

Climate Smart Communities

A Guide for Local Officials

February 2009

State of New York - David A. Paterson, Governor

New York State Department of Environmental Conservation – Pete Grannis, Commissioner

New York State Energy Research and Development Authority – Francis Murray, President

New York State Department of State – Lorraine Cortés-Vázquez, Secretary of State

New York State Public Service Commission – Garry Brown, Chair



New York State Department of State



Model CLIMATE SMART COMMUNITY PLEDGE

Councilmember _____ moved and Councilmember _____ seconded that:

WHEREAS, the Town/Village/City of _____ (hereinafter “local government”) believes that climate change poses a real and increasing threat to our local and global environments which is primarily due to the burning of fossil fuels; and

WHEREAS, the effects of climate change will endanger our infrastructure, economy and livelihoods; harm our farms, orchards, ecological communities, including native fish and wildlife populations; spread invasive species and exotic diseases; reduce drinking water supplies and recreational opportunities; and pose health threats to our citizens; and

WHEREAS, we believe that our response to climate change provides us with an unprecedented opportunity to save money, and to build livable, energy-independent and secure communities, vibrant innovation economies, healthy and safe schools, and resilient infrastructures; and

WHEREAS, we believe the scale of greenhouse gas (GHG) emissions reductions required for climate stabilization will require sustained and substantial efforts; and

WHEREAS, we believe that even if emissions were dramatically reduced today, communities would still be required to adapt to the effects of climate change for decades to come,

IT IS HEREBY RESOLVED that Town/Village/City of _____, in order to reduce greenhouse gas emissions and adapt to a changing climate will

1. Pledge to Combat Climate Change by Becoming a Climate Smart Community

Set goals to reduce GHG emissions and adapt to predicted climatic changes. Establish a task force of local officials and community members to review the issues and propose a plan of action. Designate a point person who will oversee climate change initiatives and publicly report on progress. Work cooperatively with similar task forces in neighboring communities to ensure that efforts complement and reinforce one another. As an official signal of commitment and for access to technical resources, sign on to a widespread climate campaign such as ICLEI Local Governments for Sustainability - Climate Protection campaign.

2. Set Goals, Inventory Emissions, Move to Action

Gather data, inventory GHG gas emissions, and establish baselines for local government operations and community sectors. Develop quantifiable interim GHG emission targets consistent with emission reduction goals and propose a schedule and financing strategy to meet them. Encourage stakeholder and public input and develop an action plan. Report emissions to The Climate Registry (TCR), which has developed a standardized method for reporting emissions inventories; use ICLEI and TCR’s tools to track and evaluate progress.

3. Decrease Energy Demand for Local Government Operations

Adopt a goal of reducing electricity use by 15 percent from projected levels no later than 2015.

- A. **Existing Public Facilities.** Inventory current building electricity usage and identify opportunities for conservation and efficiency retrofits. Obtain energy assessments from the New York State Energy Research and Development Authority (NYSERDA), the New York Power Authority, the Long Island Power Authority or other professionals. Consider actions such as purchasing energy efficient equipment and appliances, such as ENERGY STAR[®]; improving lighting, heating, and cooling efficiency; setting thermostats for maximum energy conservation; decreasing plug load from office equipment; and increasing pump efficiency in water and wastewater systems.
- B. **New Public Buildings.** Achieve at least minimum U.S. Green Building Council Leadership in Energy and Environmental Design standards (LEED Silver) for all new local government buildings.
- C. **Infrastructure.** Incorporate energy efficient technologies and operations and maintenance practices into municipal street lighting, traffic signals, and water and wastewater treatment facilities.
- D. **Vehicle Fleet and Commuting.** Improve the average fuel efficiency of local government fleet vehicles. Discourage vehicle idling and encourage bicycling, car-pooling and public transit for employees. Consider reducing the number of vehicles; converting fleet vehicles to sustainable alternative fuels; and using electric vehicles where possible.

4. Encourage Renewable Energy for Local Government Operations

Supply as much of the local government's power, heat and hot water needs as possible from solar, wind, and small hydro through purchase or direct generation.

5. Realize Benefits of Recycling and Other Climate Smart Solid Waste Management Practices

Expand the "reduce, reuse and recycle" approach to waste management in local government operations and in the whole community. Reduce the amount of solid waste generated -- promote backyard composting, implement volume-based pricing and educate residents on how to prevent waste. Promote reuse by organizing community-wide yard sales, and providing a space for drop-off or trade of reusable goods. Provide recycling receptacles in local government buildings and outdoor spaces, require duplex printing in government offices, compost food scraps and green waste, and adopt a comprehensive green purchasing program.

6. Promote Climate Protection through Community Land Use Planning

Combat climate change by encouraging low-emissions development that is resilient to climatic changes. When updating land use policies, building codes or community plans, include provisions to combat climate change; reduce sprawl; preserve and protect open space, biodiversity, and water supplies; promote compact, transit-oriented, bikeable and walkable communities; promote infill development; minimize new development in floodplains; maintain or establish healthy community forests; and promote best forest management practices and encourage tree planting, especially along waterways, to increase shading and to absorb carbon dioxide.

7. Plan for Adaptation to Unavoidable Climate Change

Evaluate risks from unavoidable climate change, set adaptation goals and plan for adaptation. Identify climate change impacts (such as flooding, drought, and extreme temperatures) that could affect the community. Identify areas such as water supply and sewer infrastructure that may be at risk due to sea-level rise and future changes in climate. Factor risks into long-term investments and decision-making. Execute climate change adaptation and preparedness measures through local government planning, development and operations, giving priority to the highest risk areas.

8. Support a Green Innovation Economy

Identify opportunities to incorporate climate protection, sustainability and environmental goods and service industries into economic development plans. Encourage workforce development training and school curricula that support the emerging green collar job sector, including renewable energy and energy efficiency, as well as climate smart solid waste management practices. Procure climate smart goods and services for local government operations and support modernizing of local and national electricity grids.

9. Inform and Inspire the Public

Lead by example. Highlight local government commitment to reducing energy use, saving tax dollars, and adapting to changing conditions. Demonstrate the benefits of energy savings, energy efficiency, and renewable energy projects by hosting open houses; distributing fliers; holding local meetings; working with school districts, colleges, and universities to develop climate change curricula and programs; engaging faith-based communities in climate protection; and regularly communicating community climate protection goals and progress to constituents.

