Executive Summary

A. The Problem and the Resolution for Change

As we enter the new millennium, global climate change presents a real threat to our economic, environmental and social systems. Since the beginning of the Industrial Revolution, human activities—primarily the burning of fossil fuels— have caused a rapid increase in the concentration of several important greenhouse gases in the earth's atmosphere. The vast majority of climate scientists now agree that human-caused emissions of greenhouse gases are having discernible impacts on global climate. Increases in global temperatures are just one of the disturbing indicators.[1]

Another potential impact of climate change is an increase in the frequency and intensity of extreme weather events. The past few years in Vermont, with their historic ice storms, droughts and flooding, are consistent with observations from around the world. They contribute to the growing body of evidence supporting predictions by climate scientists that humans are now causing the world's weather to become more volatile and more intense. A host of other impacts and indicators—including rising sea levels, an expansion of the range for tropical diseases, and losses from polar and glacial icepacks—have all been observed, and demonstrate that human-driven climate change is very real, and it is here today.

The City Council of Burlington has joined with local business and political leaders, and with other communities, in recognizing the dangers posed by global climate change. In 1996, the City Council voted to participate in the "Cities for Climate Protection" campaign organized by the International Council For Local Environmental Initiatives. In 1998, the Council passed a second resolution that set a target for the year 2005 of reducing greenhouse gas emissions in Burlington by 10 percent below 1990 levels.

The mayor then formed the Climate Protection Task Force. He charged it with developing an action plan with specific suggestions for achieving the city's goal.

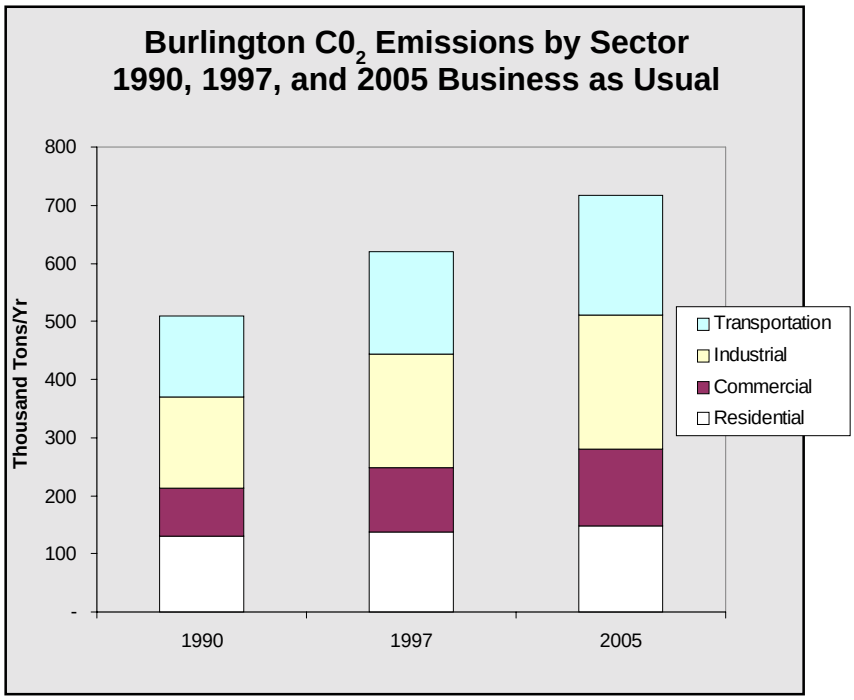
Did you know?

- **The eleven hottest years on record have occurred since 1980.**
- **The decade of the 1990's is the hottest decade of the millennium.**
- **1998 has recently replaced 1997 as the hottest year in recorded history**
- **The planet is heating at a rate faster than at any time in the last 10,000 years.**

B. Burlington's Emissions: Recent and Projected Growth

The largest source of greenhouse gas emissions in Burlington, as in the rest of the United States, is carbon dioxide (CO_2) from fossil fuel combustion. Burlington's estimated emissions of CO_2 from this source were 509,000 tons in 1990, and 624,000 tons in 1997. If we continue in a "business as usual" manner, CO_2 emissions for 2005 could be as high as 716,000 tons per year.

