nature will continue to absorb carbon dioxide at current rates. The latest science suggests it will absorb less as natural systems become saturated, and that several factors limit the ability of plants to take up more CO₂.

This Plan proposes that New Castle take a proactive approach and reduce emissions by taking advantage of existing technology and resources.

VISION *and* STRATEGIES

1. Vision Statement

In 2025, we see our world and Town doing things better and smarter. We will live and work in “energy smart” buildings that use readily available technology to maximize energy efficiency. Computerized controls on heating, cooling, and lighting systems automatically adjust for daylight levels and turn off when rooms are vacated. Appliances and office equipment use much less energy for the tasks they perform. Geothermal heat pumps eliminate the need for furnaces and boilers in many buildings.

The demand for energy conservation services has created a bustling industry with well-paying jobs. New Castle has dramatically reduced its reliance on centralized electricity systems. Buildings do not just consume electricity; they also produce power. Some have fuel cells that provide the energy reliability important to Internet businesses, biotech laboratories, and public safety operations. Solar photovoltaic panels and roof tiles are common; any excess power they produce is sold into the regional electricity grid, allowing owners to run their meters backwards. Solar thermal systems are installed to heat air and to produce hot water, reducing the need for fuel and electricity. Where electricity from the regional grid is still needed, users have negotiated contracts with suppliers, often through group buying programs, to buy electricity from renewable sources. Consumer demand is driving the installation of wind power turbines, large-scale fuel cell facilities are running on hydrogen, and landfill gas is being recovered to generate electricity. Where renewable energy supply is insufficient, natural gas fuels clean-burning combined cycle generators.

Rooftop gardens and green roofs are routinely installed on buildings of all types to reduce the need for air conditioners in the summer and to reduce storm water runoff. The Town’s tree canopy has expanded as a result of aggressive planting and conservation, reducing energy needs for adjacent buildings and increasing shading to offset the urban heat island effect. There is enough quantity and variety of vegetation to support songbirds, and the shaded sidewalks and pleasant open space encourage people to enjoy the Town in summer instead of fleeing the heat.



Vision Statement Continued...

Fewer cars with single occupants are seen on the road. The regional transit system has expanded in response to demand for more and better service. Vehicles running on alternative fuels, hybrid technology, and fuel cells have replaced diesel buses. Cyclists and pedestrians share the streets with automobiles, since mixed use neighborhoods mean many destinations are within walking or biking distance. With fewer cars, the streets are safer and cleaner for everyone.

Very little material is thrown away. Products are increasingly made out of recycled materials. Manufacturers and retailers take back old products for refurbishing or recycling.

The Town provides a welcome home for diverse communities with its clean air, safe neighborhoods, and easy access to jobs, services, and recreation. Children have a sense that they are partners with adults as community stewards, and the Town is safe for them to explore.

As a result of all these changes, the buildup of greenhouse gases in the atmosphere is abating and the adverse effects of climate change are diminishing. While past emissions have caused the climate to shift, changing precipitation patterns, average temperatures, and sea level, scientists have lowered their concern about the scale of the impacts. This has happened because the previous generation recognized the problem and chose to modify their ways to protect future generations.



2. Strategies

Reversing climate change is a daunting task. Some scientists state that reductions in the emission of greenhouse gases of 75 to 85% are likely to be required to stabilize GHG concentrations in the atmosphere. This Plan does not propose actions that would result in such deep cuts in emissions. The Plan does propose actions to begin the necessary process of shifting away from our reliance on fossil fuels. As people begin to experience the multiple benefits of these actions, more ambitious steps will become more acceptable. We can draw on the examples offered by nations (such as Germany, Denmark, Norway, and Sweden) that have taken such steps and continue to enjoy a high quality of life. Clearly the rate at which we move away from fossil fuels will need to increase dramatically; working on actions like those proposed here is an important start.

This Plan's basic strategies are ***fuel switching, energy efficiency, and waste reduction***. These strategies aim to reduce and replace the use of fossil fuels and reduce emissions from landfills and incinerators. The focus of these strategies is on CO₂ and to a lesser degree methane.

Fuel Switching. Fuel switching involves converting existing fossil fuel uses to alternative fuels that reduce or eliminate the emission of CO₂. Wherever possible, renewable forms of energy such as solar, wind, and landfill gases can replace fossil fuels. Fuel cells running on hydrogen can replace oil and coal fired electric generating stations. Where these technologies cannot be employed, energy systems can be switched to natural gas, which is a fossil fuel that can be used much more efficiently and cleanly than oil or coal.