10. Commit to an Evolving Process

Acknowledge that research and policy on climate protection are constantly improving and evolving. Be willing to consider new ideas and commit to update plans and policies as needed. Compare successes, cooperate and collaborate with neighboring communities to redirect less-effective actions and amplify positive results.

CLIMATE CHANGE AND NEW YORK'S COMMUNITIES

Climate change affects every community in New York -- economically, socially and environmentally. As the first line of response in emergencies, as the proprietors of critical infrastructure and as the governments with immediate responsibility for public health and safety, municipalities face a critical challenge in confronting and responding to climate change.

Why Our Climate is Changing

Naturally occurring greenhouse gases (GHGs) like water vapor, carbon dioxide and methane help keep temperatures on earth stable. By trapping heat near the surface of the earth -- a natural phenomenon known as the greenhouse effect -- GHGs keep the planet warm enough to support life as we know it. Since the industrial revolution, however, human activities have been adding significantly to the amount of GHGs in the atmosphere. Higher levels of atmospheric GHGs enhance the greenhouse effect, altering the earth's energy balance and resulting in the warming of its surface, ocean, and atmosphere.

About Carbon Dioxide Equivalent, or CO₂e

CO₂e expresses the global warming potency of greenhouse gases as a multiple of the potency of carbon dioxide, whose CO₂e is 1. Methane, for instance, has a CO₂e of 21, which means each methane molecule holds as much heat in the atmosphere as 21 molecules of CO₂. The CO₂e values of the other GHGs, nitrous oxide and halocarbon gases, are even higher than that of methane.

By the year 2100, average global temperatures are expected to be between 2.5°F and 10.4°F higher than 1990 temperatures, according to the nearly 2,500 scientists who make up the Intergovernmental Panel on Climate Change (IPCC). How much warming we experience will depend on how much GHG we emit. Warming is already having significant effects on climate, and will continue to change local climates for decades to come.

The latest available data about emissions in New York State show that fossil fuel combustion contributes almost 14 tons of CO₂e per New York resident to atmospheric GHG per year. (For perspective, driving an average car across the U.S. would contribute about a ton and a half of CO₂ into the atmosphere.) The

goal of local climate protection programs is to reduce the GHG contribution of each New Yorker now and in the future, while preparing communities to adapt to unavoidable changes in our climate.

Climate Change in the Northeastern United States

The *Northeast Climate Impacts Assessment (NECIA)* prepared by the Union of Concerned Scientists identifies impacts of climate change that already have occurred in the northeastern U.S. The assessment found that average temperatures in New York today are 2°F higher than they were in 1970. The assessment also projected the following:

- GHGs already in the atmosphere will continue to raise temperatures across the Northeast. GHGs can persist in the atmosphere for hundreds of years. Several decades from now, New York's winter temperatures are expected to be 2.5°F to 4°F higher than today, and summer temperatures, 1.5°F to 3.5°F higher.
- A warming climate will affect New York in many ways, and the impacts will persist long after GHG emissions have been reduced and atmospheric GHG concentrations become stabilized. Projected impacts in New York include the following:
 - Intense storm flooding will threaten roadways, infrastructure and developed areas.

- Rains too intense for the land to absorb, along with reduced meltwater from dwindling snowpack, will cause erosion of topsoil, and will mean less reliable replenishment of groundwater and surface water sources used for public water supply.
- Short-term droughts will increase in frequency, with dry spells of several weeks' duration punctuated by extreme rains and storms.
- Some native plants, like the sugar maple, as well as some native animal species, may migrate further north, possibly becoming extirpated from New York. Mosquitoes and other pests may become more abundant.
- Sea level will rise by between 4 and 25 inches, or possibly even more, as a result of the expansion of warming seawater and the melting of land ice.

The earth's climate in 2100 will depend largely on how much greenhouse gas we emit today and in the near future. The more we are able to reduce emissions in the next few years, the less risk we will experience from climate change later in the century. Conversely, failure to reduce emissions now will compound the impacts of climate change in the future, making dealing with them even more costly.

Local Government Response to Climate Change

Climate Smart Communities minimize the risks of climate change and reduce its long-term costs by changing in two ways:

- 1) Reducing GHG Emissions:** To stabilize atmospheric GHGs at manageable levels and avoid severe climatic changes, it is necessary to start now to reduce GHG emissions and to create permanent sinks that remove GHG from the atmosphere.
- 2) Adapting to a Changing Climate:** Altering the built and natural environment in anticipation of predicted climatic changes, or in response to actual changes, will alleviate the risks associated with unavoidable changes in climate.

Areas for Local Climate Action

New York's local governments can take many actions to reduce GHG emissions and to help the community adapt to coming changes.

- **Municipal operations:** Local governments can act directly to reduce fossil fuel consumption in municipal buildings and vehicles, to improve solid waste management practices, and to adapt infrastructure and operations for resilience to anticipated changes due to the warming climate. Flooding and changes in precipitation and snow pack that may affect water supplies are of special concern to localities.
- **Community-wide:** Local governments can enable climate-smart practices in the community at large through land use plans, zoning and building codes, through policies dealing with roads and public transportation, and by leading, educating and setting an example of energy efficiency.

Benefits of Local Climate Action

A local commitment to climate change will contribute substantially to other community objectives:

- **Saving taxpayer dollars:** Reducing energy costs and improving operational efficiency will lower local governments' operating costs and save taxpayer dollars. Climate smart land use practices can lower infrastructure and service costs as well.

- **Promoting economic growth:** Climate protection will create a demand for workers and providers of “green” (energy efficiency and renewable energy) products and services. Green technologies generate more jobs per dollar than conventional fuel technologies, and these dollars are more likely to be retained in the local economy. The American Solar Energy Society estimates that the renewable energy and energy efficiency sectors can generate up to 37 million jobs by 2030 – more than 17 percent of all anticipated U.S. employment. To support this growing sector, local educational institutions are beginning to train workers to install and maintain green technologies. Community-wide climate protection also helps to maintain property values by making communities desirable and attractive to new residents.
- **Improving operations and upgrading infrastructure:** Improving the energy efficiency of aging infrastructure by retrofitting or upgrading will save operating dollars in the years to come. Energy efficiency improvements also present opportunities to improve air quality and modernize aging infrastructure. The technical and operational changes that reduce greenhouse gas emissions often will reduce other air pollutants at the same time.

