



Combating Climate Change

*A Comprehensive Look at Local
Climate Protection Programs*

DECEMBER 2006

Introduction

Scientists predict that an unmitigated increase in greenhouse gas concentrations in the atmosphere will cause temperatures to rise between 2.4 and 10.5 degrees Fahrenheit in the next one hundred years. Due to this warming, sea levels are expected to rise between 3.5 and 34.6 inches by 2100 and precipitation patterns will shift. The effects of global climate change will not only have a great impact on ecosystems, they will also have serious effects on cities, counties, and other population centers. Local governments will be faced with rising sea levels, extreme weather events, warmer temperatures, and associated health impacts, especially among “at risk” communities. However, local governments are empowered with the ability to limit their own contributions to climate change and provide needed leadership by reducing the emission of greenhouse gases (GHG) resulting from their municipal operations and the larger communities they serve.

ICLEI has been facilitating local government emissions reduction progress since 1991 when it launched the Urban CO₂ Reduction Initiative, the pilot project that gave rise to ICLEI’s Cities for Climate Protection® (CCP) Campaign. From the first fourteen American, Canadian, and European cities that developed a municipal planning framework for greenhouse gas reduction and strategic energy management, the CCP has expanded internationally and across the United States. Today over 229 cities and counties in the United States (and over 770 world-wide) participate in the CCP. Collectively these communities represent over 20 percent of the U.S. population. Together CCP participants annually reduce greenhouse gas emissions by over 23 million tons, eliminating more than 43,000 tons of local air pollutants, and saving in excess of \$535 million in energy and fuel costs.

These achievements are due to the strong commitment of individual local governments to climate protection. The following case studies aim to highlight key criteria that make local government climate protection programs successful. In brief, these criteria include:

- Sustaining strong political and financial support;
- Hiring motivated and innovative staff with strong technical and communication skills;
- Beginning at or expanding to a regional level to pool resources;
- Maintaining an innovative direction and scope;
- Including staff and community in the planning process;
- Identifying unique opportunities; and
- Integrating climate protection into the jurisdiction’s overarching goals and programs.

This document showcases four local governments that have developed innovative programs that have been effective in achieving significant reductions in greenhouse gas emissions – Portland, OR; Miami-Dade County, FL; Fort Collins, CO; and Burlington, VT. Each case study follows the history of these jurisdictions’ climate protection efforts, highlighting why their efforts have been successful and identifying the unique circumstances that have directed their efforts to reduce greenhouse gas emissions. These case studies have been compiled to provide examples of climate action frameworks to inspire communities that have not yet taken action to combat global warming, as well as to encourage those that are already committed to reducing emissions to think creatively about new ways to enhance their existing efforts.

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with input from ICLEI liaisons in each community profiled*

Portland, Oregon

I. INTRODUCTION

With the adoption of a climate action plan in 1993, the City of Portland, Oregon was one of the first communities in the United States to officially address global warming and reduce local greenhouse gas emissions. Being a forerunner has paid off. In the spring of 2005, Portland announced that it has held community-wide emissions to one percent above 1990 levels. This is particularly impressive in the face of rapid population and economic growth. Portland has demonstrated a particular commitment to reducing greenhouse gases through its willingness to adapt and expand as opportunities arise. Expanding to a regional approach by including all of Multnomah County has allowed for a pooling of resources and greater regional coordination. The commitment of innovative and motivated staff has ensured that climate protection programs are continually monitored, updated, and expanded. Portland's significant progress towards meeting its target is proof that hard work pays off.

II. BACKGROUND

City Profile

Portland is an urban center with a population of over 540,000, located in Multnomah County. The County includes 6 other cities and has a total population of 670,000, making Portland the regional center. Situated at the confluence of the Willamette and Columbia Rivers, and under the shadow of Mt. Hood, Portland is considered to be an attractive, hip, environmentally-oriented city. However, this was not always the case.

Environmental Action

In the 1950s and 1960s the city was overtaken by freeways that fueled urban flight to the suburbs. Downtown began to change as older buildings were replaced with parking lots to accommodate commuters. The loss of population from the urban core was countered by "urban renewal projects" that developed high-rise apartment complexes in areas that were historically dominated by vibrant interconnected neighborhoods.

Fortunately for the City, this anti-urban trajectory was stymied by visionary planners who began to appear on the political scene in the early 1970s. The first strong push came from the State when Governor Tom McCall announced in his opening address to the State Legislature in 1973 that Oregon was, "...in dire need of a state land use policy...we must respect one truism: that unlimited and unregulated growth leads inexorably to a lowered quality of life."

The Oregon legislature rose to the occasion and in the same year adopted Senate Bill 100, which instituted a state-wide planning process to limit sprawl and protect natural areas and farmlands. Under this law, cities must designate 'urban growth boundaries' around existing population centers. These growth areas must be of sufficient size to accommodate predicted population growth. Planning and zoning was designed to promote higher density development within the growth boundaries and preserve the rural characteristics of areas outside the boundaries.

This policy mirrored the vision of the City of Portland, which adopted a new downtown plan in 1972 that envisioned a vibrant, public transit-oriented downtown with increased housing and commercial opportunities. Instead of being replaced with parking, historic buildings were preserved, and a new transit mall was constructed to anchor the downtown and provide a sustainable alternative to vehicle

travel. The height of this shift is embodied in the removal of the Harbor Freeway, which was replaced by an urban park along the water front, and the development of a light rail system instead of the proposed Mt. Hood Freeway.

Through these and many other initiatives, Portland was able to stem the tide of urban sprawl and lay the foundation for a more sustainable community. Thirty years later, the City reports that it is on track to meet its emissions reduction goals.

III. CLIMATE ACTION

Combating Climate Change: The First Steps

In addition to requiring cities to limit sprawl, the Oregon Senate Bill 100 also required cities to develop a comprehensive plan that addressed meeting energy goals. In response to this requirement, Portland created its own Energy Policy in 1979. This Policy created the Portland Energy Office and Energy Commission that set into motion a plan to increase energy efficiency across all sectors by 10 percent by the year 2000. The Energy Policy of 1979 was reviewed and expanded in 1990 in order to incorporate broader principles of sustainability, such as supporting an equitable economy and protecting air quality and other natural resources. Concurrently Council member Mike Lindburg raised the issue of global warming, believing that Portland should aim to reduce its greenhouse gas emissions as it reduced its use of energy. With his political support, the Energy Office was able to secure grants and City funding to participate in ICLEI's climate change programs in 1991 and 1993.

In 1991, Portland became one of the first U.S. cities to adopt a global warming policy when it joined thirteen international local governments in ICLEI's Urban CO₂ Reduction Initiative. During these early years participation in ICLEI's programs proved to be extremely helpful and motivating. As an organizing force, ICLEI provided technical knowledge, software, and networking that greatly supported the City's work. Shortly after the conclusion of the Initiative in 1993, Portland adopted its own Carbon Dioxide Reduction Strategy. Portland's Strategy set a goal to reduce greenhouse gas emissions by 20 percent below 1988 levels by 2010.

Implementation: Funding, Government Structures, and Staff

When the Portland Energy Office first joined ICLEI in 1991 it was comprised of four staff people, only one of whom was funded by the City. The other three were funded by outside grants. Taking on a climate protection campaign required additional funding and staff time. For a short period of time, Portland borrowed both money and part-time staff from the Oregon Department of Energy to support the launch of its climate protection work. Beyond this financial support, climate protection work was integrated into all aspects of the Energy Office. Since 1993, climate protection programs have greatly expanded due to the receipt of external grants,¹ increased City funds, and the acceptance of responsibility from other City departments to take on related portions of the climate protection policy.

In 2000, the Energy Office merged with the Solid Waste and Recycling Division (previously part of the Bureau of Environmental Services),² creating Portland's Office of Sustainable Development (OSD). The creation of this department enabled more comprehensive greenhouse gas reduction planning and a more consistent funding base from the solid waste sector. The inclusion of four main divisions under the

¹ External grant sources have included: US Department of Energy, US Environmental Protection Agency, the State of Oregon, private foundations, and electric utilities.

² The Bureau of Environmental Services today is primarily concerned with stormwater and watershed protection issues.

OSD allows for climate protection policies to be implemented under the guidance of one main office in a variety of divisions including Energy, Solid Waste and Recycling, Green Building, and Sustainable Technologies and Practices. The most recent budget of the OSD is between \$5 and \$6 million, half of which comes from Solid Waste and Recycling and about \$400,000 from the general fund. The remainder of the funding comes from a variety of different federal, state, and private grants.

This funding supports a dedicated and innovative staff of over 30 employees. Susan Anderson, the Director of the Office of Sustainable Development, states that a key to the success of Portland's Sustainability Programs comes from its focus on hiring highly credible people with superior technical and communication skills. The department's decision to hire a new Communications Specialist to oversee the Office's communications has led to significant progress in reaching out to both the community and other City departments and has also been instrumental in securing grants. Anderson believes that this investment has paid for itself already.³

Expanding to a Regional Approach

In the late 1990s Multnomah County Commissioner Maria Rojo de Steffey began the County's Sustainability Initiative that would include greenhouse gas reduction strategies. Concurrently, Portland began to revamp its Carbon Dioxide Reduction Strategy. Staff within both the County and City realized that this would be an opportune time to begin working together on sustainability and climate protection issues. In addition, some of the data necessary for Portland's greenhouse gas inventory was tracked at the county level, making it even more sensible that the two agencies work together. In June of 2000, the City and County began to formally work in cooperation to develop a Local Action Plan that would embody a regional approach. A draft plan was released for public comment in November. City and County agencies held meetings to further the conversation and invite comments and improvements.