In the transportation sector, alternate fuels such as natural gas, electricity, and biodiesel can replace gasoline and diesel. Affordable hybrid engines are now readily available, with their significant fuel economy benefits, and vehicles powered by fuel cells are on the horizon.

Energy Efficiency. By being smarter about how we design and use buildings, homes, and devices and by taking advantage of technological innovations, we can use less energy to accomplish our tasks. In buildings, this means taking advantage of daylight to reduce artificial light, insulating while maintaining adequate indoor ventilation, and using green building techniques. Appliances and other machines have become dramatically more energy efficient in recent decades. Choosing products with energy in mind can reduce demand, particularly for electricity.



Fuel economy is the transportation version of energy efficiency. The new federal **Corporate Average Fuel Economy (CAFE)** standard for new cars beginning in 2012 will require an increase of 5% per year through 2016 in order to yield a combined average fleet of 35.5 miles a gallon. Vehicles are on the market and on the road now that vary from 12 miles a gallon to over 50 miles a gallon. The key is consumer choice.





Drivers can purchase a 50-mile/gallon vehicle instead of a 12-mile/gallon vehicle.

Another form of fuel economy is the choice of transportation mode. Greater use of public transit, carpooling, private shuttle buses, cycling, and walking would significantly reduce vehicle miles traveled (VMT). In this way, the consumption of fuel could decline.

Waste reduction. Strategies to create less waste and to recycle have been in place for many years. Twenty years ago recycling began with about 10% of the total waste stream, now it exceeds 50%. New Castle waste reduction experience reads as follows: efforts must be made to increase the return of materials to productive use by preventing waste, increasing recycling, and purchasing products with less packaging and more recycled content.

External Factors

New Castle does not entirely control its fate. Our current energy, transportation, and waste systems are dependent on structures and forces outside the community. This Plan proposes a role for the community to play in taking responsibility for its GHG emissions. However, the Plan assumes that actions at the international, national, and state level are required and essential.

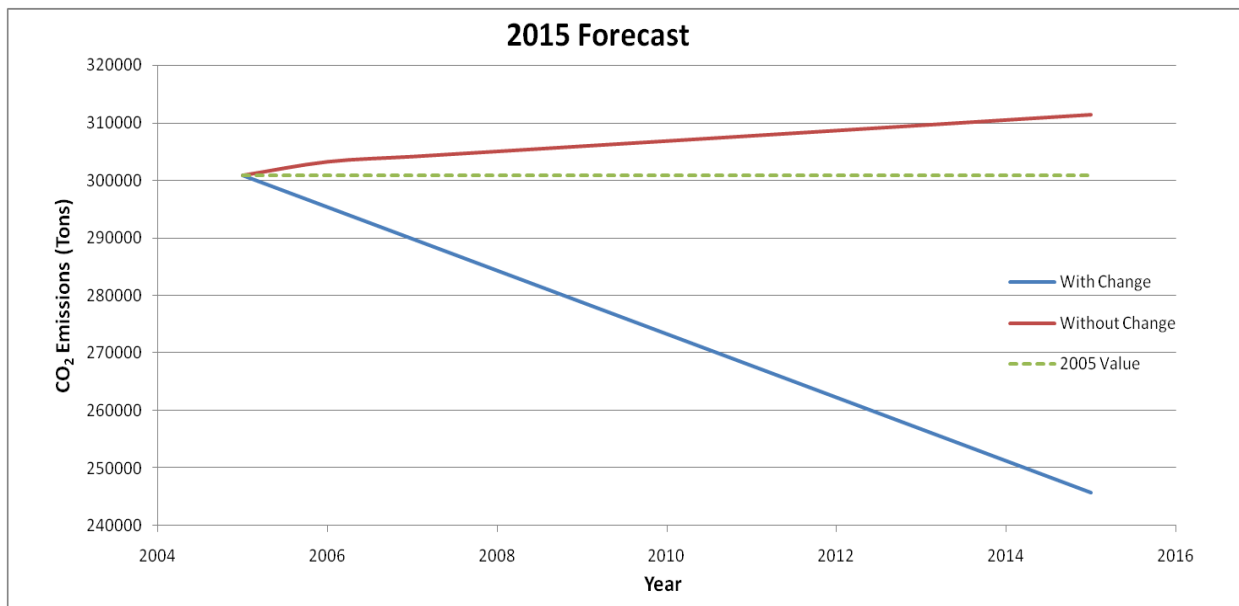
Changes in laws, standards, subsidies, and incentives at the federal and state levels can have huge impacts on local emissions; they can either undermine or enhance local actions. People from all sectors need to be active participants in the debate over issues such as increased funding for mass transit, stronger vehicle emissions standards, incentives for renewable energy research and development, regional land use planning, and improved power plant standards.



