CHAPTER I

FAIRFAX COUNTY AND GLOBAL CLIMATE CHANGE

II. FAIRFAX COUNTY AND GLOBAL CLIMATE CHANGE

A. INTRODUCTION AND BACKGROUND

In the summer of 2006, Fairfax County was approached by the Sierra Club and was asked to join its Cool Cities Program. This program was designed to help cities meet the conditions of the U.S. Mayors Climate Protection Agreement, which was to reduce their greenhouse gas outputs 7 percent below their 1990 levels by 2012. After carefully reviewing the Cool Cities protocol, county staff recommended against participation in that specific program. However, at the insistence of the Chairman and other members of the Fairfax County Board of Supervisors, county staff was asked to develop a program that would be more robust and contain similar goals and be better suited to county protocols. This program, Cool Counties, which was first mentioned by Chairman Gerald E. Connolly in his 2007 State of the County address, was developed in collaboration with the Sierra Club and other local government partners, and was officially unveiled in July 2007 at the National Association of Counties annual conference that was held in Richmond, Virginia. Much of what Fairfax County lists within the framework of this Cool Counties program was initiated previously to address clean water and clean air issues. However, on October 1, 2007, county staff presented its climate change initiatives as part of its fiscal year 2009 Environmental Improvement Program (http://www.fairfaxcounty.gov/living/environment/eip/).

B. COUNTY EFFORTS SUPPORTING THE COOL COUNTIES INITIATIVE

1. Green Vehicle Solutions

a. Hybrid Vehicle Replacement Program

The county's vehicle fleet currently has 99 hybrid vehicles: 56 Toyota Priuses and 43 Ford Escape Hybrids. The county plans to continue its hybrid vehicle replacement program in 2008. In 2005, the fuel savings from the use of hybrids amounted to 12,939 gallons of unleaded gas, which equates to a savings of 126 tons of CO_2 emissions. Most recently, the county converted one of its Priuses to a "plug-in-hybrid-electric" vehicle. This car travels up to 30 miles on electric power alone before dual power is used; it could have a fuel efficiency averaging over 100 miles per gallon of gas. The county is also pursuing grant funds to have a plug-in-hybrid-

electric school bus transition completed. It is expected that a 40 percent decrease in diesel fuel consumption would be achieved by this process.

b. School Bus Retrofits

The county has retrofitted 436 school buses with diesel particulate filters that reduce NOx emissions and indirectly benefit greenhouse gas reduction.

2. Energy Efficiency Solutions

a. Green Buildings

The Department of Public Works and Environmental Services has informally adopted the Leadership in Energy and Environmental Design rating criteria for its building designs. DPWES has also accomplished innovative energy saving measures in many of its industrial plant processes. For example, the Noman M. Cole, Jr. Pollution Control Plant uses methane gas from landfills in its sludge burning process. As noted below, methane gas is also used to generate electricity at the I-95 Landfill site. The Division of Solid Waste collects and transports trash in Fairfax County to produce electricity in the Waste to Energy Facility. The Fairfax Center and Crosspointe Fire Stations, both of which are green building project, opened recently. DPWES is incorporating the green building approach on nearly twenty active building development projects. The Park Authority will also be using green building technology on an expansion to one of its recreation centers. In addition, the county is developing Comprehensive Plan policy to address green building practices and is exploring mechanisms to encourage such practices through Comprehensive Plan guidance.

b. Energy Efficiency

The county's Facilities Management Department has started an energy efficiency program for the buildings in its inventory. In 2005, 4,232,639 kWh were saved and in 2006 an additional 2,398,036 kWh were saved. Natural gas consumption was also reduced by 111,440 therms per year. Cost avoidance has been over $3.0 million since 2001. These savings would be higher but for the new square footage that came on line during those fiscal years. This department has set an internal goal of a one percent reduction in kBTU/SF; recent numbers show an annual reduction averaging 1.9 percent. The annual savings are cumulative; therefore, after a 10 year period, reductions of 10-20 percent in energy usage per square foot are expected.