With the launch of the Multnomah County Sustainability Initiative in 2001, Multnomah County joined Portland in committing to reduce greenhouse gas emissions, improve energy efficiency and reduce solid waste, while increasing economic and social health. A jointly adopted Local Action Plan on Global Warming, adopted by both agencies in 2001, supplanted Portland's previous 1990 Energy Policy and 1993 Carbon Dioxide Reduction Strategy. In combining efforts, both jurisdictions recognized that in order to effectively curtail regional emissions, a coordinated and cooperative effort would be required. Molly Chidsey, the County's interim Sustainability Manager believes that these efforts have proven to be a "powerful way to pool scarce resources and work together towards achieving the same goals."⁴ The two agencies are currently working together to improve energy efficiency in City and County facilities by 10 percent and to increase fuel efficiency of passenger vehicles in the City and County fleets to 35 miles per gallon.

When the City and County agreed to work together, they recognized that in the face of rapid population growth, the original CO₂ reduction target would be difficult, if not impossible, to meet. The City, therefore, adjusted the emissions reduction goal to reduce emissions by 10 percent below 1990 levels by 2010. Adapting to current and future realities allows the County to not only show measured progress towards its target, but also identify the best strategies to achieve its goals.

The Multnomah County Sustainability Initiative doubled its staffing by adding a pollution prevention specialist as recommended in the Local Action Plan on Global Warming. These two people now work closely with the Portland Office of Sustainable Development to cooperatively and efficiently

³ Susan Anderson, *Interview with Jennie Wheeler, Program Assistant at ICLEI*. March 2006.

⁴ Molly Chidsey, *Interview with Jennie Wheeler, Program Assistant at ICLEI*. March 6, 2006.

achieve some of the same goals. These positions have historically been funded by the County departments they assist and by the County general fund.

Although the City and County primarily work closely together, there are some distinctions in the work that they do. These differences stem from disparate constituencies, who have varying degrees of concern for environmental and economic issues. The City's constituents are more willing to support environmental and sustainability initiatives than the more rural constituents of the County who live outside Portland. It is therefore crucial that the County take a lead role in making sure its constituents are convinced that its sustainability work is beneficial and necessary. The County's core mission is to provide excellent social services to the community, which requires that sustainability initiatives make sense from a public benefit standpoint. The County's upcoming initiative to weatherize 10,000 low-income homes with the objective of lowering energy use and costs illustrates some of the community benefits of striving for sustainability.

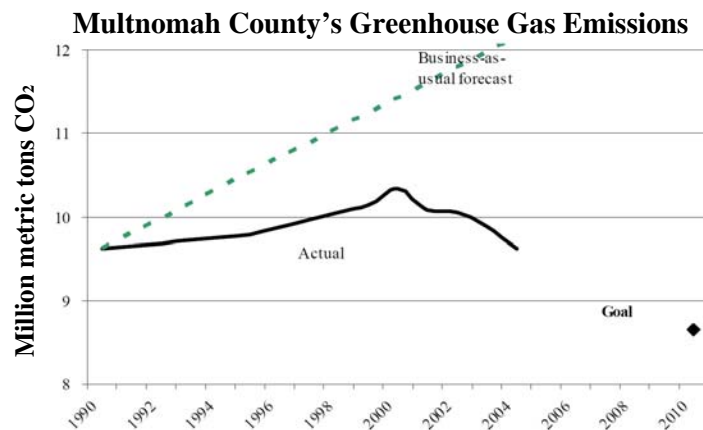
Local Action Plan

Portland's Office of Sustainable Development and the County's Sustainability Initiative work together to implement their joint Local Action Plan on Global Warming (LAP). The Plan resulted from a participatory public process, which brought together citizens, businesses, NGOs, local utilities, and local government agencies. These groups met together in formal discussions throughout the summer of 2000. A draft plan was completed in the Fall and distributed for comment.

The Local Action Plan contains over 150 actions for implementation along with specific timelines and reduction targets. See attached chart for a breakdown of topics, measures, and targets.

On the Way to Reaching the Target

Portland and Multnomah County have made great progress towards meeting their reduction target. With emission levels only slightly higher than 1990 baseline levels and per capita emissions 12.5 percent below 1990 levels, the City and County are demonstrating outstanding success and accomplishment. While most local governments continue to see growth in emission levels, Portland and Multnomah County have, in effect, been able to hold emission levels constant over 14 years despite rapid population and economic growth. (See Graph) In 2002, the U.S. Environmental Protection Agency honored Portland's successes with its highly selective Climate Protection Award.



Contributions to Success

The City has been able to make significant strides due to the comprehensive nature of the regional Local Action Plan and the innovative programs it has implemented. The inclusion of all sectors of local and regional governments and the community as a whole has driven the effective implementation of measures. Ongoing monitoring and evaluation have allowed both the tracking of successes and the identification of opportunities for improvement. Finally, the City has demonstrated a deep commitment to reducing emissions and an understanding that actions taken to protect the environment also improve the quality of life of Portland's citizens.

The City and County attribute their success to a range of programs addressing land-use planning, waste, energy efficiency, and public outreach. Below are some examples of outstanding programs that have demonstrated considerable results:

TRANSPORTATION

- Two major light rail lines and the Portland Streetcar, along with a 75 percent growth in the use of public transit, have reduced total emissions from transportation by 62,000 tons of CO₂ below 1990 levels.
- Portland's Transportation Options Program uses incentives, marketing, and public outreach to educate its citizens about alternatives to driving alone. Combined with improvements in transit systems and bike routes, this has resulted in an increase of commuting by foot or bike by 10% since 1990.
- Portland has added 30 hybrid vehicles to its municipal fleet and runs all diesel vehicles on a 20% biodiesel blend (B20), and Multnomah County has added five hybrid vehicles to its fleet.
- Multnomah County set high fuel efficiency standards for vehicle purchases and replaced diesel fuel with biodiesel (B20), reducing fleet emissions from diesel sources by over 70 percent.

ENERGY

- Energy efficiency incentives from the Energy Trust of Oregon, OSD's green building assistance program, and Multnomah County's energy performance standards combined have contributed to a 7 percent decline in building energy use since 1990.
- City and County traffic signals have been converted to LEDs.
- The City purchases 11 percent of its energy from renewable sources like wind and solar power. Multnomah County purchases 3 percent of its energy from renewable sources.

SOLID WASTE

- Residential and commercial sectors recycle over 54 percent of total waste.
- A new commercial food waste collection program in Portland will greatly expand composting.
- Portland's rigorous waste reduction and recycling programs, together with improvements in landfill management, have reduced CO₂ emissions to 148,000 tons below 1990 levels.

FORESTRY

- 750,000 trees planted since 1996 have significantly reduced air and water pollution, storm water runoff, sequestered CO₂ and provided energy benefits by sheltering and shading buildings.⁵

⁵ Office of Sustainability, *A Progress Report on the City of Portland and Multnomah County Local Action Plan on Global Warming*, June 2005.

Ongoing Commitment

Although Portland has realized significant accomplishments to date, the City has also renewed its commitment to achieve a 10 percent emissions reduction goal. Activities slated for implementation in the next few years include:

- Boost recycling rate to 60 percent;
- Implement a Transportation Options campaign aimed at reducing automobile travel by City and County employees;
- Power 100 percent of City operations electricity needs with wind power;
- Institutionalize the City's commitment to climate protection by joining the Chicago Climate Exchange to provide additional financial incentives toward progress; and
- Enhance climate protection throughout the region through involvement in the West Coast Governor's Global Warming Initiative and the Oregon Governor's Global Warming Strategy.

IV. CONCLUSION

Portland and Multnomah County's climate protection accomplishments have enabled them to stem the growth of emissions despite significant economic and population growth. Current emissions levels are only slightly higher than in 1990, and they are continuing to drop as the City and County expand and extend climate protection programs. The inclusion of Multnomah County into the 2001 Local Action Plan has not only allowed the City and County to pool resources, but has also enabled a regional approach that more efficiently addresses the reduction of greenhouse gases. Innovative energy efficiency programs, an extensive public transit system, effective recycling and composting services, and compelling public outreach campaigns have all contributed to the region's incredible success.

Lessons Learned

- Portland's ability to remain active in its commitment to reduce greenhouse gases has halted the growth of emissions despite a growing economy and population.
- Hiring motivated, innovative, and committed staff with both technical and communications skills has been crucial to the success and expansion of Portland's climate protection initiatives.
- Expanding the climate protection program to include Multnomah County allows for the City and County to pool resources, and facilitate collaboration on regional issues.

TIMELINE

- 1972 City of Portland adopts the *Portland Downtown Plan*
- 1973 Senate Bill 100 passed by Oregon State Legislature to limit sprawl
- 1974 Plans to build the Mt Hood Freeway officially cancelled
- 1979 Portland Energy Policy established
- 1990 Portland Energy Policy reviewed and expanded
- 1991 Portland joins ICLEI's Urban CO₂ Reduction Initiative
- 1993 Portland adopts its first *Greenhouse Gas Emissions Reduction Strategy*
- 1997 Carbon Dioxide Reduction Strategy Update published
- 2000 Office of Sustainable Development created
Carbon Dioxide Reduction Strategy: Success and Setbacks published
- 2001 Multnomah County Sustainability Initiative begins
City of Portland & Multnomah County Local Action Plan on Global Warming adopted
- 2005 A Progress Report on the City of Portland and Multnomah County Local Action Plan on Global Warming published