Climate Smart Communities Guide

New York State is developing a comprehensive *Climate Smart Communities Guide* that will provide detailed information to help communities develop and implement climate-smart practices. This guide will include information that communities need to become climate smart, including step-by-step guidance for planning and implementing climate smart practices, information on resources and funding, examples of successful implementation, and considerations for measuring and monitoring success.

This document summarizes some of the information that will be found in the *Climate Smart Communities Guide*. It discusses the first steps to becoming a Climate-Smart Community: **pledging to combat climate change** and **inventorying the community’s GHG emissions**. It also outlines the role of community planning in reducing GHG emissions and adapting to climate change.

FIRST STEPS FOR PROTECTING THE CLIMATE

Climate Smart Communities do their part toward avoiding the worst impacts of climate change by making emission reductions that help to stabilize atmospheric GHGs. At the same time, they develop plans to adapt to unavoidable changes in the climate. Climate Smart Communities do the following:

- Publicly demonstrate their leadership and their commitment to climate security and “green” economic development by adopting the Climate Smart Communities Pledge and demonstrating the benefits of lower GHG emissions.
- Determine how much GHG they currently emit; set measurable goals for reducing GHG emissions, and identify locations or community services that are at risk from climate change.
- Create local **Climate Action Plans** that work out the steps to meet emission reduction goals and **Climate Resilient Action Plans** that chart the way to community adaptation to unavoidable climate change.
- Begin immediately with easy projects that reduce emissions (and often save taxpayer dollars by reducing energy use).

Adopt the Climate Smart Communities Pledge

Adopting the Climate Smart Communities Pledge is a public declaration of leadership and commitment to reducing emissions and adapting to a changing climate. Communities can adopt the pledge as it appears on page’s 2 to 4 of this summary guide or add their own legislative findings or pledge elements.

New York’s First Pledge Community

The Town of New Castle was the first New York local government to adopt the Climate Smart Pledge. The model pledge in this summary is adapted from the town’s resolution.

The Climate Smart Communities Pledge includes all the elements of a successful local climate program. By reducing GHG emissions and preparing for a changing climate, local climate programs protect public health and safety, and support a secure economic future.

Each Climate Smart Community joins the state’s most forward-thinking municipalities in active climate protection. Climate Smart Communities benefit from the experience and knowledge of communities with mature programs, and in turn help other communities to get started. The Climate Smart Communities Pledge demonstrates that local government is acting to protect the future of its citizens and of coming generations, reassures concerned citizens and invites everyone to join in doing something about climate change.

Create a Task Force and Identify a Local Climate Leader

To be successful, climate protection actions must align with existing municipal goals and must have broad support from the community. Task forces and advisory groups can help the community identify and implement actions that will reduce greenhouse gas emissions while saving money and energy. Your task force can be an offshoot to an existing municipal committee (e.g., environmental commission or comprehensive planning committee), or a separately appointed group. Task force members should bring diverse backgrounds to the work. Include elected officials, concerned citizens, local experts, and dedicated citizen volunteers.

More than a dozen New York communities have called on task forces to move the climate protection process forward. As an example, the Town of Brighton charged its Green Brighton Task Force

“to educate the community about energy-saving measures, to develop recommendations for maximizing the energy efficiency of town operations, and to identify regulatory changes to promote green practices in the built environment.”

While the task force will be responsible for recommending action items, the success of these projects will require a designated leader or coordinating body to guide projects and facilitate communication.

- Ulster County has created a new Department of the Environment to coordinate programs and activities related to the environment across six different county departments and agencies.
- The Town of Brighton charged its Green Brighton Task Force “to educate the community about energy-saving measures, to develop recommendations for maximizing the energy efficiency of town operations, and to identify regulatory changes to promote green practices in the built environment.”

Whenever a community completes a project in the Climate Smart Communities Pledge, it is crucial to recognize contributors and publicize accomplishments.

Inventory Local Greenhouse Gas Emissions

To select an appropriate GHG reduction target and effective reducing actions, and to measure how well they are working, communities need to identify local activities that generate these gases and determine how much GHG the sources emit. Annual inventory updates demonstrate the community’s progress toward meeting its emission reduction target and show the program’s effectiveness at reducing GHG emissions. In New York State, nearly all GHG emissions come from three sectors: **residential and commercial buildings** (41.87 percent of total CO₂e), **industry** (10.7 percent) and **transportation** (35.9 percent). Localities vary in the proportion of emissions that comes from each sector.

To inventory GHG emissions, local governments calculate emissions from each sector based on readily available data on electricity use, fuel consumption for buildings and transportation, and the amount of solid waste the community generates. A locality may decide to inventory only emissions attributable to local government activities, or may choose to inventory emissions from both local government and the community at large.

Localities should, at a minimum, compile an inventory of emissions from local government operations. Such an inventory typically will concentrate on facilities, vehicle fleet and street lighting, and will lead to a local Climate Action Plan that recommends energy-saving improvements in these areas.

A community-wide inventory goes beyond local government operations to assess emissions from the residential/commercial, industrial and transportation sectors, and from waste. Community-wide local Climate Action Plans might include updating building codes, adopting smart growth land-use strategies and improving recycling and composting programs.

To identify opportunities to reduce GHG emissions, the local inventory must be accurate and must support the full scope of the community’s climate protection goal. Information about the sources and magnitude of GHG emissions is important to help the community set GHG emission reduction targets, and identify and set priorities for actions that will reduce emissions. These action items and priorities, along with an implementation schedule and funding sources, are important elements of the local Climate Action Plan.

In addition to the inventory of existing emissions, some communities also develop business-as-usual emission forecasts that provide further benchmarks for planning and for monitoring progress.

How Local Governments Can Conduct Greenhouse Gas Inventories

Local governments do not have to invent a process or hire experts to compile GHG emissions inventories. To guide municipalities through inventories, ICLEI- Local Governments for Sustainability USA, Inc. (ICLEI USA) and The Climate Registry, the two leading organizations in local GHG accounting, have developed programs for local government and community-wide inventories with software that is easy to use and ensures consistent GHG accounting nationwide. Local governments that join these organizations have access to comprehensive support as they develop emissions inventories.