3. Renewable Energy Solutions

a. Wind Energy Purchase

The county purchased 5.8 million kWh of wind energy in 2005 from Washington Gas Energy Services/Community Energy/Mountaineer Wind Farm in West Virginia, bringing a reduction of 6.2 million pounds of CO_2 in the two-year contract. Fairfax County will continue the commitment of purchasing five percent of the general county's energy from wind in 2007 and 2008 and has made a commitment to expand to 10 percent of the general county usage in 2009.

b. Waste-to-Energy

The Department of Public Works and Environmental Services has adopted a waste-to-energy approach, recovering methane, controlling nitrous oxide and generating electricity from solid waste. Methane traps 21 times more heat per molecule than CO_2, and nitrous oxide absorbs 310 times more heat. The waste-to-energy plant at the I-95 Landfill generates electricity, offsetting the CO_2 emissions equivalent to that of an 80 MW coal-fired power plant. Also, gas produced can be sold so the recovery offsets energy that would be generated by fossil fuel.

c. Land Fill Gas Recovery and Utilization

The county is in the process of using landfill gas generated at the closed I-66 Sanitary Landfill as a fuel source to heat county buildings on the West Ox Campus. In particular, the new Department of Vehicle Services garage has radiant heaters that can be easily converted to burn landfill gas, as was done for the shop building at the I-95 Landfill. In 2005, the county began the Phase 1 planning and design for the project. Construction of the necessary infrastructure to use landfill gas from the I-66 complex (closed landfill) as a source of renewable energy to heat the Transfer Station Administration Building and Department of Vehicle Services Maintenance Garage will be accomplished in Phase 2, which is to be completed in 2007. The total project cost is $300,000, with estimated annual savings of $70,000 per year in reduced natural gas consumption. The landfill gas pipeline would be approximately 2,500 feet from the existing flare station to the garage. The project would require 4" high density polyethylene pipe to transmit landfill gas. Approximately 150-200 standard cubic feet per minute of landfill gas would be required to heat the garage. In addition, landfill gas is used to generate an additional six MW of electricity at I-95, and as fuel for sludge processing at Noman M. Cole, Jr. Wastewater Treatment Plant.

4. Land Use and Transportation Solutions

a. Board of Supervisors' Environmental Agenda and the Fairfax County Comprehensive Plan

Both the Board of Supervisors' Environmental Agenda and the county's Comprehensive Plan support development in transit-oriented, pedestrian friendly, mixed use centers. The concentration of new development in relatively high intensity, transit-oriented centers characterized by a mix of residential, employment and retail uses, and the provision of opportunities for non-motorized transportation to, from and within these centers should serve to reduce, in aggregate, the number of motor vehicle trips and vehicle miles traveled, and the associated CO_2 emissions, that would otherwise occur through more traditional suburban development patterns in the region. Numerous Area Plan Amendment and zoning actions have been taken to encourage and implement this approach to development, and the Board of Supervisors has adopted a definition and guidance for transit-oriented development in the Comprehensive Plan.

b. Ride Sharing, Telework and Other Transportation Policies

Transportation policies that serve to reduce vehicle trips and vehicle miles traveled (e.g., provision of transit support facilities; transportation demand management efforts such as ride sharing programs and incentives, telework opportunities, bicycle parking and shower facilities in offices, shuttle bus service, transit incentives, etc.) are implemented routinely through the zoning process.

c. Transportation Programs

Numerous transportation programs are also in place that serve to reduce vehicle trips and vehicle miles traveled, therefore reducing overall CO_2 emissions. These include:

- **Employer Services Program** – This program promotes transportation demand management strategies and associated outreach efforts to employers in Fairfax County, thereby reducing single occupancy vehicle trips.

- **South County Bus Plan** – This program has increased bus ridership significantly on Richmond Highway.

- **Fairfax County Transit Program** – This multi-modal transportation program supports Metro and Virginia Railway Express services. Metrorail trains will soon expand to eight car trains, VRE is replacing existing cars with double deck passenger cars, and CUE bus service will

continue to be subsidized. Ridership on all transit systems (Fairfax Connector, Metro, VRE) serving the county has increased. To further encourage the use of mass transit, on Code Red and Code Orange Days, transit systems throughout the entire region offer free rides to all passengers.

- **Metrocheck** – This is a fare card voucher program that benefits employees using public transportation. Fairfax County's Employees Transportation Benefits Program provides up to $105.00 per employee for transportation by bus, rail or vanpool.

- **Ridesources** – This program provides ridematching services to county employees and residents along with a marketing program to encourage its use.

- **County telework program --** Currently, more than 1,000 county employees telework. Fairfax County is the first jurisdiction to reach — and then exceed — the regional goal set by the Metropolitan Washington Council of Governments to have 20 percent of the eligible workforce teleworking by the end of 2005. The county's outreach efforts on telework and other transportation demand management efforts have broader benefits countywide.