PORTLAND AND MULTNOMAH COUNTY LOCAL ACTION PLAN HIGHLIGHTS

Focus Area	Goals	Existing Measures	Proposed Measures
Policy Research & Education	Provide policy, research, & education to local agency staff and the community	<ul style="list-style-type: none"> ▪ Bi-annual report of greenhouse gas emissions to monitor change & adjust plan ▪ Community outreach & education 	<ul style="list-style-type: none"> ▪ Inter-office communications & training sessions ▪ Advocacy for national action on global warming
Energy Efficiency	<p>Reduce energy use in facilities across all sectors by 10% by increasing energy efficiency</p> <p>1.35 mil. metric ton eCO₂ reduction</p>	<ul style="list-style-type: none"> ▪ Block-By-Block free insulation for low income single family homes ▪ Multi-Family Energy Saving Program ▪ BEST: Businesses for an Environmentally Sustainable Tomorrow offers assistance & awards 	<ul style="list-style-type: none"> ▪ Investment in efficiency measures with short-term paybacks ▪ Public-private energy conservation partnerships ▪ Green building standards for municipal construction, technical assistance, education & financial incentives to builders ▪ Convert traffic lights to LED signals ▪ County-wide energy use best practices and performance standards for equipment
Transportation, Tele-communication & Access	<p>Reduce per capita vehicle miles traveled by 10% below 1995 & improve average fuel efficiency of vehicles from 18.5 to 26 mpg</p> <p>0.67 mil. metric ton eCO₂ reduction</p>	<ul style="list-style-type: none"> ▪ Large employers required to reduce employee commute trips by 10% ▪ Trip Reduction Incentives Program provides transit and carpool incentives to City employees 	<ul style="list-style-type: none"> ▪ Open three major light rail lines ▪ Develop more than 200 miles of bikeways ▪ Launch the first modern streetcar line in the U.S. ▪ Switch from diesel to biodiesel ▪ Purchase hybrid vehicles for vehicle fleet
Renewable Energy Resources	<p>Emphasize renewable energy resources to meet all growth in electricity load through renewable sources</p> <p>0.54 mil. metric ton eCO₂ reduction</p>	<ul style="list-style-type: none"> ▪ Capture methane from wastewater treatment plant for neighboring industry and building heating ▪ City purchase of renewable energy ▪ Tax credits for geothermal space & water heating systems 	<ul style="list-style-type: none"> ▪ Renewable energy demonstration projects ▪ Portland's construction of a fuel cell electricity generator powered by methane from the City's wastewater treatment plant will produce enough electricity to power 120 homes ▪ Purchase of 44 million kWh of wind power ▪ Install solar cells on maintenance vehicles to power tools without engines
Waste Reduction & Recycling	<p>Minimize methane emissions from landfills & manufacturing processes by promoting waste reduction & recycling</p> <p>0.23 mil. metric ton eCO₂ reduction</p>	<ul style="list-style-type: none"> ▪ Recover 60% of waste by 2005 ▪ Increase residential curbside recycling ▪ A commercial recycling ordinance (1996) requires every work site to establish and use a recycling system 	<ul style="list-style-type: none"> ▪ Require businesses to recycle 50% of the solid waste that they generate ▪ Sustainable Paper use policy to minimize paper generation from City operations ▪ Commercial recycling & food waste collection programs ▪ Investigate & set standards for recycled materials purchasing

<p>Forestry & Carbon Offsets</p>	<p>Expand urban & rural forestry practices</p> <p>0.31 mil. metric ton eCO₂ reduction</p>	<ul style="list-style-type: none"> ▪ Urban Forestry Management Plan lists strategies and recommended actions 	<ul style="list-style-type: none"> ▪ Support reforestation initiative by planting 3,000 acres of trees ▪ Document benefits provided by urban forest cover & use data to inform policy decisions & obtain funding ▪ Tree planting to maximize carbon offsets, energy conservation, air quality, stormwater management, & habitat benefits
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Miami-Dade County, Florida

I. INTRODUCTION

Even before its County Commission officially committed to reducing greenhouse gas emissions, Miami-Dade was a pioneer in climate protection. By developing climate protection initiatives at the County level, 35 municipalities and a large diverse population are benefiting from improved air quality and energy cost reductions. Under the strong leadership of Harvey Ruvlin, County Clerk and then County Commissioner, the County became one of the first local governments in the world to commit to take action against climate change. Sustained leadership has enabled the County to make progress and remain an innovative forerunner. For instance, in 2003 Miami-Dade initiated official discussions on adaptation to climate change and plans to take action to minimize the affects of climate change as resources allow. Miami-Dade's commitment to curbing greenhouse gas emissions has resulted in the reduction of 1.47 million tons of CO₂ per year.

II. BACKGROUND

County Profile

Miami-Dade County encompasses almost 2,000 square miles along the southeastern coast of Florida. A large unincorporated area and 35 municipalities make up an ethnically diverse population of 2.25 million people. The County government provides police and fire protection, zoning, emergency services, neighborhood parks, and other services to the unincorporated areas that represent approximately half of the County's population. Transportation, environmental management, and solid waste disposal are services provided to both unincorporated areas and incorporated municipalities. The tourist industry, which relies on the unique natural resources of the region, is the primary economy of Miami-Dade. Miami-Dade's low elevation, sensitive ecology, and miles of beachfront make it especially sensitive to the effects of climate change, sea-level rise and flooding in particular.

Early Environmental Actions

During the energy crisis of the 1970s, Miami-Dade County established an Energy Management Office to create a fuel and energy conservation plan. In 1977, a Comprehensive Energy Management Plan set minimum energy conservation standards for the County's facilities and operations. The Plan was successful in cutting County electric bills by 20 percent and the County's gas use by 37 percent. The Energy Office was dispersed in 1991 when energy conservation policies were incorporated into other County departments. These initial actions to reduce fuel and energy use set the stage for sustained commitment to energy conservation and greenhouse gas reductions.

Early actions taken by the Miami-Dade Transit Agency provided other opportunities to build future greenhouse gas reduction programs. The County Commission passed an ordinance in 1960 creating the Metropolitan Transit Authority. This entity unified separate public and private transit operations into one public countywide service. In the following years Miami-Dade County citizens approved a \$9 million revenue bond (1962) and a \$132.5 million "Decade of Progress" bond (1972) to expand transit service and support the transit system operation. The transit system continued to expand to a four-mode system including Metrobus, Metrorail, Metromover, and Paratransit moving nearly 300,000 passengers daily. The early development of this regional transit system provided a foundation upon which the County developed future greenhouse gas reduction measures in the transportation sector.

In the mid 1960s an environmental issues office was created in the County Manager's Office in response to a private company's proposal to build an oil refinery on Biscayne Bay, just north of the Florida Keys. Air quality issues were the initial concern of this office, but it quickly expanded and formally became the Department of Environmental Resources Management (DERM) in 1974. The Department has significantly grown in size and influence since 1974, tackling issues from water conservation to brownfield redevelopment. DERM is now considered a leading environmental resource management program in the United States.

III. CLIMATE ACTION

Combating Climate Change: The First Steps

Under the direction of then County Commissioner Harvey Ruvin, in 1990 DERM staff attended the first planning meeting of ICLEI's Urban CO₂ Reduction Project, securing Miami-Dade's participation and commitment to reduce greenhouse gas emissions. In April 1991 the Board of County Commissioners formally authorized participation in ICLEI's Urban CO₂ Reduction Project, making Miami-Dade County one of 14 international jurisdictions to participate in the program. With funding support from the Urban Consortium Energy Task Force and the Public Technology Institute, a County steering committee chaired by Commissioner Ruvin, including representatives from local electric and gas utilities, universities, business groups, and environmental organizations began to develop an action plan to reduce greenhouse gases. A full time staff person from the Department of Environmental Resources Management administered the project with additional support from staff in many different County departments including Solid Waste, Miami-Dade Transit, Metropolitan Planning Organization, Planning, and Building and Zoning. Cross-departmental support assured that measures assigned to particular departments were realistic and feasible.

The committee's first step was to establish a baseline greenhouse gas emissions inventory. The committee chose 1988 as the baseline year, along with the 13 other international jurisdictions in the Urban CO₂ Reduction Project. Data was collected from local utilities and County departments and inputted into an early software program. Subsequent inventories and measures estimates were calculated with ICLEI's CCP Software. The inventory identified that transportation and electricity use produced the most emissions, both at 45 percent of total emissions. The County, therefore, concentrated its reduction efforts in these areas. In November 1993, the committee completed the final draft of *A Long Term CO₂ Reduction Plan for Metropolitan Dade County*. This foundation document outlined the County's long range goals to reduce emissions 20 percent below 1988 levels by 2005, and specific measures it would undertake to combat climate change.

County CO₂ Reduction Plan and Annual Progress Reports

The CO₂ Reduction Plan divided measures into four categories: Transportation, Land Use, Electrical Production/Use, and Solid Waste. The measures the County pledged to implement were further organized into each County department responsible for implementation. The departments responsible for implementing measures include DERM, Solid Waste Management, Department of Planning and Zoning, Transit Agency, General Services Administration, Public Works, and the Metropolitan Planning Organization. Specific measures in these categories are outlined in the attached table.

Between 1995 and 2001 DERM issued annual Progress Reports outlining measures completed, in progress, inactive, and dropped. By 2001, 6 of 35 measures were completed, 22 were in progress, 5 were

inactive, and 2 had been dropped.⁶ Funding for these reports came from the DERM operating budget. Each Progress Report also includes an update of the Plan and areas of new opportunity not included in the original 1993 plan. The 2001 Progress Report outlines new opportunities and programs that have been implemented since 1993 including:

- Adopt-A-Tree funded through the Florida Department of Agriculture to plant over 150,000 trees;
- Shade for Dade funded at \$100,000 by the County to plant approximately 100 trees in each of 13 Commission districts;
- Electric Wave Shuttles in the City of Miami Beach that have transported over 3.5 million passengers between 1998 and 2002, avoiding over 4,000 vehicle miles traveled and 3,800 tons of CO₂;
- SPIRIT, a system that digitizes paper-based documents allowing access throughout county facilities, which has contributed to better public service, a 15 percent cut in staff, and reduced vehicle miles traveled to and from the courthouse;
- DIAL, a voice response system established in 1995 that has annually avoided 708 tons of CO₂ by allowing individuals to make payments and find information over the phone;
- Dade Green Coalition established to encourage green building;
- Community Action Agency tasked with a Low Income Home Energy Assistance Program and an Energy Conservation/Weatherization program for residences owned by low income families; and
- Alternative Fuels Advisory Committee established in 2002 to develop and implement a program to increase the utilization of alternative fuels in the County fleet.