3. Greenhouse Gas Emissions Reduction Target

A target of reducing GHG emission rates to a level 20% below 2005 levels by the year 2015 is achievable in New Castle. The following figures show the amount of emission reductions that may be attained to reach a 20% reduction.

2015 Emissions Forecast



2015 Emissions Forecast with Change

2015 Forecast (Change) at 15% total decrease by 2015		
	2005	2015
Residential	160,240	125,700
Commercial	20,191	16,200
Industrial	0	0
Transportation	126,022	103,000
Waste	2,452	1,500
Total	308,905	246,400

A cleaner electric fuel mix. The projected total of GHG emissions in 2015 assumes that the regional electric system will reduce emissions per kilowatt-hour by about 20%. By 2015, many new combined cycle natural gas fired power plants are expected to be on line in the Northeast, replacing many of the current oil and coal facilities. The deregulation process is driving the construction of these cleaner plants. It is estimated that this will reduce GHG emissions for each kilowatt-hour (kwh) of electricity generated from 1.54 pounds of CO₂ per kwh to 1.23 pounds. Whether an actual reduction in emissions materializes will depend on developments in the market beyond New Castle's control.

Energy efficiency. The Plan includes an improvement in electricity efficiency based on an assessment of demand side management prepared for Consolidated Edison. That analysis indicates a market potential for a 12.5% improvement in the efficiency of electricity use. Additional efficiency improvements may become economically feasible with changes in the electricity market.

Natural gas and fuel oil use reduction. An assessment of the potential to reduce natural gas and fuel use was not available to the task force. A 10% reduction of each is a reasonable estimate, however, given the potential to improve building energy performance through measures such as upgrading of furnaces and boilers, adding insulation, and improving efficiency of water heaters and appliances.

Increasing fuel economy. The Federal government sets fuel economy standards for vehicles in an effort to improve air quality and increase the nation's energy security. The American Council for an Energy Efficient Economy states that a combined CAFE standard of 40 miles a gallon is achievable. This position is supported by a recent National Academy of Sciences report on the CAFÉ standard that indicates that a standard in the low- to mid-30 range is achievable without reducing vehicle weight.

4. Achieving the Target

To achieve the emissions reduction target, all sectors of the community will need to take action. While the Town can take a leadership role, households, businesses, institutions, schools, community organizations, and individuals will have to be motivated to take part. While this Plan lays out a set of strategies and proposed actions, it is not prescriptive. It builds on past actions and proposes new actions within a framework that incorporates tracking of progress, accountability to the public, and ongoing reassessment and adjustment based on experience. The following sections of this Plan describe the role of energy, transportation, land use, and waste generation in the emission of greenhouse gases (primarily CO₂ and methane). Each section describes trends, tools, and resources to reduce emissions; actions taken since 2005 that have reduced emissions; and proposed actions to move New Castle toward a 20% GHG reduction goal.

The final section on implementation discusses the basic elements needed to ensure that effort is sustained. Taking steps to make 20% reductions in so many activities will help us develop a systemic understanding and commitment to looking at all activities in the light of mitigating Greenhouse Gas Emissions. It is this systemic shift that is needed for us to reach the solutions that are ultimately needed.



PROPOSED ACTIONS

Note: Actions are classified based on which sectors of the community would be directly involved:



= Business community



= Town government



= Residents



= Institutions / Schools

The primary sector involved appears on the left



ENERGY

a. Principles

ENERGY PRODUCTION via renewable sources and energy efficiency via technological advances will save money and improve our environment.

GIVEN THAT EXISTING BUILDINGS consume the bulk of energy, retrofitting them should be the top priority.

RENEWABLE ENERGY provides a way to meet the community's energy needs with few or no GHG emissions.

AS NATURAL GAS EMITS LESS GHGS than other fossil fuels, it can serve as a transition fuel.

EFFORTS TO PROMOTE ENERGY EFFICIENCY and renewable energy are needed to compensate for imperfect market signals that do not reflect the actual costs to the environment and society of energy production and use.

