# Local Action Plan:

## to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations

City of Ithaca, New York
**February, 2006**

*Adopted by Common Council on July 5, 2006*

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In cooperation with:
Mayor Carolyn Peterson &
International Council for Local Environmental Initiatives

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# Acknowledgments

The author would like to thank Mayor Carolyn Peterson for leading the City of Ithaca's efforts to proactively address environmental concerns, such as reducing greenhouse gas emissions. The author especially appreciates the opportunity to assist in this effort. Moreover, gratitude is extended to all those who have helped in the creation of this document, including members of the International Council for Local Environmental Initiatives (ICLEI) and the many individuals from City and County departments. Additionally, the author wants to thank the City department heads and Common Council members for their enthusiasm and willingness to assist in implementing recommendations contained in this plan. Finally, the author would like to thank his direct supervisor, Annie Sherman, who provided much-appreciated technical and personal support.

# Executive Summary

Worldwide climate patterns are expected to change significantly over the next century.[1] Changing climate patterns are already causing environmental disruptions. These disruptions will have an impact on our economic and social systems. Despite the uncertainties about climate change, we currently know enough to begin implementing measures to deal with this issue. Though the problems of climate change are global in nature, the root causes can be effectively addressed locally and regionally.

In April 2001, Tompkins County developed a plan[2] to reduce greenhouse gas (GHG)[3] emissions. The City of Ithaca is proud to add to this effort by producing this document – *Local Action Plan: to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations*. The City of Ithaca plan largely focuses on energy conservation and greenhouse gas emission reductions relating to municipal operations, rather than community-wide activities. This route has been chosen principally because the City of Ithaca is in direct control of its own greenhouse gas emissions and thus can more easily implement desired policies and quantify the results. This plan recommends that ***the City of Ithaca set a goal to reduce greenhouse gas emissions to 20% below 2001 levels by 2016.*** It is expected that strong City leadership will encourage residents, businesses, and organizations to implement their own strategies to conserve energy and consequently reduce their greenhouse gas emissions as well.

In addition to reducing greenhouse gas emissions, energy conservation initiatives are good for the local economy. Aggressive short- and long-term energy conservation strategies will not only mitigate the effects of increasing energy costs but will also enable Ithaca to have an economic advantage over other regions less able to adapt to higher energy costs.

This document discusses the City of Ithaca's role in global climate protection and sets policy goals that are socially equitable, economically feasible and environmentally responsible. These policies are translated into tangible and practical strategies that can be implemented to cut greenhouse gas emissions.

The strategies proposed in this plan are far from definitive. As specific measures are further investigated and implemented, the plan itself will need to be revised to respond to new opportunities and challenges. However, this initial, and major, step will commit the City of Ithaca to a decade of responsible energy use.

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[1] See: Union of Concerned Scientists <http://www.ucsusa.org/>, International Council on Local Environmental Initiatives (ICLEI) <http://www.iclei.org/>, United Nations Framework Convention on Climate Change <http://unfccc.int/2860.php>, and U.S. Environmental Protection Agency <http://yosemite.epa.gov/oar/globalwarming.nsf/content/index.html>.

[2] See <http://www.tompkins-co.org/emc/docs/4%20ccp%20local%20action%20plan.pdf> Note: as some additional staffing and monetary resources were available, it was determined that greater regional GHG reduction benefits would occur from a Local Action Plan that addressed issues at a County-wide, as opposed to City-wide, scale. Consequently, Tompkins County produced a Local Action Plan before the City of Ithaca Local Action Plan.

[3] Greenhouse gases (GHG) can be naturally occurring, such as water vapor and carbon dioxide, or man-made, such as methane and carbon dioxide. Naturally occurring greenhouse gases maintain a global atmosphere conducive to life. **Elevated greenhouse gas levels, caused by humans, are tipping the natural balance and causing global climate change.**

# 1.0 Background

# 1.1 Introduction

## *1.11 Global Climate Change*

The international scientific community is in agreement that global warming is occurring. Scientists also agree that global warming is caused, or at least accelerated, by human activity—namely, the production of greenhouse gases via the combustion of fossil fuels.[4] One effect of global warming is increasingly rapid climate change.[5]

Though climate change is a global problem, many countries have found it difficult to enact strategies to combat climate change at a national level. This situation is aptly demonstrated by the international response to the Kyoto Protocol.[6] Basically, the Kyoto Protocol outlines greenhouse gas emission reduction targets for industrialized countries. According to the United Nations:

> "*The Kyoto Protocol is an agreement under which industrialized countries will reduce their collective emissions of greenhouse gases by 5.2% compared to the year 1990 (but note that, compared to the emissions levels that would be expected by 2010 without the Protocol, this target represents a 29% cut). The goal is to lower overall emissions from six greenhouse gases - carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, HFCs, and PFCs - calculated as an average over the five-year period of 2008-12. National targets range from 8% reductions for the European Union and some others to 7% for the US, 6% for Japan, 0% for Russia, and permitted increases of 8% for Australia and 10% for Iceland.*"[7]

A few industrialized nations that are accustomed to consuming large quantities of energy[8] have resisted the Kyoto Protocol proposals due to the necessary energy reductions required to achieve the Kyoto Protocol goals. For the United States to do its part to reduce energy consumption, and consequently greenhouse gas emissions, U.S. federal decision-makers contend that implementing the Kyoto Protocol would "harm our

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[4] Most human-produced GHG emissions come from the combustion of fuel, and some emissions come from natural biological sources—such as agriculture. The EPA notes that: "As an individual, you can affect the emissions of about 4,800 pounds of carbon equivalent, or nearly 32% of the total emissions per person, by the choices you make in three areas of your life. These areas are the electricity we use in our homes, the waste we produce, and personal transportation. The other 68% of emissions are affected more by the types of industries in the U.S., the types of offices we use, how our food is grown, and other factors." Source: EPA.

[5] Specifics about the science of global warming can be viewed on the Union of Concerned Scientists web site - <http://www.ucsusa.org/global_warming/science/>.

[6] For information about the Kyoto Protocol, see <http://unfccc.int/resource/docs/convkp/kpeng.html> and <http://en.wikipedia.org/wiki/Kyoto_Protocol>.

[7] Source: United Nations Environment Programme <http://www.unep.org/>.

[8] The U.S. has the highest per capita emissions level in the world at 5.37 tons/capita, and Australia is in second place at 4.63 tons/capita. Though China is the second highest polluter, China ranks 18th with 0.76 tons/capita. For reference, France emits 1.69 tons/capita, the UK emits 2.59 tons/capita, and India emits 0.29 tons/capita. Source: Union of Concerned Scientists, *Science of Global Warming: Each Country's Share of Global $CO_2$ Emissions*, <http://www.ucsusa.org/global_warming/science/each-countrys-share-of-co2-emissions.html>.

economy and hurt our workers."[9] However, at the close of the UN conference of 2005, a framework was negotiated that, on one hand, advanced the international community's efforts to pursue the Kyoto Protocol goals and, on the other hand, was able to keep the U.S. involved but without committing to the Kyoto Protocol goals.[10]

Issues surrounding energy consumption, greenhouse gas emissions, climate change, and human-caused environmental degradation in general are extremely complex topics that involve many interrelated factors and various stakeholders with often conflicting sets of goals. Furthermore, the U.S. federal government *is* moving forward with some voluntary and market-based climate protection initiatives. Dr. Paula Dobriansky, Under Secretary for Democracy and Global Affairs and Head of U.S. Delegation to COP 11, indicated in her remarks at the Opening Plenary of the Eleventh Session of the Conference of the Parties (COP 11) to the U.N. Framework Convention on Climate Change that the U.S. leads "the world in funding climate science—$2 billion this year. And [the U.S. is] spending $3 billion this year to accelerate the commercialization of cleaner energy technologies." She went on to say, "New legislation includes $11 billion in incentives for wind, geothermal and solar power, clean vehicles, clean coal technology, emissions-free nuclear power, and renewable bio-fuels. Our international efforts reflect the consensus that an effective response to climate change must include all countries."[11] Though the above information provides hope, actual federal progress has been slow and lacks concrete and enforceable goals—as the initiatives are largely voluntary.

Due to the slow progress in addressing climate change at the federal level, many local governments have decided to implement greenhouse gas reduction measures on their own. Often local governments adopt goals similar to the Kyoto Protocol goals but may tailor specific strategies to address local objectives—for example, the City of Ithaca would, as proposed in the *Local Action Plan*, basically follow the Kyoto Protocol recommendations except that the greenhouse gas reduction level would be greater[12] and the measures would (initially) focus on municipal operations, as opposed to community-wide sources of greenhouse gas emissions.

Just as society has made countless choices that have led to excessive greenhouse gas emissions resulting in global warming and climate change, society can make *new choices* to reverse climate change.

To be feasible, any plan that attempts to reduce greenhouse gas emissions must satisfy three interrelated topics: environmental stewardship and protection; economic compatibility and incentives; and social equity and responsibility. Additionally, clear policy goals must be set and enforcement mechanisms must be in place to assure compliance.

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[9] As stated by President Bush on March 28, 2001 – source: The Heritage Foundation, referenced from "Bush Firm over Kyoto Stance," *CNN.com*, March 29, 2001.

[10] For additional information about the UN Climate Change Conference, see the United Nations Framework Convention on Climate Change (UNFCCC) web site <http://unfccc.int/meetings/cop_11/items/3394.php>.

[11] Referenced from the U.S. Department of State's International Information Programs web site <http://usinfo.state.gov/gi/Archive/2005/Dec/09-552483.html>.

[12] The Kyoto Protocol called for $eCO_2$ levels in 2010 to be 7% below 1990 levels—the *Local Action Plan* for the City of Ithaca proposes $eCO_2$ levels in 2016 to be 20% below 2001 levels.

Finally, climate protection is not an esoteric "environmentalist" cause nor a political strategy nor an academic debate among scientists. It is an internationally acknowledged priority that merits concerted action. The City of Ithaca is proud to contribute to the climate protection effort and is optimistic that positive local actions can have positive global effects.