After 2001, tracking the activity of a variety of different departments became increasingly difficult as staff turnover occurred. Dwindling resources and difficulty in obtaining data also underlined the decision to discontinue annual progress reports. Since 2001, no report has been conducted, however data has been collected for years 2001 – 2005 and a Final Report is currently being developed.

Results

The 1997 Progress Report states that the quantification of greenhouse gas reductions for implemented measures will be completed every five years. Following this timeline, a new greenhouse gas inventory was completed in 1999 using the CCP software. The 2001 report summarizes these results and reveals a 9.9 million ton disparity between forecasted and actual reductions in CO₂. The report cites two main reasons for this discrepancy. First, two different software programs were utilized to calculate the 1988 forecast and 1999 actual reductions. ICLEI's CCP software, considered to be more accurate, was used for the 1999 inventory. Second, the 1988 forecast included an 8.2 million ton reduction due to the National Highway Transportation Safety Administration's adoption of higher CAFÉ (Corporate Average Fuel Efficiency) standards. Since higher standards were not mandated this reduction did not occur. Excluding this reduction, projected emissions were 1.7 million tons greater than reductions accomplished in 1999.

Total County greenhouse gas emissions increased 20 percent (4.7 million tons) along with a population increase of 16.4 percent. Since energy use had increased 36.4 percent since 1988, the 2001 plan calls for more measures to promote energy efficiency and conservation. In lieu of higher CAFÉ standards, the County has developed a transportation initiative, the People's Transportation Plan, to foster significant emissions reductions in the transportation sector.

⁶ Miami-Dade Department of Environmental Resources Management, *A Long Term CO2 Reduction Plan Progress Report*, 2001.

Moving Forward: The People's Transportation Plan

Miami-Dade's willingness to monitor, reassess, and identify future project priorities has enabled the County to make significant progress since 2001, such as the adoption of a comprehensive transportation plan. In 2002, County voters overwhelmingly approved a half percent sales surtax to fund the Citizen's Independent Transportation Trust. The Trust oversees a \$17 billion dollar plan that will add more buses and routes, improve transit service, and expand rapid transit over the next 25 years, as well as support existing systems.⁷

The Transportation Plan is heavily concentrated on expanding bus and rail services, routes, and hours. Over two-thirds of projected capital expenses from 2004 to 2032 are dedicated to new bus acquisition to expand the fleet, bus renewal and replacement, new rail capital expansion, rail rehabilitation and renewal, and rail modification. Road improvements make up the remaining expenses.⁸ The plan's strong financial commitment to expanding transit systems echoes the County's commitment to reduce vehicle miles traveled and increase transportation demand management programs included in the 1993 CO₂ Reduction Plan.

Adaptation

In 2003, County Clerk Ruvin initiated the Climate Change Adaptation Task Force, making Miami-Dade one of the first local governments to specifically analyze adaptive strategies to deal with the effects of climate change. In June 2006, this Task Force was formally adopted by resolution. Since Miami-Dade County is located in an area predicted to be hard-hit by extreme weather events, rising sea levels, warmer temperatures, and increased risk of vector-borne disease, it must be prepared to deal with these changes or face enormous future costs. Professors, climate experts, architects, engineers, economists, and environmental planners volunteer their time to contribute to the Task Force, which is staffed by DERM. The Task Force first identified how Miami-Dade will be affected by climate change and what it must do to respond to those affects. Some responses include building pumps and dikes to keep rising sea levels at bay and strengthening building codes to prepare for future hurricanes like Katrina. Ultimately the Task Force hopes to anticipate and minimize the effects of climate change and quantify the cost of inaction.

Regional Success

Much of Miami-Dade's opportunity to affect change lies in its ability to provide energy savings and air quality improvements to a large, diverse population of over 2.5 million people. A regional approach has encouraged unincorporated areas and 35 municipalities to work together to achieve reductions through a regional transit system. In addition, countywide public outreach campaigns engage and educate more people in the fight against climate change.

IV. CONCLUSION

The population of Miami-Dade County directly benefits from the County's commitment to climate protection. County Clerk Harvey Ruvin continues to keep the County at the forefront of innovative progress in climate action planning. He not only led the County to join ICLEI's Cities for Climate Protection Campaign, but in recent years has set up a Climate Change Adaptation Task Force to address the possible impacts of climate change and how the County should take action to prevent devastating

⁷ Miami-Dade Department of Environmental Resource Management. *A Long Term CO₂ Reduction Plan for Metropolitan Dade County*. 1993.

⁸ Miami-Dade County. *People's Transportation Plan Status Report*. April 2004.

effects. This political leadership and the County's willingness to move in new directions will continue to drive emissions reductions and help the community prepare for the effects of climate change.

LESSONS LEARNED

- Strong and sustained political support from the County Commission and the County Clerk has been crucial to continued progress.
- Maintained funding and staff time for implementation of climate protection initiatives has provided the support necessary to realize emission reductions.
- Innovative direction from political leaders has enabled Miami-Dade to remain at the forefront as it addresses adaptation to climate change.
- An inclusive County approach has incorporated a large number of municipalities and a diverse population.

TIMELINE

1960	Metropolitan Transit Authority created
1960s	Office under County Manager created to address environmental issues
1970s	Energy Management Office created
1974	Department of Environmental Resources Management created
1977	Comprehensive Energy Management Plan adopted by Board of County Commissioners
1991	Board of County Commissioners authorize participation in ICLEI's Urban CO ₂ Reduction Project
1993	A Long Term CO ₂ Reduction Plan for Metropolitan Dade County completed
1995	First annual Progress Report completed
1996	Progress Report issued
1997	Progress Report issued
1998	Progress Report issued
2001	Progress Report issued including updated greenhouse gas inventory
2003	Climate Change Adaptation Task Force initiated
2005	Target completion date for goals of initial Urban CO ₂ Reduction Plan
2006	Resolution passed to formally establish the Climate Change Adaptation Task Force
Late 2006	Final Report for initial Urban CO ₂ Reduction Plan to be released

MIAMI-DADE'S CO₂ EMISSION REDUCTION PLAN AND PROGRESS REPORT HIGHLIGHTS

Focus Area	Goals	Measures Proposed in 1993 Plan	Measures Added in Progress Reports
Transportation	<ul style="list-style-type: none"> ▪ Reduce CO₂ emissions by between 8,927,000 and 9,231,000 tons 	<ul style="list-style-type: none"> ✓ Expand Metromover to Brickell Ave & Omi Center ○ Extend Transit ○ Construct road improvements ○ Increase traffic demand management programs ○ Incorporate bike facilities into County plan for new road construction & improvement ○ Shower facility ordinance for professional offices ✓ Implement Bikes-on-Tri-Rail program ○ Use fuel efficient cars in County fleet ○ Public outreach to limit vehicle idling ✓ Promote increase in national gas mileage standards 	<ul style="list-style-type: none"> ▪ People's Transportation Plan to fund and extend transit ▪ Electric Wave shuttles in Miami-Beach ▪ Clerk for the Courts voice response system allows payments or set court dates over the phone ▪ Alternative Fuels Advisory Committee established
Land Use	<ul style="list-style-type: none"> ▪ Reduce VMT by 5% through mixed land use ▪ Reduce CO₂ emissions by 172,000 tons 	<ul style="list-style-type: none"> ○ Encourage transit and pedestrian oriented development ○ Encourage infill development ○ Promote a sub-centered urban form ○ Expand tree plantings and white surfaces ✓ Revise landscape code to require strategic tree planting 	<ul style="list-style-type: none"> ▪ Adopt-A-Tree program to give away over 150,000 trees ▪ Shade-for-Dade will plant 700 trees on City property ▪ Eastward-Ho Brownfields development project ▪ HOPE IV to create affordable, economically diverse, & environmentally friendly community to replace old public housing
Electrical Production & Use	<ul style="list-style-type: none"> ▪ 20% increase in energy efficiency in County buildings ▪ Reduce CO₂ emissions by 492,610 tons 	<ul style="list-style-type: none"> ○ Green Lights program to install energy-efficient lighting in County facilities ○ Promote use of cogeneration plants × Reduce electricity consumption in 35,000 rebuilt homes ✓ Miami Herald energy guide targeting homeowner ○ Expand use of alternative fuels ○ Shift to photovoltaic and/or LED street lighting ○ Energy Conservation and Assistance program 	<ul style="list-style-type: none"> ▪ Dade Green Coalition established to promote Green Building practices ▪ Community Action Agency provides weatherization and energy efficiency assistance to low income families ▪ Parks and recreation installed solar light fixtures
Solid Waste	<ul style="list-style-type: none"> ▪ 30-50% recycling rate ▪ Reduce CO₂ emissions between 1,753,000 and 2,562,000 tons 	<ul style="list-style-type: none"> ○ Expand residential, commercial, & yard recycling ○ Recover and utilize landfill methane ○ Public waste reduction program ✓ Waste reduction purchasing for County operations 	

Fort Collins, Colorado

I. INTRODUCTION

Whether through the City's Action Plan for Sustainability, Air Quality Action Plan, or climate protection initiative, Fort Collins has realized that social, economic and environmental issues are closely intertwined. Fort Collins' organized, detailed, and comprehensive approach to climate action and sustainability has not only produced results, but also a firm foundation on which to build future progress. Biannual monitoring and quantifying of climate action measures has allowed Fort Collins to target sensitive areas, adjust as needed, and achieve and demonstrate measured success. Through this comprehensive approach, Fort Collins was able to avoid approximately 241,000 tons of carbon dioxide in 2004.