SINCE CLIMATE CHANGE IS UNDERWAY, the future energy system should better enable the community to adapt to impacts and to changes in energy availability.

c. GHG Emission Factors by Fuel Type (based upon average generation modes)

Electricity: 1.43 lb. of CO₂ per kilowatt hour (1998)
Heating Oil: 24.7 lb. of CO₂ per gallon consumed
Natural Gas: 11.8 lb. of CO₂ per therm

b. Strategic Approaches to Reduce GHG Emissions from Energy Use

GHG emissions associated with energy use can be reduced by using less energy and by converting from fossil fuels to sources of energy that emit fewer GHGs or none at all.

For the purposes of this Plan, using less energy means achieving higher efficiency—accomplishing the same task with a lower amount of energy. Fortunately, myriad measures to increase energy efficiency are available, such as increasing building insulation; improving window glazing; installing more efficient heating, ventilation, and air conditioning (HVAC) equipment; and using more efficient lighting, appliances, and equipment (e.g., Energy Star compliant appliances).

The deployment of these energy efficiency measures requires education and publicity about the technologies and their costs and benefits. Financial incentives could further encourage the public and businesses to adopt these measures.

d. Energy Star

The U.S. Environmental Protection Agency's Energy Star program provides a variety of tools to measure energy use in buildings and products and to recognize superior performance. The EPA evaluates products for their energy performance and awards the Energy Star label to those that meet its criteria. This provides consumers with a guide to compare products for their energy attributes.

The EPA also awards the Energy Star label to commercial and industrial buildings that perform above the agency's criteria. The designation is contingent on use of the EPA's energy benchmarking tool and monitoring of actual energy consumption. Residences can be awarded an Energy Star Homes designation, which qualifies the owners for utility rebates on high-efficiency major appliances and high-efficiency natural gas heating and water heating equipment.

The Energy Star program provides a process for businesses and institutions and other organizations to become partners and make a commitment to the program's goals. The Town is a partner in the Energy Star program. The Town recently adopted Energy Star compliance requirements for **NEW Residential Construction**.

In fact, 5 new homes have been built and received Energy Star certification since the new ordinance was passed.



e. Actions to Reduce GHG Emissions

Strategy 1: Energy Efficiency

Short-term



Establish a town working group on energy management with representatives from the public works, parks, police, and other departments to track energy use in Town buildings. Based on the use data, devise standards for achieving the Town's goal on reducing energy use.



Replace incandescent traffic signals with light emitting diode (LED) lights, which are 80 to 90 % more efficient and rated to last 100,000 hours compared to 8,000 hours for incandescent. Take advantage of available utility rebates.



Recruit businesses and organizations into the federal Energy Star program with the goal of reducing energy use. Utilize pledges, peer exchanges, and public recognition programs to sustain involvement.



Work with local stores to promote Energy Star products and educate consumers about the Energy Star label.



Organize community and school "green teams" to promote household practices that reduce GHG emissions, such as increased recycling.



Organize "green teams" within Town departments to promote more sustainable practices in municipal operations, such as the purchase of hybrid vehicles.



Assess the condition of existing buildings to understand the inefficiencies prevalent in the building stock and design appropriate programs to address them.



Publicize utility energy efficiency programs and encourage homeowners to purchase replacement light bulbs and switch lighting to timers.



Promote the use of Energy Service Companies (ESCO's) and performance contracting, where appropriate, to facilitate energy efficiency improvements when initial financial costs are a barrier.



Enforce a Town-adopted green purchasing policy.



Explore options to increase the efficiency of Town street lighting (replacement of incandescent fixtures with LED fixtures)

Medium-term



Implement an energy management program for municipal facilities to evaluate use patterns, identify opportunities for energy efficiency improvements and renewable energy installations, pursue utility and other outside funding sources, manage contract work, and evaluate options for the energy supply. Consider establishment of an energy management position.



Integrate energy efficiency upgrades and renewable energy installations into the Town capital planning process.

Strategy 2: Promote Cleaner and Greener Electricity

Short-term



Pursue funding of solar energy installations for private, town, and school facilities through state and federal grant monies.



Install solar energy systems on Town facilities.



Purchase more renewable energy, including wind power, through local utilities.

Medium-term



Develop funding sources for solar energy installations and biomass to address distribution system bottlenecks and Renewable Portfolio Standard (RPS) requirements.



Develop one or more projects with schools to install solar energy systems, or biomass, and conduct associated classroom activities.



Support implementation of the Clean Air Act regulations on older power plants. Advocate for a federal renewable portfolio standards.



Evaluate adding Green Building Code (GBC) requirement in our Town Code; or at least a “fast-tracking” provision for Building Permits on buildings that meet GBC.

