



CITY OF DURHAM, DURHAM COUNTY, AND DURHAM-CHAPEL HILL-CARRBORO METROPOLITAN PLANNING ORGANIZATION:

GREENHOUSE GAS EMISSIONS INVENTORY, FORECAST & TARGET

DURHAM'S COMMITMENT TO CLIMATE PROTECTION

In 1996, the City of Durham joined the Cities for Climate Protection (CCP) and committed to achieving quantifiable reductions in local greenhouse gas emissions, improved air quality, and enhanced urban livability and sustainability. In the United States, over 160 municipalities have joined the CCP. Together, these communities are home to 55 million Americans and are reducing greenhouse gases by 23 million tons per year, equivalent to the emissions produced annually by four million passenger vehicles.

In 1999, the City of Durham completed a greenhouse gas inventory and action plan as part of the CCP. This new inventory is a follow up to that document. By joining the City in the development of this inventory and local action plan, Durham County and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) have indicated their desire to take a leadership role in climate change mitigation and air quality improvement within the community.

Apart from Durham's responsibility to reduce its contribution to global climate change, there are numerous other benefits of reducing emissions in the region. Some of these benefits include, but are not limited to, increased

efficiency for local government operations, improved air quality and public health - leading to a better quality of life for all citizens, reduced energy costs which will in turn lead to the community becoming less vulnerable to the market price of energy, and job creation within new fields as well as construction.

In 2005, ICLEI Energy Services (the consulting division of ICLEI – Local Governments for Sustainability) was

retained by Durham to help develop a greenhouse gas (GHG) and criteria air pollutant (CAP) inventory and action plan and set a reduction target for the community and local governments of Durham. Using the CCP Framework and Protocol, ICLEI worked in collaboration with City and County staff and a community Advisory Committee to develop the inventory and action plan using 2005 as the baseline year and 2030 as a target year. In addition, a public

forum was held in June 2007 and public input was solicited through a survey. The targets for GHG emissions reductions for the City and County of Durham as a result of this process include a **30%** reduction from 2005 emissions levels by 2030 for the community and a **50%** reduction from 2005 emissions levels for local government operations.



This is the Executive Summary of the Durham Greenhouse Gas and Criteria Air Pollutant Emissions Inventory and Local Action Plan for Emission Reductions. The full report is available online at www.durhamnc.gov/ghg. The Durham City Council and Board of County Commissioners approved the plan on September 19, 2007.

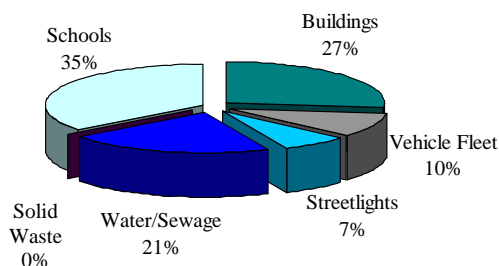
LOCAL GOVERNMENT INVENTORY, FORECAST & TARGET

Local government operations for the City of Durham and Durham County resulted in the production of approximately **158,710** tons of greenhouse gases in 2005. This accounts for approximately **2.5%** of the community's total emissions. Figure 1 illustrates the relative contribution of each sector of Durham's local government operations (including buildings, fleets, water and sewage treatment, streetlights and solid waste) to the total local government emissions profile. Durham requested that this inventory also include emissions from Durham Public Schools buildings and fleets. These emissions have been included in the schools sector.

A business-as-usual (BAU) emissions forecast scenario was developed for local government operations for the target year 2030. It was estimated that by 2030, if energy use and waste production continue to follow existing patterns, local government operations would result in approximately **205,146** tons of GHG, or a **29%** increase from the baseline year emissions.

Information was then gathered about energy efficiency and emission reduction measures that have been implemented or are planned for future implementation by the City and County. Historic measures (before 2005) have resulted in a reduction of approximately **5,630** tons of GHGs emissions annually

Figure 1. 2005 Local Government GHG Emissions

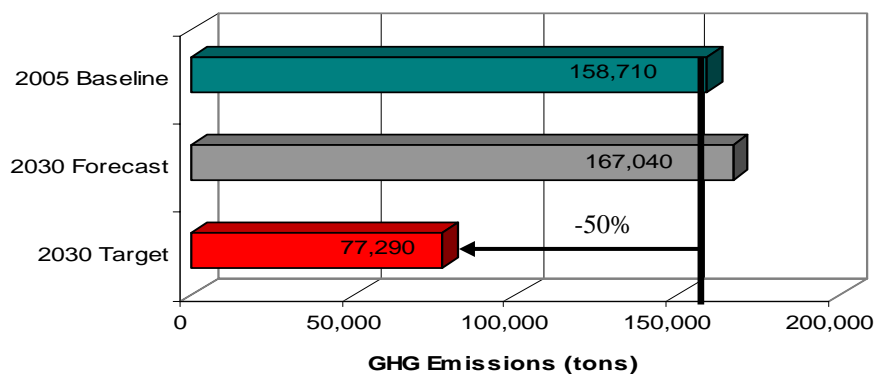


and annual energy costs savings of approximately **\$510,380**. Measures that Durham has planned to undertake in the future will result in an annual reduction of approximately **38,110** tons of GHG and **\$3,566,310** annually in energy cost savings. These reductions and savings have been through measures such as retrofitting buildings, a County green building policy, a police bike fleet, education and awareness programs and public school energy efficiency initiatives. The "2030 Forecast" scenario in Figure 2 takes into account the business-as-usual scenario and the future planned measures to provide