ICLEI USA and The Climate Registry have collaborated with the California Climate Action Registry and the California Air Resources Board on a single inventory protocol for local government operations. The Local Government Operations Protocol (LGOP) details the policy framework, calculation methodologies, and reporting guidance for quantifying GHG emissions from local government operations. LGOP is now the standard for local governments to inventory and report GHG emissions. ICLEI USA and The Climate Registry are developing additional protocols for completing a community-wide emissions inventory and for quantifying emissions savings associated with GHG reductions.

Gathering and compiling inventory data, then analyzing and reporting results, may take from a few months to a year. These activities are likely to require a significant investment of time, whether from paid staff or consultants, or from volunteer assistants such as student interns or climate action task force members. It is helpful to notify staff and municipal departments of the inventory and outline their involvement in collecting inventory data. Express support from the chief executive officer can be very helpful. There is no need to hire an expert to compile the local inventory, although some communities do choose to retain outside organizations or private consultants to complete the inventory.

ICLEI-Local Governments for Sustainability – ICLEI is a membership association of local governments committed to climate protection and sustainability. More than 500 local governments in the USA, including nearly 40 in New York, have begun developing greenhouse gas inventories as the first step of ICLEI’s Five Milestone climate protection program. Localities can use the Clean Air Climate Protection (CACP) emissions management software from ICLEI USA to track emissions from local government operations alone, or from the entire community (including local government operations). Using this software, local governments can quantify the effect of emission reduction measures, predict future emission levels, set reduction targets and track progress. To help members complete inventories, ICLEI USA provides technical support, online training and additional tools for collecting, inputting, and analyzing energy data to develop an inventory that is consistent with the LGOP. Membership in ICLEI USA also provides access and engagement within a robust network of local climate protection leaders and best practices. Annual ICLEI membership fees are assessed based on the population size of the community.

For more information:

ICLEI-USA: <http://www.iclei-usa.org/programs/climate>

LGO Protocol: <http://www.iclei-usa.org/programs/climate/ghg-protocol>

The Climate Registry – Twenty-one New York public and private organizations, including three local governments, DEC and NYSERDA, have enrolled as reporting members to The Climate Registry (TCR). TCR is a nonprofit partnership that has established a common system for recording, independently verifying and publicly reporting greenhouse gas emissions, both entity-wide and at the facility level. Membership is voluntary and a fee is charged. Reporting entities are required to have their inventories verified by a third party and publicly report their emissions. The benefits of developing an inventory through TCR include the ability to verify and document early GHG reduction actions that will enable a local government to be recognized as an environmental leader. To

simplify the inventory process, TCR provides exclusive access to web-based accounting software and extensive technical support.

Reporting through The Climate Registry must be completed on an annual basis. During the first two years, communities can elect *transitional reporting* and submit partially completed emissions inventories. This option simplifies the requirements for early GHG inventories and enables localities to become familiar with the TCR process. Local governments are responsible for the cost of joining the Climate Registry, for staff time to collect and report data, and for the cost of third-party verification of emission inventories. Contact the Climate Registry for estimates of these costs to your community.

For more information:

The Climate Registry: <http://www.theclimateregistry.org>

LGO Protocol: <http://www.iclei-usa.org/programs/climate/ghg-protocol>

LOCAL CLIMATE PROTECTION PLANNING

Local governments are responsible for public health, safety and local infrastructure (roads, flood control structures, wastewater treatment, and water supply treatment and delivery facilities). To fulfill their traditional responsibilities in the face of possibly disruptive impacts from climate change, local governments need to plan for reducing GHG emissions (Climate Action Plans) and adapting to predicted changes (Climate Resilient Action Plans).

Local governments that set goals now and begin taking action will be able to allocate their resources effectively and to integrate climate protection into government operations and the wider community. Thoughtfully developed policies and programs can maximize the benefits and minimize the costs of responding to climate change.

ACTION NOW! **Start a community discussion of climate protection today:**

- Propose the Climate Smart Community Pledge as your community's response to climate change.
- Work with volunteer or paid community planners on a planning approach that works for you.
- Work with a broad array of stakeholders to develop successful mitigation and adaptation that fit your community's needs and values.

Planning to Reduce GHG Emissions

Local governments are developing action plans to reduce greenhouse gas emissions for their own operations; some localities also are planning for GHG reductions community-wide.

Every local government can reduce GHG emissions in its own operations, as outlined in the next section of this summary, **Action Items: Reducing GHG Emissions from Municipal Operations**, and can use community planning and land use controls to support emission reductions by local businesses, institutions and individuals (discussed in the final section, **Promote Community-wide Climate Protection through Land Use Tools**).

Nearly 40 local governments in New York are developing plans of action using ICLEI USA's Five Milestone climate protection program.

- **Milestone 1: Conduct a baseline emissions inventory and forecast:** Helps the community identify and set priorities for actions that will reduce emissions.
- **Milestone 2: Adopt an emissions reduction target for the forecast year:** Establishes an emission reduction target through a resolution passed by a local government.
- **Milestone 3: Develop a Local Climate Action Plan:** Identifies the areas where emissions can be reduced most cost-effectively and suggests specific actions that will reduce emissions to achieve an emissions reduction target.
- **Milestone 4: Implement policies and measures:** Are guided by the implementation schedule and measures identified in the local Climate Action Plan.
- **Milestone 5: Monitor and verify results:** An ongoing process that provides important feedback that can be used to improve the measures over time. ICLEI's CA-CP software can also be used to monitor and report on measures.

The local climate protection planning process revolves around Milestone 3: **Develop a Local Climate Action Plan**. According to ICLEI USA, most Climate Action Plans include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff. In addition to direct GHG reduction measures, most plans also incorporate public awareness and education

efforts. The emissions reduction target and local Climate Action Plan should be incorporated into comprehensive plan goals and other community plans. The ICLEI USA process of inventory, goal-setting and implementation empowers local communities to explore options, control costs and accomplish effective GHG emission reductions. For more information on accessing ICLEI USA's climate protection resources, visit <http://www.icleiusa.org>.