Long-term



Support federal action on lowering power plant emissions of CO₂ and conventional air pollutants.

TRANSPORTATION

a. Principles

ENCOURAGE PUBLIC TRANSPORTATION and alternative technologies that consume less fuel per passenger mile traveled

MOTORISTS SHOULD pay more of the true costs—direct and indirect—of driving. Currently, motor vehicle travel is heavily subsidized, to the detriment of rail

DISCOURAGE travel by single-occupancy vehicle, . . . such travel should be a last resort.

ENCOURAGE motorists to use an alternative-fuel and/or fuel-efficient vehicle

b. Strategic Approaches to Reduce GHG Emissions from Transportation

There are two strategic approaches to reducing GHG emissions related to transportation: **reducing the vehicle miles traveled (VMT)** and **reducing the GHG emissions per mile of travel**. Promoting use of mass transit is an example of the first approach; replacing conventional vehicles with electric-powered vehicles is an example of the second approach. In weighing approaches, it is important to remember that reducing VMT has many benefits. Motor Vehicles affect the livability of a community and the ability of children to play outside independently or travel on their own. The quantity of paving cars require makes cities hotter, cuts down on the availability of space for planting trees, increases stormwater runoff, and is aesthetically unpleasant. Motor vehicles are noisy and pollute soil and water, as well as the air. Motor vehicle traffic causes many direct problems for communities and profound indirect effects, including increased GHG emissions.



c. Actions to Reduce GHG Emissions

Strategy 1: Reduce Commuting by Single-Occupancy Vehicles

Short-term



Expand incentives; create a Town Transportation Demand Management (**TDM**) program for municipal employees. Encourage transit oriented development (**TOD**). This should be coupled with additional workforce housing.



Undertake aggressive **TDM** measures and monitor the results.



If driving alone to work, discuss with employer ways to make it easier to ride-share, take transit, walk, or bike.

Medium-term



Monitor results of Parking and create a Parking & Transportation Demand Management (**PTDM**) program and investigate increasing the requirements.



Investigate lowering further the minimum parking standards for new development, especially near Train Station.

Long-term



Continue aggressive **TDM** measures and monitoring.

Strategy 2: Improve Facilities for Walking and Cycling

Short-term



Expand the pedestrian program to further improve intersections and increase year-round sidewalk maintenance, provide public restroom access and benches, and make aesthetic improvements, e.g., trees, flowers, buildings with windows, fences that are low and transparent.



Install additional bicycle parking and look for new opportunities to install bicycle lanes or guidelines and improve intersections for cyclists.

Medium-term



Consider creating a secure, sheltered bicycle parking structure at the train station.



Install new sidewalks and trail ways as part of our Comprehensive Town-wide Trail network.



Construct links between walkways, roads, trail ways, and sidewalks.

Long-term



Continue pedestrian and bicycle programs.



Investigate possible shared-use very low-speed neighborhood streets.



Finished sidewalk on Route 120 between Chappaqua Hamlet and Marcourt Drive



Beginning of proposed sidewalk on Route 117



Finished sidewalk and stone wall on Station Place

Strategy 3: Reduce the Amount of Motor Vehicle Travel through Parking Incentives and Restrictions, Car-Sharing, Promotion, and Education

Driving Tips for Environmentalists from CarTalk.com

1. Get your car serviced regularly.

Regular servicing uncovers many problems that reduce gas mileage and increase pollution.

2. Check your tire pressure.

Tires that are under-inflated by only four pounds of air can reduce your mileage by as much as 10 percent.

3. Don't top off your gas tank.

Topping off fills the vapor recovery equipment with liquid gas instead of the vapors the gas gives off. When this happens, the equipment ceases to work properly, contributing to the formation of ground level ozone, smog, and acid rain.

4. Don't use more octane than you need.

Most modern engines neither require nor benefit from premium gas. The extra octane may in fact increase the pollution given off by your car.

5. Stop your idling.

Car exhaust pollutes! And in Westchester County it is illegal to idle for more than 3 minutes. Cars no longer need to warm up unless the temperature is below zero, so just turn on the motor and go.

6. Slow down.

Wind resistance increases dramatically (exponentially) with speed. For every mile over 55, your gas mileage goes down 2%, and decreases exponentially. If you drive 70 MPH you get half the fuel economy you get at 55.

Short-term



Encourage the Bee-Line to install signs with schedule and route information at bus stops.



Install shelters or benches at busy bus stops where there is room on the sidewalk.



Investigate traffic measures to expedite bus travel.