a more realistic estimate of where emissions are likely to be by 2030. In the forecast scenario, local government GHG emissions will be **167,040** tons in 2030, which is a **5%** increase from the 2005 baseline year emissions.

ICLEI, City and County staff and the Advisory Committee then collaborated to identify new measures that could be implemented before the target year 2030. Low, medium and high target scenarios were developed to illustrate the levels of emissions reduction that could be achievable given different levels of commitment on the part of the City and County. The low scenario predicted a **38%** reduction in emissions, the medium, a **51%** reduction and the high scenario a **72%** reduction in emissions by 2030. The Advisory Committee has decided to recommend that the City and County adopt a **50%** reduction in local government emissions by 2030.

Figure 2. Local Government GHG Emissions, Forecast, and Target



Recommended Actions for Local Government Emission Reductions

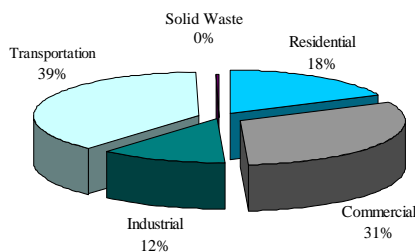
In the Local Action Plan, the Advisory Committee and ICLEI have made many recommendations for ways in which the local governments of Durham can reduce emissions in each sector of operations. Some examples include:

- Expanded energy efficiency improvements in the buildings of both the City, County, and Durham Public Schools and implementing a green building policy for all new construction and major renovations.
- New efficiency improvements in both the City and County's water and sewage operations including treatment processes, pumps, motors, etc.
- Considering offsetting emissions from buildings, streetlights and water & sewage operations by purchasing green electricity or green tags.

COMMUNITY INVENTORY, FORECAST & TARGET

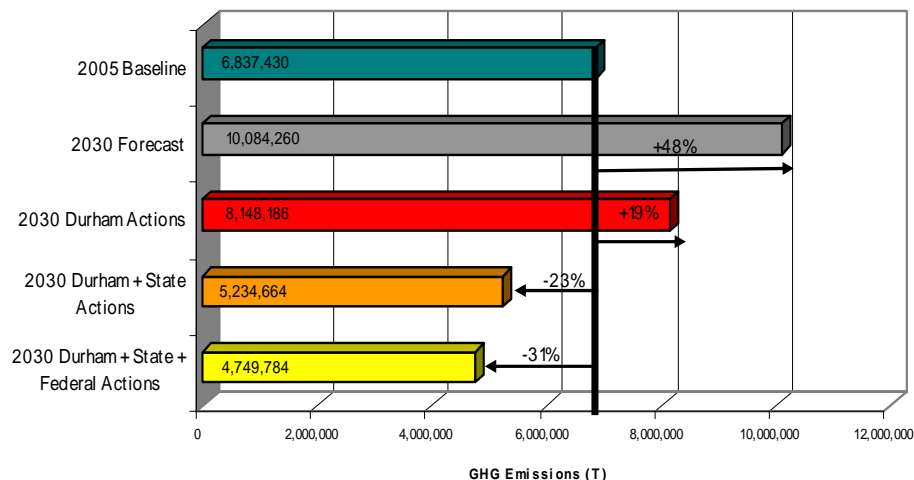
The community inventory provides an estimate of all of the greenhouse gas and criteria air pollutant emissions produced within Durham County, both by residents in their homes and by local businesses and agencies as they carried out their operations in the 2005 baseline year. In 2005, Durham produced approximately **6,837,430** tons of GHGs. Figure 3 illustrates the contribution of each sector to Durham's community emissions profile. Transportation is the largest single sector, however if the residential, commercial, and industrial sectors are combined, it is clear that buildings are the most significant source of GHG emissions in the community.

Figure 3. 2005 Community GHG Emissions



A business-as-usual (BAU) emissions forecast scenario was developed for the community for the target year 2030 using socio-economic growth factors to help determine what level of emissions reduction could be achieved. It was estimated that by 2030, if energy use and waste production continue to follow existing patterns, the community would produce approximately **10,237,010** tons of

Figure 4. Community GHG Emissions, Forecast, and Target



GHG in that year, equivalent to a **50%** increase from 2005 emissions.