An effective climate protection strategy will need the support of the local community. Climate protection planners should engage local stakeholders and community members, including local nonprofit and advocacy organizations, residents, and the business community. A local climate protection task force or other advisory group can be at the forefront, serving as a resource to the community's climate protection planning work. A task force can help garner support from the local community, develop specific action items and identify opportunities for implementation.

Planning for Climate Adaptation

Even if all GHG emissions were to stop now, temperatures in the Northeast still would warm by about another 2° F, with a corresponding increase in the number and intensity of impacts. Because climate change will continue long after GHG emissions have been reduced and atmospheric concentrations stabilized, risks to communities from climate change will persist for many years.

Only local government can successfully evaluate a community's risks and lead the community as it determines how it will adapt to climate change. Planning to adapt to climate change begins with an in-depth assessment of the climate change impacts that are likely to affect the local community. To help with this vulnerability assessment, NYSERDA is currently supporting a two-year study (*Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State*) that will identify and assess both near-term and longer-term potential impacts under different climate change scenarios, and will identify and evaluate potential vulnerabilities.

Once local risks are identified, local governments can assess how the risks will affect particular sectors within the community, and can act to enable the community to respond quickly and effectively if these climate risks come to pass. Including climate adaptation goals and targets in the community's comprehensive plan can keep attention on the issue as the years pass.

ICLEI's Climate Resilient Communities™ program is a five-step local process for community adaptation planning that parallels the process for GHG emission reduction planning. This process includes an assessment of the community's vulnerability to climate change impacts, such as increased storm flooding or more frequent droughts. A Climate Resilient Action Plan includes specific options for adaptation within vulnerable planning areas, such as water supply and public health.

Adaptation Planning Case Study Keene, NH - pilot community, ICLEI Climate Resilient Communities program

A committee of local officials, community members, university and health professionals assessed how local climate change impacts predicted by the NECIA report will affect the built environment (buildings and infrastructure), the natural environment (biodiversity and ecosystems), and the social environment (economy, emergency services, public health).

They identified Keene's climate vulnerabilities in each sector, then set measurable targets to achieve each adaptation goal. A major recommendation is to incorporate relevant portions of this plan into the city's comprehensive master plan, an opportunity for a detailed community discussion about sustainability.

ACTION ITEMS: REDUCING GHG EMISSIONS FROM MUNICIPAL OPERATIONS

The first action most communities take to reduce GHG emissions is to assess their own operations for opportunities to reduce energy use. Local governments can reduce emissions through energy-related improvements to municipal buildings, green purchasing requirements, and improvements in infrastructure, solid waste management and public transit. The action items discussed in this section have proved successful in reducing GHGs and are included in many local Climate Action Plans.

Some GHG emission reduction actions available to local communities are free or inexpensive and bring immediate savings in both emissions and energy costs. Typical examples of such actions are shown in the boxes headed ACTION NOW! in this summary. Local governments can realize savings from these actions without waiting for the inventory or the climate planning process to be completed.

Municipal Buildings

Significant greenhouse gas reductions and energy savings can be realized in municipal buildings and facilities. In New York State, buildings produce 42 percent of total GHG emissions.

Identify Cost-saving Retrofit Measures with an Energy Audit

An energy audit evaluates building structure, systems, equipment, and energy consumption patterns (both electricity and gas), and identifies cost-saving energy efficiency improvements for each building or facility.

An audit should lead to a retrofit project to upgrade or replace building systems and components, including lighting, boilers and chillers, energy-management-control systems, motors, and building envelope (i.e., insulation, windows and doors). More than 70 local governments throughout New York State have taken advantage of NYSERDA's Energy Audit program to identify effective cost-saving measures for buildings and facilities. The Energy Audit program is available to facilities with less than \$75,000 in annual electricity bills. For larger facilities, NYSERDA's cost-shared energy audit programs, such as FlexTech, Technical Assistance, are available.

Retrofit a Portfolio of Buildings with Energy Performance Contracting

Local governments can save money by auditing and retrofitting several buildings and facilities for energy efficiency through an energy performance contract (EPC). The benefits of an EPC include little to no upfront capital expenditure, and long-term energy cost savings. The EPC can be financed through a tax-exempt "**municipal lease**," which is considered non-balance sheet debt and can be paid back through savings in the operating budget.

About NYSERDA Funding for Energy Efficiency and Renewable Energy Projects

The New York State Energy Research and Development Authority (NYSERDA) offers programs that can be used by local governments for services such as obtaining technical assistance or offsetting a portion of the incremental cost of an energy efficiency or renewable energy project.

Specific programs for obtaining these services are mentioned throughout this document. Many of these programs require that your local government pay into the System Benefits Charge.

A report from the Lawrence Berkeley National Laboratory estimates median energy savings from state and local government performance contracts nationwide at 17 kBtu per square foot, or approximately 7 percent of average building energy consumption per square foot. NYSERDA's cost-shared energy audit programs, such as FlexTech, Technical Assistance, and Energy Audit Programs, are available to help local governments assess the feasibility and cost effectiveness of implementing energy saving measures. For more information, visit <http://www.nyserdera.org>.

Cost Savings: An EPC for the City of Saratoga Springs, N.Y. is expected to reduce the city's total electric energy consumption by 10 percent (473,132 kWh) and natural gas consumption by 16 percent (3,105 decatherms). Annual cost saving from reduced electricity use alone is more than \$72,000.

GHG Emissions Reduction: The Saratoga Springs EPC will reduce greenhouse gas emissions from the city by 429 tons of CO₂e annually.

Create a Climate Smart Purchasing and Disposal Policy

Energy-efficient purchasing standards will ensure that appliances, information technology equipment, lighting and control equipment have the greatest efficiency for their use, reducing utility bills, and lowering operation and maintenance costs. Using the standards and specifications for energy-efficient products from programs such as the Environmental Protection Agency's ENERGY STAR[®] program, the Federal Energy Management Program (FEMP), the Consortium for Energy Efficiency, and the Electronic Product Environmental Assessment Tool (EPEAT), you can identify purchasing requirements that fit your operational needs. New York State has created purchasing guidelines and specifications for many products in accordance with state law and various executive orders, including EO4: Establishing A State Green Procurement and Agency Sustainability Program and EO111: Green and Clean State Buildings and Vehicles. These standards can be accessed through the following links:

- EO4: <http://www.ogs.state.ny.us/ExecutiveOrder4.html>
- EO111: <http://www.nyserdera.org/programs/state.asp>
- Equipment Standards for State Purchasing: <http://www.nyserdera.org/programs/equipstds.asp>

Cost Savings: NYSERDA estimates that New York's county governments alone could save an estimated \$10 million annually by adopting existing energy-efficient purchasing standards for office equipment.