Continue to develop and distribute promotional material and hold promotional events.



When giving directions to businesses, events, and institutions, include directions by bus routes.



Work with community groups to promote walking and biking for health.

Medium-term



Investigate measures to expedite bus travel.



Establish a “walking bus” program.

A “walking school bus” is a group of children walking to school with one or more adults



Long-term



Examine the feasibility and logistics of establishing a Town-wide bicycle-sharing program.

Strategy 4: Reduce Motor Vehicle Emissions

The way that vehicles are driven affects emissions. Driving speed, tire pressure, and braking habits all affect mileage. Idling is a significant source of GHG emissions as well as local air pollution.

Short-term



Adopt a Town green fleet policy that incorporates energy efficiency criteria for acquiring municipal vehicles, including sizing of vehicles appropriate to their tasks and giving preferences to alternative fuels and hybrid vehicles where possible and promotion of using the smallest vehicle necessary for jobs.



Continue the Town’s Anti-Idling policy for town vehicles, and enforce County anti-idling laws.



Mandate the removal of unnecessary weight from town vehicles; i.e. Plows between snow storms.



Establish a municipal work group to coordinate implementation of alternative fuel vehicle acquisition and infrastructure installation.

-  Switch to alternative fuel and minimum-sized vehicles.
-   Provide a program on driving and maintenance practices that reduce fuel use and emissions for employees who use Town vehicles and for the community.
-   Publicize the health and environmental costs of motor vehicle emissions. Work with the New York Power Authority to obtain electric vehicles for local use.

Medium-term

-  Encourage Transit Oriented Development growth near transit hubs.
-   Undertake an anti-idling campaign. Do education about idling through signs, targeted mailings to schools, parents, bus companies, shipping destinations; follow up with enforcement.
-   Work with the Town's congressional delegation to advocate for higher Corporate Average Fuel Economy (CAFÉ) standards.
-   Work with state agencies to develop a system to more closely tie vehicle insurance costs to vehicle miles traveled.
-   Develop stickers on tire pressure for optimum energy efficiency to install at service station air pumps.

Long-term

-   Establish infrastructure for AFVs (Alternative Fueled Vehicles), including a compressed natural gas ("CNG") fueling station for Town vehicles, free public access refueling stations, partly solar-powered, for electric vehicles; and reserved spaces for zero and super low-emission vehicles in parking lots.
-  Install emission controls on heavy-duty Town trucks and construction vehicles; investigate requiring emissions mechanicals on trucks doing business with the Town.
-  Link parking sticker fees to engine size and put a cap on the tonnage of vehicles eligible for residential parking permits. Increase fees for second, third cars.
-  Establish a parking maximum for residential units.
-  Study possible creation of neighborhood-zoned parking.

LAND USE, BUILDINGS, & VEGETATION MANAGEMENT

a. Principles

A MIXTURE OF LAND USES makes the Town healthier, more livable, and more economically sustainable.

PLANTING NATIVE AND WATER-EFFICIENT PLANT SPECIES improves the Town's microclimate and reduces energy use.

LIFE-CYCLE COSTS AND BENEFITS of buildings, landscaping, and infrastructure should be considered when planning, building, or renovating.

IT IS IMPORTANT TO THINK REGIONALLY about land use; regional sprawl affects New Castle.

DENSITY NEAR TRANSIT HUBS and commercial districts lessens environmental impacts.

b. GREEN BUILDINGS

A growing trend in architecture and development is to design buildings in an environmentally holistic manner so that site choice, energy performance, indoor air quality, resource efficiency, water consumption, and waste management are optimized in terms of environmental values. The U.S. Green Building Council (USGBC) developed the Leadership in Energy and Environmental Design (LEED) rating system to provide a process and guidelines by which to evaluate buildings for their environmental and energy performance.



LEEDs and other “green building” standards are applicable to commercial, industrial, institutional, and multifamily residential buildings. The USGBC is in the process of developing rating systems for residential buildings and for building remodeling. LEEDs and other “green building” standards provide a standard that can be used as a reference in design and construction documents, government policies, and laws and regulations.

Existing building retrofits can also be based upon EnergyStar benchmarking/rating systems, weatherization and retrofit strategies, and incentives (Con Edison, NYSEERDA, etc...) and other financial tools available for financing retrofits.

c. Actions to Reduce GHG Emissions

Strategy 1: Improve Efficiency of Land Use Activities

Life-cycle analysis of buildings shows significant energy savings and reduced environmental impact when existing structures are reused or rehabilitated rather than replaced. Compact mixed-use development lowers energy use within buildings, promotes less automobile travel, and helps make the Town livelier and more livable.