The following chart breaks down these emissions by sector.



Per person, Burlington emitted approximately 13 tons of greenhouse gases in 1990, and 16 tons in 1997. In comparison, total U.S. CO_2 emissions from fossil fuel combustion in 1990 were roughly 21 tons per capita.[2] Burlington's average annual growth rate in emissions from 1990 to 1997 was close to 3 percent.

Energy consumption forecasts[3] now predict a lower emissions growth rate, from 1997-2005, of 1.7 percent annually under business-as-usual conditions. That growth will bring a 40 percent overall increase in CO_2 emissions by 2005.

In Burlington, most of the current and projected growth in CO_2 emissions comes from the transportation and industrial sectors of the local economy.

C. The Action Plan

This plan proposes five strategies that can work together, cutting across sectors of the local economy. By formally adopting these strategies and making them part of the city's decision-making procedures, the City Council will build a strong foundation for attaining current and future climate protection goals.

After careful assessment of emissions and opportunities to reach the 10 percent goal, the task force suggested that this action plan propose an emissions reduction goal of 156,000 tons per year. Reaching this goal requires that emissions in the year 2005 be reduced to 561,000 tons per year. This is 10 percent below the 1997 level of 619,000 tons. Reaching the 90 percent level of 1990 emissions would require annual emissions reductions of 257,000 tons. Reductions of this magnitude are possible, but are likely to take more time. Even with a lower progress goal, the task force considers this an aggressive plan. The following table summarizes these five recommended strategies.

The task force hopes the strategies and climate protection opportunities identified in this plan will stimulate decision makers, individuals and organizations to take a broad range of climate protection actions. The City of Burlington cannot by itself achieve the overall goal of reaching ninety percent of 1990 emissions levels. To achieve these dramatic reductions, **everyone** will need to take part.

Strategies to achieve target CO_2 emissions reductions for the city

Strategy	Annual CO_2 Reductions Goals
1. Implement climate action plans for municipal buildings and operations.	**6,000 tons** *Energy Efficiency: 4,000 tons* *Solid Waste: 2,000 tons*
2. Support the full implemenmtation of planned (2000-2005) efficiency programs to maximize the capture of lost opportunity efficiency potentials.	**20,000 tons** *Residential 6,000 tons* *Commercial & Industrial: 14,000 tons*
3. Develop and lead a public education campaign, demonstrate civic commitment to climate protection activities and implement a TEN PERCENT CHALLENGE CAMPAIGN.	**70,000 tons** *Transportation: 20,000+ tons* *Buildings: 50,000+ tons*
4. Support biomass district energy and other alternative fuel supply options.	**35,000 tons for Phase I** *50,000 tons at full build-out*
5. Implement transportation demand management (TDM) projects and support climate friendly transportation policy at the local, state, and federal levels.	**25,000 tons** *TDM Projects: 9,000-15,000 tons* *Policies: 10,000 tons*
TOTAL	**156,000 tons**

Strategy 1: Provide Leadership through Municipal Buildings and Operations

By adopting, fully implementing and monitoring climate protection action plans for municipal buildings and operations, the City of Burlington is helping to demonstrate and lead the community's climate protection activities.

The following table summarizes the actions the city has already taken, and those it can take, to reach its goal of reducing emissions to 90 percent of 1990 levels by the year 2005. These efforts are consistent with the city's broader vision of serving as a model of sustainable development.

The task force suggests the City Council take the following actions to create immediate and long-term impacts from Strategy 1:

- Direct each department to develop the steps necessary to implement the municipal action plan by the target dates.
- Establish a revolving energy efficiency fund, dedicated to improving the efficiency of municipal buildings and operations.
- Appoint an energy and environmental services coordinator to monitor and assist in advancing climate-protection efforts.

Energy efficiency measures installed in municipal buildings in Burlington since 1990 have already saved the City approximately $307,000 and 2,200 tons of carbon dioxide annually.