GHG Emissions Reduction: If energy efficient purchasing were adopted by just half of government agencies nationwide, there is potential to save 21.6 billion kWh of electricity and 34 trillion Btu of gas and fuel oil annually, resulting in 4.1 million metric tons of avoided CO₂e emissions.

ACTION NOW!

Pilot Energy Efficient/Green Procurement

Select two or three products that you purchase in volume and that are available under the ENERGY STAR[®] label.

Use ENERGY STAR's savings calculator to estimate the life cycle cost savings that would result from switching. ENERGY STAR compliant compact fluorescent lamps (CFLs) or LED exit signs are excellent places to start; tremendous energy savings and long life make their payback time very short.

ENERGY STAR[®] Products Page:

http://www.energystar.gov/index.cfm?fuseaction=find_a_product.

Cost Savings: If you pay an extra \$3,000 to purchase 100 ENERGY STAR[®] compliant exit signs, the savings calculator estimates savings of more than \$41,000 over the 10-year life of the exit signs

GHG Emissions Reduction: Over its lifetime, one LED bulb saves more than 4,000 lbs of CO₂.

Retro-commission Buildings to Improve Operation and Maintenance, Avoid Emissions

Retro-commissioning (RCx) is a method of improving building performance by developing a plan to improve operation and maintenance. RCx is an opportunity to reduce energy consumption in, and GHG emissions from municipal buildings.

According to the American Council for an Energy Efficient Economy, energy savings from RCx can range from 5 percent to 20 percent, depending on the size, complexity and age of the building, with a realistic estimate of savings reported to be on the order of 10 percent. A NYSERDA study (1996) showed that retro-commissioned buildings were able to exceed the minimum requirements of the New York State Energy Conservation and Construction Code by an average of 32 percent and reduce peak-electric demand by an average of 40 percent. Contact NYSERDA for services available for RCx projects: <http://www.nyserda.org>.

Cost Savings: In a sample of 106 buildings nationwide, the U.S. Department of Energy found that meeting RCx standards resulted in a median energy-cost saving of 15 percent of total building-energy consumption, with a median simple payback period of 0.7 years. In addition to energy cost savings, RCx has other benefits (such as reduced change-orders, longer equipment life, and better thermal comfort) for an added average savings of \$0.18/square foot annually.

GHG Emissions Reduction: Reducing energy consumption by 10 percent in all U.S. buildings would reduce CO₂e emissions by almost 8 million tons per year.

Mandate Green Standards for all New Public Buildings

Green buildings are designed, constructed, and operated to boost environmental, economic, health, and productivity performance as compared to conventional buildings. While green-building practice has been shown to increase initial costs in commercial buildings by two percent, or \$3 to \$5 per square foot, this investment will yield an overall life-cycle cost savings of 20 percent of total construction cost.

The U.S. Green Building Council (USGBC) has established nationally recognized green building standards for designing, constructing, and certifying sustainable buildings through the Leadership in Energy and Environmental Design (LEED) rating system. LEED establishes standards for six categories of design and construction, including sustainable siting, water efficiency, energy and atmosphere, materials and resources, indoor environmental air quality, and innovation in design. Using LEED shifts the certification process to a third party, eliminating the need to establish a local body to certify green-building projects. NYSERDA's New Construction and Green Buildings Program provides cost shared funding and technical assistance to identify and assess energy efficiency improvements for the design and construction of new and major renovation green building projects located in areas that pay the System Benefits Charge. For more information visit <http://www.nyserda.org>

Cost Savings: According to "Costing Green," a widely cited report on the costs of green buildings, savings in energy costs of 20 to 50 percent are common as a result of green building practices. An additional benefit of green-building practices is improved employee productivity. Annual benefits of employee productivity amount to \$200 per square foot.

ACTION NOW! Plan and Track Building Energy Use with ENERGY STAR® *Portfolio Manager*

Free U.S. Department of Energy/Environmental Protection Agency software lets building owners evaluate energy performance against similar buildings across the nation. A rating of 75 or higher out of 100 puts a building in the most efficient quartile and makes it eligible for the ENERGY STAR® label. ENERGY STAR® also provides tools to prioritize efficiency measures, set goals and track progress.

ENERGY STAR® Portfolio Manager:
http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

GHG Emissions Reduction: Since the development of the LEED standards, green buildings have avoided emissions of 2.7 million metric tons of CO₂e and saved the U.S. as much energy as burning 1.3 million tons of coal for electricity, according to the USGBC.

Municipal Infrastructure

Install LED Traffic Signals and Timers

Traffic signals and timers run twenty-four hours a day, using a significant amount of energy. LED traffic signals are widely used; they are 80 percent to 90 percent more efficient than incandescent bulbs, last ten times longer and appear brighter. NYSERDA estimates the overall potential energy savings for New York State traffic signals at 230 million kWh. NYSERDA's Existing Facilities Program is available to local governments that pay the System Benefits Charge for cost-shared support of LED traffic signal projects.

Cost Savings: The City of Syracuse estimated that replacing traffic signals at 229 intersections throughout the city would yield an electric-energy savings of 4.8 million kWh and cost savings of \$1,533,781 annually.

GHG Emissions Reduction: Syracuse's LED upgrade will yield an annual GHG reduction of 2,269 tons of CO₂e.

Municipal Water and Wastewater Treatment

New York State's municipal wastewater plants and drinking water systems consume up to 3 billion kWh of electricity annually. Energy and operating costs to pump, treat, deliver, collect, and clean water for water and wastewater treatment can add up to one-third of a municipality's total energy bill.

NYSERDA anticipates administering programs that emphasize energy efficiency, minimal carbon emissions and improved economic and climate performance with funds that may become available in 2009. The result will be lower operating costs for the site communities and reduced climate impact over the potentially decades-long lifetime of the new infrastructure.

For more information:

The NYSERDA Focus on Water and Wastewater program provides water and wastewater professionals with knowledge and resources to identify and implement energy efficiency improvements. For more information, visit <http://www.nyserda.org/Programs/Environment/muniwaterwwt.asp>.