II. BACKGROUND

City Profile

Fort Collins is a moderately sized college community of 139,000 people located along the front range of the Rocky Mountains in Colorado, approximately 70 miles north of Denver. It is a regional shopping and employment center for northern Colorado and Southern Wyoming. As such, the city deals with issues similar to other communities of its size. It has been experiencing an average growth rate of three percent. The city finds itself addressing transportation needs, demands on infrastructure, and continued pressures on the local environment as a result of this growth.

III. CLIMATE ACTION

Combating Climate Change: The First Steps

Fort Collins' climate protection initiatives grew out of the earlier 1985 *Air Quality Monitoring and Control Plan for the City of Fort Collins*. This plan was the first City action to address air quality; however, it did not mention greenhouse gases or climate change. By 1993 international awareness of climate change was heating up. With encouragement from its Citizen Air Quality Advisory Board (CAQAB), Fort Collins decided to expand and revise its Air Quality Monitoring and Control Plan to provide a more comprehensive long-term planning framework to protect air quality, to integrate new strategies with existing strategies and programs, and to expand the scope to include new areas of concern such as air toxics and greenhouse gases. One particular citizen specifically encouraged the City to join ICLEI's Cities for Climate Protection Campaign. In the same year, the City officially adopted the new Air Quality Policy Plan, and in 1995 the Air Quality Action Plan.⁹ Important aspects of the Plan included the creation of the Air Quality Task Force to serve as an advisory body to the City Council, the addition of greenhouse gases as "moderate priority pollutants," and the directive to join CCP. In 1997, the principles and policies of the Plan were revised and "Global Climate" became a targeted policy.¹⁰

⁹ Fort Collins Air Quality Plan. 2004. <http://fcgov.com/airqualityplan/pdf/airqualityplan.pdf>

¹⁰ Fort Collins Air Quality Policy Plan. 1993. <http://fcgov.com/airquality/93-97aapp.php>

Joining the Cities for Climate Protection

Fort Collins officially joined the CCP in 1997. Resolution 97-97 identified multiple community benefits as outcomes of joining the CCP including, “decreasing air pollution, creating jobs, reducing energy expenditures, and saving money for the City government, its businesses and its citizens.”¹¹ The Resolution further committed the city to develop a Local Action Plan (LAP) that would outline the steps the City would take to reduce greenhouse gas emissions. The Resolution called for an initial audit of the quantity and sources of greenhouse gas emissions released by the community, a forecast of future emission levels, and the recommendation of a specific greenhouse gas reduction target. The last component of the resolution was to develop a strategy to meet the reduction target including specific steps and their estimated impacts.¹²

With the completion of the *Fort Collins Local Action Plan to Reduce Greenhouse Gas Emissions* in the Fall of 1999, the City solidified its commitment to climate protection and fulfilled a requirement of the resolution. Upon completion, the City Council passed Resolution 99-137, which set the Local Action Plan into action with the declaration that the city would:

- Continue to identify new measures and implement proposed measures to reduce greenhouse gases;
- Establish an Energy Management Team to oversee the implementation schedule of measures;
- Submit a biennial report that evaluates greenhouse gas reduction efforts and recommends future actions for consideration; and
- Reduce greenhouse gas emissions by at least 30 percent below predicted 2010 levels.

Developing the Local Action Plan

The City chose an inclusive strategy to develop its Local Action Plan that emphasized gaining early support from City departments, staff and the community. To achieve this, two committees were established: a Citizen Advisory Committee and a Staff Technical Committee. The City invited local businesses, environmental organizations, and scientists to participate in a Citizen Advisory Committee to provide critical input from a community perspective and develop a list of new measures to reduce emissions. This committee included representatives from four citizen boards of the City Council, the Chamber of Commerce, the Sierra Club, Colorado State University, and the U.S. Geological Survey.

The Staff Technical Committee also considered measures to reduce greenhouse gas emissions. It functioned as a direct link between City departments and determined how proposed measures would work within the framework of existing policies. This committee included representatives from City departments such as Building and Zoning, Facility Services, Fleet Services, Forestry, Natural Resources, Purchasing, Transportation Planning, Travel Demand Management, and Utilities. The primary objectives of these committees were to build consensus for the project early on and ensure coordination among existing programs that contribute to climate protection. Each committee prioritized suggestions on the basis of technical or logistic limitations, potential greenhouse gas reduction, cost, and political feasibility. A lead staff person in the Natural Resources Department, with assistance from a local pollution prevention consultant, provided logistical support for the committees.

¹¹ Resolution 97-97 of the Council of the City of Fort Collins Authorizing the City of Fort Collins to Join the Cities for Climate Protection Campaign, passed July 1, 1997. <http://www.fcgov.com/climateprotection/ccpresolution.php>

¹² Resolution 97-97 of the Council of the City of Fort Collins Authorizing the City of Fort Collins to Join the Cities for Climate Protection Campaign. <http://fcgov.com/climateprotection/ccpresolution.php>

Once the committees, staff support, and consultant were in place, the City followed a straightforward process to develop its Local Action Plan based on seven concrete steps. These steps provided an organized approach that would ensure the plan was both comprehensive and detailed.

1. **Identify and measure effectiveness of existing greenhouse gas reduction policies and programs**

The consultant gathered information on existing programs, proposals for future programs, and reasons for eliminating or retaining certain programs by interviewing city staff and community members. Analysis considered programs within and outside City government.

2. **Identify new programs and estimate local feasibility and cost-effectiveness**

The consultant compiled a list of alternative measures and local feasibility based on committee suggestions and information from cities and counties with similar policies and programs.

3. **Set a reduction target and write the Local Action Plan**

The committees held regular meetings to review the information gathered in steps one and two in order to identify measures that could be accomplished by 2010. The contents of the Local Action Plan would include:

- Baseline inventory and forecasts of greenhouse gas emissions;
- Greenhouse gas reduction target of 30 percent below projected 2010 levels;
- Recommended strategies to meet the target;
- Budget and staffing needs for implementing recommended strategies;
- Recommendations for public education and outreach; and
- A monitoring and evaluation plan for measuring progress.

4. **Build public support for the Local Action Plan**

City staff and the consultant implemented public participation strategies. They held public meetings to introduce the plan and gather comments. After the draft plan was completed the City hosted another public meeting and an internal open forum for City employees to gather comments. At the conclusion of the comment period, the committees reviewed the comments and evaluated necessary changes to the Local Action Plan.

5. **Evaluate benefits and costs**

City staff and the consultant prepared estimates of the costs and benefits associated with proposed measures. Just prior to drafting the Local Action Plan, both the Citizen Advisory Committee and the Staff Technical Committee ranked all the proposed new or pending measures taking into account costs, benefits, and ease of implementation. This assessment smoothed the adoption process by addressing council members' questions about costs and expected benefits.

6. **Receive City Council approval of the Local Action Plan**

The City held a study session with the City Council midway through the process to obtain guidance on the directions being taken in the emerging plan. The success of this meeting and inclusion of Council's input led the City Council to adopt the Local Action Plan in 1999.

7. **Prepare for implementation of the Local Action Plan**

Once the Council adopted the Local Action Plan, an Energy Management Team was created to develop an implementation schedule. The adopting resolution also called for a biennial report to be submitted to City Council that evaluates past greenhouse gas reduction efforts and recommends future measures for consideration beyond those included in the Plan.

ACTION PLAN COMPONENTS

The Local Action Plan includes an inventory of 1990 greenhouse gas emissions, a forecast of future 2010 emissions, and a target by which emissions will be reduced by 2010. It also includes strategies and measures that the City will follow in order to successfully meet its target.

Inventory and Forecast: In order to set an emissions reduction target and develop an effective plan to meet the target, the City first needed to establish its baseline emissions level. The City chose 1990 as the base year because high quality data was available on energy use, transportation, and waste generation. In addition, the year matched CCP recommendations and those embodied in international agreements such as the Kyoto Protocol. The inventory determined that in 1990 the community emitted approximately 1,360,000 tons of CO₂ or 15.5 tons per person.

The base year emissions inventory was then used to forecast emissions levels for 2010 assuming no actions would be taken to actively reduce greenhouse gases in the community. This forecast was made by applying annual growth multipliers supplied by local utilities, the Department of Transportation, and the City Planning Department to base emission levels in the sectors of electricity and natural gas, transportation, and waste. The analysis determined that community 2010 emissions would be approximately 3,523,000 tons of CO₂ or 159% higher than 1990 levels.

A similar analysis was applied to the City's internal operations. The local government itself produced 39,736 tons of CO₂ in 1990, accounting for about three percent of community-wide emissions. Quantifying the municipal emissions separately helped the City take action specifically aimed at reducing municipal emissions and allowed it to demonstrate a leadership role.

Reduction Target and Strategies: Fort Collins emphasized emissions reduction strategies in its Local Action Plan involving all sectors of local government and community activity. These included a combination of existing measures that had already been implemented, measures under consideration, and new measures that emerged out of the process of creating the action plan. (See the attached table for a list of measures incorporated into the plan.)

Taken together the measures identified for implementation would yield a 32 percent reduction in greenhouse gas emissions below the forecasted 2010 emissions level. When fully implemented this analysis illustrated in detail how the City could influence emissions levels and was the key factor in the decision to officially adopt a 30 percent reduction target. This target would limit the community's emissions growth to 77 percent above the baseline from the 159 percent growth originally forecasted.

IMPLEMENTING THE LOCAL ACTION PLAN

As adopted by Resolution 99-137, the City created an Energy Management Team, composed of representatives from Utilities, Facility Services, Transportation Services, Purchasing, Forestry, Parks, Building and Zoning, and Natural Resources responsible for "maintaining a focus on climate change abatement activities within the City government."¹³ The Energy Management Team, initially housed in Utilities but subsequently transferred to Facilities, took the lead in overseeing implementation of the Local Action Plan.