## *1.12 Cities for Climate Protection Campaign*

The Cities for Climate Protection (CCP)[13] campaign is a project of the International Council on Local Environmental Initiatives (ICLEI). ICLEI, founded in 1990, has collaborated with over 670[14] cities, counties, and organizations worldwide to assist local governments in pursuing efficient and effective strategies to achieve local, regional, and global energy conservation and pollution reduction goals. On March 12, 2001, the City of Ithaca Conservation Advisory Council submitted a resolution requesting that the City of Ithaca join ICLEI and participate in the CCP campaign. This initiative was unanimously passed by the City of Ithaca Common Council on April 4, 2001 (see appendix 1).[15] This *Local Action Plan* is the logical next step. The CCP campaign is a program designed to aid municipal governments in identifying, and mitigating, sources of local greenhouse gas emissions. Organizationally, the CCP campaign is structured around five milestones:

- ✓ Milestone 1 - Conduct a greenhouse gas emissions analysis and inventory
- ✓ Milestone 2 - Set a reduction target
- ✓ Milestone 3 - Develop a Local Action Plan
- o Milestone 4 - Implement the Local Action Plan
- o Milestone 5 - Monitor progress and report results

This document marks the completion of the first three milestones. A greenhouse gas emissions analysis and inventory (1) has led to the setting of a reduction target (2) which, in turn, has led to the development of the *Local Action Plan: to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations* (3). More detail is provided about the milestone process in section ***1.22 Developing a Local Action Plan*** on page 7.

This *Local Action Plan* has been developed using software and resources available through the CCP campaign. The City of Ithaca is incorporating this *Local Action Plan* as a component of the U.S. Mayors Climate Protection Agreement (see page 5 and appendix 2), which calls for an "inventory [of] global warming emissions in City operations and in the community, set reduction targets and create an action plan."[16]

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[13] For more information see <http://www.iclei.org/index.php?id=800>.

[14] As of Feb. 17, 2006, the Cities for Climate Protection program had 674 participants from 30 countries.

[15] As some additional staffing and monetary resources were available, it was determined that greater regional GHG reduction benefits would occur from a Local Action Plan that addressed issues at a County-wide, as opposed to City-wide, scale. Consequently, Tompkins County produced a Local Action Plan before the City of Ithaca Local Action Plan. In 2005, additional staffing resources became available and the City of Ithaca was able to create this Local Action Plan that was originally initiated four years prior. See appendix 1 and 2.

[16] For additional information, see <http://www.seattle.gov/mayor/climate/>.

# 1.2 Program Goals and Objectives

## *1.21 Climate Change and the City of Ithaca*

***Overview***

Residents of the City of Ithaca, as well as the larger Ithaca region, are quite fortunate that the current local environmental conditions are very good. Ithaca is, however, not immune from the effects of global climate change. Alternately, the City of Ithaca, just like other cities, should carefully assess how local actions may be contributing to the problem of global climate change.

Electricity production is a significant source of pollution. The City of Ithaca relies largely on the burning of fossil fuels (coal 35%, natural gas 18%, oil 15%)[17] for electricity generation. Nuclear power represents 20% of electricity production. On the positive side, hydro-electric power accounts for 11% of electricity produced, and other "green" energy sources such as wind, biomass, and solar energy are becoming more cost-effective as technology improves and fossil fuel prices escalate.

Transportation choices greatly affect the levels of local greenhouse gas emissions. Individuals can choose among a variety of personal transportation modes, producing various levels of greenhouse gases and other pollutants. The local greenhouse gas emission levels would be much higher if it were not for the fact that a very large percentage of City of Ithaca residents walk to destinations instead of driving. Indeed, the City of Ithaca has the highest percentage of walk-to-work trips in New York—over 40% of trips![18] Additionally, bike-to-work trips account for about 1.8%[19] of trips within the City of Ithaca, and only 36% of work trips are via private motor vehicle.[20] However, as the City of Ithaca is one of the largest employment (and shopping) destinations in the region, a great number of vehicles, perhaps 50,000, pass through the City of Ithaca each day.[21] Some investigation is currently underway to expand and better integrate the park-and-ride facilities surrounding the City so that more transportation choices, namely public transit and carpooling, are available to those visiting Ithaca. Further analysis is required to determine the impact these vehicles have on local greenhouse gas emission levels.

To sustain and build upon the already favorable conditions within the City of Ithaca, constant vigilance and investment are required at all levels: government,

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[17] Source: City of Ithaca Controller's Office.

[18] Source: 2000 Census (<http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=16000US3638077&-qr_name=DEC_2000_SF3_U_QTP23&-ds_name=DEC_2000_SF3_U&-_lang=en&-redoLog=false&-_sse=on>). Note: In comparison, 22% of residents walk to work in Manhattan, 8.4% in Saratoga Springs, 10.8% in Albany, 5.3% in Buffalo, 5.8% in Binghamton, 6.2% NYS average. Additionally, the 40% statistic (actually 41.2%) relates only to work trips and does not include shopping trips, recreation trips, etc. However, work trips do include home-to-school trips made by students.

[19] Bicycling accounted for 1.8% of work trips in the City of Ithaca according to the 2000 Census—four times the national average of 0.44% (the NYS average is 0.39%). Bicycling to work in the City of Ithaca accounted for 58.5% of bike-to-work trips in Tompkins County.

[20] Source: 2000 Census. Note: Private motor vehicles, especially single-occupancy private motor vehicles, are highly polluting on a per capita basis. The 36% statistic is a sign that the City of Ithaca has a well-balanced transportation system.

[21] The City of Ithaca Department of Public Works Engineering Division estimates that approximately 50,000 motor vehicles enter and then exit Ithaca each day.

businesses, organizations, and residents. Collaborative initiatives to reduce local energy consumption and greenhouse gas emissions will directly benefit the local economic, environmental, and social conditions.

***Benefits to the City of Ithaca***

Climate protection and greenhouse gas reduction efforts benefit the City of Ithaca government and the community residents and businesses.

- Climate protection initiatives will save taxpayer money. Using energy more efficiently will reduce the demand for energy, which will reduce energy costs.
- Air quality will improve as less fossil fuel is used. Improved air quality is especially important for those suffering from asthma and other respiratory problems.
- Greenhouse gas reduction measures will improve the "quality of life" in Ithaca. Measures such as reducing automobile dependence will reduce automobile use and traffic congestion, with the associated noise and air pollution, and will encourage more walking, bicycling and transit usage.
- The use of "green products" and "green energy" will benefit the local economy. By demonstrating a strong demand for energy-efficient products and renewable energy sources, local businesses can develop new products and services to meet this need. These opportunities will create new jobs and will positively contribute to the local economy.

***Ithaca Joins the U.S. Mayors Climate Protection Agreement***

At the 73rd Annual U.S. Conference of Mayors, held in June 2005, a resolution was passed endorsing the U.S. Mayors Climate Protection Agreement (USMCPA)—a voluntary initiative designed both to encourage mayors from across the nation to take action to reduce greenhouse gas emissions and to encourage collaboration among local governments on climate protection programs (the full text of the resolution can be seen in appendix 2). Objectives of the USMCPA are similar to those in the Kyoto Protocol; an excerpt is listed below:

> We [USMCPA participants] will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities such as:
>
> 1. Inventory global warming emissions in City operations and in the community, set reduction targets and create an action plan.
> 2. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities;
> 3. Promote transportation options such as bicycle trails, commute trip reduction programs, and incentives for car pooling and public transit;
> 4. Increase the use of clean, alternative energy by, for example, investing in "green tags," advocating for the development of renewable energy resources, and recovering landfill methane for energy production;
> 5. Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy-efficient lighting and urging employees to conserve energy and save money;

6. Purchase only ENERGY STAR® equipment and appliances for City use;
7. Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system;
8. Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel;
9. Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production;
10. Increase recycling rates in City operations and in the community;
11. Maintain healthy urban forests; promote tree planting to increase shading and to absorb $CO_2$; and
12. Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

The City of Ithaca is one of 204 (as of February 16, 2006) U.S. cities to participate in the U.S. Mayors Climate Protection Agreement. Adoption of the USMCPA by the City of Ithaca is significant in that the agreement outlines specific measures to be taken to meet pollution reduction goals. Significant also is the fact that the agreement sets consistent standards and goals for participating municipalities. One of the initial tasks required of the USMCPA is the development of a *Local Action Plan*. A key component of this plan will be the setting of a pollution reduction target—and strategies to achieve that target.

***Sundance Summit: A Mayors' Gathering on Climate Protection***

Forty-five mayors, including Mayor Peterson, were invited to the Sundance Summit, hosted by Salt Lake City Mayor Rocky Anderson, actor and environmentalist Robert Redford, and the International Council for Local Environmental Initiatives (ICLEI), to learn about and discuss strategies to reduce greenhouse gas emissions. Among the speakers at the Sundance Summit were former Vice President Al Gore, New Mexico Governor and former Energy Department Secretary Bill Richardson, and Ocean Future Society President Jean-Michel Cousteau, son of world-renowned oceanographer Jacques Cousteau, as well as many other climate change experts.