The New York State Cofunding Initiative is a partnership between state and national agencies that serves to streamline and maximize public funding for public water and sewer projects. For more information, visit <http://www.nycofunding.org/DotNetNuke/>.

Transportation

Every gallon of gas burned by a vehicle releases 20 pounds of CO₂ to the atmosphere. According to NYSERDA, the transportation sector accounts for 93.4 million metric tons of GHG emissions, or 39 percent of annual emissions in New York State. Many options can reduce GHG emissions, minimize congestion and save money. Investments should be made now to hedge against rising fuel costs, which the experience of 2008 has shown can spike quickly and unexpectedly. NYSERDA's FlexTech program can be used to conduct alternative fueled vehicle (AFV) studies that evaluate the feasibility of implementing AFVs in a municipality's operations. Additionally, NYSERDA administers State Energy Program funds through the Alternative Fueled Vehicles Program. Distributed by competitive grants, these funds are available for alternative fueled vehicles and fueling stations.

Green Municipal Fleets

Options for greening municipal fleets include establishing minimum fuel-efficiency standards for new vehicles purchased; incorporating alternative fueled vehicles and fueling stations, improving vehicle maintenance, sizing fleet vehicles appropriate to their use, driver education on maintenance and use of vehicles, and establishing an early retirement program for the municipality's least efficient vehicles. New York State has created a purchasing specification for passenger vehicles under Executive Order 4.

Examine Opportunities to Reduce Employee Driving

Local governments can implement comprehensive travel demand management that includes compressed work schedule options, carpooling and/or financial incentives to employees that carpool or use mass transit. Local governments can promote bicycle commuting by providing bicycle storage.

Optimize Traffic Signal Timing

Traffic signal timing optimizes the timing and efficiency of existing traffic signals, helping to reduce fuel consumption and emissions by improving traffic flow, reducing idling, and easing bottlenecks along high-traffic roadways. The Federal Highway Administration (FHA) estimates that 75 percent of all traffic signals in the U.S. could benefit from traffic signal-optimization practices.

Cost Savings: According to the Institute of Transportation Engineers, traffic signal timing programs have documented benefits of 7 to 13 percent reduction in overall travel time, 15 to 37 percent reduction in delay and a 6 to 9 percent fuel savings.

GHG Emissions Reduction: The National Transportation Operations Coalition estimates that nationwide, traffic signal timing could save 17 billion gallons of motor fuel per year, reducing CO₂e emissions by 170 million tons annually.

Establish a Municipal Vehicle Anti-Idling Policy, and Educate Employees and Public About Idling

Vehicle idling wastes fuel, damages engines, and results in excess GHG and air pollutant emissions.

Cost Savings: Idling 15 minutes per day can cost you up to \$100 in wasted gas in a year. Many studies have shown that frequent restarting has little impact on the mechanics of an automobile, while excessive idling can result in incomplete combustion, which can damage an automobile's engine and exhaust components.

GHG Emissions Reduction: Vehicle idling wastes fuel, damages engines, and results in excess greenhouse gas and criteria air pollutant emissions. Despite popular belief, idling for more than ten seconds almost always wastes more fuel than simply turning the vehicle off and restarting it.

ACTION NOW!

Promote local ridesharing

Ridesharing programs exist in many areas of the state through regional Metropolitan Planning Organizations (MPOs) or transit authorities.

Cost Savings: The considerable cost savings from ridesharing go to citizens rather than to local government. Sharing \$2 per gallon gas just one day per week for a 40-mile trip in an average car will save more than \$100 in a year.

GHG Emissions Reduction: Rideshare programs typically reduce commuter vehicle miles traveled by up to 8.3 percent.

Renewable Energy

By obtaining energy from renewable sources, rather than from fossil fuel, local governments can conserve energy, cut dependence on foreign oil, and reduce air pollution and greenhouse gas emissions. Renewable energy is generated from natural, inexhaustible resources such as sunlight, wind, hydropower, geothermal and biomass.

Many New York local governments are interested in purchasing onsite renewable energy systems, particularly solar, or purchasing renewable energy that is generated elsewhere (also known as Renewable Energy Credits, or RECs). NYSERDA's Photovoltaic (PV) and Small Wind Energy programs can be used by local governments that pay the System Benefits Charge. For more information, visit <http://www.powernaturally.org>.

Municipal Solid Waste Management

An estimated 37 million tons of municipal solid waste (MSW) are managed each year in New York State. (This total includes all commercial, institutional and residential solid waste.) As it decomposes in a landfill or is combusted in a waste to energy facility, MSW generates approximately 5.74 MMT CO₂e annually, or 2.17 percent of total GHG emissions statewide.

To reduce the amount of waste and the associated GHG emissions from landfills and waste to energy facilities, New York State's local governments and solid waste planning units can adopt climate smart solid waste management strategies that include waste prevention, reuse, comprehensive recycling and organic material (food scraps and green waste) recovery programs.

For their own operations, local governments can adopt in-house solid waste reduction strategies, such as requiring double-sided printing in municipal buildings. According to the U.S. EPA, landfilling provides the largest contribution of waste management GHG. Common methods to divert waste from landfills include source reduction, recycling and composting. For more information on MSW reduction strategies, see

- NYSDEC Local Solid Waste Management Planning: <http://www.dec.ny.gov/chemical/47861.html>
- New York State Association for Reduction, Reuse and Recycling: <http://www.nysar3.org/>
- New York City WasteLe\$\$ at Agencies and Schools: http://www.nyc.gov/html/nycwasteless/html/at_agencies/at_agencies.shtml

PROMOTE COMMUNITY-WIDE CLIMATE PROTECTION THROUGH LAND USE TOOLS

Good community planning that strives to protect open space, biodiversity and water supplies will support the objectives of planning for adaptation to climate change. Additional ways to incorporate a response to climate change into land use planning include 1) encouraging development that is energy efficient, 2) enabling the use of renewable energy, 3) encouraging development that reduces vehicle miles traveled (VMT), and 4) encouraging development that will be resilient to climatic changes.

Communities can use existing local land use powers, such as zoning, subdivision regulations, and other land use tools (such as transfer of development rights), to encourage GHG emission reductions, minimize risks from climate change and reduce the long-term costs of adaptation in the private sector. The Comprehensive Planning Process is an excellent way to ensure that these tools will integrate climate protection in a way that aligns with your community's land use development goals.