Climate protection activities are largely funded through existing City budget and staff time, but have been supplemented by outside grants. Funding specifically dedicated to climate protection was not allocated initially because climate protection measures were projected to bring cost savings to the City

¹³ Fort Collins Local Action Plan to Reduce Greenhouse Gas Emissions. 1999. <http://fcgov.com/airquality/lap.php>

over time. Each department is assigned responsibility for the implementation of specific measures. These responsibilities include making necessary budgeting and staffing requests and including climate protection actions in annual staff work plans. Because budgeting and staffing responsibilities are allocated to various departments, the Energy Management Team must work hard to ensure that greenhouse gas reduction measures are considered in traditional budgeting mechanisms. In 2006, the Climate Wise program began receiving dedicated funding from the City's General Fund.

Climate Wise

Fort Collins' award winning Climate Wise program was launched in 2000 as a key component of its Local Action Plan. This innovative program creates a one-stop gateway for a number of related pollution prevention services available to local businesses—from energy efficiency and green power to solid waste reduction and transportation management. Businesses voluntarily commit to take steps to reduce their greenhouse gas emissions, and in exchange receive technical assistance, public recognition, and networking opportunities. The initial forecast included in the Local Action Plan estimated that the program would reduce greenhouse gases by 93,390 tons of CO₂ per year. Participating businesses already have reduced emissions by over 95,000 tons of CO₂ per year (2004).

Results to Date

Between 1990 and 2004, emissions levels in the city increased by 81 percent to 2.47 million tons per year, while population increased by 53 percent. At the same time, measures implemented by the City since 1990 have avoided approximately 9 to 10 percent of the community's total annual emissions. The first biennial report confirmed that in 2000 the City avoided 190,000 tons of CO₂. In 2001-02, the City avoided 237,000 tons of CO₂, and the latest report (2003-04) declared that the City had avoided 241,000 tons of CO₂ in 2004. City wide emissions would have been closer to 2.71 million tons in 2004 if no action had taken place.

The majority of reductions (54 percent) in 2004 came from businesses and organizations through recycling, purchasing wind power, energy conservation, trip reduction, and participation in the Climate Wise program. Municipal achievement accounted for 14 percent of total reductions through efficiencies in an electricity distribution system, methane flaring at the wastewater treatment plant, and the purchase of wind energy.¹⁴

VI. OTHER RELATED CITY PROGRAMS

The 2003 Electric Energy Supply Policy

Since the adoption of its Local Action Plan in 1999, Fort Collins has maintained its commitment to climate protection. Because Fort Collins owns its own electric utility, it was able to adopt an Electric Energy Supply Policy that instated a one percent fee on energy bills to fund City energy efficiency programs. In addition to funding efficiency projects, the Policy also established a citywide renewable energy goal of 15% by 2017, a reduction of per-capita energy consumption to 10% below 2002 levels by 2012, and a reduction of peak demand by 15% by 2012. Reduction of greenhouse gases was cited as a major justification for the policy. This Policy demonstrates Fort Collins' willingness to integrate climate protection into related policies and goals.

¹⁴ City of Fort Collins 2003/2004 Climate Protection Status Report. *Energy Management Team. November 2005.*

SUSTAINABILITY ACTION PLAN

In order to position the City government as a community leader in economic, social, and environmental sustainability, the Environmental Leadership Team developed the Sustainability Action Plan in September 2004. The Plan identifies and recommends policies and measures that advance sustainability within City operations with a unified, cross-departmental approach.¹⁵ The Plan is meant to be a guiding document that will allow Fort Collins to improve internal operations and demonstrate to the public that the City spends tax dollars responsibly and is a leader in environmental progress. Furthermore, the Plan unites all departments under a common framework with the goal of improving sustainability performance. Examples of sustainability goals include establishing City purchasing guidelines, purchasing the most fuel efficient and/or lowest emission vehicles and increasing the mental and physical health and safety of employees. The City's Community Planning and Environmental Services area provides funds to implement the Plan. Many of the City's sustainability goals will reduce greenhouse gas emissions in the process. Fort Collins anticipates the future development of a sustainability plan that will engage the entire community.

FUTURE CLIMATE ACTIONS

The development and expansion of existing programs, like the Climate Wise program and the building of bike paths, is one powerful way that Fort Collins continues to reduce greenhouse gas emissions. The City has planned to extend its climate protection program into new areas by:

- Developing an emission factor for water consumption that will connect water conservation to energy conservation and greenhouse gas emissions;
- Providing biodiesel (B20) to 100 percent of City vehicles;
- Conducting a demonstration project of building a hydrogen electrolyzer fueling station next to the existing natural gas fueling station with the potential to fuel municipal buses;
- Replacing all retired buses with buses fueled by natural gas; and
- Hiring an Energy Performance Contractor to audit and retrofit municipal buildings.

IV. CONCLUSION

Fort Collins' comprehensive approach to climate action initiatives has enabled the City to maintain its commitment, track progress, and adopt new greenhouse gas reduction strategies. Building both staff and community input and support through the Local Action Plan development process ensured that the final Plan was realistic, inclusive, and feasible. The Energy Management Team's biennial Status Reports, which quantify and assess results, enable the City to expand in new directions and highlight calculated success. The strong commitment of City staff has ensured that future progress will surely occur.

LESSONS LEARNED

- By following a highly organized and directed schedule the City developed its Local Action Plan efficiently and effectively.
- Staff and community input in the planning process helped to build political support.
- Formation of a City "Energy Management Team" to oversee implementation, biennially report progress, and assess new actions has been an important tool to maintain momentum.
- Biennial Status Reports that both assess and quantify progress allow Fort Collins to demonstrate progress and identify issues deserving attention.

¹⁵ City of Fort Collins Action Plan for Sustainability: Policy and Recommended Strategies. *September 2004.*

- The Action Plan for Sustainability and Electric Energy Supply Policy illustrate sustained commitment to reducing greenhouse gases.

TIMELINE

1985	Fort Collins Air Quality Monitoring and Control Plan released
1993	Air Quality Policy Plan released
1994-95	Air Quality Action Plan released, including action to “join CCP”
1997	Resolution 97-97 of the Council of the City of Fort Collins Authorizing the City of Fort Collins to Join the Cities for Climate Protection Campaign adopted
1997-99	Local Action Plan developed
1999	Air Quality Action Plan Update released Local Action Plan completed Resolution 99-137 of the Council of the City of Fort Collins Establishing a Policy to Take Cost-Effective Actions that Benefit the Community to Reduce Local Greenhouse Gas Emissions adopted
2000	Climate Protection Status Report released
2001-02	Climate Protection Status Report released
2003	Electric Energy Supply Policy released
2003-04	Climate Protection Status Report released

FORT COLLINS 1999 LOCAL ACTION PLAN HIGHLIGHTS

Focus Area	Goals	Existing Measures	Proposed Measures
Energy	<ul style="list-style-type: none"> ▪ Encourage “green building” practices 	<ul style="list-style-type: none"> ▪ Solar panels for street crossing signals ▪ REACH-home weatherization program ▪ ClimateWise for businesses ▪ ZILCH: Zero Interest Loans for Conservation Help 	<ul style="list-style-type: none"> ▪ Replace traffic signals with LEDs ▪ Reduce City building energy use 15% below 1990 levels ▪ 4% mandatory renewable energy ▪ Green building program for residences ▪ Commercial Building Code update 2006
Transportation	<ul style="list-style-type: none"> ▪ 14% shift away from single occupancy vehicles by 2015 ▪ VMT growth should not exceed population growth ▪ Increase transit ridership to 2 million by 2002 ▪ Provide transit to 70% of population 	<ul style="list-style-type: none"> ▪ New zoning regulations to promote higher density and transit ▪ Expand bike paths ▪ Transportation impact study required for new developments ▪ Increase parking charges ▪ Expand TransFort routes and hours ▪ Free bus passes to City staff ▪ City telecommute and flex-time options 	<ul style="list-style-type: none"> ▪ Fort Collins-Denver Commuter Rail ▪ Push for tighter fuel efficiency standards ▪ Build a CNG Fueling station for City bus fleet ▪ Provide 100% Biodiesel for City vehicles ▪ Support “Plug-In Hybrid Vehicle” campaign
Renewable Energy Resources		<ul style="list-style-type: none"> ▪ Wind Pilot Program 2 turbines supply 600 residential and 6 industrial customers 	<ul style="list-style-type: none"> ▪ City government purchase wind power ▪ Build 5 more wind turbines
Waste Reduction & Recycling	<ul style="list-style-type: none"> ▪ Increase recycling vol. 10% ▪ Increase composting in City govt 25% from 1997-2000 ▪ 10% reduction of municipal solid waste 	<ul style="list-style-type: none"> ▪ Pay-As-You-Through trash rates ▪ Curbside recycling at no extra charge ▪ Business Recycling program 	<ul style="list-style-type: none"> ▪ Construction debris recycling ▪ 50% diversion goal ▪ Landfill gas to Energy ▪ Use the Resource Recovery Farm as the location for an “eco-industrial” park
Vegetation	<ul style="list-style-type: none"> ▪ Increase health, stability and diversity of the urban forest through maintenance, tree stewardship, and plantings. 	<ul style="list-style-type: none"> ▪ Support tree plantings ▪ Promote tree stewardship 	<ul style="list-style-type: none"> ▪ Plant 3600 trees ▪ Increase mortality age of City owned trees with proper maintenance ▪ Quantify carbon sequestration in City-owned natural area
Purchasing & Education		<ul style="list-style-type: none"> ▪ Municipal pilot of environmentally preferable products purchasing ▪ Hire a “Climate Change Education and Outreach Coordinator” 	<ul style="list-style-type: none"> ▪ Climate change education and outreach ▪ Energy efficiency training for builders

Burlington, Vermont

I. INTRODUCTION

The City of Burlington's commitment to climate protection takes a different approach than other Cities for Climate Protection participants. Recognizing its unique opportunity with a municipally owned electric utility, tenuous funding, and limited sphere of influence, Burlington has created a Climate Action Plan tailored to achieve targeted, realistic near-term goals. In addition, the City has integrated climate protection into broader City programs and plans, ensuring that climate protection will remain a long-term priority. Burlington's primary successes in emissions reductions stem from the Electric Department's energy efficiency programs, its commitment to renewable energy sources, and the City's public outreach campaign – the 10% Challenge. To date these programs have enabled Burlington to avoid approximately 53,000 tons of CO₂ annually.