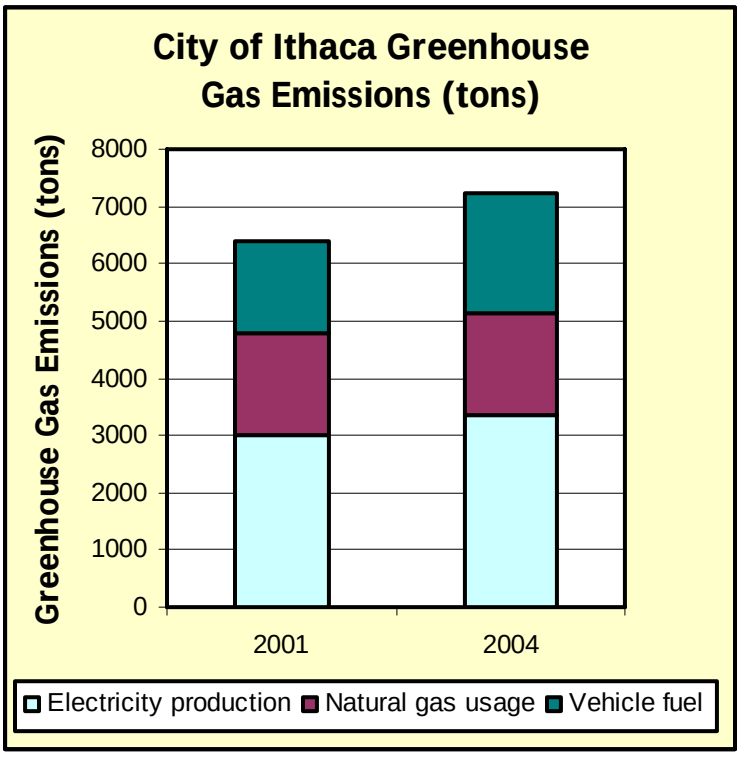
The Sundance Summit provided a forum to connect the issues surrounding global climate threats with national and local initiatives to combat those threats. By sharing local successes and challenges, the participating Mayors expanded their abilities to directly influence the energy usage and greenhouse gas emission levels within their communities, while utilizing strategies that save money as well. National decision-makers will certainly look to these successes when developing new laws and regulations regarding climate protection programs. (See appendix 3 for the Sundance Summit's *Mayors' Commitment to Action.*)

## *1.22 Developing a Local Action Plan*

***Milestone 1 - Greenhouse Gas Emissions Analysis and Inventory Results***

The City of Ithaca Greenhouse Gas Emissions Inventory was completed in December 2005 for city government emissions. The inventory was generally based upon 2001 and 2004 data, which included electricity and natural gas usage for City buildings (including the Waste Water Treatment Plant) and traffic/street lights and fuel[22] usage for City fleet vehicles.

In 2001, the City of Ithaca consumed approximately 7.04 million kilowatt hours of electricity costing about $380,000. The production of this electricity created around 3000 tons of $eCO_2$. In addition, about 301,000 therms of natural gas were used, costing $156,000 and creating 1800 tons of $eCO_2$. During 2001, the City's fleet vehicles consumed close to 152,000 gallons of gasoline and diesel fuel costing $140,000 and causing 1600 tons of $eCO_2$. In total, $676,000 was spent on energy, and 6400 tons of $eCO_2$ were produced from this energy consumption.




In contrast, the 2004 data (the most recent data available) shows a slight increase over 2001 levels: approximately 7.9 million kWh of electricity; 294,000 therms of natural gas; and 199,000 gallons of gasoline and diesel fuel. The energy consumed in 2004 cost the City of Ithaca $860,000 and produced 7300 tons of $eCO_2$.

***Milestone 2 - Setting a Reduction Target***

This plan recommends that the City of Ithaca set a goal to reduce greenhouse gas emissions to 20% below 2001 levels by 2016.

A number of factors were involved in determining the appropriate greenhouse gas emissions reduction target for the City of Ithaca. One contributing factor was the desire to maintain consistency with the Tompkins County *Local Action Plan*, which also calls for 20% greenhouse gas emission reductions. Additionally, the International Council on Local Environmental Initiatives (ICLEI) has recommended that local governments strive

[22] Fuel data includes diesel and unleaded gasoline and is based on a calendar year from January to December. Note: The accuracy and precision of this data are suspect due to record-keeping inconsistencies; current record-keeping practices are greatly improved.

for 20% reductions in greenhouse gas emission levels. Finally, as the City of Ithaca's rate of energy consumption has remained relatively consistent over the past five years and no significant additional energy demands are anticipated in the near future, a 20% reduction over the next eleven years seems manageable—an additional 3% reduction each year for eleven years (see CHART 1). As the *Local Action Plan* is implemented, effective monitoring must occur to assure that the reduction goal, and the time frame to achieve that goal, remain appropriate based on changing situations and emerging technologies.

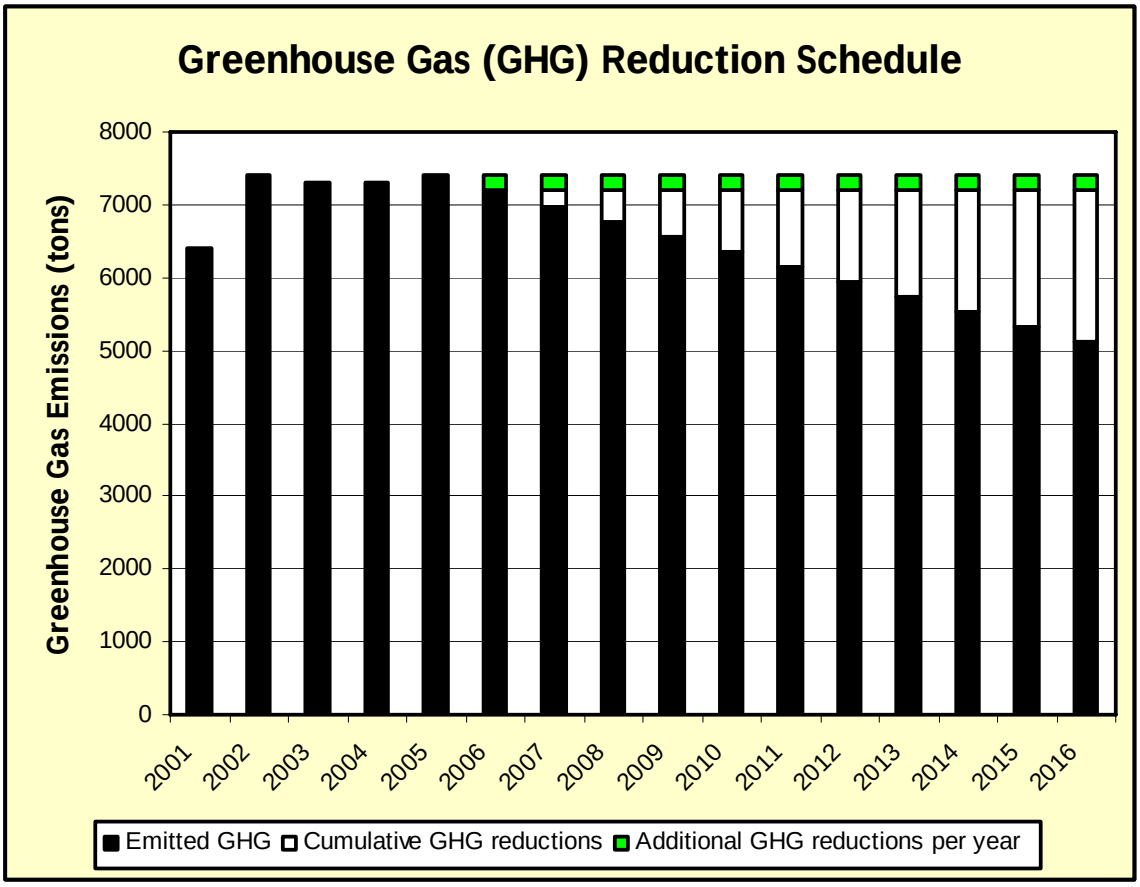



**CHART 1:** To achieve the City of Ithaca's greenhouse gas (GHG) reduction goal, an additional 207 tons of $eCO_2$ will have to be prevented each year for about 11 years.

***Milestone 3 – Development of a Local Action Plan***

In developing this *Local Action Plan*, past trends, current conditions, and future projections have been analyzed. This analysis is largely based on energy consumption data but also takes into account land use policies, transportation trends, economic considerations, social equity issues, environmental factors, and a variety of other related measures and policies. This plan attempts to include relevant facts whenever possible; however, the data included is for reference only and should not be considered absolute.

***Methodology and Data Collection***

To assess the greenhouse gas (GHG) emissions produced by the City of Ithaca municipal operations, utility billing statements relating to city buildings, vehicle fleet, and streetlights/traffic signals were analyzed. This data was entered into the Cities for Climate Protection (CCP) greenhouse gas emissions analysis and inventory software, which computed emission levels based on a wide-ranging array of coefficients pertaining to various energy uses. The CCP software then converts this data into *equivalent carbon dioxide* ($eCO_2$)[23] emissions.

Two primary challenges arose when gathering energy use data: 1) a lack of data in some topic areas, and 2) the abundant, yet unorganized, data in other topic areas. All efforts have been made to provide accurate data whenever possible; however, even data that appears accurate should be viewed skeptically and should be used for reference only. Before implementing any energy conservation or greenhouse gas reduction measure, a thorough, scientific examination of the facts is required. This will allow an accurate baseline to be set to compare future data and will allow for a cost-benefit analysis to be conducted to determine how best to allocate the City's resources.

Generally, this is a *policy-oriented* document that utilized relevant data whenever possible. To analyze and understand the complex energy use patterns of the City, additional effort should be devoted to collecting and examining data. Essential to obtaining this data are improved tracking and record keeping of energy usage at the departmental level.

The primary focus of the *Local Action Plan* is to provide an implementation strategy to meet the City's reduction target. Secondarily, this document provides a forum for the City of Ithaca to showcase some ongoing, and new, initiatives that contribute to energy conservation, environmental stewardship, and climate protection. Finally, this plan suggests topics requiring additional investigation.

The development of this *Local Action Plan* is but one early step needed to realize the City's goals for comprehensive climate protection. Though the City of Ithaca can lead the effort, it is essential that a broad range of stakeholders are involved; thus, an expanded local action plan should be developed that looks at the entire community, not just City operations. The development of a community-wide plan would, however, be a major undertaking.