Facilities that support non-motorized transportation also serve to reduce motor vehicle trips and motor vehicle miles traveled. The county has provided substantial funding for the construction of trails in support of non-motorized transportation.

d. Tree preservation and planting

Planting efforts can also reduce CO_2 concentrations, as trees sequester carbon by absorbing CO_2 during photosynthesis and by storing carbon as biomass. For every acre of forest that the county is able to preserve and keep healthy, approximately 20 to 30 tons of carbon is stored. Fairfax County's tree canopy is currently estimated to cover 41 percent (104,000 acres) of the county; therefore, this equates to between roughly two and three million tons of carbon storage. An earlier study estimated that the biomass of the county's tree canopy stored over 3.5 million tons of carbon. It has also been estimated that the county's current tree canopy absorbs and stores an additional 11,700 tons of carbon annually. A single tree is capable of absorbing and storing an additional 600 to 700 pounds of carbon per year. It has therefore been calculated that between 110 and 130 trees can offset the carbon "footprint" (77,400 pounds of carbon dioxide) that is estimated to be produced by each household in Virginia annually. These data underscore the value of the county's urban forestry programs and other efforts that serve to protect and restore tree cover.

Requirements for the preservation of Resource Protection Areas and commitments during the zoning process to tree preservation efforts, landscaping efforts and the preservation and restoration of Environmental Quality Corridors all serve to enhance overall carbon sequestration, thereby supporting reduced atmospheric CO_2 concentrations. The establishment and enforcement of limits of clearing and grading on site plans, subdivision plans and grading plans also support reductions in CO_2 concentrations, as do tree planting initiatives and public outreach focusing on land stewardship issues such as tree preservation and planting.

The Fairfax County Board of Supervisors has adopted a tree canopy cover goal for the county of 45 percent coverage by the year 2037 and has approved a tree conservation ordinance to strengthen tree preservation policies and procedures. In addition, trees were identified as a special area of interest in the FY 2008 Environmental Improvement Program.

The county continues to support legislative efforts to strengthen local government authority to require tree preservation during development.

C. NATIONAL RECOGNITION FOR COUNTY EFFORTS

Fairfax County has received national recognition for many of its efforts, including the following:

- In 2007, the county was recognized as a Green Power Partner by the U.S. Environmental Protection Agency for efforts to reduce the risk of climate change through green power purchasing.

- In 2007, the county joined the U.S. Environmental Protection Agency's ENERGY STAR® Challenge program.

- In 2006, the county received a National Association of Counties Achievement Award for Environmental Excellence for the Board of Supervisors' Environmental Agenda ("A 20-Year Vision") and for the Environmental Improvement Program.

- In 2006, Fairfax County was first among large counties in the National Association of Counties Change a Light Campaign, a two-month nationwide campaign challenging county employees to change incandescent bulbs with compact florescent bulbs.

- In 2005, the county received recognition as the U.S. Environmental Protection Agency Landfill Methane Outreach Program Community Partner of the Year Award for use of landfill gas as a renewable energy source, saving the county $5,000 a year in fuel.

- In 2005, the county received a National Association of Counties Achievement Award for "Improving Air Quality in the Washington Metropolitan Region, a Commitment to Air Quality Excellence - Air Quality Protection Strategy".

D. COMMENT

1. According to a presentation given at the June 11, 2007 Board of Supervisors' Environmental Committee meeting, the Facilities Management Department cost avoidance since 2001 for electricity is well over $3 million with part-time efforts. For example, one energy project performed by part-time efforts of one staff resulted in a cost avoidance of approximately $83,000 annually at the Government Center (variable frequency drives, lighting retrofits and lighting software upgrades).

   In addition, coordinated energy purchasing efforts could result in much larger energy cost savings. Currently, each agency independently arranges energy purchases and the result is that the Park Authority was overlooked and missed out on the opportunity to take advantage of the Metropolitan Washington Council of Government's Natural Gas reverse auction. The Facilities Management Department alone managed to secure significant savings (about $120,000) through this program which will contribute towards offsetting rising electricity costs. How much could the Park Authority have saved if there was a dedicated staff member coordinating all agency purchases?

   EQAC commends the county for its past efforts and looks forward to working with the county in the future on its climate change program.

E. RECOMMENDATION

1. EQAC recommends that the county hire an Energy Coordinator who will coordinate efforts among a number of county agencies to build coordinated, cross-agency efforts to enhance energy conservation and efficiency. The position would also provide an initial point of focus to support implementation of energy conservation practices in the county. A Countywide Energy Coordinator would serve as a central conduit of information to and from agencies and the community to better understand and leverage energy conservation practices employed, and lessons learned. This position would act as the county's expert on all matters pertaining to energy efficiency and renewable energy and work closely and collaboratively with the Environmental Coordinator and other agencies as required.