Unpaved open space offers opportunities to grow vegetation that can serve as a CO₂ sink and reduce the heat island effect. Opportunities for new open space are limited in New Castle, because most land has been built on and buying and converting property to green space is very expensive.

Short-term



Provide developers and property owners with information about using green roofs or high reflectance roofs on buildings and other reflectance and shading techniques.



Provide developers and property owners with information about reflectance and shading for parking lots.



Provide developers, citizens, and Town staff with information to assist them in applying LEED or other “green building” standards.



Develop green standards for renovation of Town-owned properties. Utilize the Town energy efficiency management (TEEM) workgroup to coordinate department implementation.



Implement and support a local Farmer’s Market to increase availability of local food.

Medium and long-term



Provide incentives for new construction and renovations to meet LEED or other “green building” standards for reflectance and shading.



Incorporate LEED or other “green building” standards for reflectance and shading in all Town and private parking lots and in new construction and major renovations.



Create zoning to encourage density near transit hubs and commercial centers to reduce sprawl.

WASTE MANAGEMENT

a. Principles

SOURCE REDUCTION, or the avoidance of generating waste, is the most effective way to reduce GHG emissions associated with waste.

RECYCLING is one important way to reduce waste.

ENVIRONMENTAL PURCHASING is key to establishing and supporting the demand for recycled materials in products.

AVOIDING EXCESSIVE PACKAGING and bags (particularly plastic) is another important way to reduce waste

b. Relationship between Waste and GHG Emissions

After products and materials have served their useful life, they are sent to landfills and incinerators for disposal. At landfills, wastes with organic constituents give off methane, a powerful GHG, as they decompose. At incinerators, burning of some kinds of waste produces CO₂, among other pollutants.

c. Strategies to Reduce GHG Emissions from Waste Management



Waste Minimization and Prevention

The generation of waste can be minimized and prevented by using materials more efficiently and by extending the length of use to avoid replacement. Even small steps, like making two-sided copies, can add up when a lot of people take them.

Reuse of Products

Reusing products and materials extends the usefulness of these items and prevents sending them to landfills and incinerators. Examples include recovery and reuse of building materials such as windows, wood beams, doors, and cabinets in construction.

Recycling of Materials

Recovering materials to reuse in the production of new goods—recycling —prevents disposal in landfills and incinerators. Some materials that the recycling program collects, such as glass or metal, do not generate greenhouse gases if they are disposed of in a landfill or incinerator, but recycling them prevents the use of energy in mining virgin materials and producing and transporting products. Recycling of paper products does prevent the emission of greenhouse gases, because they would generate methane if they decomposed in a landfill or CO₂ if incinerated.

Composting

Composting food scraps, instead of sending them to landfills, results in a net reduction of greenhouse gases. Composting in backyards or in central facilities does not produce methane. In a landfill, food scraps will degrade and produce methane. Composting of yard trimmings also does not produce methane. In landfills, yard trimmings tend not to decompose and the carbon contained is sequestered, but they use up limited landfill capacity, and their potential for improving soil is lost. Using compost returns valuable nutrients to the soils and avoids the use of chemical fertilizers.



d. Actions to Reduce GHG Emissions

Strategy 1: Prevent Waste

The most effective way to reduce greenhouse gases from waste is to prevent the generation of waste in the first place. Not only are the impacts of disposal prevented, but the cost and impacts of producing and transporting products and transporting materials for recycling are also avoided.

Short-term



Implement a waste prevention program for Town governmental operations.



Encourage the use of the “Take it or Leave-it Shop” at the Recycling center.

Medium and Long-term



Promote waste prevention measures in the commercial sector, after having implemented a waste prevention program in Town government.



Promote the concept, and educate the public about the environmental benefits of **one-day per week** garbage collection, and residential waste reduction.

Strategy 2: Increase Recycling

Short-term



Carry out projects to increase participation in existing recycling programs using community-based social marketing techniques, starting with a pilot project.



Medium-term



Conduct waste composition studies every two years to develop information about which new portions of the waste stream to target for recycling or reduction and to evaluate the success of the current program. The study should examine the waste streams from residences, Town government buildings, schools, and the commercial sector across all the seasons of the year.



Expand electronics recycling to encourage more recycling of printers and other computer peripherals, as well as old phones, VCRs, stereos, and other electronic equipment.