Working with the Advisory Committee, ICLEI analyzed some of the emissions reduction measures already in place in the community as well as those planned for future implementation. Historic measures have resulted in approximately **152,280** tons of savings and planned measures will result in approximately **152,750** tons of emissions savings. The "2030 Planned" scenario was then developed by combining these emission reduction estimates with the BAU forecast. In the planned scenario, Durham's emissions in 2030 will be approximately **10,084,260** tons of GHG; a **47%** increase from 2005 levels.

As was done with the local government sector, potential new measures were identified and high, me-

dium and low emissions reduction scenarios were developed based on different levels of commitment on the part of the local governments. Given the scale of growth anticipated in the County and the amount of time between Durham's selected baseline and target years, it will not be possible for local governments of Durham to reduce emissions below baseline levels by 2030 on their own. The high scenario results in a **19%** increase in emissions from baseline levels by 2030, the medium scenario results in a **33%** increase and the low scenario results in a **41%** increase. The Advisory Committee has recommended that the City and County adopt the high target, which when combined with the impact of potential state and federal actions will result in a **30%** reduction in emissions from 2005 levels by 2030. Figure 4 illustrates the cumulative impact of local government, state and federal emissions mitigation strategies.

Recommended Actions for Community Emission Reductions

In the Local Action Plan, the Advisory Committee and ICLEI have made many recommendations for ways in which the local governments of Durham can reduce emissions in each community sector. Some examples include:

- Expand energy conservation measures in the commercial, residential and industrial sectors in both existing and new construction through education and awareness campaigns, partnerships, energy audits and design standards.
- Expand and enforce land use planning strategies to avoid transportation emissions related to new development through controlling urban sprawl and encouraging active transportation and transit use.
- Promote the use of alternative vehicles and fuels in the transportation sector.

IMPLEMENTATION — NEXT STEPS

The completion of the *Durham Greenhouse Gas Emissions Inventory and Local Action* report qualifies Durham for recognition of Milestones 1 and 3 in the Cities for Climate Protection Framework. The next step is for the Durham City Council, the Durham County Board of Commissioners, and the DCHC MPO to formally adopt the local government and community targets in order to achieve Milestone 2.

The Local Action Plan section of the report highlights many areas in which emissions reductions could be wrought in both the community and local government sectors. As the level of government closest to their citizens, the City and County have a unique ability to influence the community. The local governments have a major role to play in encouraging the public to reduce emissions through education and incentives. The governments of Durham can also help to coordinate the efforts of local businesses and non-profit groups in the community. Land use and transportation planners have a significant influence on the shape that a community will take and their decisions can impact not only the emissions profile of Durham, but can also help to make Durham a more socially, environmentally and economically sustainable community. In terms of the local governments' own operations, energy efficiency initiatives will result in financial savings which can be redirected into other community programming.

The development of an inventory and local action plan are major steps toward achieving GHG emissions mitigation; however, unless the plan is implemented, it will not be successful. The CCP Campaign divides these two steps into Milestones 3 and 4. Milestone 4 involves the implementation of the action plan. In order for the action plan to be successful, programs and efforts need to be coordinated across departments and between the two local governments and the DCHC MPO.

The Advisory Committee recommends that the City and County jointly fund a sustainability coordinator staff position to fulfill this role and ensure that progress is being made towards the targets. The sustainability coordinator would organize the work of City and County departments, monitor progress, update the inventory and provide regular plan updates to the City Council and County Commissioners (Milestone 5: Measuring Progress and Reporting Results). This person will ensure that the experiences, successes and failures of both governments are shared with one another. The sustainability coordinator would also pursue grants and funding and would coordinate community outreach and educational programs and work with citizens in identifying and pursuing new incentive programs, regulations, and policies to implement the plan. Timelines should also be developed to guide the implementation of the local action plan over the next 25 years.

CITIES FOR CLIMATE PROTECTION (CCP) PROTOCOL AND ACHIEVING THE MILESTONES

The City of Durham has committed to following the five milestone framework of the CCP program. These milestones are:

- **Milestone One:** Create a GHG Emissions Inventory and Forecast
- **Milestone Two:** Set a Reduction Target
- **Milestone Three:** Develop a Local Action Plan
- **Milestone Four:** Implement the Local Action Plan
- **Milestone Five:** Measure Progress and Report Results

The Durham City Council and the Durham Board of County Commissioners adopted the Durham Greenhouse Gas and Criteria Air Pollutant Emissions Inventory and Local Action Plan for Emission Reductions on September 19, 2007. Adoption by the DCHC MPO is expected in at a later date.

For more information please visit:
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This executive summary brochure was created for the City and County of Durham and the DCHC MPO by ICLEI Energy Services. For more information please contact icleicanada@iclei.org. This is a summary of a full document for the City and County of Durham and the DCHC MPO