[23] Equivalent Carbon Dioxide ($eCO_2$) (alternately, Carbon Dioxide Equivalent ($CO_2E$) or Million Metric Tons of Carbon Dioxide ($MMTCO_2$)) is a standard unit that allows emissions of greenhouse gases of different strengths to be added together. For carbon dioxide itself, emissions in tons of $CO_2$ and tons of $eCO_2$ equal the same number, whereas for nitrous oxide ($N_2O$), an example of a stronger greenhouse gas, one ton of emissions is equal to 310 tons $eCO_2$. Additionally, some GHG inventories use *Carbon* Equivalent instead of *Carbon Dioxide* Equivalent. As Carbon is $12/44^{th}$ the mass of Carbon Dioxide, $CO_2$ equivalent can be multiplied by 12/44 to convert to Carbon Equivalent. See the EPA website <http://yosemite.epa.gov/OAR/globalwarming.nsf/content/EmissionsStateEnergyCO2Inventories.html> for more information.

***Milestone 4 – Implementing the Local Action Plan***

The development of an efficient and effective implementation process is crucial. This issue is further discussed below in section ***3.0 Implementation*** on page 21.

***Milestone 5 – Monitoring Progress and Reporting Results***

As mentioned above, careful monitoring of various actions is essential or the results will be ill defined and poorly understood. In addition to the practical importance of monitoring to assure that specific measures are properly implemented, it is equally important to report the results to the public. Implementation successes and challenges faced by the City should be candidly communicated to the public so that a genuine sense of trust can be maintained and realistic expectations can be set. This public/private trust and clear expectations will be essential when pursuing future community-wide climate protection initiatives. The topic of monitoring progress and reporting results is also further discussed in section ***3.0 Implementation*** below.

# 2.0 Local Action Plan

This *Local Action Plan* includes two categories of measures—*Existing Measures* and *Proposed Measures*. In the interest of addressing the City of Ithaca's greenhouse gas reduction and energy conservation goals, existing measures, enacted since the base year 2001, will be counted toward achieving those goals. Since 2001, the City has pursued a number of initiatives to reduce energy consumption and greenhouse gas emissions. These efforts have varied in scope and effectiveness; a few of the most successful measures are detailed below. This is not an exhaustive list but rather a sampling. To better understand the cause-and-effect relationships among various measures, further study is required.

A vast array of possibilities for both reducing energy consumption and curbing greenhouse gas emissions is available. A selection of proposed measures is listed below and correlates to the three key areas of the City of Ithaca's energy usage: 1) City-owned buildings, 2) City fleet vehicles, and 3) City-operated traffic signals and street lights. These proposed measures, in tandem with the ongoing, existing measures, seem likely *by 2016 to reduce the emissions of greenhouse gases generated by city operations by 20 percent compared to the base year of 2001*.

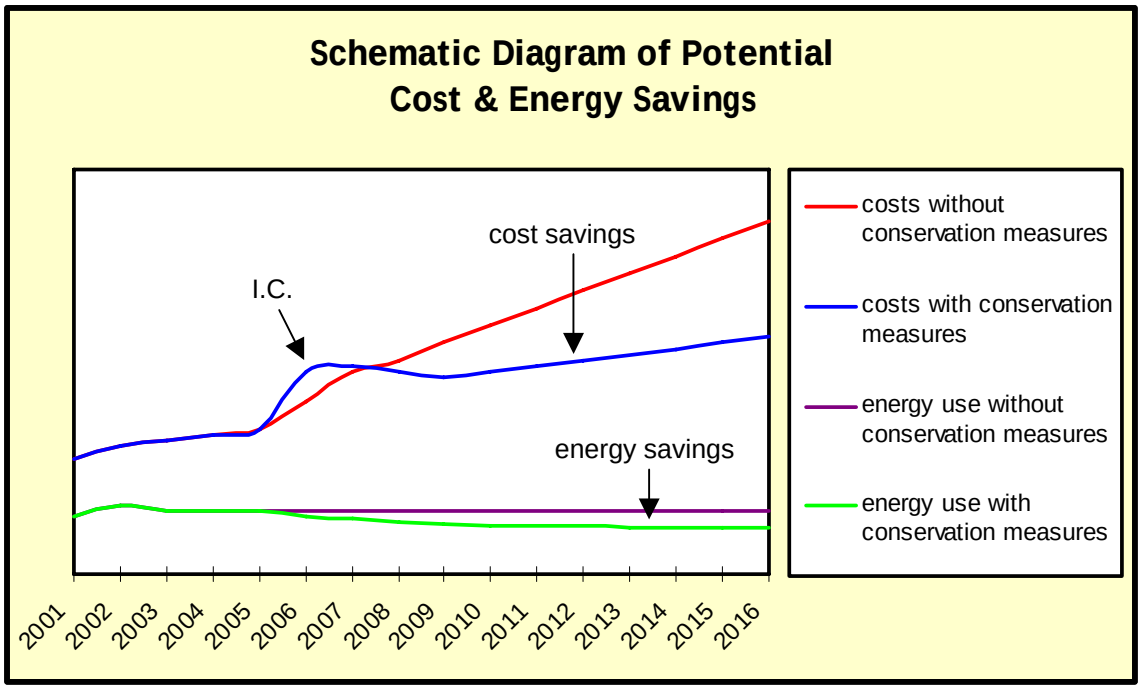



**CHART 2:** The above chart illustrates a schematic relationship between *energy costs* and *energy use*. Additionally, the chart compares the projected energy costs (red line) and energy use (violet line) if *no* energy reduction measures are implemented with the projected energy costs (blue line) and energy use (green line) if energy reduction measures *are* implemented. When energy reduction measures are further investigated and implemented, there will likely be an initial cost (I.C.) amount associated with improving infrastructure. This initial cost will be recovered by future cost savings. Despite the possible future cost savings, actual energy costs will most certainly continue to rise. By reducing energy use, greenhouse gas production will also be reduced (though this is not necessarily a 1:1 relationship).

***Will Initiatives to Reduce Greenhouse Gas Emissions Save Money or Cost Money?***

Together, the proposed measures in this plan are intended to, on average, save taxpayer dollars as well as reduce greenhouse gas emissions. However, money savings should be viewed as a *way* to facilitate the development and implementation of a particular measure, not as a *reason* to pursue a particular measure. The costs (monetary and other) must be weighed against the probable greenhouse gas reductions and other benefits. This requires a complex analysis that looks not just at a specific measure but also at how that measure may interact with other existing or future measures. Effective analysis, including post-implementation evaluation and monitoring, may consume considerable time. Additionally, many of the potential benefits may not be easy to quantify in monetary terms.

Though due care has been taken in developing the proposed measures, greater investigation and analysis are necessary to prepare the measures for implementation. As indicated in section ***3.0 Implementation***, an effective monitoring process is crucial to compare pre-implementation assumptions with post-implementation realities.

## 2.1 Existing, Post-2001 Measures

***Overview***

To achieve the City of Ithaca's goal of reducing greenhouse gas emissions to 20% below 2001 levels by 2016, GHG emissions will need to be reduced by about 3% each year from 2006 to 2016 (see CHART 1 on page 8).

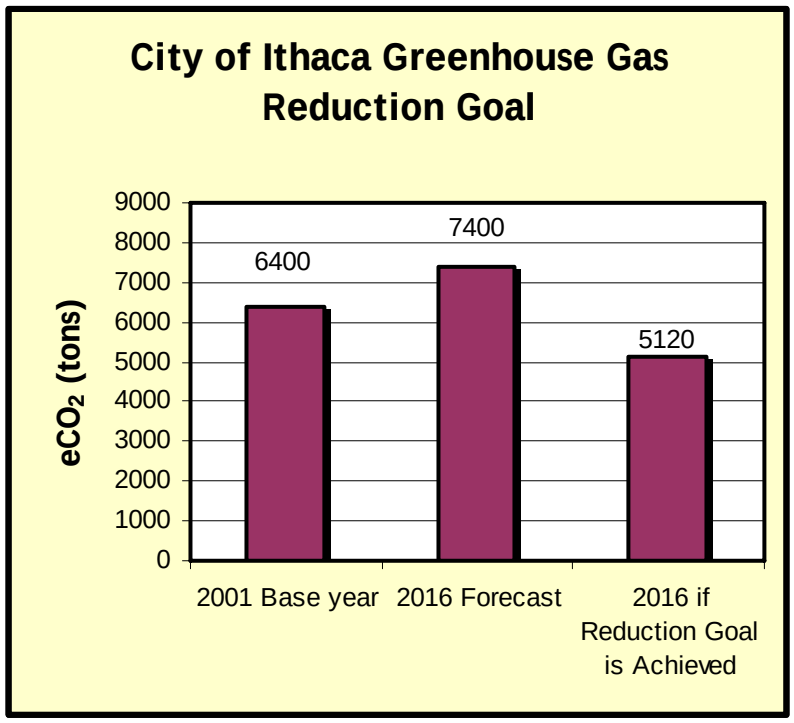



**CHART 3:** This chart indicates the greenhouse gas (GHG) emissions created by the City of Ithaca government operations (this does not refer to community-wide emission levels).

If greenhouse gas reduction measures are not implemented, it is estimated that the City of Ithaca's greenhouse gas emissions will remain relatively constant at around 7,300 to 7,400 tons of $eCO_2$ produced each year. If the City achieves the 20% reduction goal, then GHG emissions will be around 5,120 tons of $eCO_2$ in 2016 (see CHART 3 above).

An important component of the *Local Action Plan* is the identification of energy conservation and greenhouse gas reduction measures that are existing and on-going, especially those measures enacted since 2001, as their resultant GHG reductions count toward the reduction goal stated above.

Key existing measures include methane recovery from the Waste Water Treatment Plant, implementation of the City's urban forestry program, and efficiency improvements of City buildings. These three initiatives were selected for analysis in this document because of their significant potential impacts in effecting GHG emissions. Additionally, numerous other energy conservation measures have been enacted at all levels within the City of Ithaca government operations for many years. Whereas it is commendable that many City employees have proactively pursued a variety of energy conservation strategies, it is unfortunate that no mechanism has been in place to monitor and evaluate the effectiveness and impact of these measures. Furthermore, there seems to have been little, if any, coordination among various initiatives, thus limiting their potential impacts.