II. BACKGROUND

City Profile

Burlington is located on the eastern shore of Lake Champlain between the Adirondack and Green Mountains. With a population of 40,000, Burlington is both the largest urban center and the economic hub of Vermont. It has a strong mixed economy of manufacturing, service-based and retail companies, as well as a major university and several colleges. Burlington residents are generally environmentally conscious and supportive of environmental initiatives.

The Burlington Electric Department

The Burlington Electric Department (BED), a "citizen-owned" non-profit municipal energy company that has provided electricity to the City of Burlington since 1905, has a long history of implementing energy efficiency programs. Throughout the middle of the century, BED electricity was generated at the Moran coal-fueled power plant. The plant added oil and natural gas firing in the early 1970s, and wood burning began in 1977.

As the demand for electricity rose and the Moran plant was slated for retirement in the 1970s and 80s, BED began to look for alternative ways to provide additional generating capacity. Studies identified wood as a fuel source that was locally available, reliable, renewable, cost-effective, CO₂-neutral, and publicly acceptable. In 1978, voters approved a bond to finance the construction of a wood-fueled power plant. In 1984, the McNeil Wood-Powered Electric Generating Facility, the largest wood-fired plant of its time, began operations. BED owns 50% of the 52-megawatt plant.

The benefits of the wood-fueled plant are numerous: the plant and its forestry operations have contributed over \$90 million to the regional economy since 1984, the consumption of wood displaces 360,000 barrels of imported oil annually, high harvesting standards promote healthy forest stewardship of over 30,000 acres, and strict air quality controls limit stack emissions to one-tenth of Vermont standards and one one-hundredth of Federal standards.

The McNeil plant supplies 27 percent of the City's energy and BED purchases additional energy from outside providers. Forty-six percent of Burlington's total energy supply is renewable. This number is predicted to increase in the future, as the City looks to expand its capacity for wind-generated power.

Other peak energy is supplied by small City-owned gas turbines on the waterfront and about 0.5 MW of power is generated from methane capture at the former City landfill.¹⁶

History of Energy Efficiency Programs

Energy efficiency projects began when voters approved an \$11.3 million bond for BED to launch an energy efficiency program in 1990. Since 1990, the funds have been used to leverage an additional \$4.5 million. In addition to funding from the bond, since 2003 BED customers, along with all Vermont ratepayers, pay a small monthly charge (\$0.00272 per kWh) to support energy efficiency programs. Programs to reduce energy consumption include:

- **Smartlight:** leases compact florescent fluorescent light bulbs to consumers;
- **Neighbor\$ave:** household and business energy audits, fluorescent light bulbs, and water and energy saving measures for electric water heaters;
- **Heat Exchange:** assistance and subsidies for customers to convert from electric heating to other heat sources;
- **Top 10 and Energy Advantage:** “positive cash flow” financing for investment in demand-side management measures for largest electric customers and small businesses; and
- **Energy-Efficiency Guidelines:** building standards and technical assistance and incentives for customers to replace outdated equipment.

Without these efficiency programs it is projected that Burlington would have used 21% more electricity in 2005 than in 1989, the year before the energy efficiency programs began. Instead, electricity use is only 2 percent greater than in 1989.¹⁷

III. CLIMATE ACTION

In the early 1990s Burlington’s officials and community members decided that they wanted Burlington to be the most sustainable city in the United States. When City officials learned about ICLEI’s mission and model for achieving sustainability through the reduction of greenhouse gas emissions, their decision to join was an easy one. In 1996, Burlington’s formal climate protection program began when the City Council adopted a resolution to join ICLEI’s Cities for Climate Protection Campaign. In 1998, the City Council commissioned the development of a Climate Action Plan (CAP), set a reduction target for 10 percent below 1990 levels by 2010, and established a Task Force to help achieve that goal. The Climate Protection Task Force was headed by BED and the City’s Planning Department. It also included participation of other Chittenden County towns, county-wide service providers and commissions, key staff from other City departments, the University of Vermont, Fletcher Allen Health Care, and other state government and non-government organizations. The discussion between state, regional, and local stakeholders produced a socially and economically feasible Climate Action Plan in 2000 by including crucial proposals and rejecting those that were unattainable or unimportant.

Climate Action Plan

The 1998 resolution to develop a Climate Action Plan also called for the finalization of Burlington’s baseline emissions inventory, the utilization of CCP Software to project future emission levels, and the creation of a list of current climate protection activities. The timeline proposed developing the plan by the year 2000 and implementing it between 2000 and 2005.

¹⁶ 2005 *Performance Measures Report*. Burlington Electric Department, March 2006.

¹⁷ 2005 *Performance Measures Report*. Burlington Electric Department, March 2006.

By the time the Task Force had fully assessed potential climate protection activities it was clear that the City would not be able to reach the initial target due to inadequate resources. Instead the Task Force recommended an annual emissions reduction goal of 156,000 tons per year by 2005, or 10% below 1997 emission levels. The Climate Action Plan outlines five main strategies to reduce emissions:

1. Implement climate action plans for municipal buildings and operations

- Direct City Departments to develop necessary implementation steps
- Establish a revolving energy efficiency fund for future municipal efficiency upgrades
- Appoint an energy and environmental services coordinator to monitor and assist

2. Support full implementation of planned (2000-2005) energy efficiency programs

- Assist statewide energy efficiency utility to increase participation in energy efficiency programs
- Raise public awareness of the links between climate change and energy efficiency

3. Public education campaign: 10% Challenge

- Develop campaign as a public effort to encourage and track community climate actions
- Support amendments to local and regional plans to help achieve target and deliver message to the region

4. Support biomass district energy and renewable fuel supply options

- Encourage McNeil station to maintain leadership role in advancing renewable energy technologies
- Support renewable energy demonstration projects, like wind generators and solar
- Pass a resolution that encourages the use of McNeil station's cogenerated heat for use by Burlington customers

5. Transportation demand management

- Generate political support for climate-friendly transportation at state and national levels
- Join with state to implement Clean Cities Program
- Investigate and implement green fleet opportunities
- Link bike/recreation paths and strengthen regional non-motorized transportation connections
- Encourage expansion of transit and a regional commuter rail

Public Outreach & the 10% Challenge

In a meeting held a few months after the adoption of the Climate Action Plan (January 2001), the Task Force identified a public outreach campaign as the highest priority for achieving emissions reduction goals. At the same meeting the Task Force changed its name to a more marketable title, the Alliance for Climate Action. Of the five goals identified in the Climate Action Plan, the public outreach campaign was projected to achieve the greatest amount of greenhouse gas emission reductions by potentially avoiding 70,000 tons of greenhouse gases. The Alliance believed that in order to be successful it needed the public to be aware of climate change and actively supportive of reduction activities. Due to the small cost investment, straightforward development, and quick results, City staff could have the most control over this type of program and would be able to create tangible emissions reductions.

Thus the 10% Challenge became the focus of resources and staff time for fifteen months, until its unveiling in May 2002. The project was headed by a directing staff person who completed the initial planning process with a small staff team, interns, and the technical advice of consultants and board members. Immediately after the January 2001 meeting, staff began to apply for and soon secured sufficient funding. To develop a successful program, funds were supplied by the U.S. Department of Energy, Vermont's Department of Public Service,

federal transportation funds through the Chittenden County Metropolitan Planning Association, BED, and the donation of money and volunteer time from individuals.

The 10% Challenge program is an outreach campaign to encourage voluntary participation by individuals, households, and businesses to take action to reduce their greenhouse gas emissions. The Alliance took a multilayered marketing approach replete with a logo and brand image, web site, residential and business emissions calculators, fact sheets, media outreach, press conferences, a paid advertising campaign, newsletters, and a traveling musical road show called “Beat the Heat.” The aim of the campaign is to educate the public about climate change and the ways each person or organization can reduce their impact.

The Challenge has been successful because it educates and encourages the public to reduce emissions, in addition to allowing the City to track reduction progress. Residents and businesses sign onto the Challenge, calculate their emissions, and commit to a variety of different actions to reduce their emissions by ten percent or more. Two calculators, one for residents and one for businesses, are available on the website and allow for easy quantification. A user will first calculate his/her total emissions. Next the calculator presents various measures the user can take to reduce those emissions. The user then chooses to undertake a certain degree of each measure and a final emissions reduction total is reported. After results are submitted through the website, the City measures progress as users report their reductions.

Education initiatives are a key component of the 10% Challenge. Currently the program includes three major initiatives:

- Mow Down Pollution, Lawn Mower Exchange: offers steep discounts to the first 140 Vermonters who turn in their gas lawn mowers to participating solid waste districts.
- Vermont High Performance Schools: a partnership of state agencies, industry experts, program providers, and trade organizations, including the Alliance for Climate Action, that identifies opportunities and barriers to action, and creates, coordinates and implements a sustainability roadmap for schools.
- “No Idling” campaign: raises awareness about the environmental, health and financial costs of engine idling.

Though the 10% Challenge began in Burlington, Vermont, the program has spread across Vermont and beyond. Communities in New York, Massachusetts, Connecticut, New Hampshire, Minnesota and Colorado are interested in adopting the 10% Challenge. To date more than 1,200 households and 100 employers have signed up. Those households and businesses that pledged to reduce their emissions reduced an estimated 13,000 tons of CO₂ annually from 2002 to 2005. Though this amount falls short of the targeted amount of 70,000 tons, the program continues to attract more participants each year, and it is likely that additional greenhouse gas emissions reductions have been achieved due to continued marketing and outreach related to the 10% Challenge beyond that which has been reported.