Strategy 3: Implement Environmentally Preferable Purchasing

Purchasing products with recycled content is essential to support a market for recycled waste material.

Short-term



Reevaluate the Town's system for tracking recycled and non-recycled paper and plastic purchases to ensure accurate recording of the quantities purchased and set goals for increasing the percentage of recycled content purchases. Work with the Chappaqua Central school district to accomplish the same steps.



IMPLEMENTATION

a. The Need for an Implementation Process

This plan does not prescribe actions that specific stakeholders must implement. That would require additional research and much more community involvement. At this point all sectors of the community—Town government, including individual agencies; businesses; institutions, particularly schools; and individuals—need to become engaged in the process of making a commitment to carrying out the effort to reduce New Castle's GHG emissions. For us to reach our 20% reduction target, all sectors of the community will need to embrace the goal and develop actions to attain it.

Developing a community consensus on the need to reduce GHG emissions and gaining active participation by stakeholders are feasible for the following reasons:

- The actions needed to reduce the buildup of greenhouse gases have many additional benefits, including increased energy reliability and security, cost savings, cleaner air and water, and a higher quality of life.
- Many resources are already available to support actions that reduce GHG emissions.
- Actions to reduce GHG emissions are already taking place in New Castle.
- Opportunities exist for economic development and job creation.
- Climate change will directly affect New Castle.

We need to begin the development of a Town Sustainability Plan. The Sustainability Action Board is tasked to work on this in 2011 with New Castle Staff support.

b. Implementation Steps

Outreach to Residents



- Encourage residents to promote and utilize household practices that are more energy efficient and reduce GHG emissions.
- Switch to alternative fuel and minimum-sized vehicles, in addition to walking and biking more frequently.
- Develop better recycling practices, understanding what more can be recycled.

Outreach to Businesses and Institutions / Schools



- Develop a flyer for businesses listing the most important things they can do and distribute it widely. Feature brief descriptions of successful efforts by local businesses. Follow up with personal contact.
- Develop a pilot program focused on a representative block of small businesses to introduce more sustainable practices in waste management, energy efficiency, and transportation. The program would take advantage of opportunities for cooperation and economies of scale.

Outreach to Town Departments



- Form a permanent staff committee to develop policies and action priorities for the Town and to coordinate work.
- Do outreach to citizen regulatory boards.
- Develop Town government policies to guide purchasing decisions, construction practices, waste management, vehicle use, and other activities with the aim of reducing energy use, vehicle miles traveled and fuel consumption, and waste disposal.
- Develop a mechanism to inform Town employees and community about climate protection activities and resources and a recognition program for outstanding employee efforts.
- Work with the public schools to incorporate environmental principles into the curriculum at all levels and to develop student projects that help carry out some of the actions in the plan.



GLOSSARY

Albedo: The amount of light reflected by a surface. A dark surface has a low albedo and will absorb more light, causing a warming effect on the object. A brighter colored surface with a high albedo will reflect more light and is therefore preferred.

CFL: Compact Fluorescent Light Bulbs

CO₂: Carbon Dioxide

Energy Star: ENERGY STAR is a partnership between the U.S. Environmental Protection Agency and industry to voluntarily label products that meet certain energy efficiency criteria

EPA: Environmental Protection Agency

Greenhouse Gas (GHG): the term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide

Fossil Fuel: A hydrocarbon deposit, such as petroleum, coal, or natural gas, derived from the accumulated remains of ancient plants and animals and used as fuel. Carbon dioxide and other greenhouse gases generated by burning fossil fuels are considered to be one of the principal causes of global warming.

HVAC: Acronym for Heating, Ventilation, and Air Conditioning

ICLEI: The International Council for Local Environmental Initiatives, a membership association of local governments focused on addressing the climate challenge

IPCC: Intergovernmental Panel on Climate Change

LED: Light emitting diode

LEED: Leadership in Energy and Environmental Design, a commonly used green building standard developed by the U.S. Green Building Council

Metric Ton: 1,000 kilograms (or 2204.6226 lbs.) Also known as a “tonne”

MPG: Miles Per Gallon

PV: Photovoltaics, a solar power technology that converts sunlight into electricity

Renewable Energy: Energy generated from natural resources – such as sunlight, wind, rain, tides and geothermal heat – which are naturally replenished

Solar Thermal: A technology that captures solar energy for heat

Therm: 100,000 British Thermal Units (BTUs), equivalent to approximately 100 standard cubic feet of natural gas

Weatherization: The reduction of air infiltration by methods such as caulking and weather stripping