It is estimated that existing, post-2001 measures have reduced GHG emissions by 1720-2830 tons of $eCO_2$ per year and that the proposed measures can reduce GHG emissions a further 1100-1600 tons $eCO_2$ per year, for a total GHG reduction of 2820-4430 tons below 2001 levels by 2016. Unfortunately, it is anticipated that insufficient

resources will be available for the City to fully implement either existing or proposed measures. However, the goal of reducing greenhouse gas emission levels to 20% below 2001 levels by 2016 only requires the reduction of 2180 tons $eCO_2$. Thus, the City of Ithaca can achieve its reduction goal even if certain measures are not fully implemented.

## *2.11 Methane Recovery from Waste Water Treatment Plant*

The City of Ithaca's Waste Water Treatment Plant (WWTP) is the City's largest consumer of energy.[24] Almost half of the City's natural gas usage and about a quarter of the City's electricity consumption goes to the operation of the WWTP, costing the City around $340,000 per year. Despite the enormous amount of energy required to operate the WWTP, the costs would be higher if it were not for a few innovative energy conservation measures. First, methane produced during the treatment process is captured and used as fuel to create electricity. This methane can supply one third to one half of the energy needed to run the WWTP. Not only does this save the City approximately $100,000 per year, but it also means that additional energy did not have to be produced for the WWTP to consume (reducing greenhouse gas emissions), and since the methane[25] was captured, it did not escape into the atmosphere (also reducing GHG emissions). Secondly, the waste heat produced by the engines burning methane is used to help heat the WWTP buildings, again reducing the WWTP's need for additional energy.

Due to the high energy use at the WWTP, even a small percentage in energy efficiency can have large overall impacts. A comprehensive evaluation of existing and potential energy efficiency/GHG reduction measures should be conducted to establish accurate baseline data, evaluate the impacts of existing measures, identify possible improvements, and develop an implementation plan for future initiatives.

Though further analysis is required, it seems likely that the existing measures enacted at the Waste Water Treatment Plant reduce the GHG emission levels by 700-800 tons $eCO_2$ per year.

## *2.12 Urban Forestry*

The City of Ithaca Parks and Forestry Department has developed a comprehensive urban forestry program. Additionally, the Shade Tree Advisory Committee, the City Forester, the Board of Public Works and the site plan review process of the Planning and Development Board all work to ensure optimal implementation of urban forestry goals. One of the goals was that *"By the year 2015, Ithaca's Community Forest will be multi-aged, fully stocked, healthy, and safe."* Those goals were achieved in 2005! In recognition of the City's tradition of supporting urban forestry efforts, Ithaca has been named a "Tree City USA" for seventeen years by the National Arbor Day Foundation.[26] The Parks and Forestry Department has been proactive in researching a number of cutting-edge topics, such as bare-root tree planting, structural soil usage, and porous asphalt development. These efforts have garnered the City of Ithaca a *New York*

[24] The WWTP and the City's fleet vehicles are very close in their energy consumption and costs—it is likely that, because of increased fuel prices, fleet vehicles now account for the City's highest energy cost.
[25] The global warming potential (GWP) of methane ($CH_4$) is twenty-one times greater than that of carbon dioxide ($CO_2$). For GWP comparisons among various GHGs, see <http://yosemite.epa.gov/OAR/globalwarming.nsf/UniqueKeyLookup/RAMR69V4ZV/$File/05Introduction.pdf>.
[26] Source: <http://www.arborday.org/programs/treecities.cfm?chosenstate=New_York>.

*Conference of Mayors Local Government Achievement Award* for its urban forestry program.

***Benefits of Trees***

Trees, of course, perform a variety of valuable functions. Trees convert carbon dioxide into oxygen, filter pollutants out of the air, reduce soil erosion from water runoff, improve aesthetics, increase property values, provide wildlife habitats, and, provide shade.

In regard to the *Local Action Plan*, perhaps the most relevant benefit from trees is the shade that they provide during the summer. This shading effect, especially within a city, helps to cool buildings and vehicles, reducing the need for air conditioning, and cools streets and parking lots to reduce the "heat island"[27] effect. Though shade reduces the energy needs for air conditioning, the specific energy savings, and consequently greenhouse gas reductions, are difficult to calculate based on existing data. Further investigation is needed to quantify the energy savings and GHG reductions from shade trees within the City of Ithaca.

Also relevant is the fact that trees clean and filter the air and absorb $CO_2$. A small tree (3-6 inches in diameter) can sequester[28] 35 pounds of $CO_2$ per year, and a large tree can sequester 800 pounds of $CO_2$ per year.[29] A comprehensive analysis should be performed to determine the $CO_2$-mitigating potential of the +/-10,000 street and park trees within the City of Ithaca. If an average of 400 pounds of $CO_2$ were sequestered for each of the 10,000 trees, then 2000 tons of $eCO_2$ would be sequestered per year. Additionally, as mentioned above, trees provide shading and thus reduce the quantity of energy needed to cool vehicles and buildings in the summer. This issue should be further investigated to evaluate more accurately the City's street and park trees' impact on $eCO_2$ emissions.

## *2.13 Building Energy Audits*

***Energy Savings Performance Contract***

In the summer of 2005, the City of Ithaca received a proposal from Johnson Controls Inc. (JCI) to conduct an "Energy Savings Performance Contract." Briefly stated, this performance contract would identify energy-saving opportunities relating to the operation of City-owned buildings and infrastructure. A unique funding structure would allow the City's future energy cost savings to pay for the needed improvements, which JCI would initially finance. Thus, the City of Ithaca would incur NO out-of-pocket expenses during, or following, the project's implementation. On the contrary, as projected in the initial proposal, the City could save over $100,000 per year during the

[27] For more information about the heat island effect, see the EPA website at <http://www.epa.gov/heatisland/>. Also see <http://en.wikipedia.org/wiki/Urban_heat_island>.

[28] Carbon sequestration relates to the removal of $CO_2$ from the atmosphere. There are many ways that this can occur: Geologic, Oceanic, Terrestrial, etc. For more information see the U.S. Department of Energy website at <http://www.fe.doe.gov/programs/sequestration/index.html>.

[29] Source: McPherson, E. Gregory; Simpson, James R. 1999. *Carbon Dioxide Reduction Through Urban Forestry: Guidelines for Professional and Volunteer Tree Planters.* General Technical Report PSW-GTR-171. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.

implementation phase, with the total cost savings after the first fifteen years reaching over $3.5 million. If fully implemented, JCI estimated that the City of Ithaca's energy costs would be reduced by 16.4%, and greenhouse gas emissions would be reduced by 936 tons $eCO_2$ per year. After careful consideration, the City opted to reduce the scope of the project to about half of the original proposal.[30] In January 2006, JCI began preparing a Detailed Evaluation Study (DES), which will precisely identify the most appropriate improvements to be made (as opposed to the initial proposal, which was based on many assumptions rather than on specific conditions). Once the DES is completed, projected energy reductions, cost savings, and GHG emission reduction levels can be accurately estimated. At this point, it seems likely that greenhouse gas emission levels will be reduced 400-600 tons $eCO_2$ per year as a result of this project.

***NYSERDA Plug-Load Audit***

In the fall of 2005, the New York State Energy Research and Development Authority (NYSERDA[31]) conducted a plug-load audit at City Hall and at the Streets and Facilities building. A plug-load audit simply monitors and analyzes the electricity used by devices such as computers, printers, refrigerators, vending machines, electric space heaters and copiers, and then compares that usage to projected electricity usage if power management strategies were implemented. For example, computers can be programmed to turn off automatically after business hours or to go into a "sleep" mode when not used for a certain period of time during the day. The NYSERDA plug-load audit found that $3,200-7,300 could be saved each year if power management measures were implemented on electronic devices in City Hall and in the Streets and Facilities building. This effort could save the City of Ithaca around 60,000 kWh per year and reduce the City's greenhouse gas emissions by 20-30 tons of $eCO_2$ per year.

<u>Recommendations</u>:

1. The City of Ithaca should implement the power management strategies outlined in the NYSERDA plug-load audit.
2. Expand the scope of the power management measures to include all City buildings.

[30] The scope of the project will include about 13 City buildings and an evaluation of City-operated water meters. One reason that the scope was reduced is that some of the initially proposed measures are going to be performed by the City without JCI's assistance—such as traffic signal retrofits.

[31] More information about NYSERDA can be found at <http://www.nyserda.org/default.asp>.

## 2.2 Proposed Measures

***Overview***

Existing post-2001 measures are likely to meet approximately half of the City's greenhouse gas reduction goal (assuming that they are moderately, not fully, implemented). In this section, additional measures are proposed to achieve the remainder of the 20% reduction goal. Key proposed measures include additional efficiency improvements of City buildings, improvements in fleet vehicles and their usage, and streetlight and traffic signal upgrades. Though these three topic areas have been chosen for discussion below, these are not, and should not be, the only energy conservation / greenhouse gas reduction measures pursued by the City. For example, each City department—in fact, each employee—should be looking for new ways to cut energy consumption and to use energy more efficiently. Together, many small measures will result in large overall savings.

It is crucial that a system be put in place to monitor and evaluate the effects of *all* measures, regardless of their individual size. Additionally, to maximize the impacts of many measures, effective coordination is required. For more details about how monitoring, evaluation, and coordination can occur, see section ***3.0 Implementation*** below.

### *2.21 City Buildings*

***Energy Conservation Measures***

In the fall of 2005, following the spike in energy prices after the Hurricane Katrina disaster, each City department began developing short-term energy reduction plans. Some departments identified new operational procedures capable of saving significant amounts of energy, and other departments determined that little could be done to reduce energy consumption without infrastructure improvements. Below are a few examples of energy conservation measures being explored by various departments:

- Install low-flow shower heads and reduce the water temperature used for laundry – *Ithaca Fire Department*
- Provide bicycles (with helmets and locks) for staff use – *Ithaca Youth Bureau*
- Adjust program schedules to utilize TCAT service and consolidate trips for program supplies – *Greater Ithaca Activities Center (GIAC)*
- Install motion-activated light switches – *Information Technology Department*
- Develop an energy conservation training course – *Ithaca Police Department*
- Encourage strong leadership to change the "culture" of excessive City energy consumption – *Department of Public Works*

Currently, each department is at a different stage in developing an implementation schedule for its particular energy reduction plans. Though these plans are focused on short-term measures, it is likely that some of the measures will be ongoing and thus will contribute to the City's overall greenhouse gas reduction goal. At this point, it is premature to speculate on potential GHG reductions from these initiatives.