Municipal Action Plan Emissions Reductions

Municipal Action Plan Components	Annual Emissions Reduction (Tons)
Building Efficiency Improvements	
Completed Building Improvements	2,200
Future Specific Building Improvements	400
Future General Building Improvements	800
Sub-total	**3,400**
Operations Efficiency Improvement	
Municipal Fleets Efficiency Improvement	250
Energy Procurement and Bulk Purchases	50
Tree and Shrub Planting	45
Amend City Municipal Code & Ordinances	200
Promote Voluntary Employee Programs	100
Sub-total	**645**
Solid Waste Reduction	**2,200**
Total Municipal Action Plan Savings	**6,245 tons**

Strategy 2: Support Full Implementation of Planned Efficiency Measures

Energy efficiency programs are an important climate protection strategy. The task force recommends that Burlington's City Council endorse and actively support the energy efficiency programs planned for the years 2000 through 2005.

These programs include activities by electric, gas and low-income service providers. They will produce significant savings across all sectors of Burlington's economy. Proposed electric efficiency programs focus on capturing comprehensive savings as part of new construction or equipment replacement decisions. Low-income energy efficiency efforts help to improve energy affordability by saving electricity, natural gas, fuel oil, propane and other fuels. Natural gas programs help businesses and households reduce consumption and purchase high-efficiency equipment.

Energy efficiency programs produce significant savings across all sectors of Burlington's economy

By 2005, the combined impact of these planned efficiency programs will produce approximately 14,000 tons of annual reductions in emissions from the commercial and industrial sectors, along with 6,000 tons of annual emissions reductions from the residential sector.

The task force suggests the City Council take the following actions to implement Strategy 2:

- Fully endorse the energy efficiency programs planned for years 2000 to 2005
- Invite the task force to help the statewide energy efficiency utility to increase participation in energy efficiency programs by raising public awareness of the links between climate change and energy efficiency.

Strategy 3: Develop and Lead a Public Education Program and Ten Percent Challenge Campaign

Overall, this strategy offers the largest potential impact, with a projected 70,000 tons of annual emissions reductions. However, achieving reductions of this magnitude will require that individuals and organizations across the city undertake a broad variety of climate protection activities, involving a wide range of technologies.

The city should continue, and strengthen, its efforts to educate the public about opportunities to protect the climate. The *Climate Protection Opportunities* section of this plan was written with this objective in mind.

The task force also recommends that the city support the development and implementation of a *Ten Percent Climate Challenge Campaign.* This would provide a means of recognizing individual actions, while also helping to motivate and track the community's progress toward its climate protection goals.

The Ten Percent Challenge Campaign

The Ten Percent Challenge Campaign will be a vital step to help Burlington achieve its greenhouse gas emissions reduction goal.

The campaign challenges everyone—individuals, businesses, the City and others—to reduce their emissions by 10 percent or more. There are many things that we can do.

The campaign will provide the means to recognize individual actions and track our community's progress.

The task force suggests the City Council take the following actions to create immediate and long-term impacts from Strategy 3:

- Support the development and implementation of a Ten Percent Climate Challenge campaign. This public effort to encourage and track climate actions is a key to generating broad-based community activity and support.
- Support amendments to local and regional plans and bylaws to help achieve target reductions and to help deliver the message to the region.

Strategy 4: Support Biomass-Fueled District Energy, and Other Renewable Technologies

The proposed biomass district heating system, where waste heat in the form of hot water is distributed from the McNeil Electric Generating plant via a two-pipe system to many buildings will reduce greenhouse gas emissions in Burlington by 30,000 tons per year.

The climate protection benefits of district heating—particularly of a system fueled by sustainably harvested biomass—are greater than any other single measure considered by the task force. Potential emissions reductions are estimated to range from 35,000-50,000 tons of CO_2 annually.

The city should continue promoting discussions on the development of a community biomass district heating and cooling system. Clearly identifying the climate protection benefits of the project, and how these fit into the community's overall climate protection objectives, is a fundamental component of this strategy.

Discussions of district heating have begun to expand beyond the current key players, to encompass the larger community that will benefit from its establishment. By continuing to inform and engage the community in future discussions, the city can help build consensus on the complex issues that surround a project of this size.