Encourage Energy Efficient Development

According to NYSERDA, energy use in residential and commercial buildings contributes approximately 42 percent of all greenhouse gas emissions in New York State. The U.S. Department of Energy estimates that applying energy efficient design techniques and technologies in the 17 billion square feet of new commercial and industrial development the U.S. is projected to build over the next 15 years could save more than 30 percent, or \$100 billion per year, in energy costs. GHG reductions in the building sector can be promoted through municipal land use tools that enable or encourage energy-efficiency ratings and performance standards for all new construction and renovations, and the integration of passive solar energy concepts.

Local governments in New York are going above and beyond minimum requirements for energy and water efficiency outlined in the New York State Energy Conservation Construction Code in order to promote energy efficiency and green building practices in the private sector. The Town of Babylon, for instance, requires all new commercial and industrial buildings larger than 4,000 square feet to achieve LEED certification. The Town of Greenburgh requires all new residential construction to meet ENERGY STAR® standards.

Encourage Renewable Energy

New York State has great potential to generate electric power from renewable sources like sunlight, wind, flowing water (hydropower), the earth's heat (geothermal), and biomass. Substituting renewable sources for fossil fuel cuts dependence on foreign oil, reduces air pollution, lowers greenhouse gas emissions and stimulates the growth of new jobs.

Land use regulations play an important role in enabling renewable energy projects that are cost effective and compatible with existing land uses. Many local governments in New York are beginning to review their land use regulations (such as zoning ordinances, subdivision regulations and the overall review and permitting process) to ensure that they encourage the use of renewable energy and do not place barriers to the development of renewables in the community.

The Climate Smart Communities Guide will help identify specific ways in which New York State local governments can promote renewable energy through their land use controls. In the meantime, visit an existing resource on promoting wind energy from NYSERDA:

NYSERDA's Wind Energy Toolkit:

<http://www.powernaturally.org/programs/wind/toolkit.asp>

Encourage Development That Reduces Vehicle Miles Traveled (VMT)

According to NYSERDA, the transportation sector accounts for approximately 39 percent of all greenhouse gas emissions in New York State. Transportation emissions are measured by the number of vehicle miles traveled (VMT), most of which occurs locally in the U.S. The Urban Land Institute suggests that the emission reductions from increased federal fuel efficiency standards are likely to be offset by projected growth in VMT.

According to the Founders Network on Smart Growth and Sustainable Communities, almost 60 percent of growth in VMT is attributable to sprawl, or development patterns that yield low-density isolated land uses, accessible almost entirely by car. Upstate New York, for instance, has experienced what the Brookings Institution calls "Sprawl Without Growth"-- between 1982 and 1997, developed land increased by 30 percent, while the population only increased 2.6 percent, for an overall decrease in density of 21 percent.

Local governments that use land use tools to reduce vehicle miles traveled (VMT) within the community will play a role in reducing GHG emissions from transportation. Local governments should revisit their land use controls, such as subdivision regulations, street design standards, parking standards and zoning, to support and encourage development projects that will reduce VMT by promoting the principles of "Smart Growth," which includes accommodating pedestrian and bike safety, enhancing public transportation options, and improving the connectivity of road networks. New York Governor David A. Paterson's Smart Growth Cabinet defines Smart Growth as

Sensible, planned, efficient growth that integrates economic development and job creation with community quality-of-life by preserving and enhancing the built and natural environments. Smart Growth encourages growth in developed areas with existing infrastructure to sustain it, particularly municipal centers, downtowns ("Main Streets"), urban cores, hamlets, historic districts and older first-tier suburbs.

Smart Growth development patterns include compact, mixed use and transit oriented development (TOD), which reduces VMT by co-locating a variety of life's daily needs, thereby creating a built environment that is conducive to walking, biking and mass transit. TOD, for example, reduces VMTs and transport-based GHG emissions by offering mobility alternatives—walking, biking and public transit. In the TOD formula, the relationship between land use and transportation is entirely symbiotic—the land use elements (dense, mixed-use, inter-connectedness) support the alternative transportation elements (transit, walking, biking), and vice versa. Research shows that people who live near transit drive 20 to 30 percent less.

VMT reductions will create more desirable and attractive places to live and result in financial savings for local businesses and residents—savings that can accrue to the local economy. Coordinating with neighboring communities for a regional approach to land use planning can address many of the challenges to implementing Smart Growth. Contact the local metropolitan planning organization for more information.

For more information on incorporating Smart Growth principles into existing land use tools, see

- New York's Smart Growth website: <http://www.SmartGrowthNY.com>
- Information on Smart Growth from the New York State DOT, including the new Smart Growth check lists: <http://www.nysdot.gov/programs/smart-planning>

Encourage Development That Will Be Resilient to Climatic Changes

Identifying effective actions for promoting resiliency in land use tools is highly dependent upon identifying the specific risks that climate change poses to the community. In fact, many existing plans for adapting to climate change include developing a thorough understanding of climate impacts as a specific action item.

Other typical action items, such as revising hazard mitigation plans or floodplain maps to reflect predicted changes, lend themselves to an additional integrated capacity building or planning process.

Adaptation Planning Case Study Orange County, N.Y. Water Master Plan Incorporates Climate Change

The Orange County Water Authority (OCWA) is incorporating predicted local climate changes into the county's first water master plan. The plan will address management and protection of existing drinking water supplies, new water supply development, water conservation, and other water resource management issues including flooding, drought, stormwater, groundwater monitoring, and intergovernmental coordination.

To supplement existing data, OCWA is partnering with the City University of New York's (CUNY) Institute for Sustainable Cities through a grant from the NYS Water Resources Institute to study stream flows in the county. The water master plan, including the climate change study, is expected to be completed in 2009.

The Climate Smart Communities program is a state and local partnership to encourage climate protection. State agencies collaborating on the program include the New York State Department of Environmental Conservation, the New York State Energy Research and Development Authority, the New York State Department of State and the New York State Public Service Commission. This summary document was prepared by Liz Compitello, with funding from Clean Air - Cool Planet, in cooperation with the DEC Office of Climate Change, Peter Iwanowicz, Director.