***Purchasing***

The products that the City of Ithaca chooses to purchase have an impact on the City's energy usage. For example, the City has a policy of purchasing high-efficiency ENERGY STAR®-rated equipment. Additionally, it seems that life-cycle costs are taken into account rather than just initial costs of equipment. This purchasing procedure, though, should be better defined and better monitored so that greenhouse gas reduction impacts can be accurately evaluated.

The City of Ithaca has recently taken the concept of purchasing to the next level, to include energy purchasing. Beginning January 1, 2006, 81% of City Hall's electricity will be provided via wind power (350,000 kWh per year). This action will cut greenhouse gas emissions by 146 tons of $eCO_2$ per year (7% of the City's GHG reduction goal!).

Beyond saving the City money and reducing GHG emissions, the purchasing of energy-efficient products and renewable energy will spur growth in these fields, will reduce unit costs, and will encourage individuals, businesses, and organizations to adopt similar practices—further reducing unit costs, etc.

It is estimated that energy-efficient purchasing will reduce the City's greenhouse gas emissions by 200-300 tons of $eCO_2$ per year.

## *2.22 City Vehicle Fleet*

From an energy-use perspective, the City's vehicle fleet accounts for about a quarter of the energy used by City operations. City fleet vehicles produce around 2,000 tons of $eCO_2$ per year. Some employees have the option of using a City vehicle for commuting and for personal uses as well. There is a great variety of City-owned vehicles, ranging from "retired" police cars to pickup trucks to new compact cars to construction equipment. Though many of these vehicles can be acquired for a relatively low cost, their maintenance and operating costs can be relatively high.

Recordkeeping for City vehicle fuel consumption has historically been inaccurate due to user input errors. This has led to over- or under-estimated costs per vehicle, making it very difficult to track fuel usage trends. However, this recordkeeping system has recently been replaced with a more accurate system. Furthermore, new vehicle types—such as hybrid vehicles—are now being investigated for possible purchase. *In fact, the City of Ithaca purchased its first hybrid vehicle in January 2006.*

The greenhouse gas emission levels related to the City of Ithaca's fleet vehicles can be reduced in basically two ways: 1) reduce the use of fleet vehicles, and 2) increase the efficiency of fleet vehicles. There are a number of strategies that should be pursued to reduce the usage of fleet vehicles and increase their efficiency:

- Optimize vehicle usage to reduce miles traveled and fuel consumed—combine trips, carpool and encourage efficient driving techniques.
- Substitute vehicle trips with walking, bicycling, or public transit. "Active transportation" choices will also improve employee health.
- Eliminate trips by teleconferencing and utilizing other electronic communication technologies whenever applicable.
- Ensure that vehicles are regularly maintained to maximize fuel efficiency.
- Implement a phase-out schedule of older, inefficient fleet vehicles.

- Revise vehicle purchasing requirements to incorporate fuel efficiency and life-cycle costs and to encourage the purchase of alternatively fueled vehicles.
- Allow a choice of vehicles[32] so that individuals may choose the most efficient vehicle for a projected journey.

Additionally, the City of Ithaca should participate with Cornell University, the Ithaca-Tompkins County Transportation Council (ITCTC), and other stakeholders in the development of a car-share[33] program. Participation in such a program would allow the City to reduce the number of vehicles in its fleet. Also, as the larger community would be involved as well, there is a great opportunity to reduce the overall number of motor vehicles and to use vehicles more efficiently.

City fleet vehicle efficiency measures should be explored in much greater detail to determine the most effective strategies to pursue. Even moderate fleet vehicle efficiency improvements seem likely to reduce the City's greenhouse gas emissions by 300-500 tons of $eCO_2$ per year.

## *2.23 Streetlights & Traffic Signals*

***Streetlight Upgrades***

The City of Ithaca is currently spending approximately $310,000 per year to operate the streetlights within the city. This energy use is the third largest after the Waste Water Treatment Plant (WWTP) and fleet vehicles and is far greater than the fourth-place energy user, the Ithaca Police Department (~$78,000 per year). The production of the 5.7 million kWh needed to operate the streetlights results in the release of about 2400 tons of $eCO_2$ per year. The streetlights currently use High Pressure Sodium (HPS) lamps, which are, at this point, an appropriate and energy-efficient choice.

It is virtually certain that the number of streetlights will increase and that electricity costs will continue to rise. The type of streetlight most likely to increase in number is the smaller, pedestrian-scaled light, particularly around new residential, office, business, and educational facilities. When new lighting fixtures are required, energy efficiency and life-cycle costs should be key purchasing criteria. The added cost (purchasing cost and use/maintenance cost) of additional street lighting is offset by positive factors such as improved safety for pedestrians and bicyclists. By improving conditions for pedestrians and bicyclists, walking trips, cycling trips and public transit usage will increase, and reliance on private motor vehicles will decrease.

Even though streetlight energy consumption and costs will likely continue to rise, there are ways to reduce the resultant greenhouse gas emissions. The most straight-forward strategy is to gradually increase the percentage of "green energy" allocated to streetlight usage. This measure would be simple to implement and would be more cost-effective than upgrading existing streetlights. To meet the proposed goal of reducing greenhouse gas emissions to 20% below 2001 levels by 2016, the percentage of green energy allocated to streetlights should increase by approximately 3% per year for the next

[32] Bicycles should be considered as well as motor vehicles. At least three City departments have requested that bicycles be made available for staff to use for work-related errands.
[33] See <http://www.ithacacarshare.org/> for more information about car sharing in Ithaca.

ten years. If that goal is achieved, GHG emissions attributed to streetlight operations will be reduced by an additional 50 tons of $eCO_2$ per year. At this reduction rate, the release of around 2750 tons of $eCO_2$ will be prevented over ten years, and the 2016 GHG emission levels will be 500 tons less than 2001 levels.

***Traffic Signals – Light-Emitting Diode (LED) Retrofit***

The City of Ithaca currently owns and operates approximately thirty signalized intersections. The New York State Department of Transportation (NYSDOT) owns an additional 30 traffic signals. The incandescent bulbs used in traffic signals typically draw 70-135 watts per light (red, yellow, green, "walk" and "don't walk"). Replacement LEDs (light-emitting diodes), which provide identical illumination, typically draw about 6-12 watts or about 10% of the energy of their incandescent counterparts. Operation of traffic signals accounted for approximately 4-8% of the City's energy costs in 2001. In 2005, NYSDOT began replacing incandescent bulbs in their traffic signals with LEDs. The LED retrofit project, however, is only for state-owned traffic signals along state highway routes in the City. This effort should be extended to *all* the traffic signals within the City. This measure is quite easy to implement and has a very short pay-back period, perhaps 1-2 years.

If fully implemented, this measure could save the City of Ithaca around $60,000 per year, 520,000 kWh per year, and 200 tons of $eCO_2$ per year. Because of its ease of implementation, short pay-back period, significant cost savings and substantial greenhouse gas reductions, this measure should be implemented as soon as possible.

| **Local Action Plan GHG Reduction Opportunities** | **Annual GHG Reductions** |
|---|---|
| <u>Existing, Post-2001 Measures:</u> | |
| Methane Recovery from Waste Water Treatment Plant | 700-800 tons $eCO_2$/yr. |
| Urban Forestry | 600-1400 tons $eCO_2$/yr. |
| Building Energy Audits | 420-630 tons $eCO_2$/yr. |
| **Sub-Total, Existing Measures** | **1720-2830 tons $eCO_2$/yr.** |
| <u>Proposed Measures:</u> | |
| City Buildings | 200-300 tons $eCO_2$/yr. |
| City Vehicle Fleet | 300-500 tons $eCO_2$/yr. |
| Streetlights & Traffic Signals | 600-800 tons $eCO_2$/yr. |
| **Sub-Total, Proposed Measures** | **1100-1600 tons $eCO_2$/yr.** |
| **Total GHG Reductions if all Proposed Measures are Implemented*** | **2820-4430 tons $eCO_2$/yr.** |
| **GHG Reductions to Meet Goal*** | **2180 tons $eCO_2$/yr.** |

* It is anticipated that insufficient resources will be available for the City to fully implement either existing or proposed measures. However, the goal of reducing greenhouse gas (GHG) emission levels to 20% below 2001 levels by 2016 only requires the reduction of 2180 tons $eCO_2$. Thus, the City of Ithaca can achieve its goal even if certain measures are not fully implemented.

# 3.0 Implementation

The *Local Action Plan: to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations* is intended to constitute a policy framework to highlight measures that the City can pursue to achieve desired greenhouse gas reduction goals. The plan also indicates topic areas that should be investigated in greater detail. Currently, a number of measures are in various stages of implementation, and other measures still require additional study and coordination before implementation can occur. For the City of Ithaca to implement greenhouse gas reduction measures effectively, three Action Items must be supported.

**Action Item 1 – Adopt the *Local Action Plan*. The City of Ithaca local government must be in support of implementing strategies to reduce greenhouse gas emissions and must be willing to commit the resources necessary to achieve the City's greenhouse gas reduction goals.**

Adoption of the *Local Action Plan* by the City of Ithaca Common Council, along with the Mayor, will demonstrate the City's commitment to energy conservation, pollution reduction, and environmental stewardship. Department heads will determine how best to integrate the City's greenhouse gas reduction goals with their existing departmental performance goals. Adoption means that department heads will align their goals and work plans to assist in the implementation of the *Local Action Plan.*

Also, there are a number of City boards and committees that should collaborate in this effort, such as the Board of Public Works; the Bicycle and Pedestrian Advisory Council; the Conservation Advisory Council; the Planning and Development Board; and the Shade Tree Advisory Committee. An essential task of the above City government groups will be to identify and enact policies that assist in the advancement of measure implementation.