Other Climate Protection Priorities

The Climate Action Plan included four other important ways in which the city could reduce energy, but because they were politically difficult and/or resulted in a lower amount of emissions reductions than public outreach and energy efficiency programs, these strategies were slated as lower priorities for the Alliance. Progress in these areas has been slower, although conversations continue and commitment remains.

Although the development of a biomass-fueled district energy system is the second largest measure identified in the Climate Action Plan for reducing greenhouse gases, it was not undertaken by the Alliance because other political and institutional leaders are integral to the adoption of this project, rather than City staff. Depending on the extent of the distribution system, savings in emissions could range from 32,000 to 50,000 tons of CO₂ annually.

These savings would be incurred by retrofitting the McNeil plant and other building facilities to take advantage of cogeneration, which would significantly improve overall efficiency of fuel use. Boilers would no longer be necessary in facilities and the use of imported oil, natural gas, electricity, and emissions would be greatly reduced. City staff have little control over the economic feasibility of the proposal because it requires the commitment of institutional customers to make investments for facility modifications and energy purchasing commitments up front. Even so, the Alliance continues to support this proposal and encourage the Mayor to solicit institutional commitment.

The transportation sector continues to emit one-third of total emissions, and progress toward reducing emissions has been slow in this area. Because expensive, large-scale projects will be necessary to significantly reduce single-occupancy vehicle travel, the City has not yet embarked on large-scale transportation planning. The Alliance, however, has recently partnered with the Lake Champlain Committee (a nonprofit environmental group) and Chittenden County Transportation Authority to expand "Curb Your Car Day," an effort to encourage people to use public transit, bike or walk, to a week-long campaign, "Way to Go Week." As funding allows, the Alliance will increasingly support transportation initiatives in the future.

Commitment to Sustainability: The Burlington Legacy Project

In 2001, the City's Climate Action Plan was integrated into a long-range sustainability plan called the Burlington Legacy Project. For over a year a diverse group of people from all segments of the community engaged citizens from all Burlington neighborhoods in discussions to develop a sustainable vision for the community's future. The Project provides a roadmap for Burlington to encourage economic growth, strong social ties, and proper environmental management. It also outlines ways in which the City can improve quality of life, increase participation in community decision-making, provide youth with high quality education and support, and preserve environmental health. Measures that promote climate protection are included in the Environment Chapter of the Plan, including those that promote alternative fuels, reduce vehicle miles traveled, and increase energy efficiency.

Financing and staffing for Burlington's sustainability initiatives are managed across municipal departments included in the Project. A \$98,000 grant from the U.S. Environmental Protection Agency and other private foundation grants have provided funding for three staff: a Project Director and two community organizers. Future directions will be included in the comprehensive Municipal Development Plan and community involvement will remain high.

Results to Date

BED's energy efficiency programs since 1990 have resulted in total savings of 61,250 MWh, for an average annual savings of \$6.7 million. Consequently, an average 40,000 tons of CO₂ per year has been avoided (650,000 tons over the lifetime of the projects). BED has estimated that \$26 million has been invested into energy efficiency programs by BED and its customers' direct investments. While the local economy and population has grown, annual electricity consumption is only 2 percent greater than in 1989.

The 10% Challenge has also produced measurable results. Household participation has grown over 200 percent from 2001 to 2005. The 1,200 households who completed their emissions calculations have pledged to reduce their emissions by 9,456 tons. The most popular actions selected (as a percentage of total emissions) include: reducing solid waste, purchasing a more fuel efficient vehicle, installing more efficient lighting, installing an ENERGY STAR heating system, and purchasing an ENERGY STAR refrigerator. On average, reduction measures totaled 3,000 tons of CO₂ per year.

Over 100 employers are participating in the 10% Challenge. The 69 employers who have estimated their emissions are emitting over 49,500 tons of CO₂ annually. They have reduced their electricity usage by

approximately 11.5 percent since 2001. Altogether the 10% Challenge has encouraged residents and businesses to reduce emissions by an estimated 9,456 tons.

Future Climate Actions

Future BED projects are proposed to further the environmental and economic success of the McNeil plant. The Riverside Eco-Park has been proposed to reside next to the plant where the Intervale Food Center, a sustainable urban agriculture project, is located. The Eco-Park will consist of a complex of greenhouses and buildings utilizing “waste” heat from the plant. The Eco-Park currently contains community gardens, citywide composting, wind power, and a Living Machine demonstration project.

The 10% Challenge is planning to expand its business support and residential transportation education programs as well as its small community campaigns. There is demand to grow these activity areas, particularly as they relate to greenhouse gas emissions.

IV. CONCLUSION

The success of Burlington’s climate protection initiatives is a function of the City’s seizure of unique opportunities and a realistic approach to program development. The municipally-owned electric utility provides the City with a unique point of leverage and control over the use of renewable fuel sources and implementation of energy efficiency programs. The Alliance for Climate Action identified a public outreach campaign, the 10% Challenge, as the focus for its efforts, and this campaign has proven to be successful in engaging citizen support and commitments to reduce greenhouse gas emissions. Burlington has further committed itself to climate protection and sustainability by integrating its Climate Action Plan into comprehensive City plans and projects like the Burlington Legacy Project. For these reasons Burlington will remain a leader in reducing greenhouse gas emissions and sustainability.

LESSONS LEARNED

- The City-owned electric utility provided Burlington with a unique opportunity to control and develop successful energy efficiency and renewable energy programs.
- Since City staff had little control over the larger district energy project, a public outreach campaign, the 10% Challenge, became the core of staff efforts to reduce greenhouse gas emissions.
- The residential and business calculators on the 10% Challenge website enable staff to track emissions reductions that would otherwise be difficult to measure.
- Integrating climate protection measures into overarching City goals and programs, like the Burlington Legacy Project, ensures that they will remain a priority in Burlington.

TIMELINE

- 1960s Downtown revitalization projects undertaken
- 1973 First Municipal Development Plan released; subsequently prepared every five years
- 1989 \$11.3 million bond issued for an energy efficiency program
- 1996 City Council votes to join ICLEI's Cities for Climate Protection Campaign
- 1998 City Council commissions the development of a Climate Action Plan, sets a reduction target, and establishes a Task Force to achieve goals
- 2000 Climate Action Plan and Open Space Plan released
- 2001 Climate Action Plan and Burlington Legacy Project Action Plan included in 2001 Municipal Development Plan
- 2002 10% Challenge Campaign launched
- 2003 81 Vermont communities pass resolutions to promote use of renewable energy and reduce greenhouse gas emissions

BURLINGTON'S 2000 CLIMATE ACTION PLAN HIGHLIGHTS

Focus Area	Goals	Existing Measures	Proposed Measures
Household Opportunities	19,000 tons CO ₂ /yr	<ul style="list-style-type: none"> ▪ Residential energy efficiency programs (Burlington Electric Department - BED) 	<ul style="list-style-type: none"> ▪ Encourage citizens to develop household action plans ▪ Residential 10% Challenge
Commercial Opportunities	25,000 tons CO ₂ /yr	<ul style="list-style-type: none"> ▪ Business energy efficacy programs (BED) 	<ul style="list-style-type: none"> ▪ Encourage use of ENERGY STAR products ▪ Invest in renewable energy supplies, like solar panels ▪ Compost organic waste
Industrial Opportunities	26,000 tons CO ₂ /yr	<ul style="list-style-type: none"> ▪ Climate Wise Program: voluntary assistance in energy and pollution prevention assessments ▪ <i>Wise Rules for Industrial Energy Efficiency</i> toolkit ▪ BED systems assessment 	<ul style="list-style-type: none"> ▪ Development of "Climate neutral" products, processes, or facilities ▪ Reduce waste by recycling and reusing ▪ Use renewable or low-carbon fuels ▪ Buy ENERGY STAR products ▪ Remanufacturing
Institutional Opportunities	35,000 to 50,000 tons CO ₂ /yr	<ul style="list-style-type: none"> ▪ University of Vermont energy efficiency programs 	<ul style="list-style-type: none"> ▪ Support development of a biomass-fueled district energy system ▪ Retrofit McNeil generating station to take advantage of co-generation to raise efficiency to more than 70% ▪ Build Riverside Eco-Park
Municipal Opportunities	5,000 tons CO ₂ /yr	<ul style="list-style-type: none"> ▪ BED energy efficiency programs ▪ Municipal Buildings Greenhouse Gas Emissions Reduction Plan ▪ New construction codes for residential and rental housing ▪ Intervale Compost commercial composting ▪ Climate integrated into Burlington Legacy Project and EMPACT Project ▪ Financing for energy retrofits 	<ul style="list-style-type: none"> ▪ Improve vehicle fleet maintenance ▪ Fuel efficiency standards for new municipal vehicle purchases ▪ Convert city signals with LED lights ▪ Buy ENERGY STAR office equipment ▪ Plant & maintain 4,500 new trees on City property ▪ Amend municipal code and ordinances ▪ Build methane recovery system to generate power ▪ Allocated savings from municipal projects to revolving fund to pay for future energy investments ▪ Appoint energy and environmental services coordinator to monitor progress ▪ Divert 55% of waste from landfill
Transportation Opportunities	9,000 to 16,000 tons CO ₂ /yr	<ul style="list-style-type: none"> ▪ Chittenden County Transportation Authority equips all buses with bicycle racks ▪ Development of multi-modal transportation district ▪ Expansion of bicycle infrastructure ▪ Street improvements for multi-use traffic 	<ul style="list-style-type: none"> ▪ Expand park-&-ride lots ▪ Expand public transit system routes; increase frequency of service ▪ Charlotte-Burlington-Essex commuter rail ▪ Increased employer initiatives for ride-sharing, telecommuting & bicycling. ▪ Tax incentives to encourage public transit, vanpools & carpools ▪ Carbon-based/transportation fuel sales taxes