Another component of Strategy 4 is the city's support for the development of additional renewable or other climate-friendly energy projects. These could, for example, include a new or continuing commitment of resources and support for select demonstration installations (e.g., waterfront wind energy), and ongoing research into promising technologies (such as biomass gasification, biological wastewater treatment).

The task force suggests the City Council take the following actions related to Strategy 4:

- Encourage the McNeil station to maintain its leadership role in advancing renewable energy technologies.
- Support for renewable energy demonstration installations, such as wind generators and residential solar programs.

- Pass a resolution that advances the question of using the cogenerated heat of the McNeil Generating Station to provide heat to customers in the Burlington.

Strategy 5: Implement Transportation Demand-Management Projects, and Support Climate-Friendly Transportation Policy

Transportation—specifically motor vehicle use—produced roughly 30 percent of Burlington's total CO_2 emissions in 1997. To help reduce these, the city should support the implementation of strategies for transportation demand management (TDM). It should also provide political support for important, climate-friendly transportation policies at the regional, state and federal levels.

Select TDM measures, such as further expansion of park-and-ride lots, are estimated to provide between 9,000 and 16,000 tons of annual emissions reductions by 2005.

Additional emissions reductions, estimated at 10,000 or more tons/year by 2005, are obtainable through policies such as increased minimum vehicle efficiency standards, and the shifting of hidden transportation costs to motor fuel taxes. While this type of policy measure tends to fall outside the direct authority of the city government, local and regional entities can provide political support for these and other transportation policies at the state and national levels.

To implement Strategy 5 the task force suggests the City Council take the following actions:

- Provide political support for climate-friendly transportation policies at the state and national levels.
- Join with the state in implementing the Clean Cities Program.
- Investigate and implement "green fleet opportunities and operational guidelines for municipal and airport vehicles.
- Link bike/recreation paths, and strengthen their regional connections.
- Encourage the expansion of transit, passenger and commuter rail, to more efficiently deliver services within and outside employment and retail centers.

Transportation-related emissions reductions also play major roles in Strategy 3, the development and leadership of a comprehensive public education and outreach campaign, and in Strategy 1 for municipal operations.

If we do nothing, we can expect a 40 percent increase in Burlington's CO_2 emissions between 1990 and 2005, mostly from transportation and the industrial sectors.

The Burlington Electric Department is testing the Twike, a pedal-powered Scandanavian vehicle.

D. Moving Forward

Implementing the five Action Plan strategies as outlined above is the cornerstone for reaching the City's Climate Action goals. The task force also recommends the following steps to help ensure sustained progress.

1. Link with Other Community Efforts

- Join in promoting Earth Day 2000, which focuses on "Energy for the New Millennium."
- Encourage the Burlington Legacy Project, as it develops its community vision, to include a focus on climate protection activities.
- Direct the task force to work closely on the implementation of the public information strategies of EMPACT, the environmental monitoring arm of the Legacy Project.

2. Monitor and Report Emissions Reductions

- Support the development of a plan and methodology to measure and report on greenhouse gas emissions.
- Incorporate greenhouse gas tracking activities into the environmental monitoring activities of the EMPACT project.
- Support and expand the Metropolitan Planning Organization's role in tracking changes in transportation usage, emissions, and the development of climate-friendly policies and projects.

3. Continue the Climate Protection Task Force

The task force should remain as a working entity, to continue advancing the actions suggested in this plan. Each of the bullet items identified in this section will benefit from continued review by a body dedicated to broadening the base of support for the action plan.

Leading the efforts of the task force may be an appropriate role for an energy and environmental services coordinator.

Finally, the task force should focus on locating sources of financial support, to spread out the financial burden of implementing this action plan.

ENDNOTES:

1 *The Heat is On*, Ross Gelbspan, Perseus Books, 1997. See also http://www.heatisonline.org/science.cfm

2 U.S. Environmental Protection Agency, Office of Policy Planning and Evaluation. 1998. *Inventory of the U.S. Greenhouse Gas Emissions and Sinks 1990-1996*.

3 "Fueling Vermont's Future: Vermont Comprehensive Energy Plan & Vermont Greenhouse Gas Action Plan." Department of Public Service, September 1997.