**Action Item 2 – Develop a committee composed of City employees and residents to direct, monitor, refine, and publicize Plan implementation.**

One of the first tasks of this committee will be to establish its specific duties. It is likely that the following key duties will be included:

- Establishment of a methodology to direct various projects relating to City of Ithaca energy usage. Appoint departmental liaisons to communicate with committee members.
- Development of a program for quantifying the results of implemented energy conservation strategies. Once measures are enacted, it is possible that unintended consequences, either positive or negative, may present themselves. Effective monitoring can quickly identify new opportunities as well as emerging challenges.

- The *Local Action Plan* is a living document,[34] not a static report. The committee, through diligent tracking and monitoring, should propose refinements to the plan as necessary. There are many topics in this plan that warrant further investigation.
- Development of a community outreach component to involve the public and to publicize the City's progress. This outreach component will also help enable future community-wide greenhouse gas reduction initiatives.

**Action Item 3 – Collaborate with regional stakeholders.**

Though the *Local Action Plan* focuses largely on City of Ithaca government operations, the broader community should be involved in this endeavor: Tompkins County Government and other local governments; Cornell University, Ithaca College, and other educational institutions; businesses; organizations; and residents. The collaboration of many stakeholders will multiply the positive effects of proactively addressing climate change issues.

There are many approaches that the City of Ithaca can take to facilitate cooperation with a variety of stakeholders. Perhaps one of the most effective approaches may be to expand the City's engagement with the Tompkins County Environmental Management Council (Tompkins County's official citizen advisory board on local environmental issues).

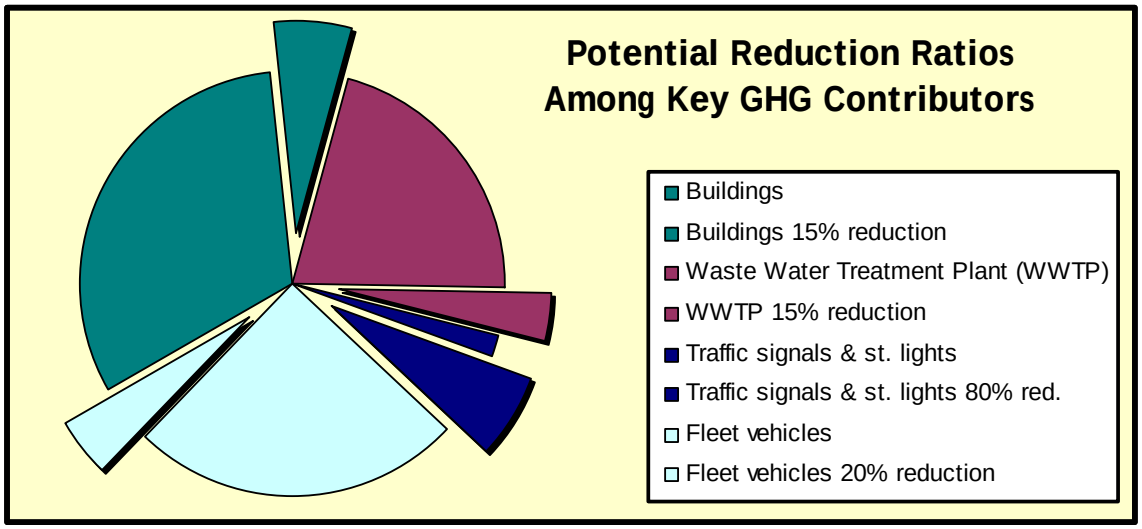



**CHART 4:** The above chart illustrates the overall greenhouse gas emissions related to City operations. The removed slices show potential GHG reductions associated with various key City GHG contributors to achieve the goal of reducing GHG emissions by 20% overall.

[34] A "living document" is simply a document that is intended to grow and evolve over time as new information is gathered and as conditions change.

# 4.0 Conclusion

This *Local Action Plan* strives to achieve two primary goals: 1) to reduce the greenhouse gas emissions caused by City of Ithaca municipal operations to 20% below 2001 levels by 2016 and 2) to encourage individuals, businesses, and organizations to assist in reducing greenhouse gas emissions.

By conserving energy and reducing greenhouse gas emissions, the City of Ithaca will reduce energy costs, reduce reliance on fossil fuels, improve environmental conditions, and encourage the development of "green energy." Additionally, City employees will benefit from the improved air quality and temperature control of more efficient buildings and the greater freedom in transportation choices. Taxpayers will also benefit since a lower percentage of tax dollars will go toward City energy costs; thus, more funds will be available for services for residents and visitors.

As additional individuals, businesses, and organizations conserve energy and reduce greenhouse gas emissions, energy costs will be reduced, green energy sources will become increasingly affordable, the local region will improve its energy security, new business opportunities will develop to provide green products, additional transportation options will be available, and greater strides will be made in climate protection. Finally, there is immense value in the development of a collaborative effort involving a diverse range of stakeholders to address issues such as climate protection.

There are a number of ways that the City of Ithaca can achieve its greenhouse gas reduction goal:

1. Continue existing efforts, such as methane recovery from the Waste Water Treatment Plant, implementation of the City's urban forestry program, and existing building efficiency improvements. Full implementation of these existing measures could reduce the City of Ithaca's greenhouse gas emissions by 1720-2830 tons of $eCO_2$ per year.
2. Implement proposed measures, such as improvements to City building and fleet vehicle operations and improvements to streetlights and traffic signals. Full implementation of these proposed measures could reduce the City's greenhouse gas emissions by 1100-1600 tons of $eCO_2$ per year.

Successful implementation of the *Local Action Plan* will positively contribute to the efforts of over 200 U.S. cities participating in the U.S. Mayors for Climate Protection Agreement, as well as the efforts of over 670 cities, counties, and organizations worldwide that are collaborating with the International Council on Local Environmental Initiatives' (ICLEI) Cities for Climate Protection (CCP) campaign. In total, these local efforts have the potential to affect global conditions.

The City of Ithaca can play an important role in global climate protection by setting policy goals that are socially equitable, economically feasible and environmentally responsible. These policies can then be translated into tangible and practical measures to cut greenhouse gas emissions. Finally, strong City leadership will encourage residents, businesses, and organizations to implement their own strategies to conserve energy and consequently reduce their greenhouse gas emissions.

# 5.0 Appendix

# 1 -

City of Ithaca
Common Council
April 4, 2001

**1.1 Planning Department – Request to Join International Council for Local Environmental Initiatives**

By Alderperson Vaughan: Seconded by Alderperson Blumenthal

WHEREAS, there is scientific consensus that carbon dioxide and other greenhouse gasses released into the atmosphere may have an effect on the Earth's climate, and

WHEREAS, based on scientific study, the United States has pledged along with 160 countries under the United Nations Framework Convention on Climate Change to reduce its greenhouse gas emissions, and

WHEREAS, energy consumption, specifically the burning of fossil fuels such as coal, oil, and gas, accounts for more than 80% of U.S. greenhouse gas emissions, and

WHEREAS, local governments greatly influence their community's energy usage by exercising key powers over land use, transportation, building construction, waste management, and in many cases, energy supply and management, and

WHEREAS, local government actions taken to reduce greenhouse gas emissions and increase energy efficiency provide multiple local benefits by decreasing air pollution, creating jobs, reducing energy expenditures and saving money for the municipality, its businesses and its citizens, and

WHEREAS, the Cities for Climate Protection Campaign (CCP), sponsored by the International Council for Local Environmental Initiatives (ICLEI), has invited the City of Ithaca to become a partner in the Campaign, and

WHEREAS, the Budget and Administration Committee has reviewed the Conservation Advisory Council resolution entitled "City of Ithaca Conservation Advisory Council Resolution for Participating in the Cities for Climate Protection Campaign," passed March 12, 2001, and

WHEREAS, the City of Ithaca Conservation Advisory Council has recommended to the City of Ithaca Common Council that it join in the Cities for Climate Protection Campaign and purchase the associated greenhouse gas emissions software, and

WHEREAS, the City of Ithaca Conservation Advisory Council has also recommended to the City of Ithaca Common Council that it join the International Council for Local Environmental Initiatives (ICLEI) and,

WHEREAS, The City has encouraged the County Board of Representatives to join ICLEI because many of the issues encompassed in the ICLEI scope of work are countywide in nature, such as transportation planning and solid waste management, and

WHEREAS, City representatives met with the County Environmental Management Council and the County Planning Committee to encourage the County to join ICLEI and to participate in the Cities for climate Protection program in a timely fashion in order to obtain the free services of an ICLEI intern to work on establishing a countywide data base or environmental issues, and

WHEREAS, the County Board of Representatives met on April 3, 2001 and voted to join the Cities for Climate Protection Program:

WHEREAS, it is still important for the City to make a commitment to ICLEI principles, and

WHEREAS, in order to do this, the City might want to purchase the greenhouse gas emissions software, to accomplish the goals set forth below; now, therefore, be it

**RESOLVED,** That the City will work with the County to provide information to assist with achieving ICLEI goals in the Cities for Climate Protection Program software analysis, and, be it further

**RESOLVED,** That the City of Ithaca pledges to:

1. Take a leadership role in the City to increase energy efficiency and to reduce greenhouse gas emissions from municipal operations:
2. Develop and implement a local action plan which describes the steps the City of Ithaca will take to reduce both greenhouse gas and air pollution emissions; the plan will include:

    - a greenhouse gas emissions analysis and forecast to determine the sources and quantity of greenhouse gas emissions within its jurisdiction related to the City's municipal operations, which include, but not limited to: buildings, vehicle fleet, employee commute, street lights, water and sewer, and waste;
    - a Carbon Dioxide or greenhouse gas emissions reduction target; related to the above items;
    - a strategy for meeting the City of Ithaca's greenhouse reduction target related to the above items;

- a process for measuring progress, on a regular basis, for the implementation of the local action plan, and, be it further

**RESOLVED**, That the City will work with the County this summer if the opportunity arises as County time on the software analysis project permits, but will not interfere with the County's goal of collecting countywide data, and, be it further

**RESOLVED,** That Common Council hereby approves the transfer in the amount not to exceed $475 from account A1990 Unrestricted Contingency to the following accounts for the purposes of acquiring the greenhouse gas emissions software:

A8020-5225 $475

**Carried Unanimously**

**2 -**

**INDIVIDUAL MEMBER – FILED RESOLUTIONS:**
**Endorsing the US Mayors' Climate Protection Agreement – Resolution:**
By Alderperson Taylor: Seconded by Alderperson Whitmore
Common Council Meeting Minutes, May 4, 2005

WHEREAS, the U.S. Conference of Mayors has previously adopted strong policy resolutions calling for cities, communities and the federal government to take actions to reduce global warming pollution; and

WHEREAS, the Inter-Governmental Panel on Climate Change (IPCC), the international community's most respected assemblage of scientists, is clear that there is no longer any credible doubt that climate disruption is a reality and that human activities are largely responsible for increasing concentrations of global warming pollution; and

WHEREAS, recent, well-documented impacts of climate disruption include average global sea-level increases of four to eight inches during the 20th century; a 40% decline in Arctic sea-ice thickness; and nine of the ten hottest years on record occurring in the past decade; and

WHEREAS, climate disruption of the magnitude now predicted by the scientific community will cause extremely costly disruption of human and natural systems throughout the world including: increased risk of floods or droughts; sea-level rises that interact with coastal storms to erode beaches, inundate land, and damage structures; more frequent and extreme heat waves, more frequent and greater concentrations of smog; and

WHEREAS, on February 16, 2005, the Kyoto Protocol, an international agreement to address climate disruption, entered into force in the 141 countries that have ratified it to date; 38 of those countries are now legally required to reduce greenhouse gas emissions on average 5.2 percent below 1990 levels by 2012; and

WHEREAS, the United States of America, with less than five percent of the world's population, is responsible for producing approximately 25% of the world's global warming pollutants yet is not a party to the Kyoto Protocol; and

WHEREAS, the Kyoto Protocol emissions reduction target for the U.S., had it ratified the treaty, would have been 7% below 1990 levels by 2012; and

WHEREAS, many leading US companies that have adopted greenhouse gas reduction programs to demonstrate corporate social responsibility have also publicly expressed preference for the US to adopt precise and mandatory emissions targets and timetables as a means by which to remain competitive in the international marketplace, to mitigate financial risk and to promote sound investment decisions; and

WHEREAS, state and local governments throughout the United States are adopting emission reduction targets and programs and that this leadership is bipartisan, coming from Republican and Democratic governors and mayors alike; and

WHEREAS, many cities throughout the nation, both large and small, are reducing global warming pollutants through programs that provide economic and quality-of-life benefits such as reduced energy bills, green space preservation, air quality improvements, reduced traffic congestion, improved transportation choices, and economic development and job creation through energy conservation and new energy technologies; and

WHEREAS, mayors from around the nation have signed the U.S. Mayors Climate Protection Agreement (list attached), which reads:

**The U.S. Mayors Climate Protection Agreement**

A. We urge the federal government and state governments to enact policies and programs to meet or beat the Kyoto Protocol target of reducing global warming pollution levels to 7% below 1990 levels by 2012, including efforts to: reduce the United States' dependence on fossil fuels and accelerate the development of clean, economical energy resources and fuel-efficient technologies such as conservation, methane recovery for energy generation, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels;

B. We urge the U.S. Congress to pass the bipartisan Climate Stewardship Act sponsored by Senators McCain and Lieberman and Representatives Gilchrist and

Oliver, which would create a flexible, market-based system of tradable allowances among emitting industries; and

C. **We will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities such as:**

1. Inventory global warming emissions in City operations and in the community, set reduction targets and create an action plan.
2. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities;
3. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;
4. Increase the use of clean, alternative energy by, for example, investing in "green tags," advocating for the development of renewable energy resources, and recovering landfill methane for energy production;
5. Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy-efficient lighting and urging employees to conserve energy and save money;
6. Purchase only Energy Star equipment and appliances for City use;
7. Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system;
8. Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel;
9. Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production;
10. Increase recycling rates in City operations and in the community;
11. Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2; and
12. Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

**NOW, THEREFORE, BE IT RESOLVED** that the U.S. Conference of Mayors endorses the US Mayors Climate Protection Agreement and urges mayors from around the nation to join this effort.

**BE IT FURTHER RESOLVED,** The U.S. Conference of Mayors will establish a formal relationship with International Council for Local Environmental Initiatives (ICLEI) Cities for Climate Protection Program to track progress and implementation of the US Mayors Climate Protection Agreement.

**Carried Unanimously (8-0)**

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# SUNDANCE SUMMIT

## A Mayors' Gathering on Climate Protection

### Mayors' Commitment to Action

*Meaningful commitment to climate protection involves long-term leadership supported by shorter-term, measurable actions. The Sundance Summit provides mayors with a structure for effective leadership and the tools necessary to take action and measure greenhouse gas reductions. Upon conclusion of the Sundance Summit, ICLEI will work with mayors to facilitate implementation of their commitments and produce an annual progress report. The following list of actions will be a guide for the facilitated commitment session on Tuesday, July 12, 2005, beginning at 3:30 pm. ICLEI appreciates and wishes to acknowledge the contribution of the graduate students and Professor Richard Green of the Public Administration Program at the University of Utah for their support of the actions and commitments session.*

*** For those mayors leaving early, please be sure to mark the boxes of the items listed on this document that you are willing to commit to and submit, with your signature, to Michelle Wyman, Executive Director of ICLEI USA, before departing.*

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**I. ESTABLISH LONG-TERM COMMITMENT TO ACTION**

- ❑ Sponsor your city's joining ICLEI's Cities for Climate Protection™ Campaign
- ❑ Sign the Urban Environmental Accords established at World Environment Day 2005
- ❑ Institutionalize climate protection in your community by integrating greenhouse gas emission reduction policies into general plans and economic development strategies
- ❑ Actively engage in state level climate protection efforts
- ❑ Prepare for carbon emissions trading by registering with carbon registries and signing up with trading mechanisms, such as the Chicago Carbon Exchange
- ❑ Sign on to the U.S. Mayors' Climate Protection Agreement
- ❑ _____
- ❑ _____

**II. ACHIEVE QUANTIFIABLE GREENHOUSE GAS REDUCTIONS IN YOUR COMMUNITY**

- ❑ Switch to LED traffic lights and compact fluorescents
- ❑ Implement/augment recycling programs
- ❑ Institute a "Green Fleets" program including alternative fuel and downsizing within municipal fleet

- ☐ Develop green building standards and/or incentives in local building ordinances
- ☐ Increase the renewable energy component of electricity portfolio through straight purchasing and negotiation of franchise agreement
- ☐ Implement a municipal green purchasing program
- ☐ Develop urban heat island mitigation strategies
- ☐ Engage businesses in your community to initiate greenhouse gas reduction programs to increase efficiency and improve their bottom line
- ☐ Expand public transit opportunities
- ☐ Expand urban forestry program

- ☐ _____

- ☐ _____

### III. Create the Public Mandate for Climate Protection

- ☐ Meet with editorial staff of local newspapers to discuss coverage of global warming and the city's climate protection activities
- ☐ Produce op-ed pieces for the local news media
- ☐ Convene town hall meetings on climate protection
- ☐ Meet with local news station meteorologists to discuss inclusion of global warming information in weather reports
- ☐ Work with school district to develop a global warming curriculum
- ☐ Establish a public recognition program for top performing businesses, schools and community groups

- ☐ _____

- ☐ _____

### IV. Demonstrate Leadership Beyond Your Community

- ☐ Present on global warming and your city's climate protection activities to your regional government association
- ☐ Meet with your state and federal representatives to discuss climate protection options at the state and federal levels, and your city's own commitments to climate protection
- ☐ Collaborate with business trade associations to reduce greenhouse gas emissions
- ☐ Support climate protection through your pension fund investments

- ☐ _____

- ☐ _____

**Name** _____ **City** _____

THANK YOU.

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City of Ithaca
Common Council
July 5, 2006

**Adoption of the *Local Action Plan: to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations* - Resolution**

WHEREAS, the City of Ithaca Common Council has demonstrated the desire to protect the environment by passing a resolution to join the International Council for Local Environmental Initiatives (2001), and

WHEREAS, the above resolution pledged that the City of Ithaca would "develop and implement a local action plan, which describes the steps the City of Ithaca will take to reduce both greenhouse gas and air pollution emissions," and

WHEREAS, the City of Ithaca Common Council further demonstrated the desire to protect the environment by passing a resolution to endorse the US Mayors' Climate Protection Agreement (2005), and

WHEREAS, the above resolution pledged that the City of Ithaca would, among other things, "strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations," and

WHEREAS, one of the initial tasks required of the US Mayors' Climate Protection Agreement is the development of a local action plan that inventories city greenhouse gas emissions and sets reduction targets, and

WHEREAS, the *Local Action Plan: to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations* ("*Local Action Plan"*) describes both the current efforts toward such reductions and recommends future steps, and

WHEREAS, the information and strategies outlined in the *Local Action Plan* will advance the City of Ithaca's ongoing efforts of environmental stewardship using methods that are economically feasible and socially equitable, and

WHEREAS, the *Local Action Plan* must have the support of the City of Ithaca at all levels of government to be effectively implemented, and

WHEREAS, this support can be demonstrated by the City of Ithaca Common Council through the adoption of the *Local Action Plan*; now, therefore, be it

**RESOLVED**, That the City of Ithaca Common Council hereby adopts the *Local Action Plan: to Reduce Greenhouse Gas Emissions for City of Ithaca Government Operations,* and be it further

**RESOLVED**, That the Mayor will name a committee composed of City staff and citizens to develop methods of monitoring aspects of the plan implementation and measuring reductions, develop additional recommendations or changes to the plan, and to create a public outreach component.

**Carried Unanimously (8-0)**